HIDDEN HOUSE, A CLIFF RUIN
IN SYCAMORE CANYON, CENTRAL ARIZONA

A Study Based on Notes by Clarence R. King
and Museum Collections

by

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Introduction

Location

The Ruin

The Burial

Artifact Descriptions

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INTRODUCTION

Hidden House is a four-room cliff dwelling in Sycamore Canyon, 7 miles north of Clarkdale, in central Arizona. The decorated pottery indicates occupation between 1100 and 1300 A.D. (Pueblo III). The utility pottery is not well known, however it, together with the architecture and location, shows that Hidden House probably belongs in the southern division of the Sinagua Branch. The artifacts show extensive trade to the northeast and east, with some contacts to the west, and no clear indication of contact with the Hohokam. Perhaps around 1275 A.D. + 25, after a possible temporary abandonment of the site, a middle-aged man died and was buried in an abandoned room. Since the cave was sheltered the offerings accompanying the burial were well preserved. These include elaborate textiles, weapons, and possible ceremonial paraphernalia, which have been prominent display items in the Arizona State Museum since 1933. The purpose of this report is to present a detailed description of these, as well as to describe a single-focus site of the southern Sinagua Branch.
Excavations at Hidden House in 1933 were under the direction of the discoverer, Mr. Clarence R. King, who was then Research Engineer with the United Verde Copper Company. Mr. King wrote up his notes on the ruin and the burial in 1933, and in 1938 the students in Dr. E. W. Haury's Primitive Arts and Industries class at the University of Arizona made more extensive descriptions and drawings of some of the artifacts. E. B. Danson edited these and incorporated them into the notes in 1941. Both the 1933 and 1941 manuscripts are on file in the Anthropology Department, University of Arizona. The present writer began a study of Mr. King's notes and the artifacts as a research project in the Anthropology Department, University of Arizona. Since the site and artifacts were found to merit a more extensive treatment than was originally planned, the study became the writer's Master's thesis at the University of Arizona.

In order to give credit to those who made the report possible, Mr. King's foreword\(^1\) is here quoted:

Credit is due to Mr. J. L. Hancock for his acute perception: he observed the "mummified" left second toe in a pile of debris near a rat's nest. He also assisted in removing the burial. To Mrs. Katherine M. Hopkins the writer is indebted for her detailed notes and excellent photography made at the time of the excavation under adverse conditions. The writer wishes to thank

\(^1\) King, 1933, p. 1.
Dr. E. H. Spicer for his help in the preparation of these notes. And lastly, the writer is deeply indebted to Dr. Byron Cummings for his kindly criticism of these notes and his great help in handling a difficult situation which arose at the time these artifacts were displayed in the Tuzigoot museum at Clarkdale.

The plants were identified in 1938 by Mr. J. J. Thomber, then Professor of Botany and Botanist with the Agricultural Experiment Station, University of Arizona.

The present writer wishes to express his thanks to Drs. E. W. Haury, E. B. Danson, H. T. Getty, E. H. Spicer, and Mrs. C. L. Tanner of the Department of Anthropology, University of Arizona, and Mr. T. L. Smiley, Tree Ring Laboratory, University of Arizona, for reading the manuscript and giving many helpful suggestions. I wish also to express my thanks to those who are credited in the footnotes for the information they provided: Miss Katharine Bartlett, Museum of Northern Arizona; Dr. George F. Carter, School of Geography, Johns Hopkins University; Mr. Louis R. Caywood, National Park Service; Dr. H. S. Colton, Director of the Museum of Northern Arizona; Dr. A. V. Kidder; Dr. Bertram S. Kraus, Department of Anthropology, University of Arizona; Dr. Allan R. Phillips, Curator of Ornithology, Museum of Northern Arizona; Mr. Roland Richert, Custodian, Tuzigoot National Monument; and I am especially grateful to Mr. Clarence R. King, who kindly answered my many questions and gave permission to use the photographs in the 1933 report.
Plates 6 through 11 are from photographs made for Mr. King by Mr. H. P. Gerlach of Jerome, Arizona. Plate 1, A and B, are from photos by Mrs. Katherine M. Hopkins, and Plates 2 through 5 were taken by E. B. Sayles of the Arizona State Museum. The drawings are by the present writer, Figures 8, 9, and 10 from 1933 photographs, Figures 6 and 7 copied from drawings accompanying the 1938 analyses, and Figures 2 and 3 are based on Mr. King's sketches in the 1933 report.

The artifacts found with the burial were donated to the Arizona State Museum in Tucson, where many of them are now on display; the Museum catalog number appears in parentheses preceded by ASM in the description of each of those artifacts. The artifacts found in subsequent excavations at Hidden House by King, E. H. Spicer, and Louis Caywood were acquired by the Tuzigoot Museum; the number of the cataloged specimens is preceded by TM. The catalog numbers of materials in the Museum of Northern Arizona are preceded by MNA. The skeleton is not available for additional description since in 1934 it was claimed for reburial by some Yavapai Indians near Clarkdale who incorrectly believed it to be one of their ancestors. In 1933 the Yapapai burial ground near Clarkdale was robbed by pothunters, and as a result some Yavapai were suspicious about the origin of the Hidden House burial. One of their leaders insisted the skeleton be given to the Yapapai for reburial. Dean
Cummings demonstrated to their general satisfaction that the burial furniture was not Yavapai, and the medicine man therefore did not insist on keeping the artifacts.
LOCATION

Hidden House is located in the NE 1/4 sec. 8, T. 17 N., R. 3 E., at approximately 34° 52' N. lat., 112° 4' W. long., about 7 miles north of Clarkdale, central Arizona (Fig. 1). The Museum of Northern Arizona site survey number is NA 3500.

The ruin is a four-room cliff-dwelling in a shallow cave in the east face of Sycamore Canyon, 1 mile from the junction of Sycamore Creek with the Verde River. From near Bill Williams Mountain, Sycamore Creek flows south across the Mogollon Rim, and joins the Verde River about 6 miles north of Clarkdale. Near this junction the Verde turns south from following the Mogollon Rim and begins to wind through the wide Verde Valley, past the city of Clarkdale, to flow eventually into the Salt River northeast of Phoenix.

At the present time the flow from Summers Spring makes


2. This ruin should not be confused with another Hidden House (NA 3317), which is in Arches National Monument in southeastern Utah.

3. This Sycamore Creek should not be confused with the other creeks and canyons in Arizona named Sycamore, one of which flows into the Verde at Fort McDowell, another south of Clear Creek.
Map of central Arizona
Map of central Arizona
the lower 4 miles of Sycamore Creek a permanent stream. Its canyon is steep and narrow, in places over a thousand feet from stream-bed to rim. Short, steep side-drainages cut into the mesa areas on both sides of the canyon. At the mouth of the creek, the canyon widens out to provide about 40 acres of farm land. The people of Hidden House may have farmed this land as well as the narrow flat lands farther up the canyon, where there is now a growth of sycamore, willow, walnut, and cottonwood trees.
THE RUIN

Since it is sheltered and concealed by a projecting point of the cliff, the cave in which Hidden House was built is not visible from the canyon bottom and can be seen from but one point on the south rim of the canyon; this position accounts for the ruin's name and also for its preservation from the pot-hunters who have ravished many of the sites in the area. The shallow cave resulted from erosion in a soft impure sandstone bed of the Supai formation. Below the cave is a talus slope 5 or 6 m. high.

Most of the available area in the cave had been utilized in the construction of three roughly rectangular rooms (Rooms 2, 3, 4), each measuring approximately 2.5 m. by 3 m., and one room with a bowed front wall (Room 1), about 3 m. in diameter (Fig. 2). It is probable that the floors were mostly bedrock, but in certain sections there was a plaster floor in poor repair. The walls of Rooms 2, 3, and 4 have fallen, with the exception of one or two sections of the partition walls which are .50 to 1 m. high where they abut the back wall of the cave. There is no information as to whether Rooms 2, 3, and 4 had a constructed roof or the front

1. The descriptive data in this section is largely from King, 1933, pp. 2-4, Figs. 3, 3A.

Sketch of Hidden House, Plan.  
A, Burial; B, Cists
Sketch of Hidden House, section along line X-Y. A, Burial; B, Cist.
and side walls were built up to meet the cave roof.

The walls of Room 1 are well preserved (Pl. 1, a). The masonry is very rough and has an abundance of mortar, with a few patches of plaster still on the walls. A loophole, 15 cm. square, originally occupied the bottom of the break in the center of the wall (Pl. 1, a). This commanded one approach, the other being guarded by a similar hole, still intact, in the wall at the right of the door (not visible in the photograph). The doorway was T-shaped, but above the widening of the door the masonry had fallen. The roof "has fallen to the floor as a unit as the result of large spalls dropping from the cave roof." It "was definitely a constructed roof: poles, brush thatching and mud." However "The space between the top of wall and cave roof is well protected from wind and rain, and evidently was left for escape of smoke." This, together with the information that "there were smoke stains over all of the cave roof except where spalls had fallen in comparatively recent times," might indicate a flimsy roof construction or a smoke hole in the roof itself if the stains were made during occupation of

1. King, 1933, p. 2.
3. King, 1933, Fig. 3A, caption.
A, Hidden House, Room 1, showing masonry, niche, and doorway; B, View of burial with artifacts in place.
the rooms.

In Room 2 were two circular cists approximately 90 cm. deep and 90 cm. in diameter (Figs. 2, 3). They had been abandoned and filled with "wind-blown debris and sand" prior to the burial, which was placed over them. In the bottom of one cist was a grass pot-rest, and in the bottom of the other were a few scattered grains of corn and one complete ear of corn, which is described on p. 144.

King remarks in both the 1933 and 1941 notes that the description of Hidden House is limited because at the time the 1933 report was written, there had been no complete excavation of the site, the burial was found by chance, partly exposed, and was immediately removed. The ruin was completely excavated in 1934 by King, E. H. Spicer, and L. R. Caywood; however the notes from these excavations were lost in a hotel fire.¹ Some of the artifacts from the 1934 excavations are in the Tuzigoot Museum,² and these, together with additional


². The site is listed on the catalog cards as "Hidden House, Sycamore Canyon, Ariz (?)." The uncataloged specimens from the 1934 excavations are in exhibit cases and are labeled as coming from Hidden House. The descriptions were kindly supplied by Roland Richert (letter, June 15, 1951) from the catalog and collections of the museum at Tuzigoot National Monument. These were confirmed as coming from Hidden House by King (letter, Dec. 1, 1951) and Caywood (letter, Aug. 14, 1951). The cloth fragments are mentioned in a letter from King to Dean Cummings dated March 31, 1934, concerning the excavations then in progress, in which "a great deal of perishable food products such as beans, various seeds, grasses, etc." were also found.
information from Mr. King, will be considered below.

The evidence for a sequence of occupation of the various rooms relative to the time the burial was made was not clear from the original notes, however King states: "It is my impression, and in some cases based on direct evidence, that the site was abandoned for some time, and later reoccupied by fewer people (possibly only one family). That during this later occupation or immediately afterward, the burial was made. I thought at the time that the building stone from the other rooms was used by the last occupants to rebuild..." Room 1, which was used until abandonment.¹ Some of this evidence seems to be "The fact that no evidence of the building stone necessary to finish the partition walls of the rooms remains..."² If the cave shelters these rooms as much as it appears, they were probably not levelled by weathering but by human agency. The later inhabitants probably used much of the stone for Room 1 and discarded the rest. Since the excavator's initial impressions are more valuable than subsequent reasoning when all the evidence is not available, it may be tentatively concluded that Room 1 as it now stands was constructed later — probably, but not necessarily, after a temporary abandonment of the site.

². King, 1933, p. 2.
Since the burial rested on about 8 cm. of "more or less compacted debris," King believed that Room 2 had been abandoned for some time prior to placement of the burial.1 "As I recall, some building stones fallen from the walls or room 2 rested directly upon the layer of compacted debris which extended undisturbed under the burial; ie. — the walls had fallen before or immediately after the burial was made..."2 before the ca. 30 cm. of "loose debris and dust" was deposited over the burial (and possibly over the wall remains). It therefore seems logical on the basis of King's observations to conclude that the burial may have been made sometime during or after the later occupation in Room 1, at a time when Rooms 2, 3, and 4 were not in use. The adjoining Room 1 need not have been abandoned at the time of burial, since evidence of continued occupation of rooms in which burials were made was found at Tuzigoot.3

It is not difficult to place Hidden House in the general architectural development of central Arizona. In Pueblo I and II times, northern Sinagua houses were typically timber-lined pithouses. In late Pueblo II, pithouses began to be masonry-lined, and in early Pueblo III, sometime between 1120 and 1130, the multi-room surface masonry pueblo began to be

built by the northern Sinagua. These were in the open on level ground, sometimes with extra "wing" walls that may have been wind-breaks, or on an easily defended mesa or hilltop, or were cavate dwellings or cliff pueblos. Loop-holes and T-shaped doorways are common. The roof was usually supported by the walls and consisted of a main beam which supported smaller poles that were covered with layers of shakes or bark, then grass, and topped with clay. Smoke vents near the ceiling line are also found, such as in the rooms along Walnut Canyon. The people of the Kayenta Branch were building masonry surface pueblos in Pueblo I times, and the Sinagua evidently followed their example in Pueblo III. There is little doubt that the Pueblo III architecture of the upper Verde Valley was derived from the northern Sinagua very soon after it began to be used in the Flagstaff area.¹

The masonry pueblo sites of the upper Verde Valley can be divided into Pueblo III and IV on the basis of pottery as well as certain characteristics of the sites themselves. The type of masonry found at Hidden House seems to be generally typical of that of both Pueblo III and IV sites, although Pueblo IV masonry "is usually a better type, laid up with roughly faced stone."² T-shaped doorways, loop-holes, and

¹ Colton, 1946, pp. 268-275, 309.
² King, 1933, pp. 3, 15.
occasional bowed walls are found in Pueblo IV cliff-houses, and are probably also found in other Pueblo III sites of the Verde Valley as they often are in cliff-dwellings in other parts of the Pueblo area. Kivas have not yet been recognized in Verde Valley ruins. The number of rooms and presence of roofing and artificial floors is largely determined by the conformation of the caves and ledges in which the buildings were constructed.

The main differences between Pueblo III and IV sites are in size and distribution. Small masonry cliff-dwellings of from one to twelve rooms, built on a natural ledge or in a natural cave, are the characteristic Pueblo III house units in the cliffs of the upper Verde Valley and its eastern tributaries. Hidden House is cited as typical of the cave dwellings. In this area there are some open pueblo sites as well. There was also a Pueblo III occupation of some of the sites near the Verde River, such as Tuzigoot, which were to become the large sites of Pueblo IV times. The thirty-three Pueblo III sites mapped by Caywood and Spicer comprise a total of ninety-six rooms. These ruins tend to cluster in groups of from one to seven in areas where water and farm lands were abundant, and they suggest a grouping into fourteen

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1. Colton, 1932; Colton, 1946, pp. 257-275; Fewkes, 1898a; Fewkes, 1912b, pp. 199-200, Figs. 58, 61, Pls. 37, 38; Jackson, 1933, pp. 42-54; Shutler, 1951.
areas of occupation.

As Caywood and Spicer suggest, around 1300 (the approximate end of Pueblo III in this area judging by pottery), the people who lived in the scattered cliff-dwellings and small open sites banded together, perhaps with people who came in from around Flagstaff, and moved down to the river where they joined the people already living there, and built such sites as Tuzigoot into large pueblos with many rooms. A few large dwellings such as Honanki and Palatki were built in the cliffs near the Pueblo III sites, but the characteristic villages are the large, open pueblos near the river. There is a thirty-room open Pueblo IV pueblo at the junction of Sycamore Creek and the Verde. The fifteen known Pueblo IV ruins average over forty rooms each, and the majority have around sixty or more. Two sites on Oak Creek may have more than a hundred ground floor rooms.¹

As mentioned above, Hidden House is considered to be typical of the Pueblo III cave-dwellings of the upper Verde Valley.

¹ Caywood and Spicer, 1935, pp. 7-13; King, 1933, p. 15.
THE BURIAL

Position. The body and offerings were placed on the floor of Room 2 in a shallow natural depression close against the back wall of the cave and parallel to it. It was on top of approximately 8 cm. of "more or less compacted debris," and, as mentioned above, was partially overlying the two debris-filled cists. (Figs. 2, 3, Pl. 1, b) "Burial had been made with the face exposed, but the turban and scalp had slipped down over the face subsequently." About 30 cm. of loose debris and dust lay over the burial as found. There was no covering of wood or stone. The body was placed on its back, fully extended, with the right arm extended at the side, the left arm bent at the elbow, the wrist over the sacrum, and the fingers over the right ilium.

Sinagua burials in the Verde Valley usually occur in trash, but exceptions are frequent. According to Jackson most subfloor burials were covered with slabs of lime- or sandstone, or timbers. Graves without roofs were uncommon. Other forms of burial are rare in the Verde Valley. At

1. The descriptive data in this section is from King, 1933, pp. 3-5, and Figs. 3, 4, 4A.
2. King, 1933, p. 4.
3. King, 1933, Fig. 4.
Tuzigoot there were 250 burials in the refuse, and 161 under the floors of rooms — only three of which were adults. Since the rooms were usually on bed-rock, subfloor burials were in shallow holes averaging about 38 cm. below the floor. Burials in rooms were usually placed near and parallel to walls, and 34% were covered with slabs of stone. Some of the rooms were lived in after the burials were made.1 It would seem that the Hidden House method of burial is not unusual in the Verde Valley.

Extended burials are typical of the Verde Valley. Those at Tuzigoot were similar in position to the Hidden House burial. While most had their arms extended straight along the sides, there were five with the left arm bent at the elbow and the hand across the pelvis. There were two with the right hand over the pelvis. This arm position has also been reported for Canyon Creek, Kinishba, and Ventana Cave.2 Extended burial is typical of the Western Pueblos.3

The skeleton. The sex may be male, however most of the observable characteristics tend to be female. The person's


3. Reed, 1950, pp. 128-129. The terms "Western Pueblo," "Pueblo," "Anasazi," and "Hohokam" are used in Reed's sense, as described on p. 152.
age may have been around forty since the teeth are in the third stage of wear. The right lower first and second molars are missing and the bone is resorbed.¹ In the writer's opinion the hair-do and artifacts accompanying the burial establish the sex as male. The original report gave the height as 5 feet, 6 inches.² The photograph (Pl. 8, d) shows what may be vertical-occipital deformation, however it is not possible to be sure. Vertical-occipital deformation is a characteristic of the Western Pueblos and generally occurs with extended burials,³ however only about half of the southern Sinagua skulls which Bartlett observed were deformed.⁴

Skin painting. A patch of skin still remaining on the chest had been painted with some yellowish pigment, which may account for its preservation. It was impossible to trace any design.

