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CAVE

IN THE  
WINCHESTER MOUNTAINS  
ARIZONA



WILLIAM SHIRLEY FULTON



No. 2

THE AMERIND FOUNDATION, INC.  
DRAGOON, ARIZONA

1941

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A CEREMONIAL CAVE  
IN THE  
WINCHESTER MOUNTAINS  
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## INTRODUCTION

THE AMERIND FOUNDATION has thus far confined its field activities to Cochise County, Arizona. As undisturbed caves or sizeable rock shelters in that area are few in number, the Foundation took great satisfaction in being privileged to conduct this work in the Winchester Mountains. Perishable materials are seldom found in a good state of preservation in open sites and must be sought in places protected from undue weathering. Fortunately a sizeable quantity of such materials was found at Winchester Cave. These specimens are now housed in the Museum at Dragoon, where our complete collections may be seen and are available for study, by appointment, during the winter months.

THE AMERIND FOUNDATION, INC.  
William Shirley Fulton, *Director*

DRAGON, ARIZONA  
NOVEMBER, 1941



## ACKNOWLEDGMENT

Mr. Arnold Withers, who completed the excavation and upon whose notes a considerable portion of this report is based, unfortunately was not available when the time came to prepare the text. Credit is nonetheless his for much of its detail.

We desire to express our thanks to Mr. Harry Saxon, owner of the property, for his generous permission to carry out our excavation; to Dr. Victor J. Smith and the West Texas Historical and Scientific Society of Alpine, Texas, for the friendly loan of the dust removal equipment used in our operations; to Mr. William C. Orchard for his detailed study and drawings of the construction of the sandals; to Dr. A. C. Whitford for identification of the vegetal materials; to Dean Byron Cummings for his comments on cane tubes; and especially to Mr. E. K. Burnett and others of the staff of the Museum of the American Indian, Heye Foundation for their aid in editing the text as well as helping with many details preparatory to publication.





## A CEREMONIAL CAVE IN THE WINCHESTER MOUNTAINS, ARIZONA

**W**INCHESTER CAVE is located in the rhyolite formation of the Winchester Mountains, eighteen miles west of the town of Willcox, Cochise County, Arizona. Its elevation is approximately 270 feet above the sloping foothills and 5000 feet above sea level. A number of small openings occur in the outcropping, the largest being the cave herein described.

In the recent past bat droppings have been collected by guano hunters and it is probable that these were the first people, other than those of prehistoric times, to have used the cave for any definite purpose. While it is quite possible that the Apache Indians may have employed the cave as a camp site, there is no direct evidence of their having established it as a permanent abode. In the foothills are the remains of many mescal roasting pits presenting the characteristics of those used by the Apache.

The records of visits to this cave are meagre. It was brought to the attention of the writer by Mrs. Jessica McMurray of nearby Mule Shoe Ranch, an enthusiastic archaeologist, who had made several visits to the cave and collected from the surface some of the material herein described. When Mrs. McMurray presented her collection to the Amerind Museum in 1940 it was apparent that work should be continued toward establishing further archaeological data from the cave. In the late spring of that year an inspection trip was made by Mr. William Hayden Fulton and the author who were fortunate in finding considerable additional material and it was then decided that the

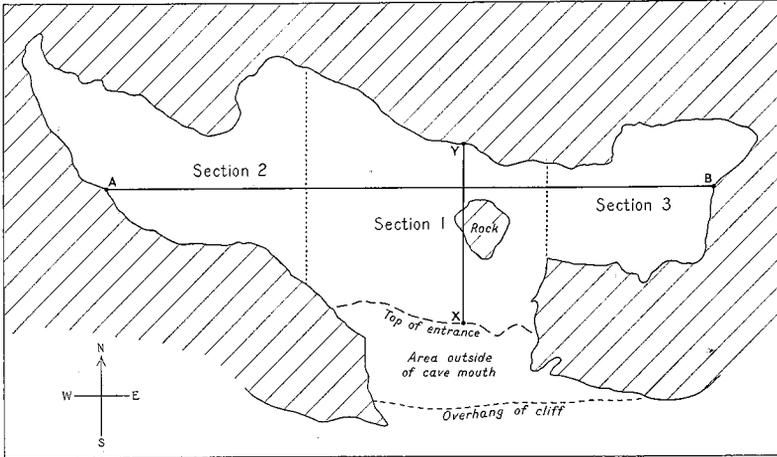
Amerind Foundation should try to obtain excavation privileges during the following season. In March 1941 Mr. Harry Saxon, owner of the property, granted us permission to undertake a thorough investigation.

While the guano collectors in their routine work had undoubtedly removed or destroyed some archaeological material and had dug some holes in seeking more fertilizer, it was not evident that pot-hunters had used the shovel to any great extent. All except the surface of the central portion of the cave appeared relatively undisturbed.

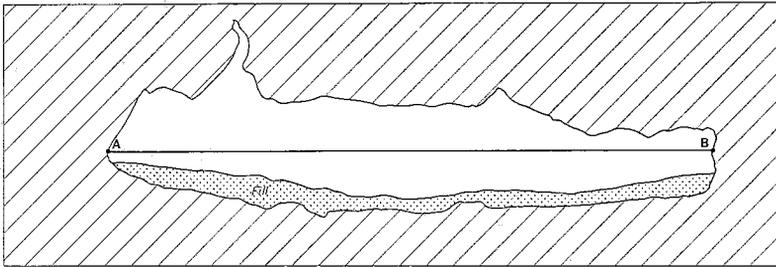
A test hole, carried to about a two foot depth without reaching bedrock, added to our hopes of finding stratified culture levels. For mapping purposes, the cave was divided into three sections roughly corresponding to its natural divisions (fig. 1). After a level area outside the entrance had been made sufficiently large to accommodate the blower and screening platform and to give working space, the initial excavation was begun at the mouth of the cave with the twofold purpose of obtaining headroom and for operations in the central section. Almost at once it was found that the depth of the fill, while varying, was only about 23 in. at the entrance and became progressively shallower as inward progress was made, and it was evident that, in this section at least, stratigraphy could not be carried out. The fill was cleared away and merely subjected to screening. Although the fill in Section 2 was somewhat deeper, reaching an extreme of 36 in. and in it were found occasional points and chipped stone, bits of wood and bark, grasses, cordage, corn cobs, manos and sherds, it also did not permit of stratigraphic excavation. It was not until the work progressed to the peripheral extremes of this wing that any quantity of the perishable materials, which were to constitute the major portion of our recoveries, was encountered. Section 3 presented much the same characteristics

# WINCHESTER CAVE

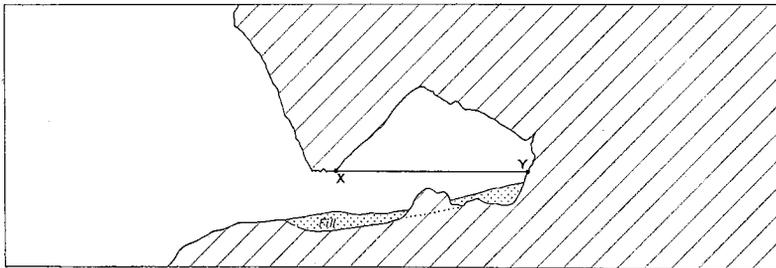
SCALE 1 INCH = 20 FEET



PLAN OF CAVE



PROFILE A-B



PROFILE X-Y

as the others, but here, although the fill was even shallower, averaging about 15 in., were found additional objects of a perishable nature, including a few sandals.

Having completely emptied the cave of its contents and having found that attempts at stratigraphy were unavailing (perishable materials having come from on, or immediately below, the surface) and having also found that one section had no different constitution from another, it became necessary to consider the fill of the cave as a whole without subdividing it into blocks or levels—the only distinction possible being between surface and subsurface areas.

It is probable that the cave was occupied to a limited extent by a people predating those whose artifacts were found at surface level. This seems indicated by the ash residue of many fires, crude manos and metates, and chipped stone—all found below surface level and unquestionably of earlier origin than the perishable material. But the paucity of findings at depth makes it futile for us to suggest the position of these earlier people in archaeological chronology.

Without further conjecture concerning its early occupants, it is our belief that Winchester Cave in its next and principal usage was exclusively a shrine. As the Winchester Mountains and the valley to the south are still in an area primarily important for wild game and grazing rather than agriculture, and as the preponderance of material recovered consists of bows and arrows, it is more than possible that here was a repository for offerings to deities of the chase and hunt. It appears, too, from the presence of quantities of unused cordage and partly worked sherds that the cave may have been used incidentally as a workshop for the making of these ceremonial offerings. These sherds are of particular interest as, undoubtedly, they were

taken to the cave as sherds and are not from vessels which had been subsequently broken within it.

In addition to those strictly ceremonial, there were the remains of a few utilitarian objects which are extremely important in their association, as they were not deposited as offerings but were left as discards or, perhaps, for future use. In this category are the worn sandals, only a few of which are in fair condition; fire-hearths and fire-sticks; and hafts and awls. Practically every other object is ceremonial in character. All of the bows and many of the arrows are miniature. Those others which had originally been utilitarian were broken beyond further usefulness.

The value of the discoveries lies not so much in the quantity of specimens or any individually unusual features among them, but in the coexistence of the several items. For example, we find sherds representing various ceramic groups including, among others, Mimbres, Dragoon, El Paso, and Hohokam to be in contemporaneous association with an Hohokam sandal, wrapped pottery discs, and arrow foreshafts with plain and bifurcated wooden points. The evidence gathered should also be of possible value in explaining the function of certain objects, such as small bows and sherd discs, recorded from the excavations of open sites and cliff dwellings, the actual significance of which has long been problematical. Diligent search over a wide range of territory for an open-site village was unsuccessful and so failed to disclose the home of the pilgrims to the shrine. Should such a site eventually be discovered and excavated, the importance of the contents of Winchester Cave would be increased.

