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Author(s): Douglas W. Schwartz, Arthur L. Lange and Raymond deSaussure

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# SPLIT-TWIG FIGURINES IN THE GRAND CANYON

DOUGLAS W. SCHWARTZ, ARTHUR L. LANGE, AND RAYMOND DESSAUSURE

THE Grand Canyon in northwestern Arizona has long been a favorite area of study for geologists from all parts of the world, but until recently little intensive archaeological work has been done within the canyon itself. In 1953 the senior author began to investigate Cataract Creek Canyon, the only major drainage leading from the Coconino Plateau on the south to the Colorado River. Also in this year Walter W. Taylor (1954) made a quick survey of the lower reaches of the Grand Canyon by boat, but due to high and fast water he was unable to locate many sites. The present project was the first major excavation to be carried on in the main canyon area and it revealed material that should stimulate further work in the region.

In 1953, 1954, and 1955 Arthur L. Lange and Raymond deSaussure, staff members of the Western Speleological Institute, conducted a survey of the caves in Grand Canyon National Park. In four of the approximately 150 caves located they found split-twig figurines. These finds and their locations were communicated to Malcolm Farmer, then Assistant Director of the Museum of Northern Arizona, who in October of 1954 visited one of the caves with Lange and deSaussure and collected surface material. This joint trip stimulated an article by Farmer and deSaussure (1955) which reviewed the previous figurine material and discussed the new finds. It was also at this time that the senior author was asked to undertake the intensive archaeological investigation of the Grand Canyon figurine caves.

The work of the Grand Canyon Figurine Project was shaped around 3 basic problems. (1) Description: Split-twig figurines had only been found in small numbers; therefore, few data were available for their description or appraisal of their variations. Since the work was to be done in caves in which figurines had been reported in fairly large numbers, it seemed reasonable that enough material could be collected and studied to obtain fairly complete descriptive data. (2) Chronology: As pointed out by Farmer and deSaussure (1955) the dates suggested for the original figurine material in the earlier sources ranged from approximately 10,000 years ago (Gypsum Cave association)

to as late as A.D. 1300. Since none of these previous associations was entirely certain it was felt that further work was needed to place the figurines satisfactorily in time. The major reliance for solution of this problem was on stratigraphic testing and radiocarbon dating. It was also hoped that associated artifacts would give some hint of the general time level of the figurines. (3) Cultural affiliations: The range of suggested dates for the figurine material is no wider than the variety of cultures to which they have been assigned. These include Gypsum Cave Hunters, Basketmaker, Pueblo, and Yavapai (Farmer and deSaussure 1955). Therefore, it was hoped that by concentrated work in one group of sites the associations would give some ideas concerning the culture of the split-twig figurine makers, as well as its relationship to other cultures in the Southwest.

*Field Work.* Field work was undertaken in August, 1955, the nature and amount being limited by the unusual location of the sites in areas difficult to reach by the main Grand Canyon trails. All food, equipment, and water had to be back-packed to the sites and excavation time was somewhat limited as a result of this. Nevertheless, at each site enough work was done to get what was thought to be a representative sample of the material; much original floor was left unexcavated, and caches were left intact in each.

*Previous Figurine Finds.* To familiarize the reader with previous work the following chronological list is given, with the date of the find, location, persons involved, reference, present disposition, and any general remarks which seem pertinent. The numbers in front of each of these paragraphs refer to the numbers on the general location maps (Figs. 1, 2).

1. 1933 (winter), Clear Creek, Grand Canyon National Park; CCC crew; Wheeler 1949, Farmer and deSaussure 1955; 1 specimen at Grand Canyon Wayside Museum, 2 at Grand Canyon Naturalists' Workshop. This site is believed to be Luka Cave.

2. 1933-34, Clarkdale (Sycamore Canyon), Arizona; Bertha Ullrick; Wheeler 1949, Farmer and deSaussure 1955; 10 specimens at Tuzigoot National Monument, 4 presently unknown as to location, 1 at Arizona State Museum.

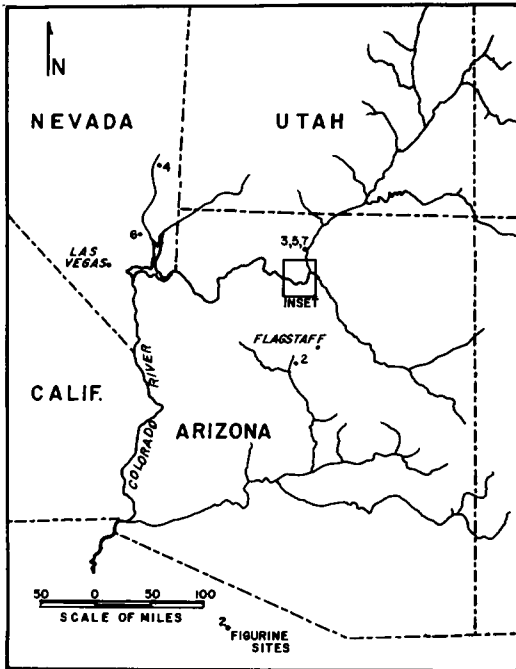


FIG. 1. Location map to figurine sites in the Southwest (see key in text).