At Tuzigoot there were eight skeletons which showed traces of blue and green paint on the faces. Eight skeletons at King's Ruin were similarly painted with green. Green

¹. It must be emphasized that the above comments, kindly supplied by Dr. Bertram S. Kraus, are based only on examination of the photographs since the skeleton is no longer available for study (p. vii).

². King, 1933, p. 4.


⁴. Colton, 1939, p. 35.
and black were found on facial bones in burials at Chaves Pass. Black marks are made on the face of the dead in Oraibi.\textsuperscript{1} There is too little data to draw sure conclusions, but since this writer has not noted mention of body painting on burials from other sites, it may be an occasional Western Pueblo trait.

Hair-style. The hair was gathered at the back to make a queue 9 cm. long, 2.5 cm. thick, with a 4-yarn\textsuperscript{2} cotton cord wrapped around the middle seven times (Pl. 8, b).

The hair is worn this way by Hopi men, and is also seen on Mimbres pottery.\textsuperscript{3}

Clothing and cerements. Clothing consisted only of the breech cloth, a pair of sandals, and a turban (?) made of two thick soft cotton strands wound around the head. The cerements may have served as blankets or clothing. Among the Hopi any clothing worn at time of death is left on the body.\textsuperscript{4}

\textsuperscript{1} Caywood and Spicer, 1935, pp. 99-100; Spicer and Caywood, 1936, p. 73; Fewkes, 1898b, p. 532; Fewkes, 1904, p. 34; Voth, 1912, p. 101; Parsons, 1936, pp. 824, 827.

\textsuperscript{2} Cordage terminology is explained on p. 86, fn. 1.

\textsuperscript{3} Fewkes, 1910, p. 564; Stephen, 1940, p. 14; H. S. and C. B. Cosgrove, 1932, Pl. 84, a.

\textsuperscript{4} E. and P. Beaglehole, 1935, p. 11.
A large painted blanket was wrapped around the body from chin to ankles with the exception of a triangular area on the back; this part had been folded over the chest leaving the upper right part of the back exposed. The blanket was tied in this position by yucca cords, one around the body below the armpits, another just above the knees, and a third at the ankles. The feet were wrapped with another decorated cloth, possibly because the painted blanket was not long enough. Over the painted blanket, and extending from the chin to the hips, was a white cotton cloth with tasseled corners.

Much of our data on prehistoric textiles and clothing comes from burials, and will be considered more fully in discussions of the artifacts. Shrouds, or use of cloth to cover a body for burial, are widespread in the Southwest (see p. 29). In Oraibi the dead were wrapped in blankets, and ropes were wound around these. A subfloor child burial from a ruin near Montezuma Castle was wrapped in cloth, and bound with a red and black cord. A burial in Jemez Cave was also bound. An elaborate blanket-wrapped burial from Canyon del Muerto was loosely wound with skeins of cotton yarns which must have been intended as burial offerings.¹

¹. Voth, 1912, p. 101; Jackson, 1933, p. 78; Alexander and Reiter, 1935, p. 50; Morris, 1948, pp. 68-70.
Burial furniture. Close to the body on its right side (Pl. 1, b) were the following artifacts: a bow with part of the bowstring, a cloth quiver containing twelve arrows, an unfinished bow, a leather quiver containing ten unfinished arrows, a bundle of four wood arrow foreshafts, a mass of yucca fiber ready for spinning, and beside the head a decorated cotton bag containing a bundle of animal sinew and a bundle of feathers tied with cotton cord.

On the chest were a feathered stick and a box made from the hollowed-out base of an agave stalk.

Close to the left hip and partially over the trunk were a decorated basket, a gourd container, and a bowl and an effigy jar of Walnut Black-on-white pottery. The effigy jar was in the bowl, and it contained, judging from the photograph, a bone which may have been a deer-bone awl, but its identification is very unsure since the specimen was not saved and there is no description of it. A large plain basket was on the left side near the feet. On the left side, close to the shoulder, were a pair of human hair looped bags or leggings, folded and tied with many wrappings of cotton yarn, and a plain white cotton bag containing a hank of human hair.

The artifacts accompanying the burial are remarkable for their excellent preservation. The following was the major damage: a rat's nest was built at the feet, which
resulted in the destruction of a large part of one sandal and most of the sandal ties, there were a few small rotted places in the painted blanket and the decorated cloth over the feet, and half of the breech cloth had rotted away. Some kind of fly, probably *Metopiidae*, had evidently reached the body before dessication was complete, probably accounting for the nearly complete skeletonization; thousands of pupae shells were found scattered within the body bundle. Practically no dried flesh remains, except for the patch of skin on the chest and the larger ligaments and toe and finger nails.

Detailed descriptions and discussions of the artifacts follow.
ARTIFACT DESCRIPTIONS

Painted blanket.¹ (ASM 20511) (Pl. 2) This cotton cloth was wrapped around the body from the chin to the ankles and tied in position with yucca cords. Measurements: ca. 147 cm. by 162 cm.

The cloth is plain-weave, with the warp as the shorter dimension. The weft averages 8.6 threads per cm., the warps 9.5. The side and end selvages appear to be 2-strand S-twined.

The design is painted in black on the natural color background, which is now yellowish. The edges of the lines forming the design elements are sharp, showing little or no tendency to run. While this may be done using a thick paint, it is probable that in this case the paint was thin. The penetration of design through to the reverse side is almost complete, but although distinct, is not as sharply outlined as on the face of the blanket because of some spreading of the paint. Whether or not the blanket had been sized before painting could not be determined. The reverse side of the blanket shows the method used in applying the design: parts of the pattern were formed by painting in

¹ The data for the description of the painted blanket is largely from King's 1933 manuscript, pp. 6-7, since the specimen could not be removed from the Museum display case for more detailed analysis.
Plate 2

Painted blanket, 147 by 162 cm., warps forming short dimension.
Painted blanket, 147 by 162 cm., warps forming short dimension.
guide lines to produce squares, then blacking in solid the squares necessary to form the design. The guide lines sometimes penetrated the cloth to the reverse side more completely than the subsequent solid blacking, thereby showing the technique clearly. In general the lines of the design follow the warp and weft well, but may cross several threads in the course of a few cm. The design was evidently begun in the center of the blanket, working out toward the edges along the major elements, which radiate from the center rectangle in the offset-quartered pattern (Pl. 2). Note irregularities and small incomplete areas.

The blanket had been neatly mended with what appears to be doubled single-yarn cotton thread using the outline stitch (Fig. 5). The end selvages are reported to be reinforced with overcast stitches. The state of preservation is excellent except for some worn spots resulting from use and a few rotten places which are probably due to contact with the decaying body.

The design of the painted blanket is essentially an offset-quartered layout, with bands of pendant stepped triangles on a cross-hatched background, and bands of pendant interlocking hooked triangles. The blanket does not have a true negative design. The layout and all of the design "elements" are found on Walnut Black-on-white pottery, a type which was found in quantity at Hidden House (pp. 139 f.). This writer
has not noted instances where the stepped triangle is built on the cross-hatching, though both "elements" do occur separately on the same piece of Walnut Black-on-white.¹ The design also bears some resemblance to the Kayenta, Betatakin, Wupatki, Tusayan, or Flagstaff Black-on-whites, and seems more similar to the first three than the last two or Walnut on present evidence. These have been dated at 1250 to 1300, 1275 to 1300, 1200 to 1300, 1225 to 1300, and 1120 to 1225 respectively (Walnut, 1120 to 1275).² The stepped triangles built on the cross-hatching is probably a late Pueblo III trait.³ Matching the blanket design to any specific pottery type or style is difficult at the present time however, since only the Kayenta and Tusayan have been extensively described and illustrated, but it is certainly related to one of those mentioned.

Undoubtedly the design was painted by someone familiar with the pottery from which the design was taken, probably by someone who made black-on-white pottery with this style of design. It therefore is more probable that the blanket was painted in the Tsegi and Marsh Pass, Flagstaff, or Little Colorado areas where the above types were supposedly

¹. Haury, 1945a, Pl. 29, e; Colton and Hargrave, 1937, Figs. 59, 60, pp. 237-240.

². Beals, Brainerd, and Smith, 1945, pp. 103-123, Figs. 38, a, b, 39, f; Colton, 1946, p. 251; Colton and Hargrave, 1937, pp. 16, 213-217, 225-229.

made, than that the design was copied from trade pottery by
the people of Hidden House, who did not produce painted
pottery. This is the most likely explanation when the de­
sign alone is considered, however the warp-weft count places
it among the other Hidden House plain-weaves rather than
with the northern textiles (pp. 70 f.). The only exceptions
to weft predominance among the counts available for the nor­
thern textiles are the painted poncho from Poncho House and
the painted blanket from Painted Cave. This suggests that
a tendency toward warp predominance may reflect an advantage
in texture for textile painting, and the thread count of the
Hidden House blanket may actually not be out of place among
the northern counts. Again, the warp predominance of the
three painted textiles may indicate that they originated in
an area where both warp predominance and the style of design
in question occurred together — possibly the Flagstaff area
for example, or perhaps the Little Colorado area. Since
available counts are restricted both in number and distri­
bution, the significance of the warp-weft counts has not yet
been proven, especially in regard to individual specimens.
At present it is thought that the painted blanket was pro­
ably traded in to the Verde Valley from the northeast.¹

¹. There is some similarity of pottery design in the
Kayenta area with Sedentary Hohokam, however the Hidden House
blanket design is clearly derived from the former rather
than the latter (Beals, Brainerd, and Smith, 1945, pp. 119-
121; Clarke, 1935, p. 65).
Large plain-weave painted blankets have been reported from only four other sites. What appears to be a blanket was found in a cliff ruin south of Navajo Mountain. It is painted in an elaborate design in red, black, and brown. "This is the only specimen we have ever found."¹ "Fragments of a cloth blanket with a solid black background bordered with red" came from Montezuma Castle.² With a child burial in White House, Canyon de Chelly, were fragments of a tasseled painted cotton blanket.³ A painted blanket from Painted Cave, northeastern Arizona, is 134.5 by 137 cm., with braids on the corners. The colors are red, green, and black on the white cotton. A second painted blanket from this cave was very similar to the first; there were at least two colors, one of which was red. The design layouts, like that from Hidden House, were the offset-quartered pattern. The main lines of the patterns on both Painted Cave blankets, and probably the others, are diagonal to the warps and wefts, whereas the pattern parallels them on the Hidden House blanket. The designs of these blankets are also similar to the pottery types mentioned above. Both were used as shrouds.⁴

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¹ Cummings, 1915a, p. 9, Fig. 6.
² Haury, 1945a, p. 75.
³ Crawford, 1948, p. 38, Pl. 6, Fig. 12.
⁴ Haury, 1945a, pp. 28-30, Pls. 10, 11, 12, a.
Other examples of painted textiles are unexpectedly rare. Painted ponchos were found in Painted Cave (colors brown and black, perhaps a green background) and Poncho House, on the Chinlee River in Utah (a negative pattern similar to the style of Kayenta pottery, using a dark brown paint on the natural cotton). Other pieces of cloth mentioned as painted are reported for Pueblo Bonito (?), Tonto (possibly painting in red on six fragments), Canyon Creek (a narrow red band on a bag), Mesa Verde (dark brown pattern), the Kayenta district, the Black Falls Ruins, and possibly Guasave, Mexico. The earliest example reported is a painted design on yucca fiber cloth from Sagiotsosi, Basketmaker II. The painting of finished textiles appears from available evidence to be more rare than some of the more complicated decorative weaves, and is probably found mainly in the Pueblo area.

1. Haury, 1945a, p. 30, Fig. 7, Pl. 12, b; Guernsey, 1931, pp. 102-103, Pl. 63.


4. Mera remarks "...the use of painted or stained designs on pre-Columbian textiles is believed to have been the almost exclusive practice in the territory north of the Mogollon Rim..." and again "These sporadic occurrences of primitive embroidery in a country where painted textile decoration was a preëminent trait..." (Mera, 1943, p. 6). Unless he had evidence not available to the present writer, these statements would seem to overemphasize its importance.
Painting (?) on cloth is mentioned in some early Spanish accounts, but it has apparently died out since then as an important decorative technique.¹

**Tapestry-inset cloth. (ASM 20493)** This cotton cloth was wrapped around the feet of the body. It is a plain-weave in natural color, with a design consisting of colored tapestry-weave insets (Pl. 3). Measurements: 40 cm. wide by 94 cm. long.

- In the plain-weave there are approximately 10 wefts and 11 warps per cm. The warp runs the width of the cloth. The side selvages are 2-strand S-twined; each strand is 4-yarn S-twisted. The end selvages are the same.

- The decoration consists of tapestry-weave insets (Pl. 3) — fourteen parallelograms arranged in two alternate rows of three, slanting obliquely to the left, and two alternate rows of four slanting to the right. They vary in length from 9 to 14 cm., and they are all about 2 to 2.5 cm. wide. Within each design unit there is a zig-zag in natural color running down the center. On one side of this zig-zag the parallelogram is filled in with a soft blue-black color; the other side is a soft brown. Around the edges of each design section there is an open-work effect, described below.

- The double-warp tapestry-weave results from passing

¹ Mera, 1943, pp. 2, 7.
Tapestry-inset cloth, 40 by 94 cm., warps forming short dimension.
Tapestry-inset cloth, 40 by 94 cm., warps forming short dimension.
each weft over two, then under two of the warps, but not in a twill movement. The weft threads are thicker than the warps (also thicker than the plain-weave wefts) and are battened down to obscure the warps. There are about 9 wefts per cm. The tapestry wefts turn on warps adjacent to the plain-weave, leaving a series of slits running diagonal to the warps to outline the sides of the parallelogram. The threads within each tapestry unit do interlock.

The cloth is worn thin and is ragged in a number of places. There are several large holes which showed no mending; they are probably due to the rats which had greatly disturbed the sandals and feet. Most of the insets had been torn or pulled apart from the plain-weave along the line of open-work, and one side of an inset was sewed to the plain-weave with outline and running stitches to draw the edges together, using a doubled single-yarn thread. The same method was used to sew up a rip in the plain-weave and some of the end selvage which had been ripped out. Side selvages are neatly reinforced with the blanket stitch using the same kind of thread.

To this writer's knowledge, no cloth similar in decoration to this one has yet been found in the Southwest. Cases in which a patterned band of decorative weave is included on a plain-weave cloth are known, however.¹ Slit tapestry and

¹ E.g., Nordenskiöld, 1893, Pl. 50.
plain-weave are relatively common weaves, and will be discussed further in the Summary of weaving and cordage techniques, pp. 69 ff.

Kent refers to this cloth as a kilt,¹ however this writer can find no conclusive evidence for the identification. Also, there is little evidence for kilts in times previous to Pueblo IV. The best evidence for Pueblo IV kilts comes from kiva murals, such as the Awatovi murals, and from pottery.²

Three "small kilts" were included in an infant burial in the Black Falls ruins, but these are not described.³ The elaborately decorated cloth from Grand Gulch, Utah, is referred to as a kilt by Amsden, a blanket by Chapman, an apron by Crawford, and a "small robe or kilt" by Goddard and Kelemen. It was originally about 76 by 122 cm.⁴

Douglas measured eight Pueblo kilts and found an average of 46 by 96.5 cm. and a range of 43 to 50 by 81 to 114 cm.⁵ A large kilt in the Southwest Museum measured by the writer is 57 by 115 cm. The Grand Gulch cloth is somewhat

². Martin and Willis, 1940, Pl. 39, 1.
³. Fewkes, 1904, p. 50.
larger, but that from Hidden House is similar in size and proportions to the kilts measured by Douglas. Thus the only evidence for Pueblo III kilts is based on the size and proportions of two decorated cloths compared with recent examples.

**Tasseled blanket.** (ASM 20501) Over the body, covering the large painted blanket, was an undecorated rectangular cloth with tasseled corners. The color was originally the natural color of the cotton, although it is now yellowed by age and in spots is stained a reddish brown. It is still intact except for a few holes and is soft and flexible. Measurements: 105 cm. long by 58 cm. wide.

The cloth is a coarse plain-weave, which is irregular since the wefts were not evenly battened down, averaging about 9 warps and 8.5 wefts per cm. The warp runs the short dimension. The side selvage is 2-strand S-twined; each strand is S-twisted using four warp-size yarns. The end selvage is the same.

In making the tassels two 4-yarn S-twisted strands were drawn through the fabric in its corner. The eight strands, resulting from the combination of both 2-strand selvage cords of adjacent sides with the four ends of the two added strands, were then braided into a short four-sided tassel.¹ The ends were evidently knotted so as to leave

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¹. For 8-strand square-braiding technique, see Graumont and Hensel, 1943, p. 226, Pl. 112, Fig. 6, or Douglas, 1938, p. 20.
free strands in a tuft. Two of the tassels had apparently been worn or broken since they were shorter than the other two, and one was knotted at the end. The longest tassel is now 4 cm. long and 0.4 cm. diameter.

Braiding the selvage cords at the corners was probably a common method of finishing large blankets,¹ but they are reported for only a few. An 8-strand round braid 7.6 cm. long was braided on each corner of a plain-weave blanket from Canyon Creek Ruin. Four of the strands in each tassel are from the selvages, while the other four come from two strings sewed into the corner.² A painted blanket from Painted Cave has 2.5 cm. long braids on the corners, made from the four selvage strands (two combined) braided together to make a 3-strand braid.³ The painted blanket from White House, in Canyon de Chelly, may have had tassels.⁴ The ponchos from Poncho House and Painted Cave had tassels.⁵ There are two tassels on corners of Tonto cloths which are 8-strand square braids, made from four selvage cords plus two strings which were added in loose, not sewed into the

¹. Kent, 1949, p. 41.
². Haury, 1934, p. 89, Pl. 59.
³. Haury, 1945a, p. 28, Fig. 6.
⁴. Crawford, 1948, p. 38, Pl. 6, Fig. 12.
corner. A fragment of a corner (of a blanket?) which is finished with a 6-strand round braid was found in the upper Gila drainage. White tasseled blankets are pictured in the Awatovi murals, and are mentioned for the 16th century Hopi by Castañeda. Many modern Hopi textiles also have braided tassels.