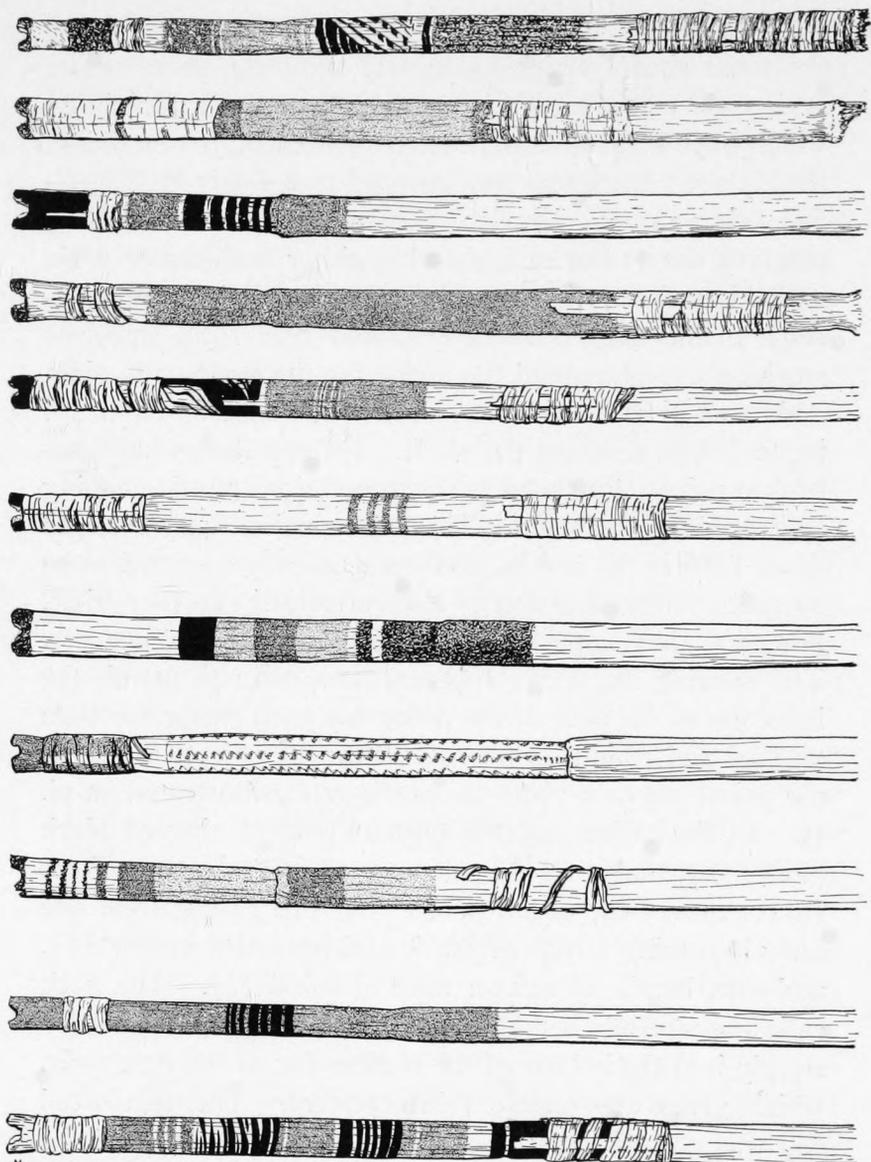


## DESCRIPTION OF ARTIFACTS

### ARROWS

Arrow foreshafts and mainshafts are classified for discussion into those of utilitarian size and employment, and those of miniature size, undoubtedly solely for ceremonial use.

UTILITARIAN FORESHAFTS (PL. II): Fifty-two foreshafts, either completely detached or with only a small portion of the mainshaft remaining, were found. These range in diameter from  $5/32$  in. to  $5/16$  in. and in length from  $4\ 1/4$  in. to  $12\ 3/4$  in. They are fashioned from unidentified wood (probably three species) and are well and carefully made and smoothed. All have some sort of tapering at the base to fit into the mainshaft, varying from those having a gradual reduction in diameter to some sharply cut away before being tapered. Foreshafts fitted into their sockets to a depth of from  $1\ 1/2$  in. to  $3\ 1/2$  in. They appear to have been first coated with pitch, assembled into the mainshaft, and the juncture then bound with sinew. Only eleven points are more or less complete and this may have been a reason for their being relegated to a ceremonial usage. Seven show burning at the tip, possibly for hardening; two have a bifurcated point; and two had been entirely painted red. One foreshaft (pl. II, *a*) is fashioned in the square, an unusual form. Its point is broken and, therefore, no knowledge may be had as to how this section was finished, but its remaining length is square until just as the socket area is reached when it assumes the usual rounded form.



Moorensen

 -RED       -OLIVE TAN       -BLACK       -SPECULAR IRON

DECORATIONS ON ARROW SHAFTS (see also pl. III)

UTILITARIAN MAINSHAFTS (PL. II): In this category are those shafts which are nearly complete, those whose nock ends are more or less intact, and those foreshafts which have a substantial amount of mainshaft remaining. Eighty-four specimens are grouped under this heading—five being nearly complete, forty-five having only fragmentary shafts but each showing either feathers or nock, and thirty-three with hafted foreshaft and part of mainshaft. The mainshafts are jointed reeds and show no working except around the nodes for the sinew wrapping. This wrapping is fairly substantial and extends from  $3/4$  in. to  $1\ 3/8$  in. along the shaft. Fifteen shafts have unbroken points, six showing sharpened tips and nine having split or bifurcated ends. These bifurcations vary in depth from  $1/16$  in. to  $1/4$  in. and are generally assumed to be so split for the insertion of a stone point. To the writer, however, they appear not practical for such a purpose. The opening not alone appears too minute to permit the insertion of the base of the point, but each prong has been worked and rounded, thus defeating the object of having the points act as a vise. Note the group illustrated on pl. II. In shafts having this type of point a ring of black paint extends about  $3/4$  in. downward from the tip. Foreshafts show little decoration. Four are painted red, one has alternating bands of black and brownish yellow (*b*), and one, bands of red on natural wood (*c*). The nock ends are carefully and artistically made. A small stick fits snugly into the hollow of the reed as far as the first node, which gives appreciable reinforcement. The reinforced end was cut off about two inches below the node and the nock formed. Three split feathers, sometimes dyed, were equally spaced around the base, secured with sinew, the bottom binding also serving at times to hold the wood

filler in place. When not so arranged, a separate binding was used for the filler and the one to attach the feathers is found farther up the shaft. Thirty-eight of the shafts have painted decoration, the area covered being confined between the butt end and the upper sinew binding (pl. III). The painting was usually done before the feathers were attached, although occasionally the bindings appear to have been painted. Some of the decorations are indicated on fig. 2. In nine specimens the black paint was found to contain specular iron.

CEREMONIAL ARROWS (PL. IV): In this classification eighty-nine were found, of which twenty-two have the complete mainshaft, some with the foreshaft in position. The foreshafts consist of almost any piece of wood roughly worked. They are loosely inserted into the mainshaft and cotton string bound around to simulate the sinew wrapping on the real arrows. No pitch was used and in only two instances was the foreshaft painted. The mainshaft is a small reed varying in length from  $8 \frac{7}{16}$  in. to  $23 \frac{1}{8}$  in. with a diameter of about  $\frac{1}{4}$  in. The two ends are cut square, not reinforced, and apparently had three small feathers attached with cotton string. In one instance this binding was dyed green. No painting was detected on any of these mainshafts.

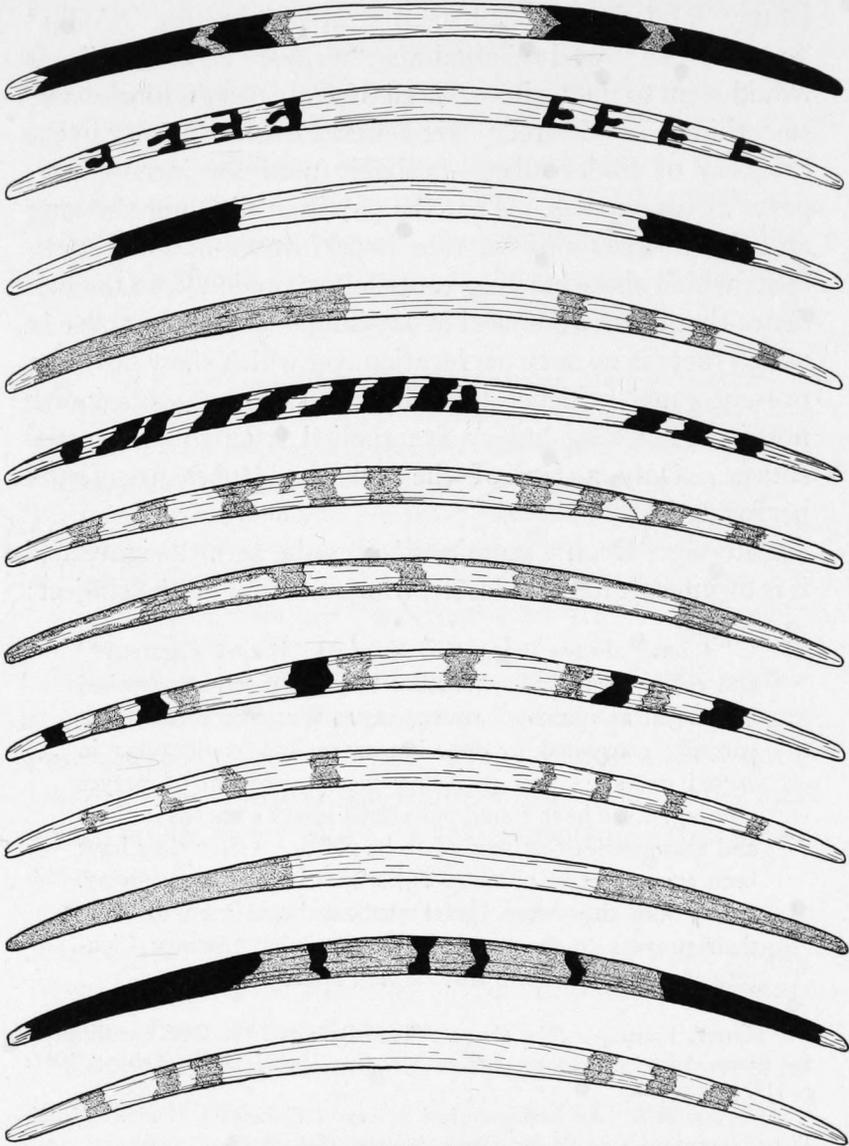
CEREMONIAL ARROW BUNDLES: One bundle (pl. XI, f) was made up of four arrows—all but one, ceremonial—held together by a loose wrapping of cotton yarn. All have foreshafts in place and one toy foreshaft is painted red. Another bundle is composed of four toy arrows, two with foreshafts, one of which is painted red. A third bundle has four toy foreshafts bound by a string of agave fibre, the specimens being all exactly 6 in. in length.

## BOWS

All bows found fall under the toy or ceremonial classification. Both complete and fragmentary, they total sixty-one specimens of which forty were scattered and twenty-one tied in three bundles. Their diameters range from  $5/32$  in. to  $7/16$  in. and their lengths from  $9\ 1/2$  in. to  $26\ 1/2$  in. They are of a variety of woods and are only slightly worked—the nocks for the bow-string showing only on three specimens. Twenty-three have complete or fragmentary bow-strings. Forty-one of the bows still show decorative painting in a variety of colors, a selected few of which are indicated on fig. 3. Additional decoration was accomplished by loops of strings, while one bow has fragmentary feathers bound with sinew on either side of the centre. One bundle (pl. v) contains five bows, considerably shorter than those in other groups, measuring from 11 in. to  $14\ 3/4$  in., held by fibre cord tied in a granny knot. This bundle is ornamented with an 11 in. string of small white shell beads strung on cotton yarn. Two pendants, one of turquoise and one of an unidentified white stone, were found with this bundle but detached from the beads. The bow strings are all intact. Another bundle consists of fifteen bows (pl. v) of varying sizes, mostly painted, held together by a fibre cord. The third bundle is composed of a single bow tied with agave fibre to the main-shaft of a ceremonial arrow (pl. xi, a).

## CANE TUBES

Tubes similar to those herein described have been recorded from caves in the southwest, particularly in Arizona, New Mexico, Texas and Chihuahua, Mexico. Both



Moorensen

-RED
  -BLACK

DECORATIONS ON BOWS (see also pl. V)

Haury<sup>1</sup> and Sayles<sup>2</sup> call them "cane cigarettes," Coffin<sup>3</sup> "reed pipes" and Cummings "prayer cigarettes." It would seem to the writer that all of these designations leave something to be desired. He believes them to belong in the category of tinder-tubes—probably used for incense purposes at ceremonies. That the partition dividing the long and short sections of the tube is perforated in some specimens which show burning contributes, no doubt, to the evidence that these were used in smoking. However, those in which there is no such perforation, yet which show burning, present equal evidence that the charring was occasioned, not from smoking but by fire applied from some external source. Only a few of the unburned tubes are found perforated.