3. 1934, Vasey's Paradise (probably Stanton's Cave), Grand Canyon National Park; Buzz Hatch, a member of Clyde-Eddy party; Wheeler 1949, Clark Wissler and Hoffman Birney Correspondence, November 20, 1934, in Museum of Northern Arizona files; "a hatful" of specimens, probably 12 to 15; 4 specimens in American Museum of Natural History, 1 kept by each of party. The figurines were found about 60 to 70 feet within the cave, several on the surface, and the majority at a depth of 2 to 4 inches. Pottery association was reported, but subsequent investigation throws doubt on this.

4. 1935, Etna Cave, Lincoln County, Nevada; S. M. Wheeler; Wheeler 1937a, 1937b, 1942; 3 whole figurines, 9 fragments; specimens were divided between Southwest Museum and Overton Museum; at least 3 are at the former location. 5 figurines were reported as associated with Basketmaker III, 4 as associated with Gypsum Cave type material, and 3 as indeterminable.

5. 1939, Vasey's Paradise (Stanton's Cave), Grand Canyon National Park; Russell Frazier; letters from Russell Frazier to Julius F. Stone in the Grand Canyon collection of Otis Marston; 12 good specimens, 20 poor ones, 1 specimen to Southwest Museum, 1 to University of Ohio, and 1 at Capital Reef National Monument. Majority of specimens destroyed by fire.

6. 1951, Moapa Valley shelter, Clark County, Nevada; Bradley Stuart; Schroeder 1953. 1 specimen, present disposition unknown. This was reported as a tule figurine and at the same site from which a grooved sandstone boulder and a unifacial percussion scraper were reported.

7. 1954, Vasey's Paradise (Stanton's Cave), Grand Canyon; reported through University of Utah; 3 whole specimens and 4 fragments, at University of Utah, except for 1 specimen on loan to Museum of Northern Arizona.

8. 1954, Tse-an-Kaetan, Cremation Canyon, Grand Canyon National Park; Farmer, Lange, and deSaussure; Farmer and deSaussure 1955; 23 specimens at Museum of Northern Arizona.

9. 1954, Tse-an-Sha, Pipe Canyon, Grand Canyon National Park; Lange and deSaussure; Farmer and deSaussure 1955; 3 specimens at Museum of Northern Arizona.

10. 1954, White Cave, Cottonwood Canyon, Grand Canyon National Park; Lange and deSaussure; Farmer and deSaussure 1955; 8 specimens at Museum of Northern Arizona.

11. 1956, Newberry Cave, near Barstow, California; Gerald Smith; AP news release to *Los Angeles Times*, February 10, 1956; 7 specimens (?), San Bernardino County Museum. Very little known about these as yet.

[EDITOR'S NOTE: a report has recently been published; see review this issue.]

**Environment.** The caves which yielded figurines were all located in the Redwall escarpment, the most prominent cliff of the Grand Canyon, formed of a massive crystalline limestone and dolomite of Mississippian age (Fig. 3). Most of the caves which occur in the Redwall are difficult to approach because of the declivity of the cliff face, which commonly

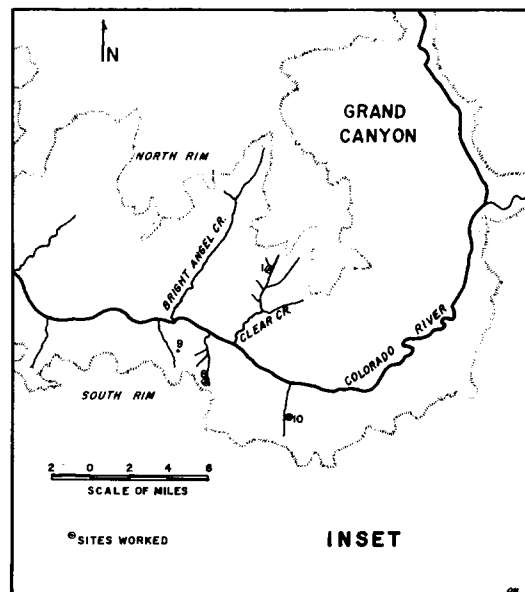


FIG. 2. Location of figurine sites in Grand Canyon.

overhangs. Its height is consistently 500 to 600 feet.

The general elevation of the caves is 4000 to 5000 feet, which is approximately the present-day boundary between the Lower and Upper Sonoran life zones, about 1000 feet below the canyon's south rim. At the cave level the mesquite, cactus, yucca, and agave of the canyon bottom intermingle with the pinyon and juniper of the rim. Water is intermittently available in springs and streams issuing from the base of the limestone, to which the game — deer, bighorn sheep, and rodents — are attracted. During summer rains water is found throughout the canyon wherever potholes collect runoff.

The caves are the result of limestone solution along joints and bedding planes, subsequent enlargement having taken place by rockfall. The figurine caves range in size from small caverns 60 feet in horizontal depth to cave systems containing several hundred feet of passages, with totally dark interior chambers. Dust, soil, dung, fallen roof-slabs, flowstone, and country rock comprise their floors. Speleothems, such as

stalactites, draperies, and crystals, decorate the interiors of certain caves; in others, these secondary deposits are lacking, or have been eroded away.