Wrapping the corpse in cloth is extremely widespread in the Southwest and was probably practised wherever cloth was woven. The writer has notes on this practise ranging from Colorado to Chihuahua and Sinaloa, and Nevada to New Mexico. Jackson's remarks on the upper Verde Valley are especially pertinent here: "The burials which we have seen were all wrapped either in tule matting or cotton cloth, or both." The Hopi wrap bodies for burial in a buckskin or woman's wedding blanket; the latter usually have tassels

1. Kent, 1949, pp. 41, 43, Fig. 8, b-e.
2. Cosgrove, 1947, p. 69, Fig. 79, b. Also Hough, 1914, p. 69.
4. Fewkes, 1898a, p. 629.
5. Since there is little data available in most of these references, they will not be listed here.
6. Jackson, 1933, p. 76.
and are two sizes which may vary considerably — 122 by 152 cm. and 152 by 183 cm.  

Decorated bag. (ASM 20492) This cotton bag was found close to the body on the right side. It may be a portion of a quiver similar to the complete one described on pp. 36 f. Like it, but differing in weaving details and size, the bag is divided into three sections: a looped or coil-without-foundation boot, a middle section of undecorated plain-weave, and an upper section of finely woven decorated irregular tapestry-twill (Pl. 4, a). Measurements: 33 cm. long by about 9 cm. wide at the top. The bag contained a bundle of sinew and a small bundle of feathers tied with a short piece of cotton string, neither of which can be found in the Museum collections.

The simple looped boot is 3.5 cm. long and 5.7 cm. wide at the point of joining. There are 3 stitches per cm. An S-twist 2-yarn thread was used. The number of stitches was decreased in order to form the boot by skipping a loop at intervals. The boot was woven on the plain-weave: the first row of coils loops over the plain-weave end selvage.

The plain-weave section is 13.5 cm. long and about 8 cm.

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2. King, 1933, p. 10, called yucca cord on p. 4.
A, Decorated bag, 33 cm. long;  B, Detail of front side;  C, Detail of reverse side.
cm. wide. There are approximately 11 warps and 10 wefts per cm. The side selvage is one heavy 5-yarn strand which is simply used as a warp and is completely covered by the wefts; the strand is Z-twisted, each yarn is Z-spun. The end selvage is two yarns S-twined. The plain-weave cloth and the twill were folded and sewed up the side with overcasting stitches using a doubled single-yarn Z-spun thread. There are several mended places. Each of the two tears nearly tore the cloth in two. They are evidently mended with the same thread used to make the looped boot, using crude running and overcasting stitches; there are also haphazard stitches of other threads S-twisted of two yarns and single-yarn thread. Another hole which has not been mended was torn out with a large part of the twill section.

The plain-weave and the tapestry-twill were woven on the same warps. As a transition, there was a change in weft movement to an undecorated over three, under three tapestry-twill for 1 cm., after which the colored elements are introduced and the irregular tapestry-twill continues.

The upper section, 15.5 cm. long, was begun with a color scheme of interlocking pendants of brown and natural colors, but the brown was abandoned and the design finished in black. A diamond pattern with pendant hooked triangles is made in over three, under three twill with occasional breaks in rhythm to produce the design. The "irregular twill with interlocking wefts," as Kent identifies this weave,
results from pulling more than one heddle for each weft row when the heddles were fixed for a regular twill, in this case over three, under three. "Because of this, in any given band of wefts the lines of floats do not ascend on the same diagonal. The diagonal ribs are broken and placed so as to form geometric patterns..."¹ There is no way of telling whether the warps were actually lifted with the heddles or were picked out with the fingers. Both methods seem equally plausible in this case.

A number of weft elements are introduced for the design and run only across six warp threads, giving the "right" side of the cloth the look of regular over three, under three twill, whereas the back, or reverse, shows series of ridges (Pl. 4, b, c). The new wefts are inserted by tying and are simply cut when not needed. Wefts in the twill section are much heavier than those in the plain-weave; they are batten ed down to obscure the warps, which are however exposed between the diagonal rows. Wefts average 9 per cm. The side selvages and stitches along the side are of course continuations of those of the plain-weave section. The twill is badly torn and has many worn places, but there is no mending. The rim of the bag is missing.

¹ Kent, 1949, pp. 37, 68.
King thought this object was the lower part of a quiver similar to the one described on pp. 36-41. The diameter is similar to that of the large quiver, but since its top selvage is missing the original length cannot be determined. While recognizing that it may well be a quiver, it will here be considered a bag, since that was evidently its use when it was placed in the burial.

Other than the Hidden House quiver, the most similar specimen was found by Cosgrove in Mule Creek Cave, in the San Francisco River drainage. It is 26.5 cm. long, 10 cm. wide at the top, and 4.5 cm. wide at the bottom. It is open at both ends, and Cosgrove does not mention signs of former sewing, nor is the piece fragmental since selvages are described for both top and bottom. The sides are evidently finished with self selvages, and are sewed together with a whipping stitch, reinforced at broken places by ties of yucca cord. The piece was woven to a keystone-shape, and is divided by the weave into three zones, evidently all on the same warps. The middle section is a plain weave, the top is a 3 cm. band made by the use of heavier weft threads, and the bottom is a 6.5 cm. monk's-cloth section made by grouping three or four warps through which are woven

1. King, 1933, p. 10.
2. Cosgrove, 1947, p. 69, Fig. 79, a.
pairs of heavy wefts. Cosgrove felt that it could not have been used as a legging, and suggest that it may be a quiver in spite of the open ends; he based his identification on the similarity of the lower part of the object with the Hidden House cloth quiver.\(^1\) However, the similarity of the two is very slight, and its consideration in this section, rather than with the quiver discussion, is based mainly on size. But since the two open ends are still baffling, the use of the Mule Creek Cave object remains an open question. Guernsey's sleeve-like Pueblo I specimen from Segi seems to be a similar problem.\(^2\)

Cummings mentions a small bag which "has been made of a piece of cloth that shows the plain, the diagonal and the twilled weave all on the same piece."\(^3\) No further description is available.

Kelemen and Amsden\(^4\) illustrate a bag found in a ruin near Montezuma Castle. It is 15 cm. wide and 32 cm. long, with white warps and black wefts. The design is made by floating the warps (Kelemen) or wefts (Kent). The piece was

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1. That the Hidden House quiver is the one referred to by Cosgrove was confirmed by Dr. A. V. Kidder (letter, July 5, 1951).


woven flat, folded end to end, and sewed up two sides.

Kent\textsuperscript{1} thinks the decorated band on the elaborate textile from Mesa Verde\textsuperscript{2} is probably an example of "irregular twill with interlocking wefts." This piece, probably about 30 cm. square, is shown laid out flat, and all four edges are tattered. Down the middle is a seam which is apparently two side selvages sewed together. The textile may originally have been a bag, the side opposite the seam having worn out first.\textsuperscript{3}

Fewkes mentions what may be "a portion of a bag, or possibly of a head covering," with a pattern in dark threads, from Mesa Verde.\textsuperscript{4}

The only other decorated bags this writer has come across in the literature are the small twilled seamless cotton sacks from northeastern Arizona and Tonto.\textsuperscript{5}

See also large cloth bag, small cloth bag, and human hair bags.

\textsuperscript{1} Kent, 1949, p. 68.

\textsuperscript{2} Nordenskiold, 1893, p. 104, Pl. 50.

\textsuperscript{3} However Amsden (1949a, pp. 23-24) interprets the seam as evidence for the waist- or belt-loom since such a seam is typical when two narrow fabrics are sewed together to form a wider piece. Both interpretations are plausible and may perhaps be resolved when the specimen is examined more closely.

\textsuperscript{4} Fewkes, 1911, p. 76.

\textsuperscript{5} Kidder and Guernsey, 1919, pp. 149-150, Pl. 62; Kent, 1949, pp. 44, 46.
Cloth quiver. (ASM 20491) The cloth quiver was found close to the right side of the body (Pl. 1, b). It contained twelve finished arrows (described on pp. 100f.), the points projecting from the opening, the feathered ends at the bottom.\(^1\) It is made in three sections: a boot of plain-weave cloth, a plain-weave middle section, and an upper section of decorated slit tapestry-weave (Pl. 5, a). The contrast between the elaborate upper half of the quiver and the coarse, crudely attached lower half leads to the belief that the original article was mutilated or worn out, and the lower part of the quiver was hastily sewed on to repair the damage. Since the boot is neatly sewed to the bottom of the middle section these two parts were probably made together for this purpose or were part of another quiver. Measurements: the total length is 82 cm., diameter about 7 to 8 cm.

The boot portion (about 4 cm. long) was formed from a plain-weave cloth with one edge sewed flat and the other three edges gathered so the rectangular cloth would fit the cylindrical middle section, to which it is attached by a fagoting stitch using a 3-yarn S-twist thread. There are about 13 warps and 7 wefts per cm. The end selvages are 2-strand S-twined, each strand S-twisted of three yarns of warp size. The side selvages are 2-strand S-twined, each

\(^1\) It is unlikely the arrows were carried in this way since the feathers might be damaged. In all accounts where it is mentioned, the feathered ends project from the quiver, e.g. Gifford, 1936, p. 286, and Awatovi murals.
A, Cloth quiver, 32 cm. long; B, Detail of flap, 32 cm. long.
strand S-twisted of two yarns of warp size. This piece of
cloth is remarkable for its small size: it is 12 cm. on
the weft dimension, 8.5 cm. on the warp dimension, and was
woven to that size as indicated by the presence of all four
selvages.

The middle section (about 37 to 38 cm. long) is plain-
weave made into a cylinder by bringing the two side selvages
together and sewing next to them with running stitches,
using a single-yarn thread. There are about 9 wefts and 15
warps per cm. The side selvages are 2-strand Z-twined;
each strand is S-twisted of three yarns of weft size. The
end selvage at the boot is two very thin strands Z-twined;
each strand is S-twisted of three yarns of warp size. The
other end is merely a ravelled edge attached to the tapestry
by two rows of uneven running stitches using doubled single-
yarn thread. The two rows are separated from each other
about 1 cm. (the middle section overlaps the upper), and
the thread of the upper row is about twice the thickness of
the other.

The decorated slit-tapestry cloth (about 45 cm. long
and 24 cm. wide) forms the upper part of the quiver (Pl. 5,
a). It was formed into a cylinder by neatly sewing along
the side selvages close to the edge with a fagoting stitch
using doubled single-yarn thread. The side selvages are
self selvages, i.e. there are no reinforcing strands, the
wefts merely turn on the outside warps. The lower end of
this section is covered for 5 cm. by the overlapping middle section. This covered part is not tapestry-weave, but is an undecorated monk's-cloth or paired-warp, paired-weft weave (a pair of wefts goes over one pair, then under one pair of warps). There are 7 pairs of warps and 7 pairs of wefts per cm., and warp and weft threads are the same size, both Z-spun. Some very heavy single-yarn threads (about 0.3 cm. thick) very loosely Z-spun are sewed in haphazard stitches, in part of the edge of the monk's-cloth; the selvage is missing and the end is raveled. (This is additional evidence for the original separation of the upper and lower halves of the quiver.) The rim is very fragmentary, but the remaining 2 cm. shows it was finished with a 2-strand Z-twined selvage, each strand S-twisted of three warp-size yarns. The selvage was later reinforced by rolling the edge with blanket and overcasting stitches using single-yarn thread. The tapestry-weave itself is paired-warp and continues on the same warps from the monk's-cloth using wefts that are thicker and more loosely spun than the other wefts, battened down to obscure the warps. There are 7 pairs of warps and about 16 wefts per cm. The slits occur where there is a color change, wefts turning on adjacent warps. The slits are used to outline the major pattern features, and occur mainly in lines diagonal to the warps. Within certain design areas the wefts do interlock. The pattern consists of elaborate interlocking hooked triangles, pen-
dant triangles, rectangular scrolls, and squares, done in a deep brown and a blue which is bright blue in several places, with natural cotton color serving to outline and separate the brown and blue design elements.

A flap of tapestry-weave 32 cm. long and 6 cm. wide was sewed at its mid-point to the side of the quiver opposite the handle, its top edge even with the rim of the quiver (Pl. 5, b). Four long stitches (using an S-twist strand of three yarns) catch the outside warps on both sides of the main tapestry piece and lock over a few threads on the flap at five places, at the same time sewing the sides of the quiver together and holding the flap in place. There are 5 pairs of warps and about 20 wefts per cm. Warps run the length of the cloth. The design elements are similar to the main piece, though smaller and in a different pattern, and the colors are the same. Some slits are parallel to the warp and in several cases are 2 to 3 cm. long. The side selvages are self-selvages. Each end selvage is 2-strand Z-twined, each strand S-twisted of two yarns. Thick hanks of Z-spun yarns (now about 3 cm. long) were inserted between the selvage cords and the last wefts, both ends of the hanks hanging free. A 3-yarn S-twist strand was twined around the hanks below the selvage strands so as to leave a row of ten tassels each about 1.5 cm. long tightly bound to the ends of the flap (Pl. 5, b).

The handle or carrying strap is composed of two strips
of belting which are united by an overhand knot at about the mid-point of the length of the strap. The overall length of the strap is 45 cm. It is attached to the tapestry section 16.5 cm. below the rim: a string (doubled, each strand is 3-yarn S-twisted) was passed through the cloth and out again, with the ends tied in a reef knot, and an overhand knot on top of that, to form a loop about 3.5 cm. long attached to the body of the quiver, to which in turn the belting was tied. The lower attachment of the strap is the same in method, thread, and knot, and is placed in the plain-weave section 45 cm. below the rim, about 5 cm. below the beginning of the plain-weave. An overhand knot was used to tie each end of the belting to its loop. On the upper loop is another fragment of belting probably from the same piece as the upper part of the strap. It is about 8 cm. total length and is also attached by an overhand knot. This may have been part of the present handle that had been torn and retied, without removing the remaining fragment. The belting analysis is on p. 58 ff.

Other than on the rim selvage and monk's-cloth as described above, the only mending on the quiver is in the middle section, where two holes are mended with outline and running stitches using both single and doubled single-yarn thread.

According to the original description, "the entire quiver is stiffened by the insertion of two reeds length-
wise. These are attached to the tapestry selvage by ties of cotton and yucca cord, and also near the bottom by passing through the lower tie for the carrying strap.\textsuperscript{1} Both reeds and ties are now missing.

The only other prehistoric cloth object yet reported which may be a quiver is that from Mule Creek Cave in the San Francisco River drainage, described by Cosgrove. However, since its similarity to the Hidden House quiver is so slight, it has been considered in the discussion of the \textit{decorated bag}, p. 33.

Morris describes a long, cylindrical basket made of reeds, held together with interlaced strips of yucca, and the bottom closed with a wad of corn husks. This Pueblo III specimen is from southwestern Colorado. Morris remarks: "Although it is known that most of the quivers used by the cliff-dwellers were made of skin, it is difficult to assign any other function to the object in question."\textsuperscript{2}

Three quivers are painted on Mimbres Black-on-white bowls. Those illustrated by Fewkes are possibly skin, and that shown by the Cosgroves may be cloth.\textsuperscript{3}

In one of the Awatovi murals, Pueblo IV, a quiver is

\textsuperscript{1} King, 1941, p. 14.
\textsuperscript{2} Morris, 1919a, p. 178, Pl. 46, b.
\textsuperscript{3} Fewkes, 1914, Fig. 15; H. S. and C. B. Cosgrove, 1932, Pl. 227, e.
picted which has a long flap pendant from the rim. No texture is indicated, and its form does not indicate its material.¹

Quivers from the Pueblos and other Southwestern Indians are rarely described, however some are incidently pictured. These all seem to be skin, with flaps pendant from the rim or elsewhere, usually the tail, legs, or other part of the animal. Deerskin and other skins are used,² but mountain-lion or wild-cat skins seem to be the most popular.³ If Morris (quoted above) is correct, perhaps it may be assumed the decorative flap on the cloth quiver is analogous to the pendant animal appendages on the prehistoric skin quivers, if the latter are similar to the historic examples.⁴ See


². Spier, 1933, p. 135 (Yuman); Spier, 1928, p. 153 (Havasupai), Bunzel, 1932b, p. 1011 (Zuni).

³. Fewkes, 1903, pp. 90, 106 (Hopi); Spier, 1928, p. 153 (Havasupai); Russell, 1908, p. 96 (Pima); Forde, 1931, p. 172 (Yuman); Gifford, 1932, p. 224 and 1936, p. 286 (Yavapai).

⁴. Skin quivers with pendant flaps are mentioned or illustrated in: Fewkes, 1903, Pls. 3, 4, 11, 30, 44 (Hopi), Pl. 2 (Zuni); Bunzel, 1932b, Pl. 33, c, Pl. 45, b, Pl. 25, d (Zuni); Spier, 1928, p. 153, Fig. 23 (Havasupai); Russell, 1908, Pl. 13, d (Pima); Forde, 1931, p. 172, Pl. 55 (Yuman); Spier, 1933, p. 155 (Yuman); Gifford, 1932, p. 224 (South-eastern Yavapai); Gifford, 1936, p. 286 (Northeastern Yavapai). The Hidden House quiver was probably worn as illustrated in Bunzel, 1932b, and Fewkes, 1903.
also the leather quiver, p. 94.

Decorated sash. (TM uncataloged, see fn. 2, p. 5) Found in Hidden House, but not in the burial. The fragment is woven of cotton, and is about 10 cm. long and 5 cm. wide. The design consists of chevrons running the width of the cloth. Each chevron is a brown stripe between two blue stripes. The chevrons are separated from each other by a wide space of natural cotton color. There is a tassel on one corner. Mr. Richert remarks that "it looks like part of a sash, much like the modern Hopis weave."

Breech cloth. (ASM 20498) The breech cloth and its belt were found in place on the body. The back portion is rotted away and the front is soiled, matted, and worn. It is 16 cm. wide where it loops over the belt, is about 9 cm. wide at the fragmentary end, and is 29 cm. long from the fold over the belt to the end. The cloth is plain-weave, with about 13 warps and 9 wefts per cm. The warp runs the length of the cloth. The side selvages are fragmentary, but are clearly 2-strand S-twined; each strand is S-twisted of four yarns. The end selvage is 2-strand Z-twined, and is too badly soiled to analyze the construction of the strands; they are apparently the same size as the side selvages. In several places the worn side selvages have been reinforced with the blanket stitch using a single-yarn thread. Other
mending is done with the running and outline stitches using several weights of single-yarn thread. In several places, where the wefts had worn away exposing the warps, the warps were separated in bunches which were twined together using two doubled single-yarn threads as the twining elements (Fig. 5, J).