Although Dean Cummings<sup>4</sup> uses the term "cigarette," it is of interest to consider his whole thought on the subject:

"I have always thought of them as 'Prayer Cigarettes' and called them that. Whether they were actually smoked or burned as incense I cannot say. We have found some partially consumed by fire, but more left as offerings in sacred caves. I feel sure they were one form of prayer offering. We have found pulverized leaves of herbs in them and also powder that seemed to be pollen. Often they have been encircled two or three times by a native cotton string. I feel sure they were 'good medicine' and used to carry their prayers to the gods. The expression 'Prayer Cigarettes' seems to be informative and appropriate."

<sup>1</sup> HAURY, EMIL W. The Canyon Creek Ruin and the Cliff Dwellings of the Sierra Ancha. *Medallion Papers*, XIV, *Gila Pueblo*, Globe, Arizona, 1934; p. 114, pl. LXVIII.

<sup>2</sup> SAYLES, E. B. An Archaeological Survey of Chihuahua, Mexico. *Medallion Papers*, XXII, *Gila Pueblo*, Globe, Arizona, 1936; p. 78, pl. XXIX.

<sup>3</sup> COFFIN, EDWIN F. Archaeological Exploration of a Rock Shelter in Brewster County, Texas. *Indian Notes and Monographs, Miscellaneous* no. 48, *Museum of the American Indian, Heye Foundation*, New York, 1932; pp. 15, 32.

<sup>4</sup> CUMMINGS, BYRON. Letter. August 22, 1941.

A wall section of one of the tubes was removed so that the complete contents might be exposed for analysis (pl. VI, a). It was found that a sprig of spruce (*Picea parryana?*) had been first inserted the full length of the tube at its long end and then a quantity of wood bark of the same species, extending into the tube about 1 1/2 in., had been wedged in, to make a compact mass flush with the opening.

Dr. Whitford's<sup>5</sup> opinion as to the possible employment of the filler as a smoking element is interesting:

“It is not evident what therapeutic effect could have been obtained in the smoking of this material although it is possible that the terpenes and essential oils contained in the bark and twigs of this tree might, when smoked, have given off fumes which would have eased a head cold or cleared the throat as the smoking of cubebs did before more effective methods were found. There seems to be no hypnotic drug or alkaloid present in *Picea* bark or wood.”

The tubes are decorated by being bound with cotton string in various arrangements of brown and white, those observed being: white alone, white-brown, white-brown-white, brown-white, brown-white-brown, and brown-white-brown-white. One tube (*b*) has a turquoise bead strung on a strand of the cotton wrapping.

In diameter the tubes vary from 3/8 in. to 3/4 in. and in length from 5 1/16 in. to 10 1/4 in., the averages respectively being 1/2 in. and 7 in. The distance from node to butt end ranges from 1/2 in. to 2 3/4 in.

Eighty-eight specimens in varying states of preservation were recovered. Of these, ten were burned, seven of this number being perforated at the node. While all tubes had probably been string-wrapped, the bindings remain, in

<sup>5</sup> WHITFORD, A. C. Letter. October 7, 1941.

whole or in part, on only twenty-eight, of which group only three were perforated. No wrapping remains on any of the burned specimens.

## POTTERY

**WRAPPED DISCS:** Nine pairs of these interesting items were recovered. In one pair (pl. VII, *a*) the sherds are square instead of round. Six pairs are plainware, two are Mimbres Black-on-White, and one has one disc of plainware and one of Mimbres. In every case the painted surfaces or, where unpainted, the interior surfaces are placed face to face. Seven pairs are encircled in two directions and two pairs in one direction with coarse or fine cotton or fibre string tied together in a fast knot. While only nine of these disc bundles remain intact, it is evident from the large number of sherd discs and knotted string fragments present that many other pairs had been similarly bundled and that the wrappings had been broken or loosened.

**OTHER DISCS:** As nearly all of the worked sherds are either in circular form or with such outline indicated, it is not unreasonable to suppose that the unworked sherds as such were taken to the cave and there shaped into discs and tied into bundles. While it is likely that among the plainware pieces a good many might be identified as coming from one or two vessels, no such incidence is encountered among either discs or sherds of painted or corrugated wares.

**SHERDS:** All sherds, whether worked or unworked, are included under this heading. Typical collections were examined by qualified specialists and a consolidated list of representative pottery found at Winchester Cave, as made by them, includes: Dagoon Red-on-Brown; El Paso Poly-

chrome; Gila Polychrome; Middle Gila Corrugated; Upper Gila Smudged; Hohokam Red-on-Buff; Mimbres Bold Face; Mimbres Classic; unidentified Red-ware.

In this listing, the arrangement suggests no frequency of incidence.

The following table divides the sherds recovered into seven classifications without attempt to indicate phases.

	No. Sherds	Unworked	Worked — %	
PLAINWARE	862	519	343	40%
SMUDGED	23	18	5	22%
CORRUGATED	26	22	4	15%
RED-WARE	22	11	11	50%
RED-ON-BROWN	80	19	61	76%
RED-ON-BUFF	18	5	13	72%
MIMBRES	33	4	29	88%
MISCELLANEOUS	6	3	3	50%
TOTAL	1,070	601	469	

Of the painted-ware sherds 77% are worked.

## SANDALS

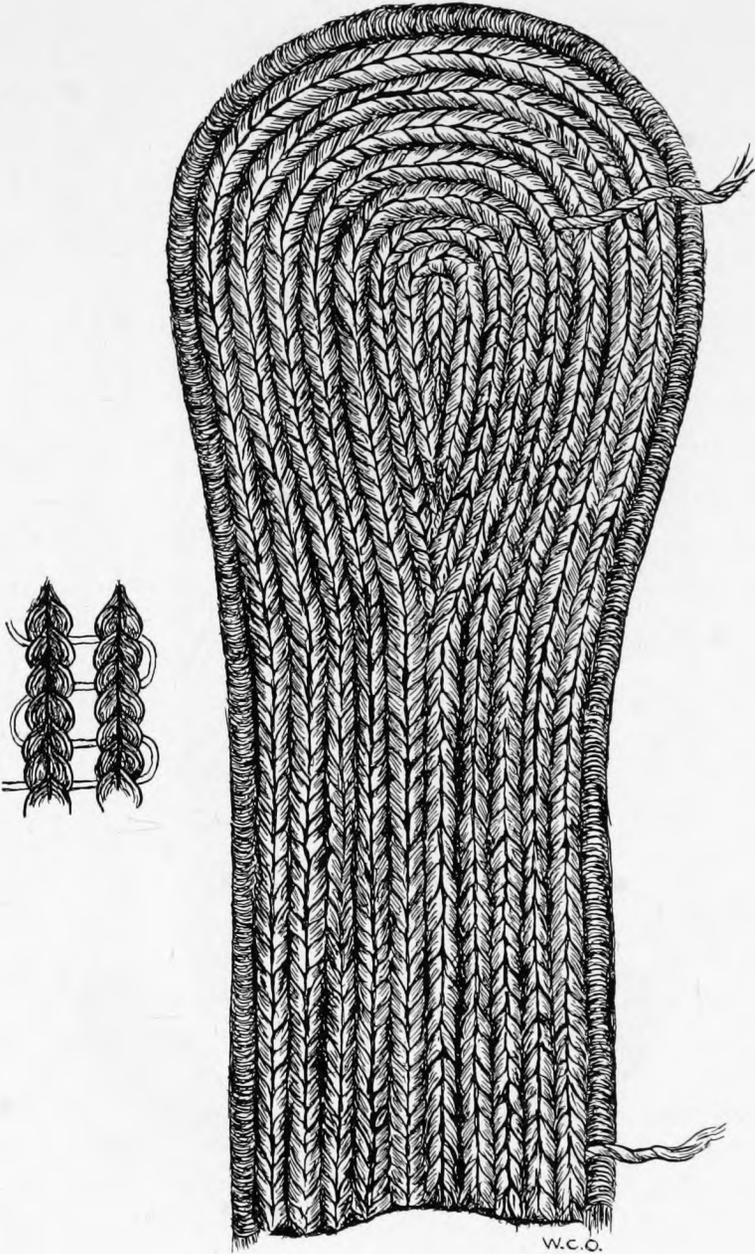
Other than articles of ceremonial classification, the most important and interesting specimens recovered were thirteen sandals, all in a fair state of preservation. Two are made of *yucca elata* and eleven of *yucca baccata*.

These are found to group into three basic techniques, sewn braid, checker weave, and twined weave, although of the latter group one shows a difference in structure and one a variation in decoration.

**BRAIDED:** Based on the evidence of a similar piece of fabric found at Snaketown and, more recently, a sandal at Ventana Cave, in what at present is considered to be a Hohokam burial, the one specimen from Winchester Cave

is designated as "Hohokam." This sandal (pl. VIII, *b*; fig. 4) is made of 3 strand braided cords of finely shredded yucca leaves (*y. baccata*). An obovate shaped center piece was formed of several short lengths of the cord, longer pieces being then sewn around this center until the width of the sandal was attained. It is obvious that the obovate piece was made the starting point inasmuch as its shape brought about the desired broadening of the sandal toward the toe and narrowing at the heel, a feature observed more or less generally in all well made primitive footwear. The sandal is in such fragile condition that a close study of the technique used in sewing the braided cords together cannot be made. Threads indicating a side stitch are to be observed in three places. This thread is a single fibre and round in shape. There is a trace of two turns of the thread in one place (see detail, fig. 4) but this does not constitute sufficient evidence to permit any definite conclusion. No overhand stitch is visible and certainly the cords are not interwoven. Except across the heel, the sandal is edged with a bunch of untwisted fibres closely sewn to the outermost braided cord with an untwisted fibre thread which forms a wrapping. The ends of the cords at the heel extremity are matted to a thin edge and it cannot be clearly demonstrated how this was finished. Short pieces of fine cord at each end of the sandal are the only evidence that tie-strings existed. These are not of sufficient length to suggest the original method of arrangement.