The location of the 3 figurine caves excavated and the one other surveyed during the summer of 1955 are given on Figure 2 with the following numbers:

1. Luka Cave
8. Tse-an-Kaetan
9. Tse-an-Sha (not excavated)
10. White Cave

*Description of the Caves.* The surfaces of the 3 cave floors examined were fairly similar, all being dry, dusty, and unconsolidated as well as smooth and level where not obstructed by large rocks. Floors were usually composed of dust, dung (probably rodent of some kind — rat or ground squirrel), organic material (mostly small, but some large pieces of mesquite, grass, and other plants), and large and small rocks, usually natural limestone chips and spalls. All of the caves also contained large numbers of relatively short split twigs which either are remnants of the raw material used in the construction of the figurines or were brought in for some other purpose. Some areas were found with consolidated manure, which appeared to be from larger animals. Some ash and small bits of charcoal were located just below the surface, but no burned material was found on the surface. In Tse-an-Kaetan (N.A. 5686), near the back of the first chamber, there were several depressions about 1 foot in diameter and 6 inches deep. These proved to be natural. A significant number of figurines and figurine fragments was also found on the surface of the cave floor.

*Stratigraphy.* The stratigraphic work in the figurine caves gave only negative results, for nothing of cultural significance was uncovered. Except for about 6 figurines which were randomly scattered near the surface, and one chipped stone piece found at a depth of about 6½ inches at Tse-an-Kaetan, no artifacts or signs of occupation of a recognizable kind were found below the surface in the caves.

The cave floor deposit was much the same at all three of the sites. The top 8 inches was very similar to the surface composition, unconsolidated and composed of small rocks, dust, rodent droppings, small bones of bat and



FIG. 3. View of N.A. 5686 (Figurine Site 8) from below.

rodent, and miscellaneous vegetable material. Some small, unconsolidated areas of ash and charcoal were found, mainly in the top 4 inches. All the figurines found during the stratigraphic testing were in this upper level, primarily in the upper 4 inches.

Below the 8-inch level the deposit was generally very consolidated, gradually decreasing in the amount of manure while increasing in the amount of dirt and rock. Below this 8-inch level no artifacts at all were found. Most of the digging was concluded at about 13 inches because of the presence of large pieces of fallen ceiling rock.

At Tse-an-Kaetan a trench was dug under Surface Feature 1 in order to collect pollen samples. At about 24 inches the dung had completely disappeared and for the next 7 inches there was a reddish soil with angular chert and limestone fragments. This trench was also stopped because of a large rockfall. Roger Anderson's pollen analysis (personal communication, January 3, 1956) is presented in Table 1.

*Caches.* Although a few figurines were found on the surface of the cave sites the majority came from cache pits slightly below the surface. The caches appeared to be of 2 types, one which can best be termed a pit and one which resembled a rat's nest. If it were not for the

great number of specimens in the second type there would be some doubt in the author's minds that they were man-made.

For the most part both types of figurine caches were located near the side of the cave rather than near the center (Fig. 4). Except for 2 cases they were all situated at the junction of the floor and the vertical cave wall.

Five of the pit type figurine caches were examined, all at Tse-an-Kaetan. All were covered on the surface with fairly large rocks, ranging in size from about 8 by 16 inches to 13 by 21 inches and a few smaller. Most of these were laid flat over the cache, but in one case 2 rocks were tilted up to form a shelter over the cache. Usually with the removal of the rock cap at least one and sometimes up to 5 figurines were visible. Parts of them were frequently covered with dust, but nearly always their presence could be detected. Also in 4 out of 5 cases large amounts of either shredded juniper bark or bundles of grass were found covering all or part of some of the specimens. With the removal of the top figurines, bark, and grass, more figurines were revealed. These were invariably partially covered with dirt, and in some cases, not visible at all, and were only located after carefully excavating (sweeping dust away with a paint brush) more of the cache. The depth of these pits was usually

TABLE 1. POLLEN ANALYSIS.

Sample	Depth in inches	Pollen	Percentages (approx.)
1	Surface	Juniperus-Cupressus (juniper, cypress) .....	40
		Gramineae (grass) .....	10
		Compositae (flowers) .....	
		Pinus (pine) .....	
		Numerous grains of insect pollinated herbaceous plants (unidentified).....	40
		Pinus type tracheids and wood fragments numerous	
2	1-3	Barren	
		Pinus type tracheids present, but uncommon	
3	12	Pinus (pine) .....	40
		Picea (spruce) .....	30
		Abies (fir) .....	20
		Pseudotsuga? (fir) .....	
		Pinus type tracheids present, but uncommon	
4	24	Pinus, Picea, Abies (low frequency) .....	
5	26-28	Pinus, Picea, Abies (low frequency) .....	

The surface sample is fairly representative of the modern flora in the area but just 12 inches below the surface Pleistocene, Late Wisconsin pine-spruce-fir forest evidence is present. Unfortunately the 1 inch to 3 inch sample had no pollen, but I think it is modern.