This cloth was woven for use as a breech cloth, rather than being a fragment of a larger piece. Its size and length-width ratio, as indicated by presence of both side selvages, support this belief. The cloth was looped over the belt, with a selvaged end hanging about 18 cm. below. This end was sewed to the rest of the cloth, using running stitches that went the width of the cloth, just above the sel­vage; the thread was 2-yarn S-twist. The thread was pulled so as to slightly gather the cloth and decrease the width. The photographs of the breech cloth taken after it was removed from the body indicate the surface with the end sewed to it was on the outside, with the continuous surface worn inside. This is further confirmed by a few hairs, probably pubic, embedded in the cloth 15 cm. below the belt on the continuous surface. The 11 cm. of the breech cloth below the place where the selvaged end was attached continues the gradual decrease in width to 9 cm. This narrowing is not only due to gathering by the sewing and wrinkling but possibly also from the weaving process. Fragments of the selvages are present to indicate the widths, and allowance
was made in the measurements for sewing and wrinkling. The evidence indicates that in all probability the narrowed end of the cloth was drawn between the legs, with the missing end looped in some way over the belt in the back.

The breech cloth was held in place by the belting (described on pp. 58-60) which, according to King's description, was wrapped twice around the waist and tied.

Reports of cloth breech cloths from the prehistoric Southwest are extremely few. Those most similar to the Hidden House example are from Tonto. Of the six Tonto breech cloths, all are plain-weave, one with an ornamental front in irregular twill with interlocking wefts. These breech cloths also had the front ends attached to the body of the cloth on the outside, but they were attached on the loom, during the weaving process, rather than being sewed. The Tonto breech cloths were also narrowed on the loom. The measurements for one are given, and they are similar in detail to the Hidden House specimen. Some of the Tonto cloths narrowed to about 2.5 cm. wide; this was not the case for that for which measurements were given or for the Hidden House specimens, perhaps because the narrower parts of these are missing, rather than a difference in form.

Most of the breech cloths found in the Southwest have not been reported on. Kent mentions some she has examined

1. Kent, 1949, pp. 51, 53, Fig. 11.
from the Pueblo III sites of Batwoman House, Floating House, Gourd Cave, White House, Wupatki, and Walnut Canyon. Cummings mentions cloth fragments that may have been breech cloths from the San Juan area. Kent also mentions three that "may date from early Pueblo IV rather vaguely assigned to the 'Upper Verde' region and a fragment from Puye (1506-1575) near Santa Fe, which may be a breech cloth." She notes that only the breech cloths from Tonto, Wupatki, and Walnut Creek have the hanging end joined to the body of the cloth while on the loom, and does not mention any instances of sewing the end down, a variation which should probably put the Hidden House cloth in the same category since the same form was achieved even though the method differs. Some breech cloths evidently have fringe at the end.

Two more examples may be added. Harrington mentions "kilts or breechcloths of white cotton cloth," the breech cloth described as "apron-like," from southern Nevada, probably Pueblo II. Wormington mentions figures of men wearing breech cloths painted on Mimbres pottery.

Kent concludes that loom-woven breech cloths are probably characteristic of the Anasazi, but that the fastening of the end to the body of the cloth on the loom is not known "from more specifically Anasazi sites."¹ This is in contrast with the one man's breech cloth from the Hohokam, which is made of strips of cotton cloth.² Jackson mentions the burial of a 5 year old child wearing a red cotton cord breech cloth, in Clear Creek Ruin in the Verde Valley.³ Cosgrove notes string breech cloths from the upper Gila.⁴ With so little information from all areas, we are limited to Kent's conclusions, above.

Hopi breech cloths are mentioned by Hough — a strip of cloth with fringed ends,⁵ and Gifford mentions breech cloths the ends of which form two aprons, in some other Pueblos.⁶ Spier indicates the same form for the Yumans,⁷ while Russell shows a Pima man wearing a breech cloth the ends of which do not hang in front and behind, but are rather looped over the outside of the belt, and are tucked

3. Jackson, 1933, p. 82.
7. Spier, 1933, p. 94.
inside. ¹ Most interesting are Stephen's notes on the Hopi, since he indicates that only a kilt used to be worn and that "the style of breech cloth passing between the legs is of comparatively recent introduction."² This writer has not observed breech cloths in the few Pueblo IV murals he has seen, but since they evidently portray religious scenes, the ceremonial kilt, rather than the breech cloth, might be expected. The continuity of breech cloths from prehistoric times is not clear, but they are undoubtedly indigenous.

**Large plain bag.** (ASM 20494) This bag was found close to the left shoulder of the body and contained a hank of human hair, described on p. 69. Originally white, the bag is now a yellowish brown and has a stain at each end. It is long and narrow, measuring 18 cm. from the side stitches to the folded side and 45 cm. from the bottom stitches to the top. It was formed from a piece of cloth (which was probably a fragment of a larger cloth) measuring about 50 cm. long by 41 cm. wide, by doubling it over the long way and sewing along the side and bottom with yucca cord. The sewing along the side was done with an S-twisted 2-yarn strand using Z-twist yarns, in running stitches that average about

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¹ Russell, 1908, Pl. 37.

² Parsons, 1936, p. 410, fn. 1.
1 cm. long. Sewing probably started at the top, where the untrimmed end is tied in an overhand knot. Near the bottom this thread ran out and was attached with a reef knot to a Z-twisted 2-yarn strand using S-twist yarns, with the running stitches (now averaging about 0.5 cm. in length) continuing down the side and along the bottom, to end near the folded edge where there was a hole in the original cloth straddling the fold; the thread now ends without any means of anchoring. Another 2-yarn Z-twist yucca cord was used to sew up the top half of the hole. The new thread was tied over the fold in an overhand knot, two overcasting stitches were made to bind the edges of the hole together, and a finishing knot (now unravelled) was evidently tied near where the running-stitch thread ends. The stitches along the side are 2 cm. in from the edge; the bottom is irregular and ravelled. The stitches are 6 cm. from the bottom edge at the folded side, 2 cm. from the edge at the stitched side.

The cloth is plain-weave, with the warp running the short dimension. There is an average of 10 warps and 8 wefts per cm. The selvages along the side of the bag are end selvages and are 2-strand Z-twined; the strands are S-twist 3-yarn. Both ends of the bag are ravelled and unfinished, suggesting this is only part of a larger cloth.
Small plain bag. (ASM 20506) This bag came from Hidden House but its location was not recorded. It is a small, wide-mouth pouch, measuring 17.5 cm. wide across the bottom and 11 cm. along the stitched side not including the loose warps. The cloth is dirty and gray but shows no stains. The top edge is ravelled (warps protrude from the last remaining wefts as much as 2 cm.) and is very irregular; the thread used to sew up the bag now ends near the top edge without any anchoring, and above it are a few holes where the thread had been pulled out. From all indications this is the bottom part torn from a larger bag, without subsequent modifications. The bag was formed from a piece of cloth 35 cm. wide and of unknown length which was folded along the middle and sewed on the side and bottom with overcasting stitches using a loosely S-twisted 3-yarn cotton strand along the bottom, and changing to a 4-yarn strand which is otherwise the same along the side; the point of change is lost in the mass of mending threads used to repair the corner. The end of the cord along the bottom is tied at the folded edge in an overhand knot.

The fabric is a coarse and uneven plain-weave, with approximately 11 warps and 6.5 wefts per cm. The warp is parallel to the sides of the bag. The side selvages are 2-strand S-twined, each strand S-twisted of four warp-size yarns. The end selvage is the same. A few places are mended with erratic outline and running stitches using several
different single-yarn cotton threads.

Cotton cloth bags are a rarity in archaeological site reports. Haury shows a tattered bag from the Canyon Creek Ruin made of a piece of cloth folded over and sewed up the side and bottom; it contained gourd seeds. Another bag may also have been present. Kent describes a bag 36 cm. long by 25 cm. wide from Tonto. It is made from two separate fragments of plain-weave cloth, placed together and sewed up three sides — with long, irregular running stitches up one side, the other with loose overcasting stitches, and the bottom with a combination of running and overcasting; threads are 3- and 5-yarn cotton strands. A fragment, which may be the rim of a bag, is made from a cloth the side selvages of which were sewed together. Hovey mentions "purses of cloth" which are probably from Mesa Verde or Grand Gulch, and Steward says that "the Judd collection at Kanab has a woven cotton bag from somewhere in the region. It contains seed or leaves and white paint."

Twilled seamless cotton sacks, about 12 cm. long, have been found in northeastern Arizona and Tonto. Small bags

3. Hovey, 1893, p. 279.
4. Steward, 1941a, p. 316.
may have been present at Tuzigoot and there was a plain-weave miniature bag in the agave box from Medicine Cave (p. 122), made of a fragment of cloth with the corners bound together. See also the decorated bag (p. 30) and human hair bags (p. 53).

Cloth from agave box. (ASM 20485) This cloth was found folded over the opening of the agave box (p. 120, Pl. 10), held in place by two pieces of belting (pp. 57-58). The cloth is roughly square but badly tattered, and is 35 cm. greatest length by 29 cm. wide. The fabric is plain-weave, with 14 warps and 11 wefts per cm. A fragment of end selavage is 2-strand twined; two yarns make up each strand but they are not twisted together. A small lump of hardened white clay about 1.5 cm. in diameter was wrapped in the edge of the cloth. The lump was placed near the selvage, the cloth was gathered around it, and a single-yarn S-twist yucca cord was tightly wrapped around below the clay and tied in an overhand knot. There is a small amount of mending near the selvage with outline and twining stitches using single-yarn S-spun cotton thread.

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2. Nordenskiöld (1893, p. 83) mentions white clay wrapped in cloth from Mesa Verde, but the amount is not given.
A piece of skin was used in a similar way on the agave box from Medicine Cave (p. 122), and pieces of cloth or skin are sometimes used on modern Pueblo feather boxes (p. 127).

**Cloth fragments.** (ASM 20505) This piece is from Hidden House, but its exact position is not recorded. The greatest dimensions are 26 cm. by 19 cm. There are no selvages and the edges are ravelled. The piece is plain-weave, with 9.5 warps and 7 wefts per cm.

Two other fragments of cloth were found in Hidden House, but not in the burial. (See fn. 2, p. 5) "I think they were plain white over-and-under weave coarse white cloth, but am not sure." These cannot be located for further description.

**Human hair bags.** (ASM 20497) (Pl. 6) A pair of bags made of human hair, folded and tied with many wrappings of cotton yarn, which are now missing, was found near the left shoulder of the burial. A great many bits of leaves, weed seeds, etc., imbedded in the weave, suggest that the objects were worn on the lower part of the leg as leggings and were later converted to bags by sewing up one end. The manner of folding and wrapping precludes the possibility of this

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Human hair looped bags, longest 59 cm.
debris becoming lodged in the objects after being placed in
the burial. That they are a matching pair also supports
this belief. One is 59 cm. long, the other 54. The cir-
cumferences at the top are 24 cm. on the first, 28 on the
second. The bags are therefore long and narrow. The widen-
ing in the main part of the body is probably due to stretch-
ing out of shape. One bag has a knot of yucca fiber placed
7 cm. from the rim, perhaps for the attachment of a band
to hold them up on the leg.

The weave of the bags is simple looping using human
hair cord which consists of Z-twist yarns S-twisted into a
2-yarn strand; each yarn contains about sixty hairs. There
are 2 coils per cm., the top one acting as the selvage at
the rim of the bag.

The closure of the bottoms with yucca cord sewing
(running stitch) is very haphazard in contrast to the care-
ful workmanship on the rest of the bag. Sewed portions are
also found close to the bottom of the bags in places where
the strands are broken. On one there is sewing about one-
quarter the way up as though the bag had come apart along
one line of stitches. The yucca mending strands are Z- and
S-twist, 2- and 3-yarn. Part of the upper portion of one
bag is missing, but they are otherwise in excellent preser-

As was brought out above, these objects were probably used as leggings, and later sewed up at the bottom for use as bags. Looped leggings have been reported from Mesa Verde (?) Canyon de Chelly, Marsh Pass and Monument Valley, Grand Gulch, Utah, and the Chinlee River, all sites of from Pueblo I through Pueblo III. This same type of legging may be illustrated in the Awatovi murals, Pueblo IV, but this cannot be positively determined from those this writer has seen. Knitted leggings are also used by modern Pueblo and Navaho Indians. Knitting was probably introduced in historic times, and taken up as an easier method of producing the same objects that were used in prehistoric times. The Navaho evidently borrowed the form and perhaps the method from the Pueblos. A pair of modern Pueblo leggings which the writer has examined in the Southwest Museum were 46 cm. long, circumference 39 cm. at the top and 26 at the bottom. The Hidden House bags are rather long, but not unduly so. The top circumference is 28 cm., but considerable stretching would be possible and even desirable to aid in holding them up.

1. Birdsall, 1891, p. 601; Hovey, 1893, p. 279.
2. Kidder and Guernsey, 1919, pp. 100, 101, 117, Pl. 34, b; Green, ca. 1891, p. 14; Morss, 1925, p. 39.
What might have been looped bags have been found in Mesa Verde (?),¹ Grand Gulch,² Monument Valley,³ probably Sagiotsosi,⁴ cliff-dwellings in the four corners area,⁵ and from the Hueco and Big Bend areas.⁶

The leggings that have been reported suggest a primarily Anasazi distribution, while the looped bags are also found as far to the south as Texas.

The technique of looping is also reported for Betatakín and Honanki ("...open-mesh woven cloth identical in pattern with leggings worn by a supernatural personification who performs a striking role in certain ceremonial performances at Tusayan today."). northeast Arizona, Aztec Ruin, and White House ("a child's knitted shirt of unique pattern").⁷

The technique occurs as early as Basketmaker II, lasts

1. Hovey, 1893, p. 279 ("knitted bags...and needle cases.").

2. Green, ca. 1891, p. 14 ("Knit Cap, containing a large ball of yarn... ").

3. Kidder and Guernsey, 1919, p. 100 ("a skullcap(?)").


5. Cummings, 1915a, p. 7, Figs. 3, 4 ("The bags are crotched [sic] of yarn spun from human hair... ").

6. Cosgrove, 1947, p. 71, Figs. 26, a, 80, b; Smith, 1941, pp. 142, 145.

7. Judd, 1930, p. 63; Fewkes, 1896a, p. 272; Guernsey, 1931, p. 79; Morris, 1919b, p. 49; Crawford, 1948, p. 38.
through Pueblo III, and probably into Pueblo IV. Human hair or yucca cordage was usually used, cotton more rarely. The Hidden House looping is the simplest and probably the most common of the looping techniques.\(^1\) A needle may have been used in manipulating the cord.\(^2\)

**Beltng.** There are five examples of warp-face plain-weave belting, and one not warp-face, in the collection.

The strip of belting that supports the breech cloth (ASM 20498) is 142 cm. long and 1.6 cm. wide. There is a total of 38 warps, with 5 wefts per cm. The selvages are two outside warps which cross between every weft; the ends are missing.

Another strip of belting (ASM 20499) is 105 cm. long, and is the same width, warp and weft count, thread twist, and selvage as the belting that supports the breech cloth; both pieces look similar and probably originally belonged to the same strip of belting. There is no information as to where this second piece was found.

Two strips of cotton belting were wrapped around the agave box (ASM 20485) (Pl. 10). The first piece is 162 cm. long, 2.1 cm. wide, and contains 34 warps. There are 7

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1. See Amsden, 1949a, p. 4, Fig. 1; Nordenskiold, 1893, Fig. 72. Mason's (1904, pp. 247-248) "coil without foundation."

2. See Morris, 1939, p. 121, fn. 5.
wefts per cm. The selvage is 2-strand S-twined; each strand consists of two yarns paired, but as far as can be seen, not twisted together. The original ends are missing. The second piece is 195 cm. long, 2.3 cm. wide, and has 34 warps, with 7 wefts per cm. The selvage is the same as the first piece. At a point 147 cm. from one end (the original end is missing) the belt was divided into two bands by separating alternate warps (except once when two neighboring warps were kept in one band in order to give an even number of warps to each), so that two narrow bands came off the main one, one on top of the other. The original weft continued on the 18 warp band (48 cm. long) and a new weft was inserted at the division point on the 16 warp band (44 cm. long); both bands are now finished in overhand knots. Since the point of division is fragmentary, the method of handling the selvage is not known, however both sides of each band have the same kind of selvage as the parent band.

The belting (ASM 20491) used as the carrying strap on the quiver (Pl. 5, a) is in two pieces which are tied together at the mid-point of the strap by an overhand knot. The upper piece is about 22 cm. long and 1.2 cm. wide, plain-weave (not warp-face); it has 12 warps, with about 13 wefts per cm. The side selvages are 2-strand S-twined, each strand S-twisted of two warp-size yarns. The end tied to the quiver loop has been wrapped tightly many times with
fine single-yarn S-spun cotton threads to prevent ravelling.

The belting which forms the lower part of the strap is warp-face plain-weave, about 25 cm. long and 1.8 cm. wide. It has 22 warps, with about 8 wefts per cm. The side selvages are the same as those on the upper piece. There is no end finishing.

Loom-woven undecorated warp-face cotton belting is described only for the Tonto collections, although Kent also lists examples from Wupatki, Walnut Canyon, "the Upper Verde Valley," and Ventana Cave. "There are none from Pueblo III Anasazi sites."¹ The Ventana Cave specimens are apparently not cotton, and the weave is coarser. They are warp-face (plain-weave and gauze-weave) and were produced on a beltloom.² The narrow apocynum bands from Chihuahua may also have been loom-woven.³ The belts from the other sites have not been described. Tonto examples are fragmentary, but "there is little doubt that these are fragments of long, narrow ties of the type used as belting with breech-cloths at several other sites." Only one has a complete weft stretch — 4.5 cm.; the other three fragments are 2 to 2.5 cm. wide. Length ranges from 8 to 85 cm. There are 23, 21, 18, and 15 warps to 4 or 5 wefts per cm. They appear to

¹ Kent, 1949, p. 75.
² Tanner, 1950, p. 456.
³ O'Neale, 1948, p. 106.
have self selvages. Those from Hidden House are more narrow and differ in selvage, but are otherwise generally similar to the Tonto belting. This distribution suggests warp-face belting is characteristic of the Western Pueblos with possible derivation from the Hohokam.

Sandals. (ASM 20502) (Pls. 7, 8, a) A pair of yucca sandals was found on the feet of the body. The partially desiccated left foot was still in one, but the other sandal and foot were greatly disturbed by rats. In weave they are like those described by Kidder and Guernsey, classified therein as type IIa; they differ, however, in shape and method of attachment. The heel portion is prolonged, gradually narrowed, and finally squared off to about a 3.5 cm. width approximately 13 cm. behind the heel loops, forming a turned-up support and protection for the heel as well as a point of very firm attachment to the ankle (Pl. 8, a). There is no attempt to taper the toe portion to correspond to the shape of the foot. The toes are square, but not fringed.