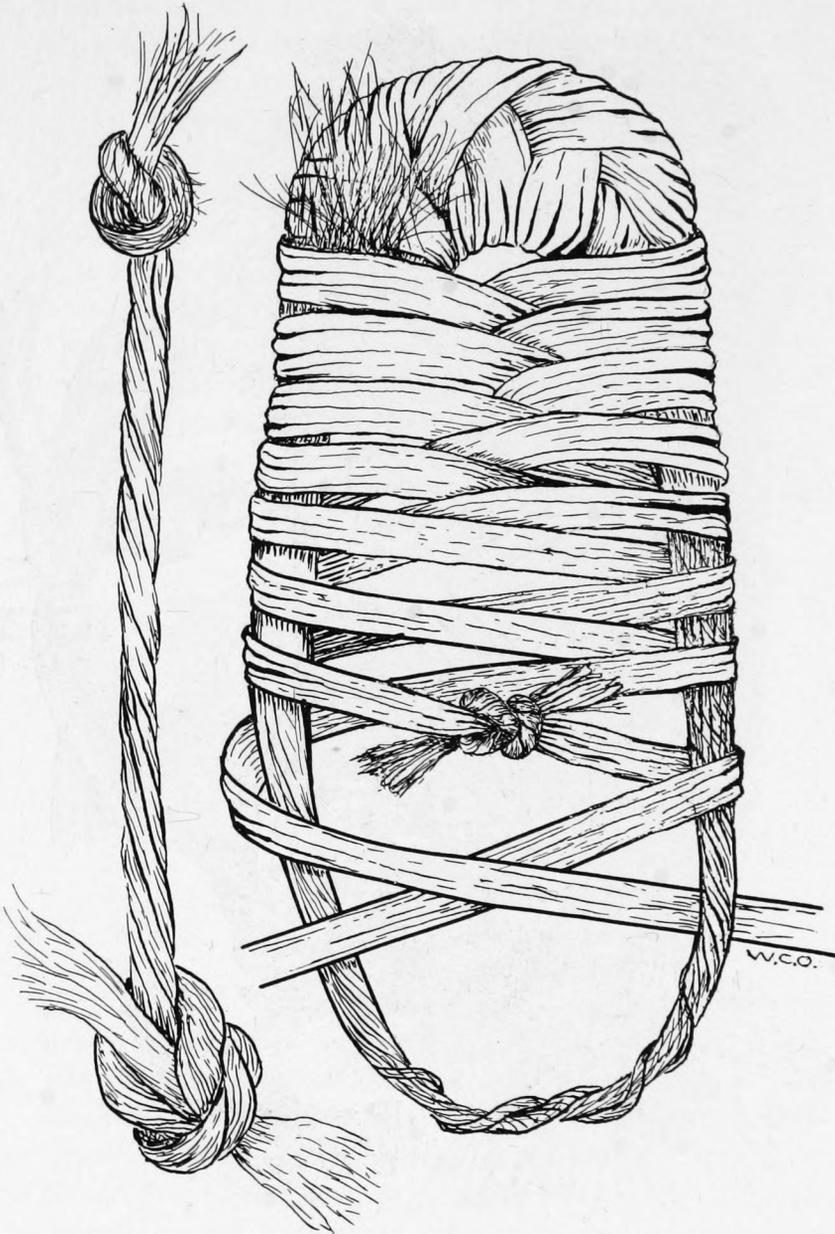
CHECKER WEAVE: The construction of the three sandals of this type is similar and represents a weave common in basketry. The one illustrated (pl. VIII, *d*; fig. 5) is made of unshredded yucca leaves (*y. baccata*). When the desired length had been attained the ends were turned back at the heel, making a thick pad at that point. The heel support is illustrated beneath the sandal more clearly to



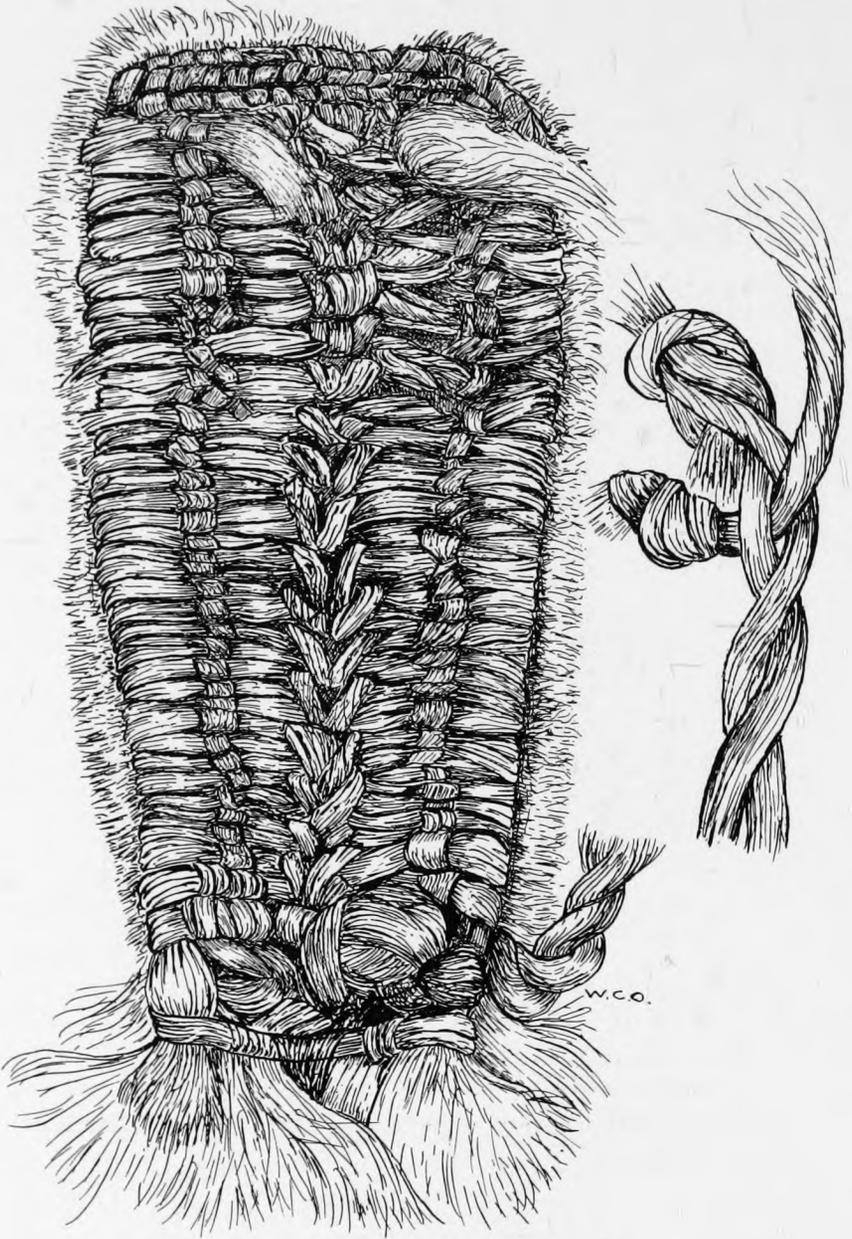
BRAIDED SANDAL



SANDAL OF CHECKER WEAVE



SANDAL OF TWINED WEAVE SHOWING CONSTRUCTION



SANDAL OF TWINED WEAVE SHOWING UNUSUAL DECORATION

show the loops or turns at each end for the passage of the side strings, the original attachments of which are still present. Near the toe of the sandal is a knotted fragment of the original loop for the insertion of the great toe to hold the foot gear in place.

**TWINED WEAVE:** Nine of the sandals recovered are of this technique. The frame of the one illustrated (pl. VIII, *a*) is composed of yucca leaves (*y. baccata*) partly shredded, massed and wrapped with strips of leaves at the toe end. The ends of the shredded leaves are brought together at the heel and twisted, apparently with no particular method of fastening, perhaps depending on the twining to make this part of the structure secure. A drawing of this specimen (fig. 6) is arranged to show the structure of the frame

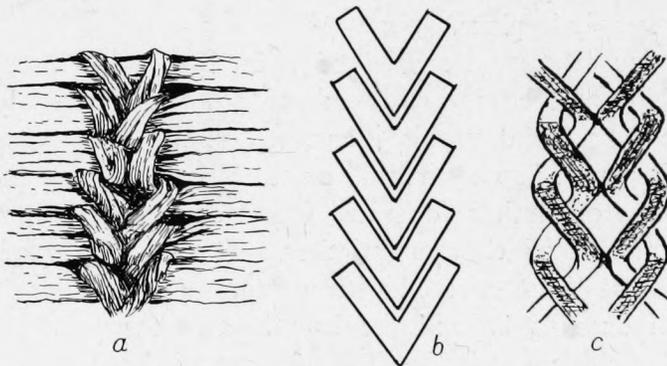


FIGURE 8. Detail of chevron stitch on sandal shown on Fig. 7.

which gives form to the sandal, and the manner of weaving the strips of yucca around the frame to form the tread. The weaving elements are purposely spread apart toward the lower end to show clearly the direction of the leaf-strips in twining and the method of adding length to them should they be too short to complete the weave. This apparently is not a common occurrence and when it does

happen the knots are carefully concealed. This specimen does not show any points of attachment for tie-strings although what in all probability is one of these supports was found with the sandal.

On a child's sandal of twined weave the tie-string is complete. A string fastened at either side of the frame well toward the heel crossed the instep. This was held snugly to the foot by passing through the looped ends of another string which encircled the ankle area above the heel. A third string attached near the inner border of the forward part of the sandal passed between the great and second toes and, running upward over the instep, was tied to the first string. This arrangement of counter tension between the anterior and posterior tie-strings prevented the foot from slipping backward or forward and held the foot gear snugly in place.

A most unusual sandal of twined weave with fancy stitching on the tread and made of *yucca elata* possibly for some ceremonial use is illustrated (pl. VIII, *c*; fig. 7). Three rows of spot-stitching exist on the extreme toe edge and two of similar form are found on either side of the central line of chevron stitches. The underside of the sandal has been covered with a nap or pile of yucca fibre which extends beyond the heel in two tassel-like tufts. Much of this nap is the fibre of some of the weaving elements, although more nap, composed of short pieces of partly shredded leaves secured by some of the decorative stitches, has been added. The central chevron stitches are poorly constructed and may represent inexpert workmanship. Figure 8 shows (*a*) a section of these stitches as they appear on the sandal, (*b*) the intended design, and (*c*) the stitch loosened to show its structure. Though broken at attachments, the tie-string has had a loop for the great toe. One side string remains intact, attached at the

heel. It consists of a twist of two cords securely knotted to a small remaining section of the other side-string. The twist has been spread to permit the passage of the toe-loop between the cords. This detail is also shown in fig. 7.

Two pieces belonging to the same sandal present an unusual structural feature of twined weave. Two cane splints had been supplied through the central long axis of the tread to reinforce the frame. The weaving is in dual alternate rows. Two courses carry across the whole width of the tread from frame to frame, the next two being woven from one frame to the nearer splint and then back to the frame. The weaving elements are *yucca elata*.

#### OTHER OBJECTS OF WOOD

**FIRE STICKS (PL. IX):** Six specimens which may be classified as fire sticks, ranging in length from 8 3/4 in. to 18 1/2 in., were found. One of them has sinew wrapping at the top end.

**FIRE HEARTHES (PL. IX):** Six hearth sticks were recovered. None of them is of its full original length, all having been broken at the circumference of a charred socket. Four show a lateral notching at each hearth to form a channel for the contact of fire with tinder. One (*c*) has two such notches spaced at regular intervals at points upon the stick not showing charring, although the primary roughenings to hold the drill are present at those points. Another (*b*) shows two holes, one at either end of a short stick, no fire-channels being in evidence. Still another has elongated charred gouges rather than rounded sockets and, consequently, might not be classed as a typical fire hearth.

**DIGGING STICK:** A 10 1/4 in. fragment of a digging or planting stick was found containing the working end. The fracture extremity shows burning.

HAFT: A wooden object (pl. XI, *e*) 2 1/2 in. long, which may have served as a haft for a stone blade, was found. Indistinct spiral markings seem to show original sinew wrapping.

MISCELLANEOUS: In the group of miscellaneous objects are included a well worked stick 9 3/16 in. long (pl. XI, *b*) tapered and with blunt ends, almost flat and having a groove down the center of one side; four pairs of intertwined bent twigs; two sticks with agave fibre attached (pl. XII, *d, f*); two sticks shredded at one end (pl. XI, *c, d*) whose function is problematical; and four sticks 5 in. to 12 in. long reamed out at each end to a depth of about 1/2 in. These latter may have been used in some ceremonial function.