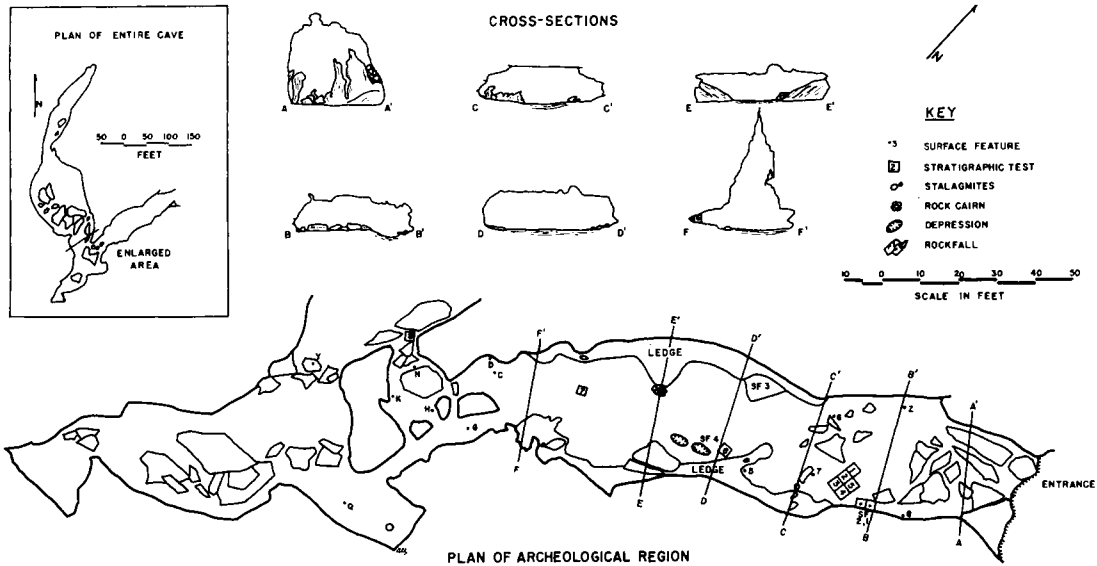


FIG. 4. Plan of N.A. 5686 (Tse-an-Kaetan) showing locations of archaeological features.

about 1 foot and figurines were found scattered throughout. The number of figurines recovered from each of these 5 caches was 5, 14, 16, 18, and 33.

Within the pits the figurines appeared to have no significant order; that is, they did not follow any discernable pattern. For example, in Pit 6 at Tse-an-Kaetan, fourteen were on their left sides and fourteen on their right sides, six faced west, six south, three east, two north, one northeast, one northwest, four southeast, two southwest, and two south-southeast. Twenty-eight were on their side more or less parallel with the level of the cave floor, one was standing up, one tilted down at about a 45° angle and two of the specimens had their heads straight down. In Pit 7 all the specimens on which information was collected were on their right side, but this does not appear significant judging from the other pits and the fact that this count does not include three of the figurines in the pit.

The rat's nest type of cache, instead of being predominantly below the cave surface was above it. It was not covered by rocks but was distinguished by rodent droppings, often solidified, and much other organic material. Again there seemed to be no order to the placement of the figurines. There were about as many figurines in these piles as there were in the rock covered cache pits.

*Associated Artifacts.* One of the distinguishing characteristics of the Grand Canyon figurine caves was their lack of associated artifacts. Whereas the split-twig objects occurred in great numbers only 14 other items were found that might be attributed to human manufacture and not all of these could be definitely associated with the figurines. These are listed below along with their location and description.

1. Hank of human hair. (Farmer and deSaussure 1955, Fig. 3). Tse-an-Kaetan (Station Q). Without a doubt the most spectacular nonfigurine artifact found was a hank of human hair hanging from 2 sticks stuck in the ceiling of the cave in the first area of total darkness. The hank measured about 10 cm. long and 2.5 cm. in diameter. It was wrapped with string (cotton?). There is no way at the present time of knowing whether or not this was in any way related to the figurines.

2. Juniper "torch." Tse-an-Kaetan (Station R). In a totally dark section of the cave, removed from any figurines, was found a 25 cm. length of juniper which was fire charred at the larger end. This may have been a torch.

3. Spatula. Tse-an-Kaetan (in surface of first passage in total darkness). This item 16.5 cm. long, 2.0 cm. wide, and 4 mm. thick resembled a flat spatula of wood, slightly curved along the long axis with a shallow groove on one side 2 mm. deep. A hole 6 mm. in diameter had been drilled 5.0 cm. in from one end which had cracked to the upper edge.