1. Kent, 1949, pp. 29, 31, Fig. 4, a.

2. Some specimens which were probably not loom-woven and are not cotton were found in Basketmaker sites in northeastern Arizona (Kidder and Guernsey, 1919, pp. 173-174); the upper Gila (Cosgrove, 1947, p. 73); and McEuen Cave (Kent, 1949, p. 75).

Sandal
A, Detail of sandal showing foot and ties in place; B, Skull, turban, and hair-do.
Measurements: 32 cm. long, 9 cm. wide at the toe, 3.5 cm. wide at the heel, and about 1.5 cm. thick.

The weave is essentially a wickerwork of cords over four 3- to 6-yarn Z-twist warps (each yarn is S-twist), made by looping two cords, with the open ends of the loops at the heel and the closed ends forming the toe. The warps are heavy and well-twisted, laced back and forth over and under the warp elements and crowded together tightly so that a strong heavy fabric results. The wefts are single-yarn and are consistently S-twist on the right side and Z-twist on the left side of each sandal, suggesting the wefts were twisted as the sandal was woven and changed from Z to S at the outside warps. In the main body of the sandal there are about 1.5 wefts per cm., but toward the heel the wefts become progressively smaller averaging 7 or 8 per cm.

The tie cords were made of thirty or forty human hairs, tightly twisted; many fragments were found in the rat's nest among the foot bones. Short doubled ends still remained woven into the heavy base fabric at the time of King's analysis,1 however at the present writing, only yucca cords can be found on the sandals. The toe of the left sandal and the cord ties on both were almost entirely destroyed by the rats. The partially dessicated left foot was still in its sandal, and the method of attachment could be reconstructed. Fastening at the toe end was done by attaching

each end of a yucca cord, in the manner described below for the heel loops, to the two outside warps. This cord must have passed over the great toe near its base and also over the second, third, and fourth toes, passing between the fourth and little toes. The remaining fragment shows it was 4-yarn Z-twist.

The doubling of the two warp cords, with the loops at the toe, allowed the four ends to extend through the heel prolongation, where overhand knots tie them into pairs to form the heel ties. The most complete ones are about 30 cm. long; these taper from a thickness of 0.4 cm. at the knot to 0.1 cm. at their ends. The heel ties were evidently passed around the heel loops and tied in back of the ankle (Pl. 8, a).

The heel loops are about 13 cm. from the heel end. They are 4-yarn Z-twist (each yarn is S-twist) strands about 13 cm. total length. One was attached to each outside warp, probably in this way: a 2-yarn strand was looped around a warp, about one-quarter of it was doubled back on itself, and was twisted to make a 4-yarn strand. On the other side of the weft, the other end of the 2-yarn strand was looped over the warp and twisted back on itself to make a 4-yarn strand. This produced a sturdy loop of neatly twisted cord that is firmly attached to the warp and can not pull out.

The hair cords mentioned above must have been used to cross over the instep. "Fragments of this cord (made up of
thirty or forty hairs tightly twisted) totalling several feet were found in the rats' nest among the foot bones.\textsuperscript{1}

This sandal weave has been designated as Type IIa by Kidder and Guernsey.\textsuperscript{2} The specimen they illustrate is from Waterfall Ruin in the Marsh Pass area. Guernsey shows two similar sandals also from Waterfall Ruin and one from Segi Canyon which are probably Pueblo I.\textsuperscript{3} Kidder and Guernsey's sandals are similar in construction to those from Hidden House, however they were made in clearly defined rights and lefts, conforming to the outline of the foot, and the toe is pointed, the heel either rounded or square. The sandal ties are not like those of Hidden House, though the warp ends occasionally form the heel attachment loop. The Waterfall Ruin sandal shows the wefts Z-twist on the left side, S-twist on the right like the Hidden House sandal.

A Pueblo II (?) heel portion of a sandal from Medicine Cave (?) is also Type IIa.\textsuperscript{4}

Judd illustrates some sandals from northwestern Arizona north of the Colorado River, which look like Type IIa.\textsuperscript{5}

\begin{enumerate}
\item King, 1941, pp. 21-22.
\item Kidder and Guernsey, 1919, pp. 103, 107, Pl. 39, a.
\item Guernsey, 1931, Pl. 57, a, c, e.
\item Bartlett, 1934, p. 46.
\item Judd, 1926, Pl. 57, d, e.
\end{enumerate}
With the possible exception of d, there is probably no heel prolongation on these, but the warps do extend out to form ties. Some wefts appear to be Z-twist on the left side, S-twist on the right. Toes are pointed on one while the other pair has square toes. The ties appear to be different from those on the Hidden House sandals. These are probably Pueblo III.

Part of a sandal from southern Nevada may be Type IIa construction, and is Z-twist on the left, S-twist on the right side. It is otherwise not similar to the Hidden House sandals.\(^1\)

Of the ten or twelve sandals King reports seeing up to 1933 from the Verde Valley, the Hidden House specimens are the only ones with the heel turned up. The majority of the others are Type Ia\(^2\) (yucca leaf, twilled weave) with squared-off heel and tapered toe.\(^3\) However, later excavations by King and E. H. Spicer in a Pueblo III cliff side on Loy Butte, east of Hidden House, disclosed four sandals which are similar in construction and shape to those from Hidden House, except that they are more narrow and have rawhide instead of human hair ties. Another sandal of the same

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\(^1\) Wheeler, 1942, p. 14, Fig. 22. See also a sandal from Pueblo Grande de Nevada in Harrington, 1927a, Fig. 2.

\(^2\) Kidder and Guernsey, 1919, p. 101, PIs. 35-37.

\(^3\) King, 1933, p. 14.
type is reported to have come from a cliff ruin in which Jeddito sherds were also found, placing the site in Pueblo IV. Whether or not there was an earlier occupation is not known. King thinks it probable that the wickerwork, squared-toe sandal is older than the twilled weave sandal in this district, since most of the Verde Valley sandals have come from the large Jeddito sites, and the few sandals he has seen that surely come from the earlier sites are all wickerwork with squared-toe, both with and without the heel prolongation of the Hidden House sandals.\(^1\) Further study of sandals in museum collections is necessary before more can be said about what is probably a widespread sandal type.

Turban. (ASM 20496) Before the burial was uncovered, the hair, turban, and part of the scalp had slipped down over the face (Pl. 1, b); they are shown restored to position in Pl. 8, b. The turban is made of two very thick soft cotton strands or hanks. They are looped around the head and appear tangled. It was felt advisable not to dismantle the turban, so it is not possible to give the exact construction of it. The size is about 28 cm. at the greatest diameter and 7.5 cm. thick. The two strands, each about 1.5 cm. thick, are of different colors, both quite faded now. One, very loosely Z-twisted, contains twenty-six S-spun

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1. King, 1941, pp. 22-23.
yarns, and seems to have been a whitish or natural color, while the other, very loosely S-twisted, contains sixteen Z-spun yarns, and was a mixture of red and tan. In one instance, only four red yarns were twisted together, making a thinner strand which seems to be a component of the main red and tan strand.

As far as it can now be determined, no other turbans of this form and material have been found in the prehistoric Southwest.

On certain prehistoric clay figurines are modelled headdresses which may represent turbans, or possibly ways of fixing the hair. Unfortunately there is not enough detail to be sure turbans are intended, much less whether they are made up of yarns or woven cloth. They are found in southern Arizona in the Pioneer Period, but the latest is from the Sacaton Phase, ca. 900 to 1100.

No examples of a yarn turban can be found from historic sources, but Russell pictures a Pima man wearing a cloth rolled up and wrapped around the head; there is probably no connection. Spinden illustrates a Zapotec girl from Oaxaca wearing a "Turban-Like Headdress made of Yarn," and

1. Gladwin, Haury, Sayles, and Gladwin, 1937, Pl. 195, a, b; Pl. 204, g, k; Fig. 114; p. 234. Also Tuthill, 1947, pp. 81-82, Pl. 23, h, q; these Tres Alamos figures are female.

2. Russell, 1908, Pl. 43, a, p. 159.
some Formative figurines with turbans from Mexico and Central America.¹

It is also interesting to note in this connection the headdress made of strands of beads from the elaborate burial at Ridge Ruin.²

It would seem that only the Hohokam examples could have an immediate relationship with the Hidden House specimen, and we may perhaps, on this slight evidence, look to the Hohokam for the origin of the trait, if it was not a unique development.

It must be kept in mind, however, that the skeins of yarn may be just that, simply placed on the head as a unique method of making the offering and not really a "turban" at all.³

*Cordage.* (ASM 20500, 20508, 20509) There are three loose yucca cords in the collection for which there were no notes as to where they were found in Hidden House. They are probably the cords used to tie the painted blanket in place (p. 15). Judging from photographs, 20500 and 20508 may be parts of the cord just below the armpits, and the two

¹. Spinden, 1946, Pl. 5, a, Figs. 13, 14.
². McGregor, 1943.
³. Cp. Morris, 1948, p. 70, and p. 15 herein. See also the cotton mask for the dead in Voth, 1912, p. 101; Parsons, 1936, p. 825, 827.
pieces numbered 20509 may be the ones near the knees and near the ankles.

ASM 20500 is a 2-yarn Z-twist strand 29.5 cm. long.

The number 20508 is applied to two pieces which are loosely tied together with a draw knot. One is 90 cm. long, and is made like 20500; it has two knots in one end to prevent ravelling — a figure-eight immediately followed by an overhand. The other piece is 36.5 cm. long and is thicker and more loosely twisted than the other two; it is similar otherwise, and has no knots.

ASM 20509 is in two separate pieces held together only by the catalog number tag. One is probably the cord near the ankles; it is 125 cm. long, and is composed of two pieces tied together with a reef knot. Both pieces gradually taper toward their ends from a thickness of about 0.5 cm. to 0.1 cm. and end in overhand knots. Both are 3-yarn Z-twist strands.

The other piece numbered 20509 is probably the one just above the knees; it is 72 cm. overall length and is composed of three pieces, all 3-yarn Z-twist strands. One end piece (38 cm. long) is attached to the middle piece (46 cm. long) by a draw knot. The ends of both sections which are tied in the knot taper as described for the first piece numbered 20509. Another strand 19 cm. long is attached to the other end of the middle piece by a reef knot.
Hanks of yucca fiber. (ASM 20507) Close to the left shoulder was a large mass of yucca fiber. The fibers had been cleaned, carded, and loosely Z-twisted so as to make two large hanks, each about 5 cm. diameter and 48 cm. long.

Hank of hair. (ASM 20495) In the large cloth bag (p. 48) was a hank of human hair about 43 cm. long and 3.5 cm. thick, with a piece of yucca cord wrapped around it four times near the middle. The cord is loosely Z-twisted into a 2-yarn strand, and is heavier than that used to sew up the bag. It is 0.5 cm. thick and 69 cm. long. The ends are merely tucked under a coil.

Raw cotton. (TM uncataloged, see fn. 2, p. 5) A small bit of raw cotton was found in Hidden House, but not in the burial.

Summary of weaving and cordage techniques. There are eleven pieces of plain-weave, three pieces of slit- or kelim-tapestry, one of irregular tapestry-twill, one tapestry-twill, one monk's-cloth, five examples of warp-face plain-weave and one of plain-weave in the belting, and three pieces of looping. Cloth decoration techniques include painting, patterns using colored wefts, texture or weave-pattern, slits, braids, and tassels.
In the plain-weaves from Hidden House the weft count varies from 6.5 (small bag) to 11 (agave box cloth) per cm., and the warp count varies from 9 (tasseled blanket) to 15 (quiver, middle section) per cm.; the average weft count is 8.5, the average warp count 11.5 per cm. The lowest warp-weft difference is 0.5 threads, the greatest is 6, and the average difference is 3.5 threads. In all cases the warps outnumber the wefts.

Chart I, Fig. 4, is a scatter diagram of 77 plain-weave cotton cloth warp-weft counts, including those from Hidden House. The line O-A is the line of square counts, i.e. the warp and weft counts are equal anywhere on this line. The nearer a dot on the chart is to the vertical limb, the more the weft count predominates; the nearer to the horizontal, the greater the warps predominate; and the farther up the diagonal, the finer the weave. In cases where several fabrics have the same count, the number of specimens is placed beside the dot representing that count on all charts except I.

Although the total of warp-weft counts available falls in nearly equal distribution on both sides of diagonal O-A, the chart shows significant differences when broken down by areas. Plain-weaves collected in Marsh Pass and Monument Valley (30 counts), Poncho House (1), Painted Cave (4), and
Scatter diagrams of plain-weave warp-weft counts. Weft counts on vertical limb, warp counts on horizontal limb.
Aztec Ruin (2)$^1$ (Chart II) show that the square count and predominance of weft over warp were characteristic of the northern Pueblos. The only exceptions are the painted poncho from Poncho House and the painted blanket from Painted Cave, a difference of only 1 and 2 threads. While the average of weft predominance is only 1 or 2 threads, there is a maximum difference of about 10 threads.$^2$ Warp counts are for the most part about average for the total, but high weft counts are found. Nusbaum reports the second highest warp-weft count yet recorded for prehistoric Southwestern textiles — 32 warps and 32 wefts per cm., from the Aztec-Durango-Farmington area.$^3$

When the 11 Hidden House counts (plotted separately in Chart III) are combined with other sites in the Western Pueblo district (Chart IV) — the Tonto Ruins (3 counts), Canyon Creek (2), Turkey Tank (1), Medicine Cave (1), and Ridge Ruin (1),$^4$ a predominance of warp over weft is

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2. Not entered on the chart in order to save space. Count: 22.4 wefts, 12.8 warps.

3. Not entered on the chart in order to save space. Haury, 1945a, p. 27.

seen as well as the square count as found in the northern samples. The square count is especially characteristic of the Tonto plain-weaves, though the Tonto average of 212 specimens (enclosed in a circle on the chart) also includes a warp dominance of up to 2 threads. There are only two exceptions: a predominance of 4 wefts from Canyon Creek (the coarsest textile there) and a predominance of 3 wefts from Medicine Cave (the little bag in the agave box). These pieces are otherwise not exceptional, however Hawley reports the finest weave yet recorded for a prehistoric Southwestern textile — 36 warps or wefts per cm., a Tonto specimen.¹

New Mexico fabrics (Chart V) also show a predominance of warp over weft as well as the square count. Those from northern New Mexico (4 counts) are not exceptional, but one of the three Pecos specimens has a predominance of 7 wefts. The coarsest plain-weave on the chart is from Pecos. Those from the upper Gila (8) are not distinctive in thread count.²

1. Not entered on the chart in order to save space. Hawley, 1932, p. 236. "From 23 to 90 threads may be counted to the inch." It is not known whether this is a warp or weft count. Hawley notes these counts in connection with plaids, which are probably plain-weaves with colored warps and wefts. Kent's study of Tonto fabrics includes plaids but evidently not the specimens examined by Hawley since the highest thread count Kent reports for plaids is 11 per cm. (Kent, 1949, p. 84). Kent's analysis did not include the entire Tonto textile collection.

2. Reiter, 1938, p. 167; Reiter, Mulloy, and Blumenthal, 1940, p. 33; Tschopik, 1939, p. 96; Kidder, 1932, p. 301; Cosgrove, 1947, p. 69.
Chart VI shows plain-weave thread counts from southern Arizona: Ventana Cave (2 counts, ratio extremes for 24), Los Guanacos (2), and Los Muertos (1), and Guasave, Mexico (labelled M); the latter emphasizes the southern distribution of warp predominance. Cloth from Las Acequias has an average of 12.4 wefts, and an average of 24 warps; this has not been entered on the chart. The Ventana Cave and Los Guanacos specimens are probably Hohokam, but those from Los Muertos and Las Acequias may be Salado. Tanner reports an analysis by Kent in which it was found that the warps exceed the wefts by ratios of from 1:2 to 5:7 in almost all 24 Ventana Cave textiles (this is the area inclosed between the diagonals O-B and O-C on the charts). The two extremes in thread count (6.8 by 8, 12.8 by 15.2), the only counts given for Ventana Cave plain-weaves, do not fall within these ratios but are nearer the square counts.1

Although the sample is small, and distributions restricted, the following trends seem clear: northern Pueblo (or perhaps mainly Kayenta) warp-weft counts tend to be equal or have a predominance of 1 or 2 wefts. Western Pueblo and New Mexico counts tend to be square or have a predominance of warps. The southern Arizona counts are similar, but for most of the Hohokam samples the warp pre-

dominance is even more pronounced at the expense of square counts. Even though some of the counts are averages and some extremes, it is felt that additional data would probably emphasize rather than obscure these trends. Hidden House plain-weaves are most similar to the Western Pueblo-New Mexico-southern Arizona thread counts. While there seems some likelihood of distinguishing collections of plain-weaves on this basis, it is still very questionable whether such characteristics can be used for relating individual specimens, as for example in determining whether a textile was traded in to a site, and if so from where (see p. 21).

The warp-weft count is itself only symptomatic of other factors: it is largely the expression of the thickness of warps and wefts, how closely the warps are strung, or pulled together, and how closely wefts are packed down during weaving. These characteristics are seldom described, so that the warp-weft counts must be depended upon. A study to determine what variations cause the thread count differences may lead to even more definitive area and time distinctions, or completely negate the classification indicated by present data. Such factors as texture, which is not expressed by thread counts, may prove more significant. The possible variations noted here are cultural, i.e. choices.

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1. The apocynum textiles from Chihuahua show an extreme warp predominance (O'Neals, 1948, pp. 130-131)
whether "conscious" or "unconscious," of the spinner and weaver — not functions of the loom type or material. Further careful study of collections of plain-weaves will probably yield valuable information.

The only other details of construction of plain-weaves that can now be summarized and compared are the techniques of selvaging. Selvages of plain-weaves from the Southwest usually have heavy cords which serve to strengthen cloth edges. End selvage cords were added during the stringing of the warp, before the fabric was woven, while the side selvage cords were added as weaving proceeds. Hidden House plain-weave selvages are characteristically two strands S-twined, each strand S-twisted of four Z-spun yarns. Some strands are 3- or 2-yarn, as on the quiver plain-weaves, the large bag, and the agave box cloth. The strands of the end selvages of the breech cloth and large bag and both selvages of the quiver, middle section, were Z-twined. The only exception to these is the plain-weave which was woven

1. A selvage is here considered to be any edge of a fabric as finished on the loom. A self selvage results when no strengthening cords are added and wefts merely turn back on outside warps.