### STONE

Scattered throughout the fill was a various assortment of miscellaneous stone, none of which should be classed as ceremonial. The list includes a corner fragment of a very crude slate palette; thirteen sharpened stone tools which might be hoes, knives, or scrapers; thirteen small scrapers or choppers (pl. X, *b, c, d*); fifteen complete or nearly complete stone points and a number of fragments; a variety of manos of all sizes and descriptions including some small bi-facial ones which resemble specimens of an early culture; a few heavy type crude pestles; several fragmentary metates of the slab and shallow basin types; and one arrow shaft polisher.

### BONE

Only a small number of bone objects were found. Four awls measuring in length from 2 7/8 in. to 3 1/2 in., the longest being the only complete specimen, and one worked piece, possibly a haft, constitute the total recovery.

## GOURDS

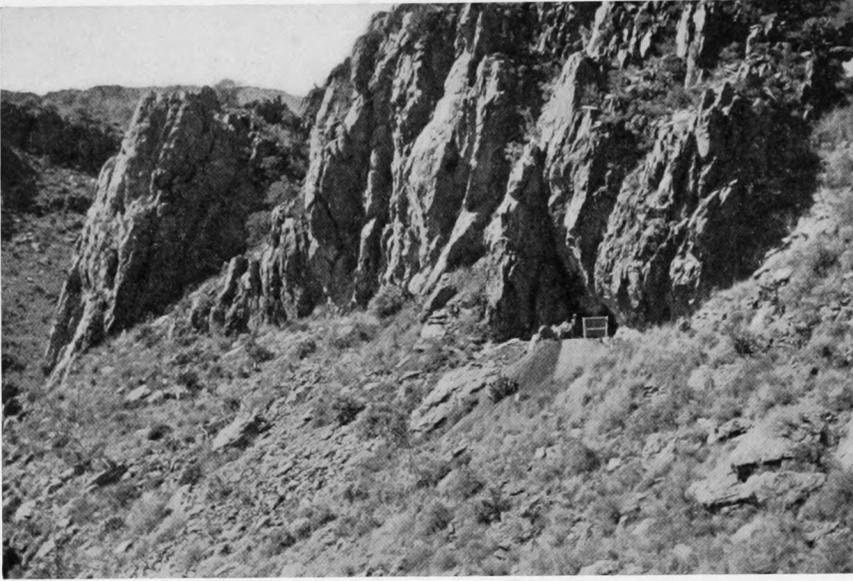
Four complete or nearly complete ladles were found. These range in width from 3 in. to 5 1/2 in., the largest being 6 1/2 in. long. Large cracks in two had been mended with cord lacings. A few fragments of gourds existed throughout the fill.

## MISCELLANEOUS FIBRE

A large number of yucca cuds or quids were found (pl. XII, *b, c*), as were some shredded agave leaves with needles attached (pl. XII, *a*) and matted or knotted pieces of both yucca (*y. baccata*) and agave (*a. parryi*). Some of these are shown as unlettered objects, pl. XII. One bundle of loosely wrapped fibre is illustrated (pl. XII, *e*).

A large quantity of twisted vegetal cordage of various thicknesses was recovered. The most representative of these are illustrated (pl. XIII) and, where possible, have been identified as follows: cotton—*c, g, k, r, u, w, y*; yucca baccata—*a, f, h, i, l, m, n, o, p, q, t, v*; yucca elata—*j*; yucca baccata and yucca elata mixed—*b, e, x*; yucca baccata with animal skin wrapping—*d, s*.

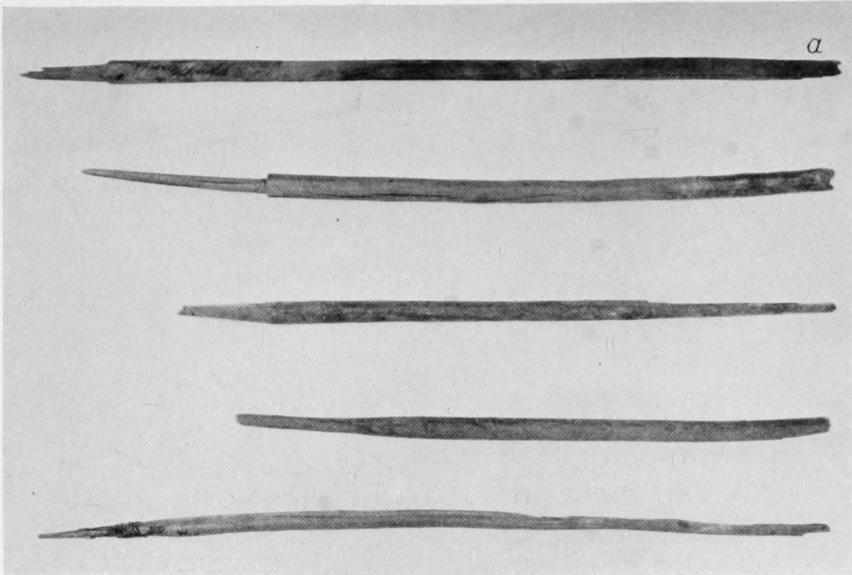




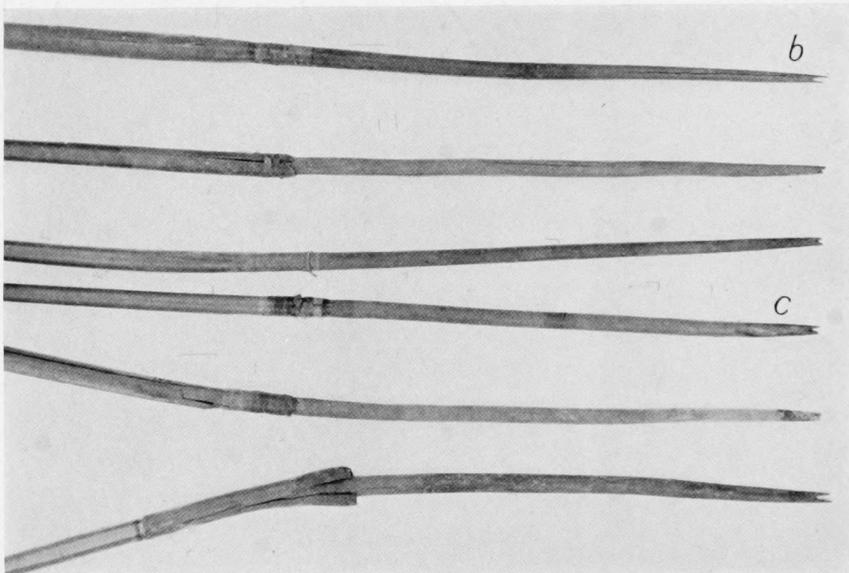
VIEW OF CLIFF SHOWING LOCATION OF CAVE



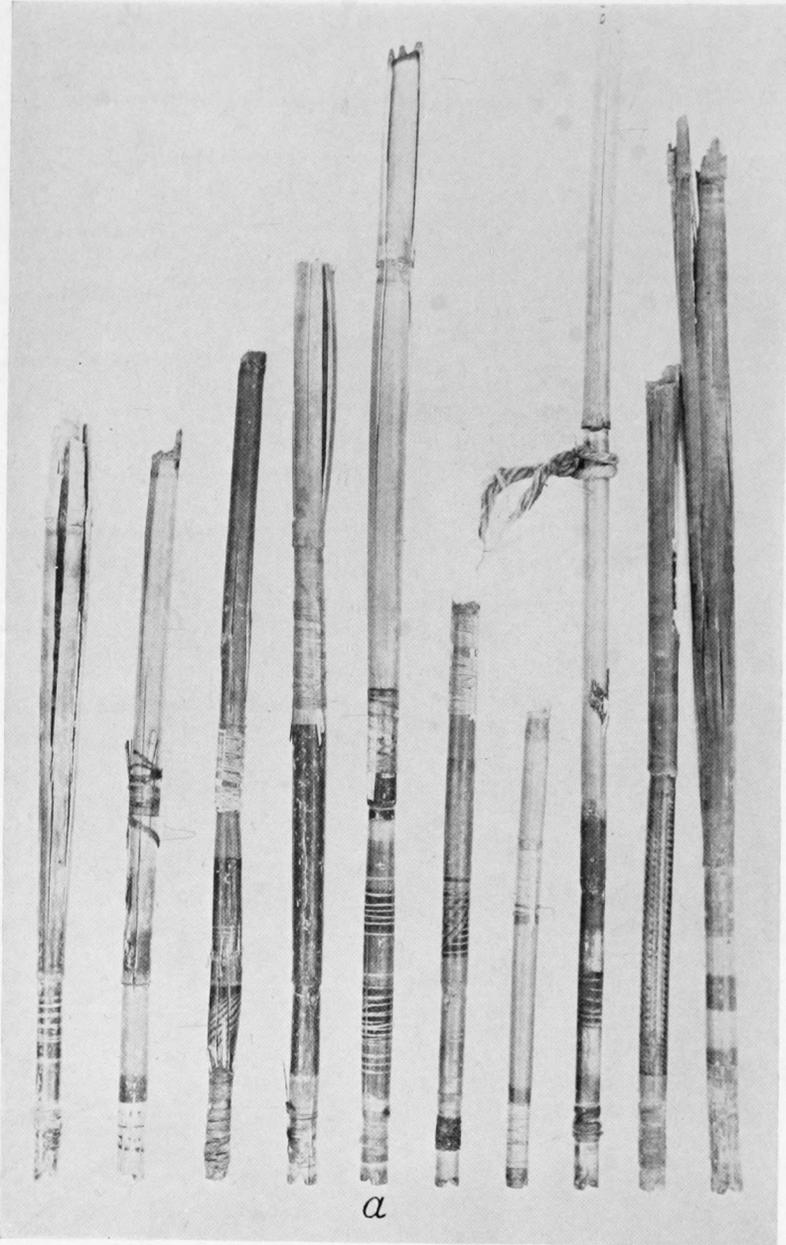
CAVE ENTRANCE WITH BLOWER APPARATUS



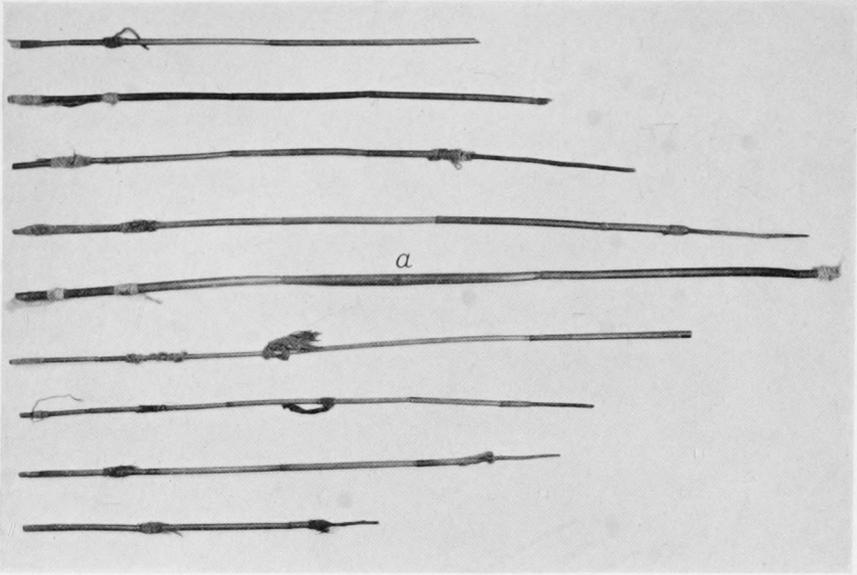
UTILITARIAN FORESHAFTS  
LENGTH OF *a*, 10 $\frac{3}{4}$  IN.