4. Awl. Tse-an-Kaetan (Station MA). On the floor of the cave in the twilight zone was found a wooden awl 18.8 cm. long and 1.3 cm. wide tapering to a point. It

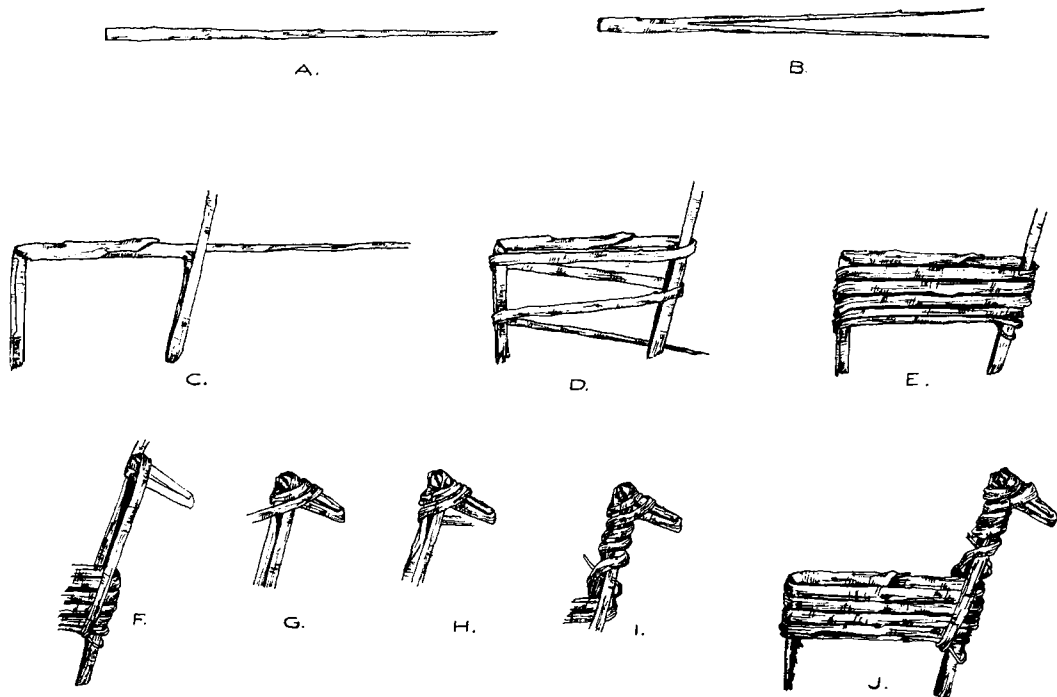


Fig. 5. Basic steps in the construction of split-twig figurines (from Wheeler 1942).

had a disclike cross section with a maximum diameter of 3.0 cm. It was decorated on 2 sides near the top with shallow inscribed holes in groups of two and four.

5. Vine-wrapped stick. Tse-an-Kaetan (S.F.1). At the 3-inch level, with a cache of figurines, a stick 10 cm. long and 4 mm. in diameter, was discovered with a piece of bundled vine less than 0.13 mm. in diameter attached to one end.

6. Small wooden "spear." Tse-an-Kaetan (S.F.1). In the first cache of figurines uncovered a piece of split stick 28.8 cm. long and 1.0 cm. wide tapering to a blunt point was found. This may have originally pierced a figurine.

7. Hammerstone. Tse-an-Kaetan (S.F.5). Above a cache of figurines was found an oval chert nodule derived from an upper Redwall limestone member; it appeared to be a slightly used hammerstone measuring 8 by 7 cm.

8. Projectile point. Tse-an-Kaetan (S.T.4). In the 4- to 8-inch level of Strat-test 4 a chert spear point 7.5 cm. long, 4.0 cm. wide, and 1.8 cm. thick was found. It was generally oval in shape and had an irregular zigzag edge. This artifact was not associated with a cache of figurines.

9. Wrapped chip. Tse-an-Kaetan (S.F.2). In the second cache of figurines uncovered was a triangular chert flake with an altitude of 2.5 cm. and a base, cross wrapped with bark, of 2.0 cm.

10. Sandstone pendant. Luka Cave. On the surface of this North Rim cave was found a rough sandstone

pendant about 5 cm. long, 3 cm. wide, and 3 mm. thick with 2 holes drilled from one side. The material appears to be local Coconino sandstone. A pendant similar to this was recovered from Etna Cave, Lincoln County, Nevada, below the Gypsum Cave level which also contained figurines (Wheeler 1942).

11. Other. One awl, a possible arrow foreshaft, and 2 wrapped sticks were found but could not be located for description.

#### FIGURINE CONSTRUCTION AND VARIATIONS

*Construction.* All the figurines found during the 1955 season conformed closely to one basic type. This is described below, as are certain variations from it. The basic Grand Canyon figurine type (Fig. 6 a) begins with a stick (Fig. 5 A) which is split (B) for most of its length. The unsplit section is bent at a right angle to form the back leg and top of the back (C). The lower split is bent down and up to form the front leg and continued up to make the neck (C). The [lower] upper split is wrapped back around the body a number of turns (D) to complete it (E). The split which has formed the neck is bent at an angle to form the first section of the nose. This piece is bent back toward the neck to complete the nose. The free end is then brought down over the head

and forms the second vertical part of the neck. This piece is bent under the body in back of the front leg and back up the right side of the figurine (E) to form the vertical body wrap and the third vertical neck piece. It is now wrapped around the crown of the head (G), thence around the neck (I), and tucked in to complete the specimen (J).

*Size.* Considerable variation in size was found (compare Fig. 6 k and l). The length from the top of the head to the bottom of the front leg ranged from 14½ inches to 2 inches. The length of the body ranged from 8 inches to 1½ inches.