2. Amsden, 1949a, pp. 40-41, Pl. 17, Figs. 3, 4; p. 44, Pl. 18, c (an account by Matthews of Navaho selvaging which is undoubtedly similar in process to prehistoric Pueblo selvaging. Amsden's Pl. 18, c shows each twist of the strand enclosing four wefts, whereas most prehistoric selvage strands are twined about each warp or weft, as is the case with the Hidden House selvages). Also Underhill, 1948, p. 50.
on the same warps as the twill of the decorated bag.

The 2-strand selvages of plain-weaves from Tonto, Canyon Creek, and Ventana Cave characteristically have 4-yarn strands, as do those from Hidden House. Three-yarn strands are also found at Tonto, Canyon Creek (?), and Painted Cave, and are apparently characteristic of selvages from Marsh Pass and Monument Valley. Several examples of 2-yarn sel-vage strands have been reported for the Canyon Creek Ruin, on the upper Gila, and in Ventana Cave, however Kent states they are found in a "high percentage of northern warp and weft selvages."¹ Other variations in plain-weave selvage construction are rare. The Hidden House selvages seem to be of the type characteristic of Southwestern plain-weaves as far as the limited descriptions available allow judgment.²

As is the case with most Southwestern plain-weaves, in all Hidden House examples the wefts are larger and more loosely spun than the warps, indeed these were often the characteristics by which warps and wefts had to be dis-tinguished. Plain-weaves with equal size warps and wefts,

¹ Kent, 1949, p. 67.
² Kent, 1949, pp. 55-57; Haury, 1934, p. 91; Tanner, 1950, pp. 449, 458; Kidder and Guernsey, 1919, p. 116; Haury, 1945a, p. 28, Fig. 6; and Cosgrove, 1947, p. 69.
which seem to be most abundant in the northern Pueblo area,
are not found at Hidden House. Warps and wefts are all
single-yarn, which is also characteristic of Southwestern
plain-weaves, and are all Z-spun.

The painting of textiles as a method of decoration has
been discussed on pp. 22-24.

The slit-tapestry technique is described on pp. 24-25,
37-39. Comparable material has not been published, unfor­
tunately, however Kent summarizes the unpublished specimens
she has seen. Slit-tapestry is not limited to loom-woven
textiles, but is more often found on tump-lines, by which
the technique can be traced back to Basketmaker II. "Other
plain-weave slit tapestries, not considered to be carrying
bands, come from the Pueblo III sites of Gourd Cave, Pain­
ted Cave, Grand Gulch, Hidden House, and the Pueblo IV vil­
lage of Palatki in the Upper Verde drainage." She further
remarks that the only pieces she has seen that could have
been woven more easily on a true loom than a simple frame
are those from Hidden House. Kent therefore feels that
slit-tapestry survived as a non-loom technique into Pueblo

1. Kidder and Guernsey, 1919, p. 115; Nordenskiold,
1893, p. 104; McGregor, 1931, p. 3.


3. There is some confusion as to whether the Grand
Gulch specimen is a twill or tapestry or both. It also
would seem to have been loom-woven. See fn. 1, p. 79.
III and that the Hidden House tapestries and narrow bands from Tonto and Montezuma Castle "may be an indication that by Pueblo IV times in central (and southern?) Arizona the technique had become incorporated more fully in the loom-and-cotton complex and was employed for a greater diversity of articles." At the moment it appears that this is the best that can be done by way of summary, except to suggest that on the basis of present evidence loom-woven slit-tapestry is as fully developed a technique in Pueblo III as IV. The Hidden House quiver tapestries have self selvages on the sides, which seems to be typical of the tapestry selvages which Kent has examined.¹

The only twill from Hidden House is that on the decorated bag, a regular under three, over three twill, and an "irregular twill with interlocking wefts" (pp. 31-32). No examples of the latter weave have as yet been published as such, but Kent lists some she has examined from Tonto, Grand Gulch, Canyon de Chelly, and Wupatki; she also thinks the decorated cloth from Mesa Verde figured by Nordenskiöld is probably this technique.² Other published

¹. Kent, 1949, p. 57.
². Kent, 1949, pp. 35, 37, 68; Nordenskiöld, 1893, p. 104, Pl. 50.
mentions of twills are from Grand Gulch,\textsuperscript{1} White House (Canyon de Chelly), southwestern Colorado, Floating House, Montezuma Castle,\textsuperscript{2} Painted Cave, Marsh Pass, Pueblo Bonito, Aztec, Unshagi, Kinishba, and Betatakin.\textsuperscript{3} In the few cases where the information is available, these are over two, under two, or over two, under one twill. This writer has noted only two other prehistoric over three, under three twills in the literature — an undescribed piece from Wupatki and one from Montezuma Castle (a diamond twill).\textsuperscript{4}

An early twill is reported from southern Arizona, the Sedentary Period site Los Guanacos,\textsuperscript{5} however as Kent points out present evidence indicates that twills were most popular in the north, and infrequent in southern Arizona. "The number of twill fragments in northern collections is second only

\textsuperscript{1} Kelemen, 1943, p. 221, Pl. 171, c; Chapman, 1916, p. 37; Goddard, 1927, pp. 46, 48, 52; Amsden, 1949a, p. 71; Kent, 1941, pp. 9, 10; Crawford, 1948, pp. 37-38, Pl. 6, Fig. 5. Goddard's and Kelemen's description infers a twill, however Crawford and Kent infer a tapestry. It is possible it was both, i.e., a tapestry-twill. It seems unlikely that two different pieces are being referred to, but this is a possibility.

\textsuperscript{2} Amsden, 1949a, p. 57, fn.*.

\textsuperscript{3} Haury, 1945a, p. 34, Pl. 13, b; Kidder and Guernsey, 1919, pp. 115-116; Pepper, 1920, p. 107, Fig. 39; Mera, 1943, Pl. 16; Reiter, 1938, p. 167; Baldwin, 1939, p. 321; and Judd, 1930, p. 63.

\textsuperscript{4} Kent, 1941, pp. 7, 8, 10; Amsden, 1949a, Pl. 35, c.

\textsuperscript{5} Haury, 1945b, p. 179.
to plain weaves.\textsuperscript{1}

Twill in basketry is known in southeastern Utah in Basketmaker II,\textsuperscript{2} so the technique is as early in the Anasazi area as the earliest cotton twill yet reported from the Hohokam area. Twilling need not necessarily have been borrowed from the Hohokam, but could have been adapted to cotton techniques from other media.

The belting is discussed on pp. 57-60, the looping on pp. 53-57.

Weft-wrap openwork, gauze-weave, rag-weft, and other rarer techniques were not collected at Hidden House. It is not necessary to review them extensively here. As Kent points out, weft-wrap openwork is most abundant in the Western Pueblos and Hohokam sites and is very rare in the northern Anasazi area. Since it had evidently not reached its greatest popularity when Hidden House was occupied, even though it was known earlier to the south, its absence at Hidden House is not surprising. It was found in late Verde Valley sites. The same remarks apply generally to gauze-weave except that it is much less frequent.\textsuperscript{3}

\textsuperscript{1} Kent, 1949, p. 69.

\textsuperscript{2} Amsden, 1949b, Figs. 24, 25.

\textsuperscript{3} Kent, 1949, pp. 72-73.
Rag-weft is reported to be "plentiful at Tonto National Monument, Montezuma Castle, Honanki and Palatki, and Canyon Creek." ¹

The broad vertical loom, such as that used by the modern Hopi, has been established as almost certainly in use in the prehistoric Pueblo area by studying the dimensions of complete textiles and the widths of looms as indicated by the loom-holes in ruins. It is also quite likely that the belt-loom was in use in both the Pueblo and Hohokam area.²

The large Hidden House plain-weaves (painted blanket, tasseled blanket, and tapestry-inset cloth) were, because of their width, almost certainly woven on the vertical loom. The breech cloth, the two slit-tapestry parts of the quiver, the small plain-weave quiver boot, and the twill and plain-weave of the decorated bag, might well have been woven on a belt-loom, although they could also have been woven on a vertical loom. The fact that all these (except the small boot of the quiver) have a much shorter weft stretch than warp stretch may be due to the use for which they were intended rather than a difference in type of loom. The belting was in all probability woven on a belt-loom, although

¹ Kent, 1949, p. 78.
² It is unnecessary to review the evidence here since there are discussions in: Amsden, 1949a, pp. 24-26; Haury, 1945a, p. 27; Kent, 1941, pp. 1-2; King, 1949, pp. 32, 35; O'Neale, 1948, p. 119; Tanner, 1950, p. 456; Underhill, 1948, pp. 41-53.
some type of vertical loom may have been used.

It is interesting to note that both the smallest and the largest complete loom-woven (presumably) textiles yet reported from the prehistoric Southwest came from Hidden House — the boot of the quiver (8.5 by 12 cm.) and the painted blanket (147 by 162 cm.).

The large cloths from Hidden House all show a greater weft dimension, as does the tie-dye blanket from Lake Canyon, Utah,¹ and a blanket from Canyon Creek; this is also true of modern Hopi blankets.² The painted blanket and ponchos from Painted Cave are nearly square.³ In contrast, the Hohokam textiles from Ventana Cave have a much greater warp dimension, probably indicating use of a horizontal loom similar to that of historic tribes in southern Arizona.⁴

The mending on Hidden House textiles suggests that their usefulness was preserved as long as possible. Reinforcing of selvages is done with overcasting and blanket stitches (Fig. 5). Mending elsewhere on the cloth includes running, outline, and twining stitches, the latter commonly used to sew up holes where the loosely-spun wefts

¹. Kent, 1941, p. 2.
². Haury, 1934, p. 89.
had worn away leaving the warps. Edges are united with overcasting, fagoting, and running stitches. Some stitches are fine and regular, but most are coarse and haphazard. Most stitching was done with single-yarn thread, though 2-yarn strand was often used and 3-yarn rarely. Half of the single-yarn threads were doubled (not twisted together) in order to achieve the strength of the multi-yarn strands.

Most stitching was done with cotton thread, however yucca was used in sewing up the large bag, the looped bags, and in mending the leather quiver.

Comparative information is scarce; in general, however, mending at Hidden House seems typical of that found elsewhere. Further study may well prove valuable. The twining stitch is rare, occurring, to this writer's knowledge, only at Ventana Cave.¹ Green reports a "Large piece of Cotton Cloth, with patches on it" from Grand Gulch.² Patching, that is, sewing another piece of cloth over a hole or worn spot on a fabric, has not been described for prehistoric textiles, nor is it found among historic tribes as far as this writer is aware. The Grand Gulch and other occurrences of the term may be due to faulty terminology, for as Spier remarks about ethnolo-

¹. Tanner, 1950, pp. 458-459, Pl. 50, b; see however Kent, 1941, Fig. 3.

gical material "Darning rather than patching may have been customary throughout the whole western American weaving area," and he quotes Nordenskiöld who indicates the same for South America.¹

Red, orange, yellow, green, black, gray, gray-blue, brown, tan,² dark blue, light blue, dark blue-black or blue-green,³ and purple⁴ are the colors reported for prehistoric Southwestern textiles and cordage. The colors on the fabrics and turban from Hidden House include only black, blue-black, brown, red, tan, and blue. Kent remarks that the deep blue and a "dark blue-green or blue-black" have been recorded only at Tonto.⁵ However a deep blue and blue-black are found at Hidden House, and Amsden reports a blue-black from Montezuma Castle.⁶ Since the colors on cotton textiles are not referred to any standard published color nomenclature, except for the Tonto collection,⁷ comparison is as yet unsure. No extensive chemical analyses of pre-

¹. Spier, 1933, p. 121, fn. 15.
². Kent, 1941, p. 3.
⁵. Kent, 1949, p. 81.
⁶. Amsden, 1949a, Pl. 35, c.
historic cotton textile coloring have as yet been made.\(^1\)

In the textile designs this writer has seen, excepting the Hidden House painted blanket and some striped and twill pieces, the main lines of the pattern are diagonal to the warp and weft lines. Without exception all designs are angular and geometric. Further whole design comparison is impracticable at the present time except for the painted blanket (pp. 19 f.). Since it is free from restrictions imposed by the weaving technique the painted blanket design can be more accurately matched to design styles in pottery than the other textiles, although for the most part they too suggest origin to the northeast. The design "elements" of the blanket may be characterized as lines, cross-hatching, pendant stepped triangles, and interlocking hooked triangles (with one instance of the opposed barbed line, probably a mistake by the painter). On other decorated textiles are found: lines, zig-zag lines, barbed lines, opposed barbed lines, chevrons, squares, checkerboard, hooked triangles, and rectangular scrolls.\(^2\) These elements are found on other

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1. See however Amsden, 1949a, pp. 69-73; Haury, 1945a, p. 30; McGregor, 1931, pp. 3-4; Hough, 1914, p. 83. The dyes on the apocynum textiles from Chihuahua have had excellent color and chemical analyses (O'Neale, 1948, pp. 116-118; Kasha, 1948, pp. 151-157).

2. Terminology from Colton and Hargrave, 1937, Figs. 3 and 4.
textiles as well as most other prehistoric Southwestern art media. The opposed stepped triangle and the triangular scroll are prominent elements not found on Hidden House textiles.

The yarns and strands\(^1\) from Hidden House were made of three materials — cotton, yucca,\(^2\) and human hair. Cotton was used in all weaving and in nearly all sewing and mending as noted above. All threads used in weaving were single-yarn and Z-spun. In sewing and mending threads, most are single-yarn; all are Z-spun except two which are S-spun. A few strands are 2-yarn and 3-yarn, with only two 4-yarn; all strands are S-twisted. The exceptions to the above are the twenty-six S-spun white yarns loosely Z-twisted together to form a strand, and the sixteen Z-spun red and tan yarns loosely S-twisted together to form a strand, both strands making up the turban.

\(^1\) As used herein, cord, string, and thread are general terms, employed according to use or size. Yarn refers to a bundle of loose fibers after they have been spun or twisted together (often called "ply"); a strand is several yarns twisted together; and a rope is composed of several strands. The twist or spin of yarns and strands has had varying terminology, most of which is unhandy or ambiguous. The system followed here is to call a strand or yarn Z-twist or Z-spun if it spirals down from right to left, following the center line of the Z; the opposite, of course, is S-twist.

\(^2\) These identifications have not been confirmed by a botanist.
The heavy cordage and some of the mending threads were yucca. One example of yucca cordage was single-yarn, but most were 2-yarn, with a few 3- and 4-yarn and one 6-yarn. All yarns were S-twisted, strands Z-twisted, except some of the cords used to sew up the hair bags which were Z-twist yarns S-twisted into strands and some thread on the large bag S-twisted of two Z-spun yarns. There was only one example of rope construction from Hidden House: two S-twist yarns were Z-twisted together to form strands, and eight of these strands were Z-twisted to form the rope (feathered stick).

The only human-hair cords for which information is available are those in the hair bags: two Z-twist yarns, S-twisted into a strand in the manner in which cotton is treated.

In cotton, yucca, and human hair cordage, the twist of the strand is opposite the twist of the component yarns. This is done so that the strand will not untwist, since the friction from the tendency of yarns and strand to untwist in different directions holds the strand together firmly. This is consistent in Hidden House cordage, except for the strand bound in to form the selvage cord of the decorated bag. Since yucca yarns were characteristically S-twist, while cotton and human hair yarns were Z-twist, it may be assumed that different methods were used to produce them.
In all probability cotton (and human hair?) yarns were twisted on a spindle, while yucca was rolled with the hand on the thigh.

The descriptions of cordage in the literature are such that it is not practicable at the present time to make extensive comparisons. Suffice it to say here that Hidden House cordage is typical of the majority of Southwestern specimens where descriptions allow comparison.¹

At Hidden House the most common knot is the overhand (Fig. 5), which is tied at least twenty times. It was used mainly on the ends of cords to prevent raveling, as a stop, in uniting two cords, or uniting the ends of one cord. The reef knot was tied seven times, used mainly in uniting two cords or the ends of one cord. It was tied correctly in every case, i.e., there were no granny or "false" knots. The two draw knots may have been functional, or merely incomplete reef knots, but the one figure-eight on the end of a cord did not appear to have any specific use. The running knot may have been used to tie the string to the bow. The ends of some yucca cords are tapered to a point to prevent raveling or the material may just have run out in making those pieces.

¹ The writer has in preparation a paper on cordage and its analysis.
Knots: A, overhand or thumb; B, reef or square; C, figure-eight; D, running; E, draw.
Stitches: F, running; G, outline; H, blanket; I, fagoting; J, twining; K, overcasting.
While the small sample from Hidden House shows a predominance of overhand knots, other sites where information is available show a predominance of reef knots, with the overhand definitely in the minority except at Lovelock Cave. As in Hidden House, the other prehistoric people were adept at tying reef knots since granny knots are far in the minority at all sites except Lovelock Cave, where, out of 404 knots, twenty-two were granny and only four reef. Other knots are comparatively rare.\footnote{1}

It is surprising that no braids are reported from Hidden House other than the 8-strand square braid on the tasseled blanket. Square braids are also reported for Mesa Verde, Betatakin, Painted Cave, northeastern Arizona, Aztec Ruin, Tonto, and the upper Gila.\footnote{2}

One of the first problems, and one of the most difficult in making distributional analyses of textile materials in the Southwest is to determine whether a certain specimen was manufactured where it was found, or whether it was

\footnote{1}{Alexander and Reiter, 1935, p. 56; Bartlett, 1934, p. 46; Caywood and Spicer, 1935, p. 91; Cosgrove, 1947, p. 68; Haury, 1934, p. 87; Loud and Harrington, 1929, pp. 83-87; McGregor, 1941, p. 251; Steward, 1941a, p. 316; Wheeler, 1942, p. 15; and see also for general discussions Haury, 1950, p. 398, and Smith, 1940, p. 183 f. (a summary of knots for west Texas).}

\footnote{2}{Nordenskiold, 1893, p. 103, Fig. 66; Judd, 1930, p. 63; Haury, 1945a, p. 49; Kidder and Guernsey, 1919, p. 114; Morris, 1919b, p. 47; Kent, 1949, pp. 41, 43, Fig. 8, b-e; and Hough, 1914, p. 76.}
brought in by trade; in the latter case the additional problem of where it came from is raised. Jones notes that two criteria have been used in judging whether cotton was grown by the people of a given area: the occurrence of parts of cotton plants which were not likely to be traded, and abundance of cotton at the site.¹ Unspun cotton (p. 69) and cotton seeds (p. 145) were found at Hidden House. On this basis it is quite possible that the people of Hidden House or their near neighbors grew cotton and that they wove it into cloth. The spindles (p. 110) are the only examples reported in the ruin of equipment usually associated with weaving. The elevation of 3600 feet and availability of water and farm land near Hidden House (pp. 1-2) would seem to indicate a more favorable environment for the cultivation of cotton than, for example, the Hopi country.² Although nothing is conclusive, it is reasonable that cotton was grown by the people of Hidden House, and that they may have woven it into cloth.