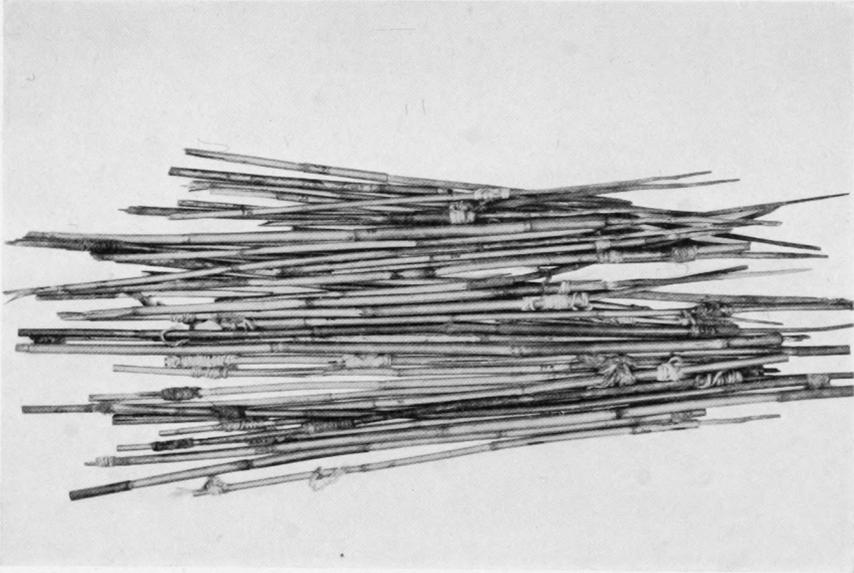
BIFURCATED POINTED FORESHAFTS WITH MAINSHAFTS  
LENGTH OF *b* (FROM END OF MAINSHAFT TO TIP), 8 $\frac{3}{4}$  IN.



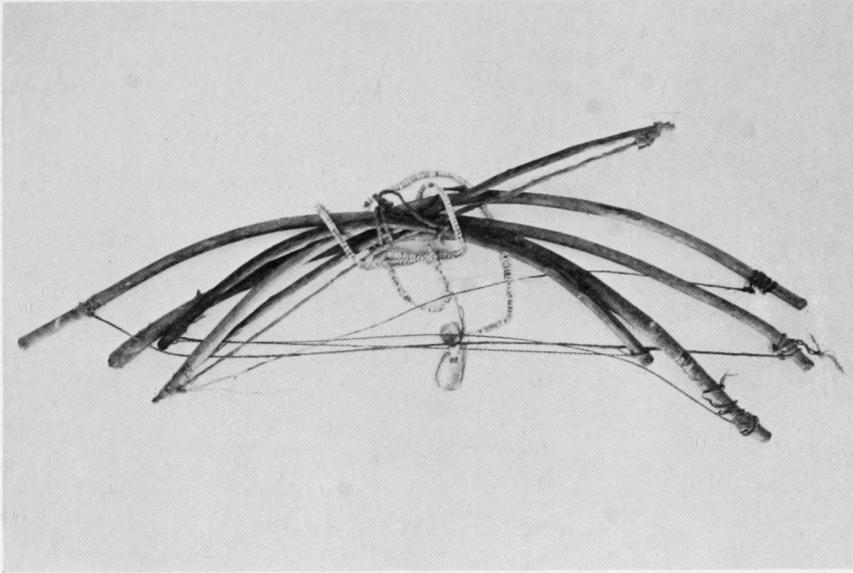
DECORATED ARROW SHAFTS (see also Fig. 2)  
LENGTH OF *a*, 13 IN.



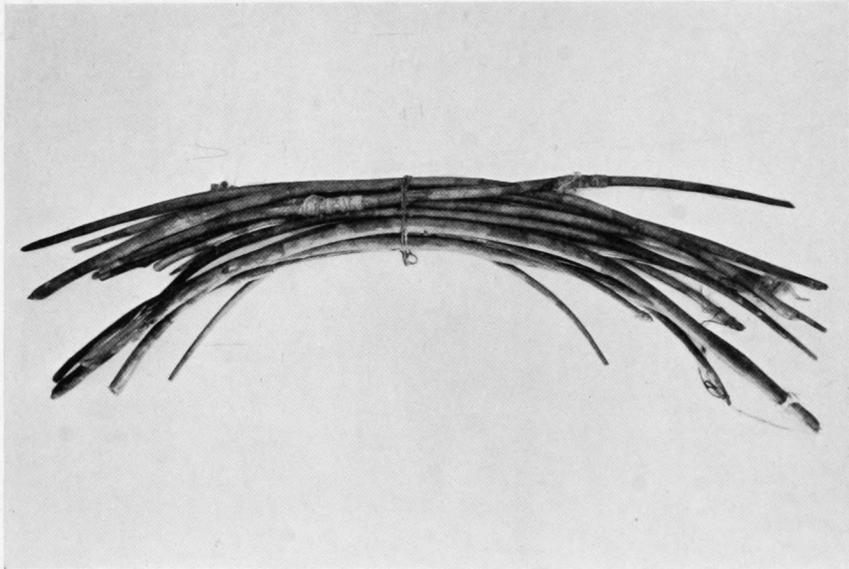
TYPES OF CEREMONIAL ARROWS  
LENGTH OF *a*, 23 IN.



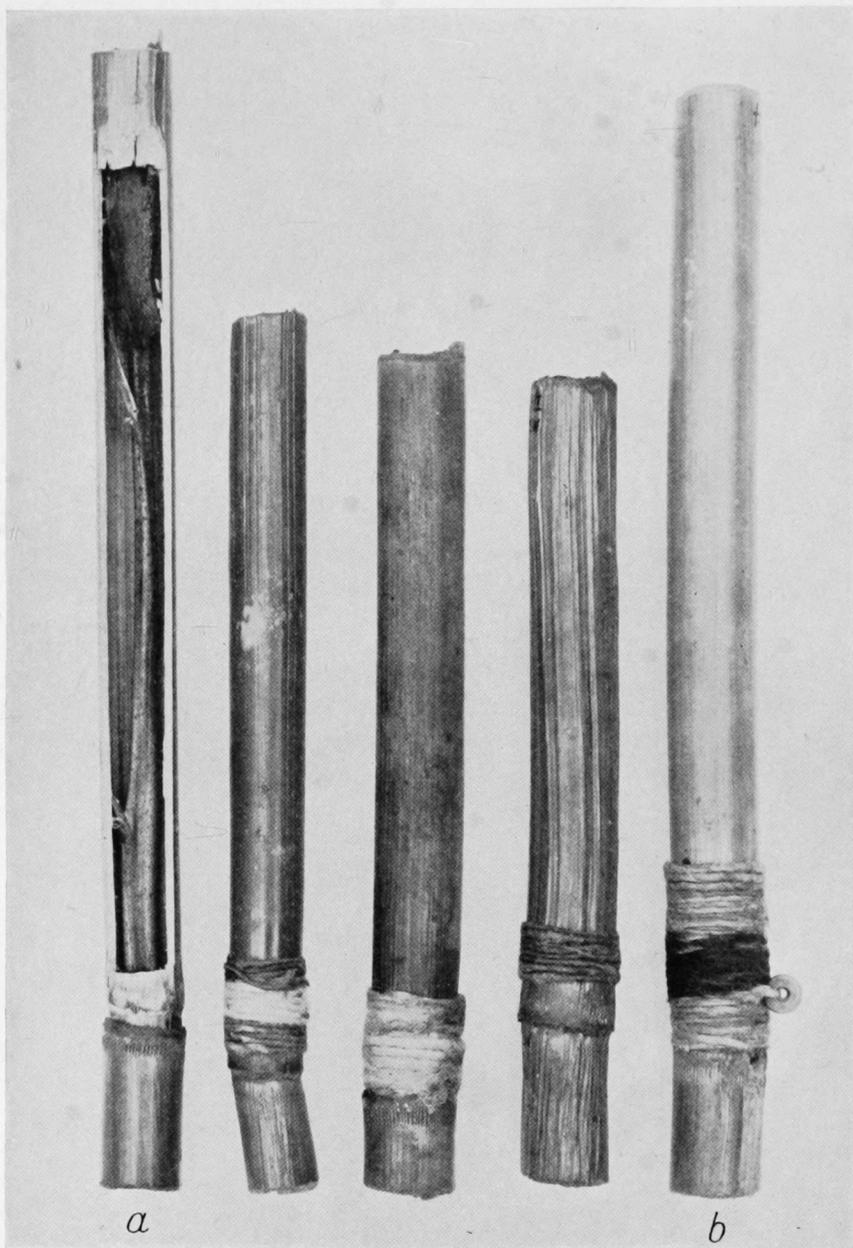
GROUP OF CEREMONIAL ARROWS



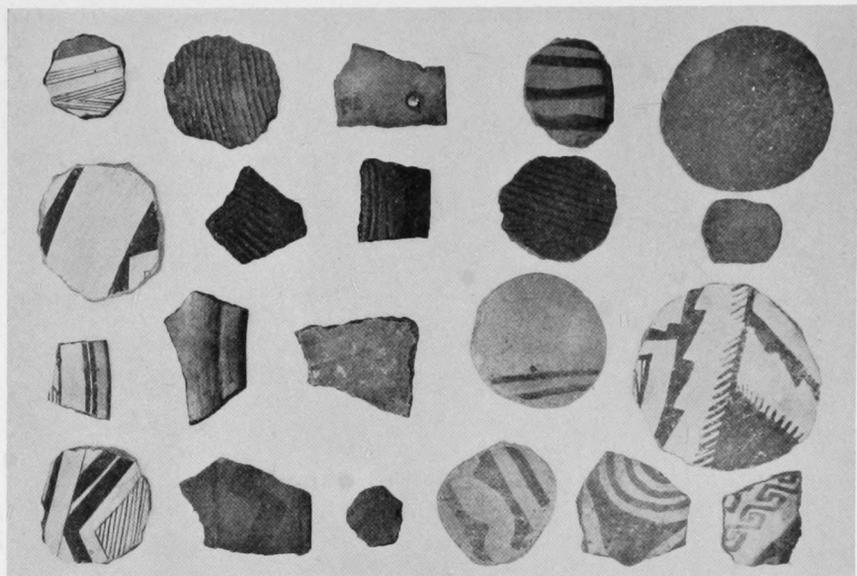
CEREMONIAL BOW BUNDLE WITH BEADS AND PENDANTS  
ARC OF LONGEST BOW,  $16\frac{1}{2}$  IN.