*Horns.* Head appendages as shown in Figure 6 b, c, p are a variation of the basic head construction. Their construction is simply a further elaboration of the same technique. At stage F (Fig. 5) the neck support is carried above the head and then bent down to form the first horn. The twig is bent under the chin and back up the other side where the process is repeated, forming the other horn. The head and neck are then wrapped to secure the horns and finish off the figurine. On at least one figurine the final neck wrapping was not done, but the second horn element was brought straight down along the neck. The horns and neck of this specimen were wrapped with another piece of material. For the most part the horns were of about equal relative length; however some variation in size was noticed, from lengths of ½ to 1 inch.

A number of horns have supplementary wrapping at their base. Apparently this served to bind the horns more securely and keep them from bowing out of shape. This is invariably done with a smaller element which appears to have been a vine of some kind. The pattern of this work can be seen in Figure 6 c.

Horned specimens were found in Tse-an-Kaetan and Luka Cave, but none were found at Tse-an-Sha or White Cave. It is interesting to note that most of the horned specimens came from 2 adjacent caches at Tse-an-Kaetan. Otherwise they were not at all common.

Wheeler (1942, Fig. 29 B) illustrates at least one horned specimen from Etna Cave. This is clearly of an entirely different construction from those found in the Grand Canyon. It is difficult to see from the illustration whether the horns are an integral part of the figurine or whether they are a completely different piece,

but the latter seems to be the case. The configuration of this appendage at once distinguishes it from the most common type found in the Grand Canyon area. However, Figure 6 l shows a deviant specimen which in most respects appears very similar to the Etna Cave specimen in that its horns are not part of the main construction element.

*Nose.* The nose presents another area of variation in the Grand Canyon figurines. For the most part the size of the nose seems to have been a function of the size of the specimen; however, some of the little animals have relatively long or short noses. Figure 6 d shows a long nose which measures 1¼ inches, while Figure 6 e illustrates a short nose ½ inch long. The type specimen, Figure 6 a, shows a nose of approximately average length.

The angle of the nose also varies; however, this may well be merely part of the construction process, which is not entirely controlled by the artisan, but is influenced by the material. A right angle nose is illustrated in Figure 6 d, while a more acute angled nose is illustrated by Figure 6 f.

*Neck.* The wrappings of the neck shows 4 types of variations. The wrapping can be tight and cover the whole neck so that the vertical neck supports do not show as in Figure 6 g, or it can be loose as illustrated by the type specimen (Fig. 6 a).

A supplementary wrapping is used at times on the neck, usually being of a different material from that of the main construction. Figure 6 h has a bark wrapped neck. Others have small vine wrapping, as in Figure 6 c. Also, Figure 6 i shows a bark addition to the neck; 2 examples of this were found, both at Tse-an-Kaetan.

Necks vary in length, the relative extremes of which can be seen in Figure 6 d with a short neck of 1⅓ inches compared to an over-all body length of 3 inches, and Figure 7 j with the same body length and a neck 2¼ inches long.

The direction from which the neck is wrapped also varies. Whereas in most specimens the neck wrapping comes from the head down, Figure 6 k illustrates a neck wrapping from the body up. This is a result of stopping at stage F and wrapping the neck from the bottom up, instead of carrying the element up to the