But not all textiles found in Hidden House were necessarily woven there. Evidence that cotton was extensively

¹ Jones, 1936, p. 60.
² See also Carter, 1945, Figs. 15-20.
traded in historic times is pointed out by Jones,¹ and considering the extensive trade in pottery there is every reason to suspect trade in textiles in prehistoric times.

The design on the painted blanket was copied from, or inspired by, the pottery to the northeast, which suggests that it was traded to the Verde Valley from there (pp. 19-21). This is consistent with their importation of painted pottery from that area rather than making it locally. There is even less evidence to indicate whether or not the other textiles were woven by the people of Hidden House. The other designs are less diagnostic but also suggest origin to the northeast, while the plain-weaves, perhaps not as likely to be traded, may have been woven at Hidden House or nearby.

Textile techniques seem at present to divide into at least two general areas or centers — the Anasazi or northern and the Hohokam or southern. The best collections of textiles which have been reported on are Pueblo III and IV from the mountainous section or Western Pueblo sites of Arizona, between the northern and southern areas. The outstanding character of these collections suggest the mountainous area of central and eastern Arizona as the region

¹. Jones, 1936; see references therein. Also Russell, 1908, pp. 94, 150; Spier, 1933, p. 112; Haury, 1950, p. 168; Tanner, 1950, p. 448.
of highest development of the textile arts, however it is clear that this may well be due to greater abundance of published collections.

The evidence based on distributions of various weaving techniques suggests that painting of textiles, perhaps tassels on blanket corners and square braiding, looping, interlocking and slit tapestry, the various twill techniques, and use of the broad vertical loom were typical of the northern Pueblo area or Anasazi with extensions to the Western Pueblos by trade and later by local manufacture. The Hohokam textile industry may be distinguished by gauze-weave, weft-wrap and perhaps the horizontal loom. Gauze-weave and weft-wrap techniques and perhaps rag-weft and the warp-face bands may have originated with the Hohokam and diffused to the Western Pueblos, where weft-wrap became especially popular in Pueblo IV. It is tempting at present to think of the Western Pueblo weaving industry as derived from the northern Pueblos, with some of the southern Arizona techniques added in late Pueblo III and IV.

Whether central and eastern Arizona could be set up as a separate weaving center, influencing its neighbors, depends partly upon study of early textile collections in the area. It might even be suggested that the warp predominance and tendency toward heavy selvage strands in Western Pueblo plain-weaves, if they prove to have significance, might be a continuity from an earlier Western Pueblo or
Mogollon weaving tradition.\(^1\) Our whole concept of the development of weaving techniques may also be changed by a few more collections of Hohokam textiles.

Present comparisons show that the Hidden House textile industry is most closely associated with that of the northern area, with the warp-weft counts, tendency to heavy selvage strands, and warp-face bands placing the Hidden House textiles with the Western Pueblo group as a whole. Lack of weft-wrap and rag-weft may be due to the relatively small sample. Since there have been no sure reports of these in Pueblo III sites, however, it is probable that they did not become a part of the Pueblo weaving industry until Pueblo IV.

It has become trite to conclude by saying that further excavation will undoubtedly help solve the problems raised. This is obviously true. However the location and study of museum and private collections is essential. Mrs. Kent has made analyses of collections from Montezuma Castle, Tonto, and Wupatki, but these remain unpublished. Especially lacking are studies of museum collections of textiles from the northern Pueblo sites. It would be very surprising

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\(^1\) There is some evidence for the vertical loom in what is possibly a Mogollon kiva, ascribed to the 600's A.D. (Haury, 1940, p. 47, Fl. 6). If correct, this infers an early textile development. The report on Tularose Cave will shed light on these problems (Bartlett, 1951, p. 85).
if the Anasazi weaving industry proves to be as poorly developed as it appears from the literature.¹

Leather quiver.  (ASM 20487) This quiver was found close to the right side of the body with the cloth quiver and bows (Pl. 1, b). It contained ten unfinished arrows (p. 108). The leather is probably rock squirrel, but it is now so worn...

¹ One of the references which suggests the opposite may be true describes briefly the archaeological specimens (collected by the Wetherills, the H. Jay Smith exploring party, and Mcloyd and Graham) which were exhibited at the World's Columbian Exposition in Chicago, 1893. These are probably mostly from Colorado, more than likely Mesa Verde, and from Grand Gulch, Utah. Because of its obscurity, relevant passages deserve to be quoted in full:

It has sometimes been doubted if these ancient people had textile fabrics except those made from the yucca flax. But I saw the cotton seeds, the carded cotton, cotton on the spindle, in the ball and skein, cotton wicks in the lamps, and as many as a hundred pieces of cotton cloth, some plain and others figured. Parts of looms were shown.

...the veneration for the dead was shown by the pains with which they were dressed for their long repose. Each body was placed with its arms crossed on the breast, and the knees drawn up to the chest, then wrapped in a large winding sheet of cotton cloth, and finally in matting of grass, reeds or willow twigs.  (Hovey, 1893, p. 279)

The study of this collection would undoubtedly shed much light on the northern textile industry. The Grand Gulch and Mesa Verde specimens already mentioned are hints of what may be found. See also Fewkes, 1911, p. 76.
it is impossible to identify definitely. All the bottom and one side of the top portion is gone. One edge was evenly cut and may have been the rim. The quiver was made of at least three pieces sewed together with a 2-yarn S-twist cotton strand, using the overcasting stitch. The holes through which the sewing strands pass are narrow slits about 0.4 cm. long, placed diagonally very near the edges. Some holes are skipped by the threads, which suggests the holes were punched before sewing started, or the pieces were re-sewed. Mending was done in one place with a 2-yarn Z-twist yucca strand, evidently to reinforce some loose sewing. A 3 cm. tear was mended with two stitches of the cotton cord. Measurements: 47.5 cm. long, with a diameter of about 4.5 cm.

The only other similar specimen reported was found in Ventana Cave, and is Hohokam, dated from ca. 1000 to 1400 A.D. It contained nine unfinished arrows. The Hidden House specimen is somewhat larger, but they are otherwise very similar in form and use. That these were used as quivers is questionable since they are so fragmentary. They are both too unspecialized to make any inferences as to the basis of their similarity.

Bow.\textsuperscript{1} (ASM 20489) This bow was found with the unfinished bow close to the right side of the body between the two quivers (Pl. 1, b). The finished bow is highly polished and has been used. It was a self bow, made from a single piece of wood. The wood could not be identified. There is no evidence of fire-hardening, but the polishing may have removed this. As in modern types of bows the sapwood is on the back (convex) side, and the heartwood is on the belly (concave) side. The natural elasticity of the bow was not reinforced, nor was there any protective binding where the arrow rested. The bow tapers evenly from the middle toward both ends (Fig. 6, a, b, c), with two shallow, narrow notches cut into both edges (Fig. 6, d) of each end for the attachment of the bow string. A small length of string is still attached to one end, which, for convenience only, is herein called the upper end. Measurements:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
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<tr>
<td>arc length</td>
<td>129.5 cm.</td>
</tr>
<tr>
<td>length of cord of arc</td>
<td>127.6</td>
</tr>
<tr>
<td>center of stave:</td>
<td></td>
</tr>
<tr>
<td>lateral diameter</td>
<td>2.7</td>
</tr>
<tr>
<td>back-belly diameter</td>
<td>2.7</td>
</tr>
<tr>
<td>mid-way between center and lower tip:</td>
<td></td>
</tr>
<tr>
<td>lateral diameter</td>
<td>2.3</td>
</tr>
<tr>
<td>back-belly diameter</td>
<td>2.1</td>
</tr>
<tr>
<td>2.3 cm. from lower tip:</td>
<td></td>
</tr>
<tr>
<td>lateral diameter</td>
<td>1.1</td>
</tr>
<tr>
<td>back-belly diameter</td>
<td>.9</td>
</tr>
<tr>
<td>lower tip to center of notch</td>
<td>1.5</td>
</tr>
</tbody>
</table>

\textsuperscript{1} The description of the bow is based on King, 1941, pp. 28-29. It could not be removed from the exhibit case for further description.
Section of bow: A, at center; B, half way between center and tip; C, 2.3 cm. below tip. Stippled area is sapwood. D, lower tip, back side. A, 2.7 cm. lateral diameter.
The string was made by twisting two strands of sinew together, which were then doubled back and S-twisted into a single strand; this was looped and attached directly to the end of the bow, in the two shallow side notches, using a running knot. The method of attachment at the lower end of the bow is not known; this end is wrapped with cotton cord just below the notches. Measurements: length of the string to the knot is 12.8 cm., including the knot 13.1 cm. It is 0.2 cm. in diameter.

Hibben remarks on the scarcity of bows in museum collections from the Southwest. There are few published, and these for the most part are briefly described. A survey of the literature shows that except for the reports of Hibben and Cosgrove finds are limited to a few whole bows and some fragments, and pictures on pottery and murals.

1. King, 1941, p. 20.

2. This cotton cord and the sinew string appear to have been removed, and cannot be found in the Museum collections. The bow is now on display in the Museum, and a new string has been added.

3. Hibben, 1938, p. 36.


5. Amsden, 1949b, p. 133; Burgh and Scoggin, 1948, pp. 60-62; Caywood and Spicer, 1935, p. 92; Fewkes, 1904, p. 100; Fewkes, 1914, Fig. 15; Fulton, 1941, p. 20, Fig. 3, Pl. 5; Guernsey, 1931, pp. 99, 107, Fig. 29; Harrington, 1933, p. 127-128; Haury, 1934, p. 106; Hodge, 1918, pp. 66-67; Hough, 1907, p. 24; Hough, 1914; Hough, 1930, p. 8; A. T. Jackson, 1937, p. 185; E. Jackson, 1933, p. 79; Judd, 1926b, p. 148, Pl. 53, a; Judd, 1930, p. 58, Fig. 9; Morris, 1919b; Morris,
All those described seem to be self bows, usually bent into a shallow arc, and with a D-shape, oval, or rounded cross-section. Most are more round at the grip and flatter on the limbs. Some are wrapped with sinew at the grip, or on the tips to prevent the string from slipping. Notches are scattered in time and area, and nowhere occur consistently. Some are decorated with simple painted designs. Grip diameters vary from 2 to 3.8 cm., averaging about 3 cm. Length, excepting small bows considered to be toys or ceremonial, is from about 130 to 150 cm. long for most, with a few around 90 cm. long. The latter are evidently the Basketmaker III average according to Amsden, whereas a few of this length are found in later times. Concerning the bows from the upper Gila area, Cosgrove remarks that the bows never reach a high degree of perfection in technique, and says:

Two bows were backed with the sapwood, which was unusual, yet it shows there was knowledge of the toughness of this outer layer, which would prevent the resilient heartwood from breaking, when bent. Then too, the flattening of the back through its entire length...[or] on the limbs...indicates recognition of the fact that this prevents the bow from twisting in the hand when sprung and forces it to follow the string.1

These remarks also apply to the Hidden House specimen.

1928b, p. 412; Morris, 1948, pp. 69, 70; Nesbitt, 1931, Pl. 23, b; Nordenskioeld, 1893, p. 101, Pl. 43, g; Wood, 1891; Zingg, 1940, pp. 58-59; copies of Awatovi murals from the Peabody Museum of Harvard, displayed at the Southwest Museum, Los Angeles, September, 1951.

The Hidden House bow is apparently within the range of the technique and form of a type of bow widely distributed in space and time in the Southwest, and perhaps better made than most.

Recent bows in the Southwest are also lacking in description for the most part, however it can be generally said that, from available information, the self bow is characteristic of Yuman, Pima, Paiute, Pueblo, Yavapai, and Western Apache and Chiricahua, while the backed bow was used mostly by other Apache groups, and the Navaho and sometimes some Pueblos. Pima, Yuman, and Hopi bows are about 110 to 150 cm. long. Some are notched, some not. Most are a simple, shallow arc. These are undoubtedly a continuation from prehistoric times.¹

**Unfinished bow.²** (ASM 20488) This bow was found with the finished bow as described above. It really is not yet a bow, but is a stave ready to be made into a bow — just a sapling roughly cut and shaped. It has been slightly bent

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¹ Drucker, 1941, p. 118; Forde, 1931, pp. 170-171; Gifford, 1932, p. 223; Gifford, 1940, pp. 29-30; Gifford, 1936, p. 285; Goodwin, 1938, p. 8; Harrington, 1930, p. 121; Haury, 1950, p. 418; Hough, 1919, p. 287-288, Pl. 45, 1; Mason, 1894, Pl. 61, Fig. 3; Russell, 1908, p. 95; Spier, 1928, p. 147; Spier, 1933, pp. 132-133, Pl. 12, c₁; Underhill, 1948, pp. 108-109, Pl. V-3.

² The description of this bow is taken from King, 1941, p. 30. It cannot be located in the Museum collections.

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so that the sapwood forms the outside of the curve. The arc length is 147 cm.

**Arrows.**¹ (ASM 20490) These twelve arrows were found in the cloth quiver described on p. 36. The mainshafts are made of carrizo reed (Phragmites communis) while the well-smoothed foreshafts are of ash (Fraxinus), probably, and ironwood (Forestiera neomexicana).² Measurements: the length of the arrows varies from 79 to 90.5 cm. with an average of about 89 cm. The mainshafts vary from 62 to 65 cm. with an average length of 64.7 cm. The exposed portions of the foreshafts are from 21.5 to 26 cm. long with an average of 25.4. The total length averages 33 cm. Foreshafts are shouldered.

Four arrows have obsidian points and one has a point of gray chert.³ The other seven have pointed wooden foreshafts. Those with stone points have shorter foreshafts with nocks at the distal end to hold the points, which are

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1. The description of these arrows is based on King, 1933, p. 20 and 1941, pp. 30-31, plus observation of six from the exhibit case. While on display in the Museum, sometime after the first descriptions had been made, the tips of some of the arrows were broken off by vandals, new points were added, and the foreshafts have since become mixed, thus preventing further analysis.


attached with pitch and sinew binding (details in Fig. 7). The arrows with heavier stone points have shorter foreshafts than those with lighter points, making them balance at approximately the same place.¹

Sinew wrappings are bound around the distal end of the mainshafts to reinforce the joint with the foreshafts. On two arrows an additional binding was placed on the first node of the mainshaft above the joining of the foreshaft and mainshaft apparently as a reinforcement, for at each binding there is a small crack which may have weakened the joint. The sinew binding which holds the butt end of the feathering in place also strengthens the reed at the nock, which is filled with a wood plug for additional strength.

Feathering consisted of three half-feathers (of which very little but the shafts now remains), applied at intervals of $120^\circ$, and bound at each end with sinew wrapping; the space between the wrappings averages about 8 cm., varying from 7 to 10 cm. Ten arrows have straight feathering, while on two the feathers S-spiral about $90^\circ$ the circumference of the shaft. According to the first descriptions, red, black, and brownish bindings are used, the red denoting those with wooden points, and the natural or black those with stone points — perhaps for their rapid identification.

¹ King, 1933, p. 20.
Detail of attachment of stone point to foreshaft. Stippled area is pitch, binding is sinew. Foreshaft is approximately 0.8 cm. diameter.
while in the quiver.\textsuperscript{1}

On eight arrows, patterns have been scratched in black paint or pitch which was applied to the shaft under the feathering before the feathers were attached. In two cases, pitch was removed leaving a series of thin wavy and zig-zag lines, parallel to the long axis of the arrow. In one case the lines were straight, and on five shafts the lines were also straight, but more lines were scratched at right angles to these, around the circumference of the shaft, leaving many fine black squares.

Compound arrows, with cane or reed mainshaft and hardwood foreshaft, are the most widely reported from the Southwest.

The Basketmaker III specimens have three feathers, and are only about 60 cm. long complete,\textsuperscript{2} evidently corresponding to the short Basketmaker bows (see p. 98).

The later Pueblo arrows which have been described are mostly from about 75 to 85 cm. long, with three feathers from 5 to 15 cm. long, averaging about 8 cm., placed from 2 to 3.5 cm. from the nock. All wrapping is sinew. Decoration is in most cases between the nock and forward feather binding, and usually consists of bands of black, red, and

\textsuperscript{1} King, 1941, p. 31.

\textsuperscript{2} Amsden, 1949b, p. 133.
Foreshafts are also often decorated. Prehistoric foreshafts are from 13 to 30 cm. long, mostly around 20 to 25 cm. The portion to be inserted in the reed is usually one-fifth to one-third the foreshaft length, and in most cases it is shouldered. The majority seem to have plain wood points rather than stone points, which is something to keep in mind when analyzing the weapon complex of sites where perishable artifacts are not preserved.

Arrows from the upper Gila are similar in size and other characteristics to the specimens summarized above, but some reach an extreme length of 96.5 cm., about 7 cm. longer than the average length of the Hidden House arrows.

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1. Hibben (1938, p. 38) reports blue and yellow in addition to black and red, in "stripes and crosses in an endless variety of combinations."

2. Morss (1931, p. 61) reports three foreshafts from the Fremont River, Utah, which are 23, 24, and 30.5 cm. long; he remarks that they "are all rather longer than is common in foreshafts from Arizona." The published data, as mentioned above, indicates they are about average.