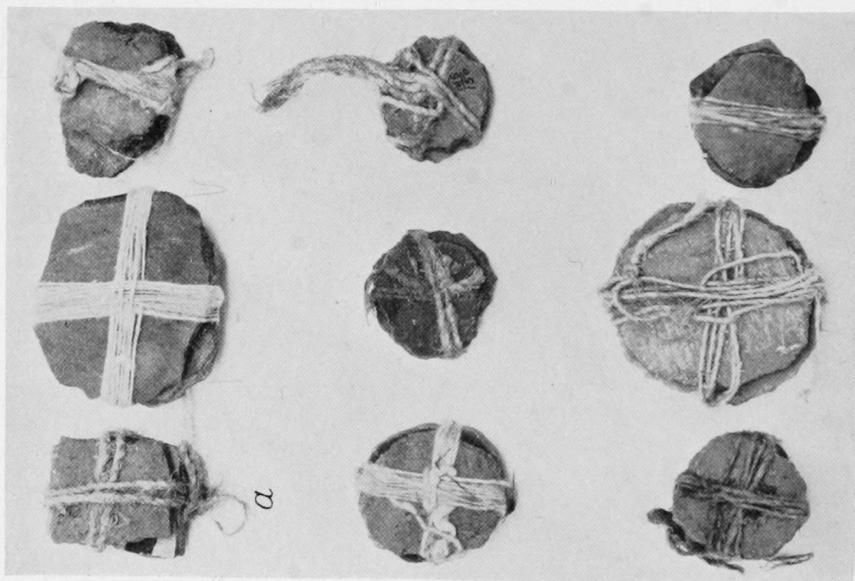
CEREMONIAL BUNDLE OF 15 BOWS (see also Fig. 3)  
ARC OF LONGEST BOW,  $23\frac{1}{2}$  IN.



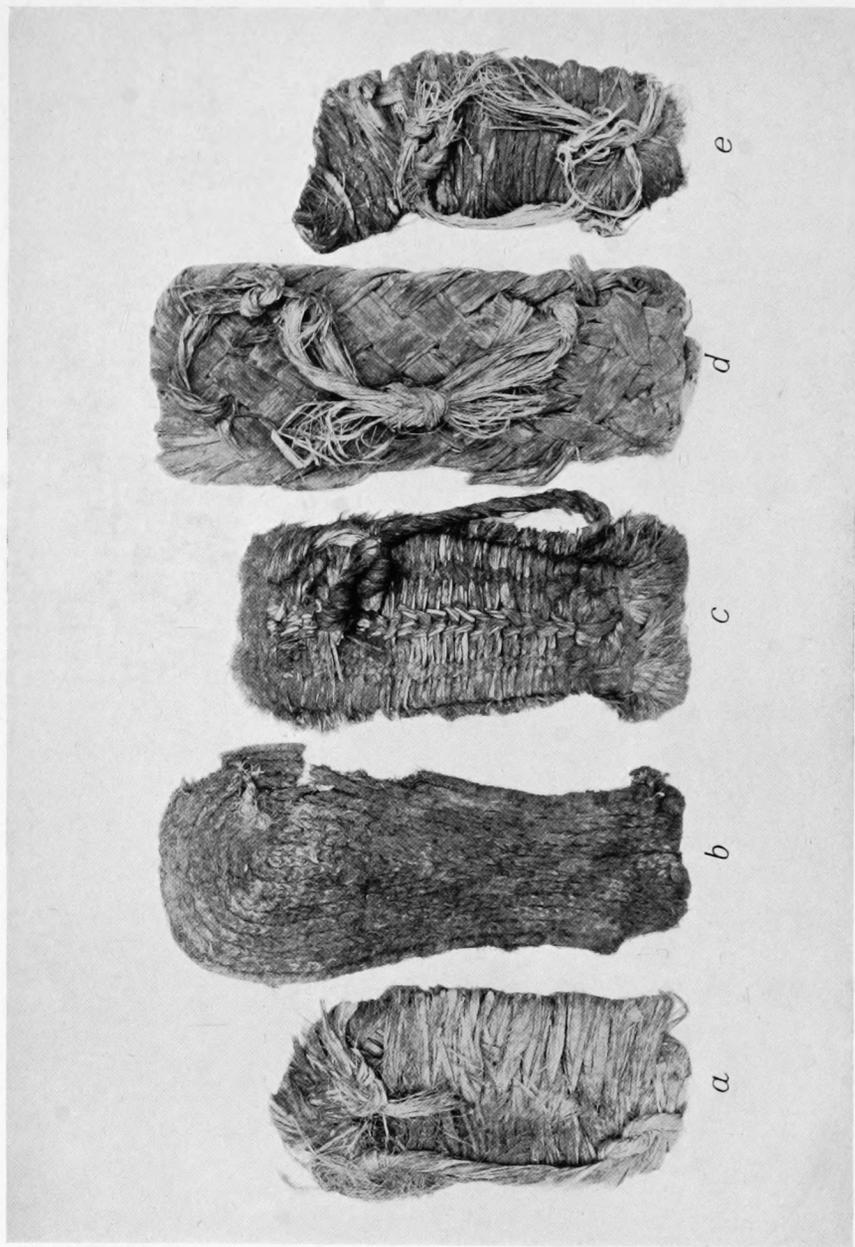
CANE TUBES  
LENGTH OF *a*, 7½ IN.



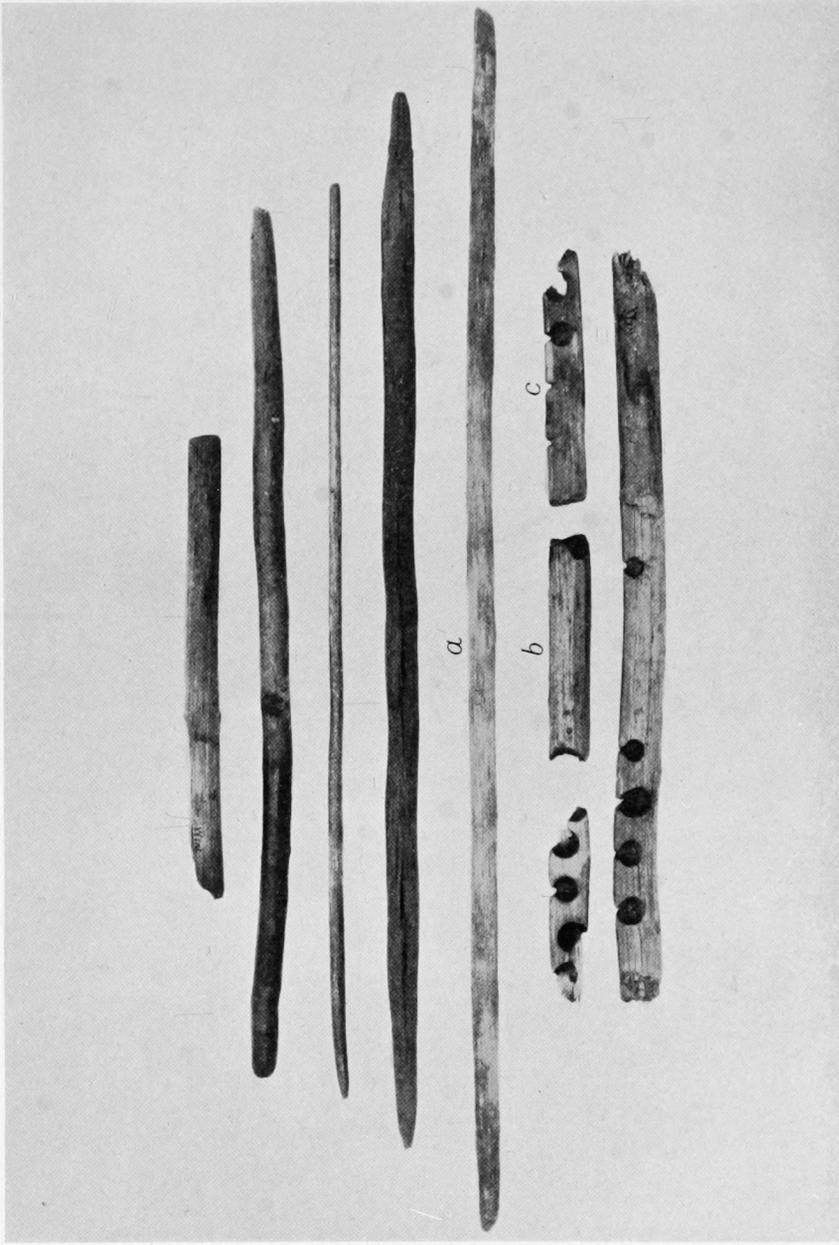
SELECTED SHERDS SHOWING VARIETY OF WARES



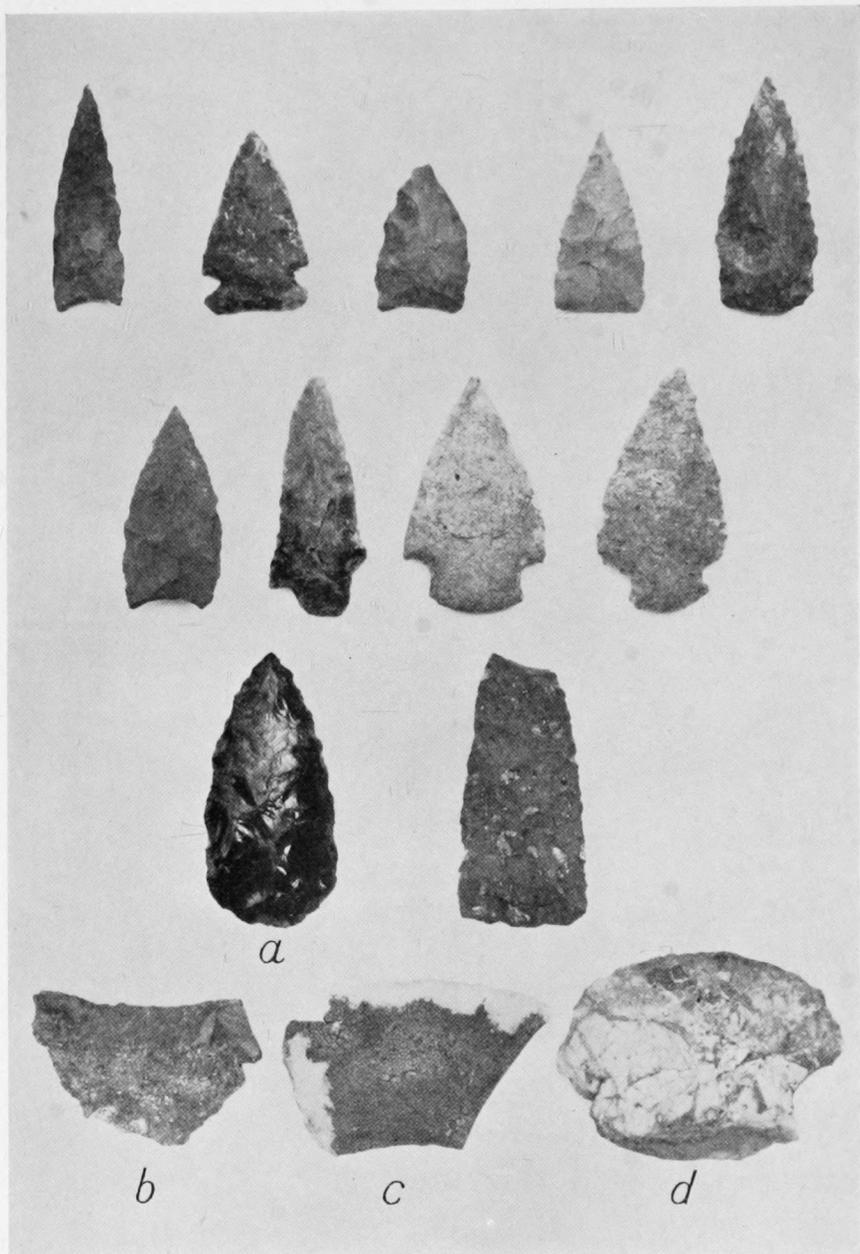
WRAPPED SHERD BUNDLES  
TOP SHERD OF *a*,  $1\frac{1}{2}$  X  $1\frac{1}{4}$  IN.