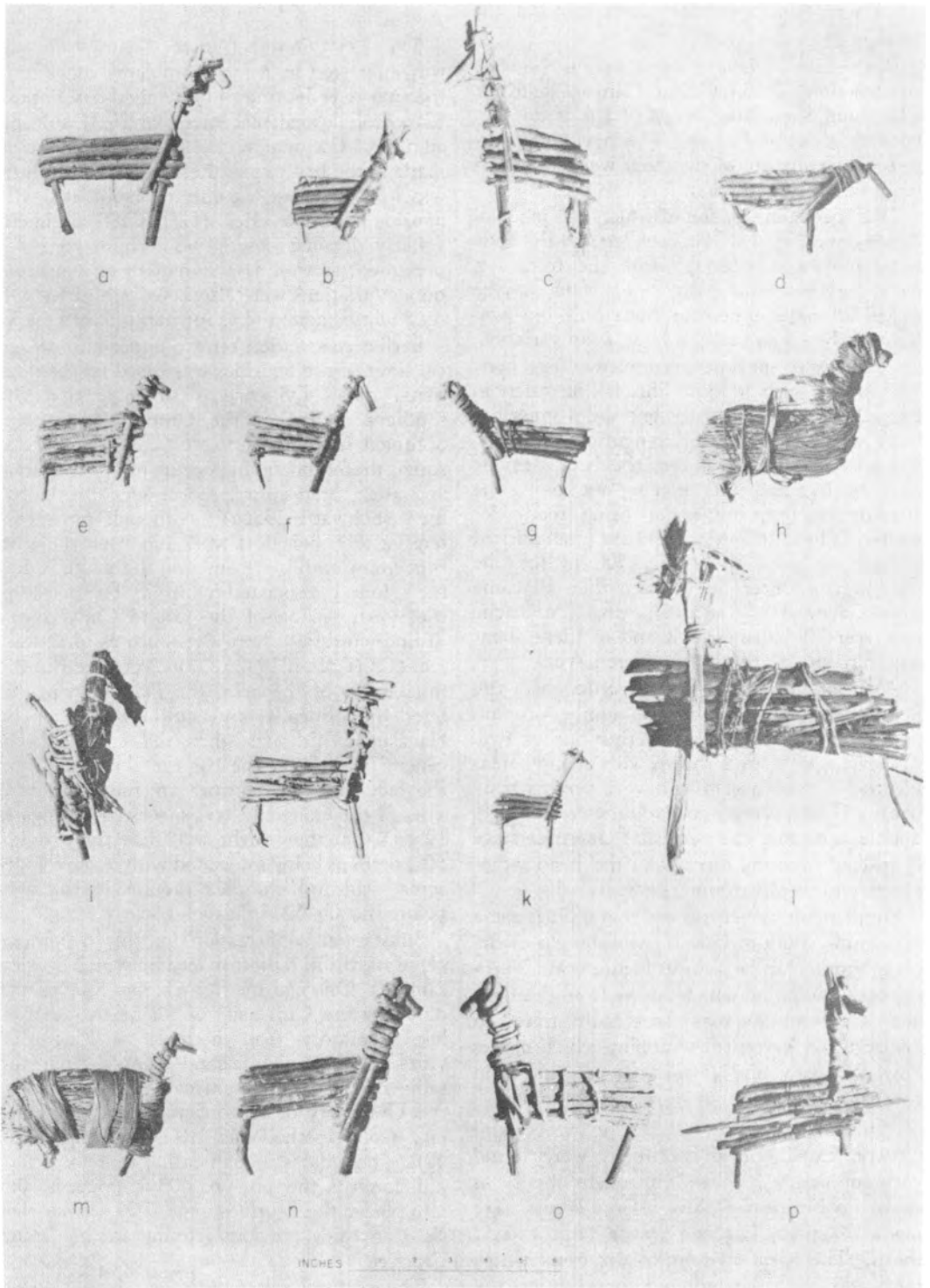


FIG. 6. Variations in figurine construction (for discussion see text).

head wrapping and then down around the neck.

*Body.* Five variations are found on the body construction of the Grand Canyon figurines. The main horizontal wraps of the body vary between three and seven. This may be a function of the amount of twig that was left at that point in the construction.

One specimen was found which was made of 2 elements (Fig. 6 *l*), the back leg and the body wrap making one unit, while the front leg, neck, and head make the other. This may be a second major type, but since only one was found it has been called a body wrap variation.

On certain specimens supplementary body wrapping is also found. This is illustrated in Figure 6 *m* where a thick bundle of grass has been wrapped around the figurine. Usually, the grass completely covers the body, leaving only the legs and neck sticking out, giving the animals the appearance of being ready for winter. The distribution of these grass-skirted figurines is very interesting. Except for one specimen of uncertain location they all came from Cache 6 in Tse-an-Kaetan. This cache had over 30 figurines in it and of these about one-third are of the grass covered type.

A variation basic in the construction of the figurines is concerned with the number of main vertical body wrappings, whether one or two. The type specimen is shown with one, whereas Figure 6 *n* can be seen to have 2 vertical body wraps. The process involved here is merely double wrapping the vertical element at stage F, instead of going directly to the head wrapping after one lap around the body.

Supplementary vertical body wrappings come in 3 forms. Bark or vine (?) wrapping over the grass bundle can be seen in Figure 6 *m*. Vertical body wrapping which comes from the neck and is part of the main twig is illustrated in Figure 6 *o*. A vertical wrapping which covers only the body and is not part of the main construction material is shown in Figure 6 *l*.

*Figurines with Spears.* During the Grand Canyon expedition 6 specimens were found with miniature "spears" through them, as shown in Figure 6 *p*. Most of the spears were made of sticks, but one was a large mesal thorn. The spear in four of the cases where there is information entered the body on the left and came out the right rear.

## CONCLUSIONS

The 1955 Grand Canyon Figurine Project was interested in 3 main problems concerning the split-twig figurines, (1) detailed description, (2) chronological placement, and (3) cultural affinities. Fortunately, contributions could be made to the first two of these; however, nothing was learned about the cultural affinities of the figurines. From a series of nearly 100 specimens a fairly detailed descriptive account could be presented, as well as a statement on construction. Variations were also noted and these will no doubt be added to as further finds are made.

Earlier speculation on the upper chronological limit of the figurines was based on distributional data. Evidence is available that the southern section of the Grand Canyon was occupied from at least A.D. 600 by the Havasupai, the ethnographic occupants of this area, and their prehistoric predecessors, the Cohonina (Schwartz 1956a). Although rather extensive archaeological work has been done on this group nothing resembling the figurines has been found associated with it. Furthermore, the north section of the Grand Canyon was distinct culturally from the south as of at least A.D. 600 (Colton 1952: 5), as were the historic inhabitants of the area, the Paiutes, who differed linguistically and culturally from the Havasupai, although they did share certain general traits. On the basis of these data and the fact that the figurines are found on both sides of the Canyon it was suggested (Schwartz 1956b) that they might well date prior to A.D. 600, perhaps being associated with a more widespread cultural complex present in the area before the A.D. 600 split took place.