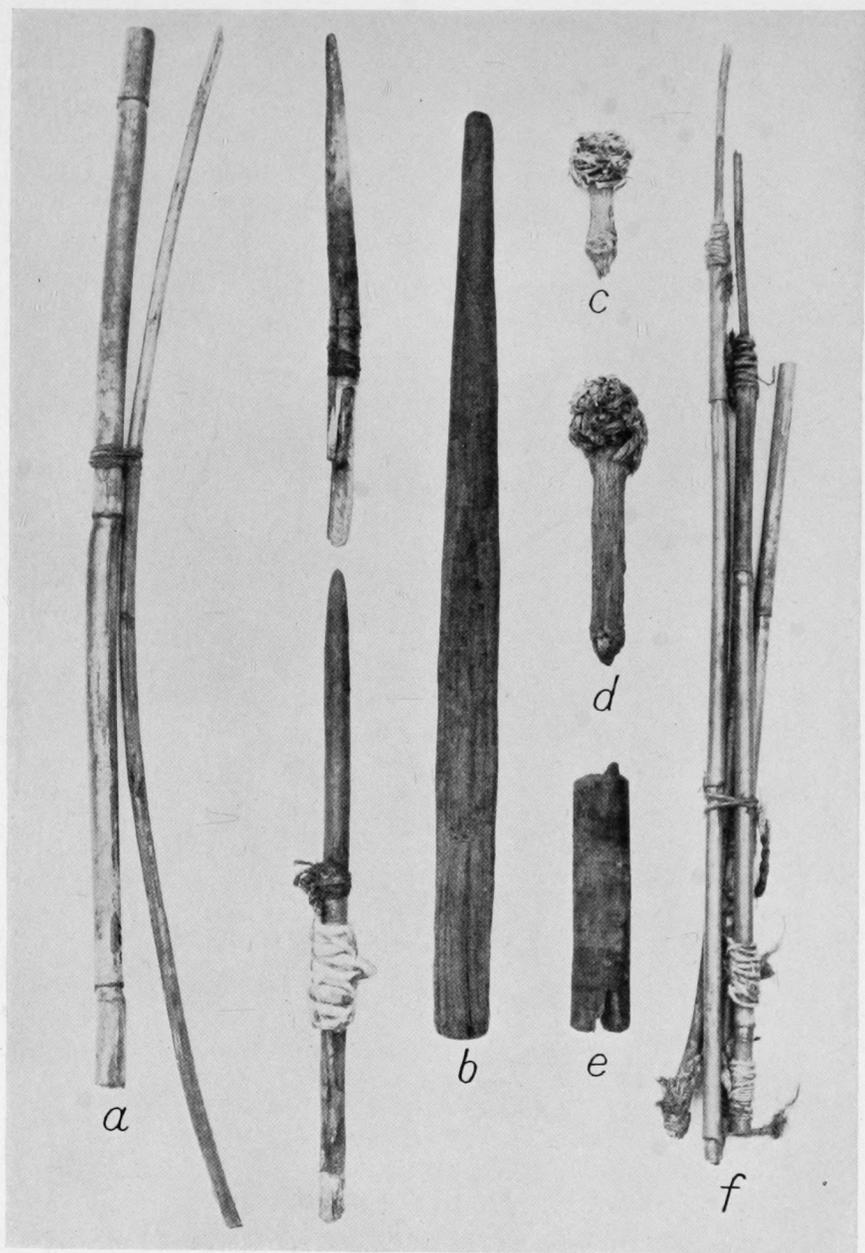
SANDALS (see also Figs. 4-7)  
LENGTH OF *b*, 9½ IN.



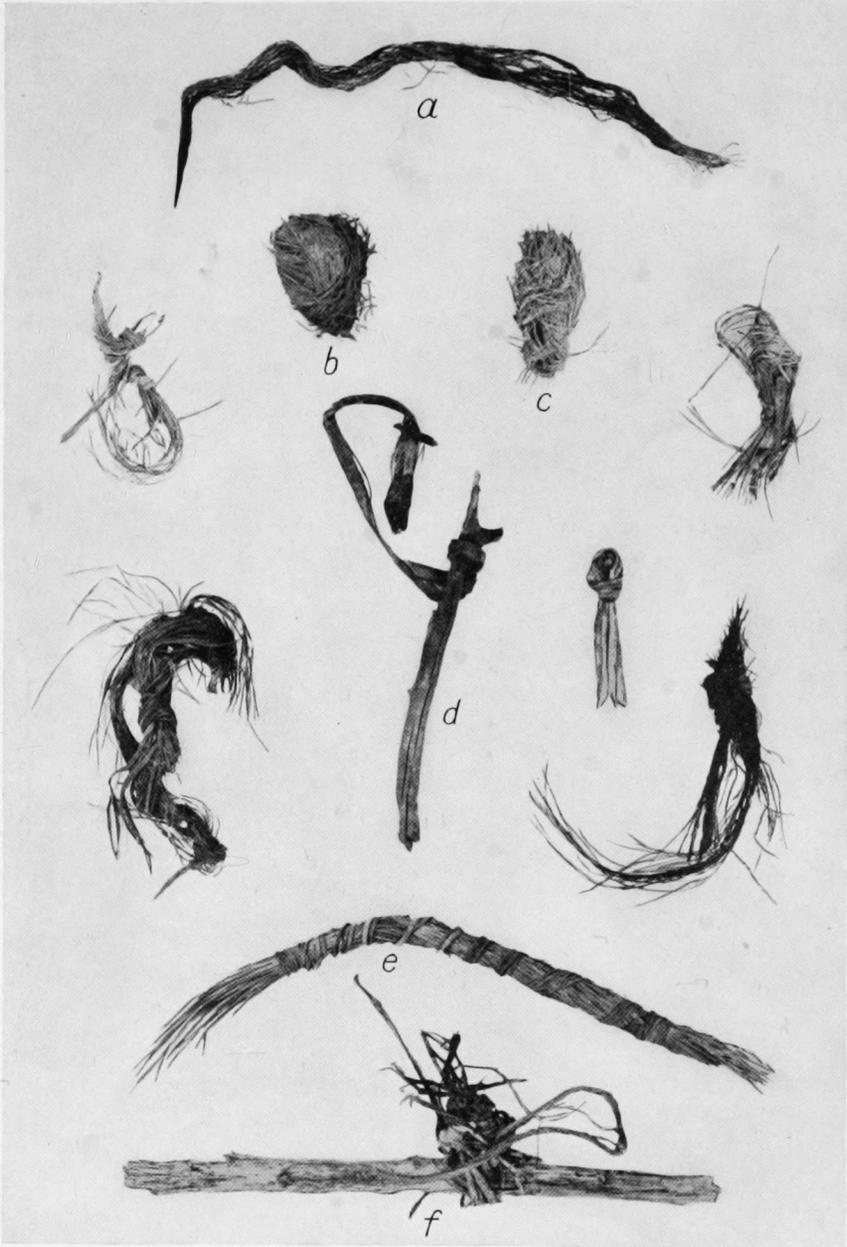
FIRE STICKS AND HEARTHS  
LENGTH OF *a*, 18½ IN.



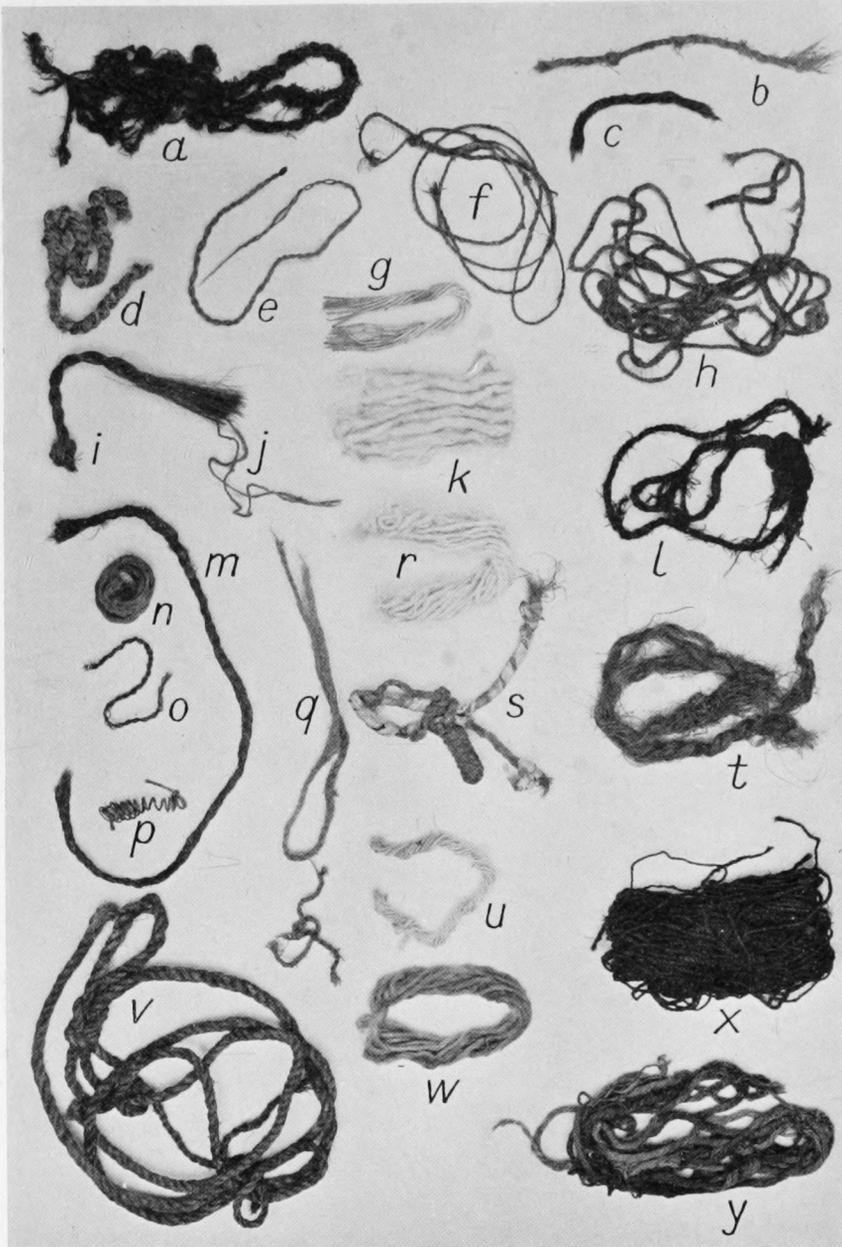
STONE POINTS AND SCRAPERS  
LENGTH OF *a*, 2½ IN.



MISCELLANEOUS OBJECTS  
LENGTH OF *b*, 10 $\frac{3}{8}$  IN.



MISCELLANEOUS OBJECTS  
SIZES NOT IN COMMON SCALE



MISCELLANEOUS FIBRE CORDAGE

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