Substantial confirmation for this hypothesis came from the radiocarbon dating of 2 figurine samples. One figurine from Tse-an-Kaetan was dated by the University of Michigan radiocarbon laboratory (gas method) at  $3530 \pm 300$  years (M-563). A second sample from the same site, but a different cache, was dated by the University of Arizona radiocarbon laboratory (solid method) as  $3100 \pm 110$  years (No. 47). These dates though earlier than expected, did confirm the pre-A.D. 600 hypothesis, but also placed the figurines some 2000 years earlier than anything previously found in the Grand Canyon.

The cultural relationships of these wooden wonders still remain nearly a complete mys-

tery. No material was found associated with the split-twig figurines which would allow for definite placement with any established archaeological complex in the Southwest or the Basin. On the other hand the date suggested by radiocarbon analysis and the figurine distribution would indicate that they may have been part of the widespread Desert Culture.

Any conjectures as to the use or function of these artifacts would be purely hypothetical, but certain informed speculations can be made. Each of the cave locations which contained the figurines had certain characteristics in common: extremely difficult to approach, no evidence of extended occupation, and the occurrence of figurines in fairly large numbers. Furthermore, a number of the figurines had small pointed sticks pierced through them which may have represented ceremonial or ritual killing. It is the feeling of the authors, therefore, that these caves were used for the purpose of ceremonial hunting magic, where, preparatory to the hunt, small animal models were made from split twigs, taken to certain sacred inaccessible caves and ritually killed, buried, or otherwise magically annihilated in order to insure success in the coming hunt.

Even though it is as yet impossible to place these activities exactly in time, or to assign them to any particular group of people, living or dead, it might be useful to set up a Grand Canyon Figurine complex, which with further work can be amplified, refined, and given fuller chronological and cultural placement as new evidence suggests.

The Grand Canyon Figurine complex has at its core the presence of the split-twig figurine. The basic type has been described in this paper, as have numerous variations. The distribution of the complex actually extends beyond the limits of the Grand Canyon (see finds 2, 4, 6, and 11), but until more is known about the non-Canyon finds, the certain distribution will be limited to it. The figurines are always located in extremely inaccessible caves, usually in the Redwall formation, and most are found randomly placed in cache pits in the floor of the caves. Associated artifacts are very rare and nothing has been found which would affiliate them with any recognized prehistoric cultural complex of the Southwest. All the cave sites in the Grand Canyon area appear to have been unoccupied since there is

no evidence of middens in the immediate proximity. This, coupled with the fact that some of the specimens are pierced with small "spears," suggests that the whole complex may well be related to hunting-magic ritual.

As is so often the case, this work has raised more problems than it has settled. It is hoped that with the location of further figurine caves and continued archaeological examination of such sites more information will be forthcoming on the extremely interesting Grand Canyon Figurine complex.

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UNIVERSITY OF KENTUCKY  
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## BURIAL MOUNDS ON THE GULF COASTAL PLAIN

WILLIAM H. SEARS

BURIAL mounds, with their contained structures, artifacts, burials, and the patterns of relationship between these concrete items, represent the largest recoverable body of data in the eastern United States which bears directly on problems concerned with prehistoric religion and ceremonialism. These data in turn are directly applicable, with varying levels of reliability, to problems of prehistoric social and political structure. This is possible through the predictably intimate relationship between supernatural and social controls which obtains in primitive societies.

A certain amount of information applicable to the study of social and religious types may be recovered through the study of community patterns, temple mounds, and other ceremonial structures. For a given amount of work, however, it seems probable that more information directly applicable to the study of social and religious systems can be recovered from burial mounds. They are, by their nature, one of the most important sources available to us of the kind of associations which "reflect human behavior outside of the limits of what ethnologists call 'material culture' and, under favorable circumstances of preservation, may permit study of most aspects of human culture except those, like folksongs and kinship systems, which are wholly dependent on language" (Wauchope 1956: 5).

Granting the limitations of the archaeological record, a number of classes of phenomena occur in burial mounds which are susceptible of interpretation in social terms as well as of classification as artifacts. It is to be remembered of course that, for this purpose, associations and sequences of associations are ultimately of more

value than the artifacts, structures, or burials themselves. The fact that a mound contains several kinds of burials may aid in placement of the structure in its appropriate temporal and cultural niche. Associations between burial types, structure types, and artifact classes provide information on ceremonial sequence and, ultimately, on the nature of the ceremonies. An oft noted example, a burial at mound base, in an elaborate tomb associated with artifacts which are ceremonial objects, is often minimally interpreted as that of a person whose social status was very different from that of another individual deposited as a bundle of bones in the top levels of the same mound.

Significant points here are the associations between initial mound building and a burial, between these and an elaborate tomb, between the burial and a class of artifacts, and among all of them as associated evidence of a ceremony. Opposed to this we may have, for example, the association of another burial only with the concluding stages of mound construction. From this we can conclude that a person associated in life with the religious activities of his group had a mound raised over his grave as a memorial and as a product of community effort while another person was simply included. A social relationship with hierarchical implications can certainly be inferred from this minimum amount of evidence.

There are obviously a number of limitations to this approach. Generally, they are of 3 kinds.

1. The normal archaeological limitation of preservation.

2. Cultural limitations. The construction of a burial mound would almost certainly have been in accordance with religious and social