3. Alexander and Reiter, 1935, pp. 46-47, Pl. 12; Bartlett, 1934, pp. 37-38; Caywood and Spicer, 1935, p. 92; Cummings, 1915b, p. 280; Cushing, 1895, p. 315; Fewkes, 1904, p. 100; Guernsey, 1931, p. 107; Harrington, 1933, pp. 121-123; Harrington, 1937, p. 47; Haury, 1934, pp. 106-108, Fig. 22; Haury, 1945a, p. 51, Pl. 23, g; Haury, 1945b, p. 201, Fig. 129, a-c; Hibben, 1938, pp. 36-38; Hodge, 1918, p. 66; Hough, 1930, p. 8; Jackson, 1933, p. 79; Jones, 1945, p. 163; Judd, 1930, p. 58, Fig. 10; Kidder and Guernsey, 1919, pp. 122-123, Fig. 47; McGregor, 1943, p. 288; Morris, 1919, pp. 59-60; Morris, 1919a, p. 178, Pl. 44; Morris, 1928a, p. 93; Morris, 1948, p. 70; Morss, 1931, p. 61, Pl. 37; Nordenskiold, 1893, p. 101, Pl. 42; Pepper, 1920, pp. 37, 109, 159, 160, Fig. 40; Vickrey, 1939, p. 21; Zingg, 1940, pp. 59-60.
The upper Gila arrows also differ in decoration, for some have designs very similar to those of Hidden House. Foreshafts are also similar to the other prehistoric examples, though they tend to be shorter on the average, but with an extreme length of 39 cm. There were shoulders on a majority of the upper Gila foreshafts, while the western Texas specimens were, with one exception, without shoulders.¹

The foreshafts from Winchester Cave in southeastern Arizona are evidently typical of Pueblo specimens as described above, and some are shouldered. The mainshafts are apparently unusual only in their decoration, which is very similar to that on some Hidden House arrows, only more varied and elaborate.²

The Hohokam foreshafts from Ventana Cave seem to be similar to those found elsewhere, but none have shoulders.³ The Gypsum Cave foreshafts also lack shoulders.⁴

Historic Pueblo compound arrows are not well described in the literature, however they seem to be similar to the prehistoric ones in those characteristics described, except


². Fulton, 1941, pp. 16-19, Fig. 2, Pls. 2, 3.


in Santa Ana, and sometimes San Ildefonso, where adhesive was used in mounting feathers in addition to wrapping — a trait not reported for prehistoric feathering.¹

Pima and Papago arrows seem not to be compound, and usually have only two feathers, those of the Pima as much as 22 cm. long. Russell remarks that Pima "war arrows have three feathers, less than half as long and slightly curved." Pima and Papago feathers were sometimes bound down at the middle as well as at the extremities. One group of Papagos used spiral feathering.²

Corbusier notes that the Apache-Yumas used three feathers that spiralled 90° around the shaft.³ Havasupai arrows described by Spier (1928) are similar to the prehistoric examples, and "twirl in flight, but the vanes are never placed spirally." Spier (1933) notes that Yuman "war arrows had three vanes, fastened only at their extremities; hunting arrows bore two, but fastened at the middle as well." Forde was informed that the same arrows were used in war and hunting, and that feathers were set in gum as well as

¹. Gifford, 1940, pp. 30-31. See also Mason, 1894, Pl. 42; Underhill, 1948, pp. 111-112.

². Russell, 1908, p. 96, and fn. a; Haury, 1950, pp. 418-419; Cremony, 1868, p. 103; Mason, 1894, Pl. 42; Gifford, 1940, pp. 31, 121.

³. Gifford (1936, p. 286) denies this trait at the time of his studies.
Goodwin notes that the compound arrow was used by the Western Apache, Chiricahua and perhaps the Navaho, whereas a Plains type was used by other Apache groups and the Navaho. The compound arrow was also used by the Yavapai.

The spiral feathering is an interesting feature of the Hidden House arrows, since it is reported for only one other prehistoric arrow, from Lovelock Cave, and only from the Apache-Yumas, Apaches, and Papago (and Pima?) among historic Southwestern tribes, in the literature examined.

Pope writes:

The feathers, of course, are simply for air friction, to keep the rear end of the shaft in the line of progress of the point, and to give rotation or stability to the arrow while in flight. This is invariably accomplished by placing three feathers from the same wing on an arrow. Their warped contours react as revolving planes and establish an axial rotation. Some aboriginal arrows


3. Loud and Harrington, 1929, p. 98, Pl. 47, 1. The three feathers are 7 cm. long, and Z-spiral a quarter-turn. Another arrow has straight feathers.

4. Spiral feathering is also reported for neighboring tribes, e.g., the Shoshone (Steward, 1943, p. 314; Steward, 1941b, p. 290), "recent" among the Deep Creek Goshute (Stewart, 1942, p. 268), common among the northern Paiute (Stewart, 1941, p. 385), reported to be the only form among a western Ute group (Steward, 1942, p. 268), the Mono, Yokuts, and Miwok (Aginsky, 1943, p. 409), and the Carrier, Lillooet, and Flathead (Ray, 1942, p. 150).
have a spiral arrangement of feathers to assist this motion. But this is an unnecessary exaggeration and retards the velocity and striking force of the arrow...

Such arrows are useful for killing small game at short distances, because they are very accurate in their flight and soon lose their speed after striking the ground, grass, or brush, owing to the friction presented to the air.

The speed of rotation given an arrow varies according to the size and concavity of the feathers. It is more rapid in target arrows than in heavy shafts, for heads require more feather surface to turn them than do cylindrical points.¹

It is most unfortunate that the remarks in the last paragraph could not be tested by matching the point-types with the spiral feathering on the Hidden House arrows (see fn. 1, p. 100).

Whatever it is worth, it is only fair, however, to quote Mason, who wrote in 1894:

On one occasion the writer saw an Apache Indian finish the feathering of an arrow by seizing the two ends of the feathering and giving them a twist, simply to make the feathers be flat on the arrow shaft. This goes for what it may be worth in accounting for the spiral position of many feathers. It is inconceivable that any savage should grasp the problem of the rifle bullet and construct his missile accordingly.²

If correct, there are two culture traits which are expressed in the same form. It is hoped the ethnologists can help


². Mason, 1894, p. 664.
clear up this point.

The only other unusual feature of the Hidden House arrows is the elaborate decoration under the feathers. As noted above, there is similar decoration on arrows from southeastern Arizona and the upper Gila. Similar decoration may occur on an arrow from Pueblo Bonito and one from Aztec Ruin, the latter more questionable, as well as the California Mohaves. At any rate, the spatial distribution may indicate a widespread technique, and more examples might be found.

To summarize, the Hidden House arrows, though somewhat longer than most, are examples of a type widespread in space and time, judging from available descriptions, and are in general more similar to historic Pueblo arrows than to those of other tribes.

Unfinished arrows. (ASM 20487) The ten unfinished arrows were found in the leather quiver (p. 94). They are made of sections of carrizo (Phragmites communis). These unfinished specimens are merely reed shafts squared off at the ends, smoothed at the nodes, and notched. In all but one a wood

1. Fulton, 1941, p. 19, Fig. 2, Pl. 3; Cosgrove, 1947, pp. 64-65, Figs. 21, 22; Hough, 1914, p. 66.

2. Pepper, 1920, p. 37; Morris, 1919b, p. 60; Mason, 1894, Pl. 41, 2; also Zingg, 1940, p. 59.
plug had been inserted in the nock end for strengthening; the exception has the nock placed just behind a joint in the reed. One of the mainshafts had a partially finished foreshaft inserted in the distal end (cf. Bundle of foreshafts, p. 109). The ten mainshafts are of nearly the same length and thickness: 64.5 cm. long and 0.8 cm. thick; the mainshaft with the foreshaft is 93 cm. total length; the foreshaft total length is 35.5 cm. A 2-yarn Z-twist yucca strand 75.5 cm. long was looped six times around the ten shafts and tied with a reef knot.

Nine unfinished arrows were also found in a leather quiver in Ventana Cave in southern Arizona (p. 95).¹

Reed arrowshafts. (TM uncataloged, see fn. 2, p. 5) Five reed arrowshafts were found in Hidden House, but not in the burial. No further description is available.

Bundle of foreshafts. (ASM 20486) A bundle of four unfinished foreshafts was found near the quivers and bows as described above. They are probably made of ironwood (Fores-tiera neomexicana). They are roughly shaped, blunt at one end, and tapered at the other, probably to fit into the sockets of the unfinished arrows described above. Measurements: average length is 36.5 cm. and thickness averages

¹ Haury, 1950, p. 418.
from 0.3 to 0.8 cm. on each specimen. If these were tied together, there is now nothing to indicate it except the word bundle in King’s notes.

**Spindle shafts.** (TM 1797, 1798, 1799, 1800, see fn. 2, p. 5). Four spindle shafts were found in Hidden House, but not in the burial. They are 22.8 (note: "broken point"), 24.7, 25.4, and 31 cm. long, made of wood.

The spindle shafts found by Cummings in the four corners area average 46 cm. long.¹ Those from Canyon Creek Ruin range from 35.5 to 66 cm. The Hidden House examples are by comparison rather short if they are complete. Haury believes the longest shafts were probably used in spinning the coarser apocynum yarns, while the shorter ones were used for spinning cotton.²

**Feathered stick.** (ASM 20504) (Pl. 9) A feathered stick was found lying with the agave box on the chest of the body. It is made from an unidentified hardwood. The stick is 35.2 cm. long and 1.1 cm. in greatest diameter; it is round in cross-section, tapering to a point at the bottom end and to a wedge at the end where eight feathers are at-

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¹. Cummings, 1910, p. 33.
². Haury, 1934, p. 110.
Feathered stick, 35.2 cm. long.
attached through a hole 0.5 cm. in diameter which was drilled from both sides. The stick is smooth and has a dull polish. The end to which the feathers are attached was painted dark brown or black from the top down 7.5 cm. before the hole was drilled. The point shows some signs of wear, as though it had been stuck in the ground. There are some shallow spiral grooves pressed (not scratched or gouged) into the wood from the tip up 11 cm., where there is an impression at right angles to the long axis, suggesting the lower part of the stick had been tightly wrapped with a string which was then fastened. The grooves are S-spiralled and vary from 0.5 cm. apart near the tip to 1.5 cm. apart near the place where the binding was fastened.

The feathers are now very fragmental. The length of the longest is about 10 cm. The remaining pieces suggest the red-and-blue macaw (*Ara macao*).\(^1\) According to King's manuscripts, when the stick was found there were other small soft feathers attached in a bundle along with each of the eight long ones.\(^2\) The following was the method used to attach the feathers to the stick: the middle of a single S-twist yarn of yucca cord was wrapped three or four times around one long feather and a bundle of small

\(^1\) Dr. Allan R. Phillips, interview, April, 1951.

\(^2\) King, 1933, p. 22. These are now missing.
feathers, and the two free ends were then brought together and Z-twisted into a 2-yarn strand; the seven other feather bundles were bound in the same way. Then the eight 2-yarn strands were drawn together through the hole and tied in an overhand knot about 1 cm. from the hole on the other side. The eight cords below the knot were Z-twisted together to form a short rope which was left hanging. The eight strands on each side of the hole were then brought together and the two groups, totalling sixteen strands, were bound together (separating the knot and the feathers from the stick) with a 2-yarn S-twist cotton cord which was wrapped around four times and tied; this anchored the feathers so they would not be pulled through the hole.

Decorated sticks are not infrequently found in graves in the Southwest and by comparison with modern forms they are generally considered to be prayer-sticks or pahos. One of the most common prehistoric forms has an elaborately carved end — either knobs and ferrules or a claw, hoof, or hand; some are painted. These are found in Pueblo III and IV sites, and are widespread in area. Another type which is common is a plain short stick painted blue, green, and sometimes black and red. Some of these have sinew or fiber bindings at one end or in the middle. These also are widespread, and their distribution perhaps extends farther south than the more elaborate sticks. Various
other forms are of rare occurrence. The writer could find no report of sticks like that from Hidden House, the most similar in description being those from Firestick House in Monument Valley.¹ These are two small peeled twigs 33 cm. long, one end pointed, the butts squared. A space of 10 cm. from the butt is painted red, and there are narrow sinew bindings at the end of the red zones. Similar specimens may have been found in Sagi Canyon and Grand Gulch.²

Many Southwestern peoples have as part of their ceremonial equipment a stick with feathers attached.³ These


2. The following are references in which some description of what might be prayer-sticks is given; the many cases where prayer-sticks are mentioned but not described are omitted. Bartlett, 1934, p. 36, Fig. 27, c; Caywood and Spicer, 1935, p. 92; Cosgrove, 1947, p. 124, passim.; Fewkes, 1896b, pp. 167-168; Fewkes, 1896c, p. 579; Fewkes, 1898a, pp. 573, 619, 630, 736-739; Fewkes, 1904, pp. 54, 99-100, 187-188; Fewkes, 1909, p. 44, Fig. 18; Fewkes, 1912a, p. 147; Fewkes, 1916, p. 114; Fulton, 1941, p. 34; Haury, 1924, p. 112, Pl. 67; Haury, 1945a, pp. 51-52, Fls. 23, 24, 26; Hough, 1902, p. 901; Hough, 1903, pp. 345-346; Hough, 1914, pp. 91-92; D.S. King, 1949, pp. 74, 76, 140, 148, Fig. 56; McGregor, 1941, p. 253; McGregor, 1943; Morris, 1919b, pp. 45-46; Morris, 1919a, p. 178, Pl. 44, f; Morris, 1928a, p. 93; Morris, 1941; Nusbaum, 1922, pp. 82-83, Fig. 6; Pepper, 1909; Pepper, 1920; Sayles, 1941, p. 82, Pl. 14, 5; Spicer and Caywood, 1936, pp. 69-70; Wilson, 1916, pp. 34-35.

3. Feathered sticks are also found used in ceremonials of groups in adjacent areas (See especially Spier, 1928, p. 290; Hough, 1910, p. 304; Kroeber, 1922, p. 316; Loud and Harrington, 1929, p. 14.). Hough mentions them for the Pawnee, Cheyenne, and Eskimo, and of course the Apache and Navaho, who are considered to be late arrivals in the Southwest, and who probably borrowed the prayer-stick from the Pueblos. Kroeber mentions offerings of feather wands reported for the
objects are most extensively used by the Western Pueblo groups. As Parsons remarks: "There is no ceremonial, as far as I know, outside of Tiwan and Tewan towns in which, in some connection, prayer-sticks are not offered or used. Indeed, it can be said that Pueblo ceremonial consists of prayer-stick-making and offering together with prayer and other ritual."¹ It is here not to the point to elaborate on the complex and, indeed, unclear meanings of prayer-sticks.²

In general, it may be said that the size, form, material, and decoration of the stick and the various objects attached to it vary according to the beings to whom it is dedicated, the occasion or ceremony on which it is given,

Chumash, Costanoans, and Maidu, and infers a wider distribution in California and historical connections of some kind with the Southwest.

Pima prayer-sticks are short and usually bundled in sets of four or more, feathered, and painted. (Parsons, 1939, p. 995; Russell, 1908, pp. 106-107. Cp. Haury, 1950, p. 424 (Papago).) They may also have been used by certain groups of northern Mexico, and Parsons also sees similarities in Aztec ceremonial equipment (Spier, 1928, p. 290; Parsons, 1939, p. 1022).

1. Parsons, 1939, p. 270.

2. See Parsons, 1939, pp. 283, 291, and passim. Most data on Pueblo prayer-sticks is scattered and incidental in ethnological literature. The following is a selected list of some of the more general sources: Bunzel, 1932a; Dorsey and Voth, 1901; W. B. Douglass, 1915; Fewkes, 1894, 1897b, 1897a, 1898a, 1900; Hough, 1910; C. T. Mason, 1886; Parsons, 1918, 1923, 1936, 1939; Solberg, 1906; Spier, 1928, p. 290; Tichy, 1947.
the purpose of the giver, and the sacerdotal position of the giver. Different groups and subdivisions of groups may have characteristic sticks, which may also indicate ranks and classifications of societies.¹

Referring to his finds of prayer-sticks in Sikyatki burials, Fewkes says:

...the use of the prayer-stick is prehistoric in Tusayan, and the many forms of the ceremonial objects which were found indicate that there was no less variation in their character in ancient than in modern rituals. Some are similar to those now manufactured, others are very different, and while the former may be interpreted by a knowledge of the modern ritual, we are at a loss to know the significance of those which have become obso­lete.²

In cases where the prehistoric form does not correspond to one in use today, it may well be the prayer-stick of some ceremonial society that has dropped certain rites or observances, or even the society may have become extinct. Even with these explanations a prayer-stick might well change in form over a period of a few hundreds of years.³

All forms of Pueblo prayer-sticks have not been well

¹. Bunzel, 1932a, p. 499; Fewkes, 1896b, p. 167; Fewkes, 1898a, pp. 736-737; Parsons, 1939, p. 281; White, 1932, p. 128.

². Fewkes, 1896b, p. 167. Also 1898a, p. 737, in which he indicates an instance of correspondence between ancient and modern sticks.

³. In this connection it is interesting to note some Hopis' apparent recognition of ceremonial equipment 800 years old. McGregor, 1943, pp. 295-296.
enough described to find any close similarities to the Hidden House feathered stick, however Fewkes mentions a Hopi example which was "a single long, black pointed stick, of the length of the forearm, and had many strings with attached feathers tied to it. It was the pá-bo of the deity Má-sau-wùh, and the several stringed feathers were individual offerings or prayer bearers to the god of death."¹ Stephen notes the Masau'wû prayer-stick is measured from "about the mid-forearm to the tip of the middle finger."² It is painted with malachite, with a noose of fourteen prayer feathers slipped over the end. Fewkes writes: "Among many other uses they [prayer-sticks] are sometimes mortuary in character, and are deposited in the graves of chiefs, as offerings either to the God of Death, or to other deities, to whom they may be presented by the shade or

¹. Fewkes, 1894, p. 27. Made during the Walpi Snake Ceremonials. "Black is associated with the dead and the kachina" (Parsons, 1939, p. 275). Black prayer-sticks are also included in burials at Acoma (White, 1932, p. 137), but black is not found on all prayer-sticks for the dead.

². Parsons, 1936, p. 675. Among the traditional requirements for form of certain prayer-sticks is the standard of length. Bunzel notes that the Zuni have four common standard measurements for prayer-sticks: from tip of middle finger to its base, to the center of the palm, to the wrist, and to the inside of the elbow. (Bunzel, 1932a, p. 499; also Parsons, 1939, p. 279) There are also other measures. While the Hidden House stick is the approximate length of a short forearm and hand, without the arm of the person who made it obviously it can only be suggested that a standard measurement was used.
breath body of the deceased,"¹ although those described above were made to be deposited in shrines. The main characteristics of the Hidden House specimen — single stick, long (about forearm length), pointed, many feathers attached at end, black paint, and its inclusion with the burial — point to its possible use as a mortuary prayer-stick dedicated to the God of Death, Masau'wû.

However ceremonial sticks placed in graves apparently may have other significance. Fewkes, commenting on prayer-sticks from Sikyatki burials, says "...their difference in form may be indicative of the sacerdotal society to which the defunct belonged."² Concerning Oraibi burial customs, Voth notes that "...certain insignia, indicating the order to which the deceased belonged are occasionally placed on the graves..."³ The feathered stick in use by the Marau (Mazrau, Mamzrau) Society (a women's curing society) is the one of those described which most closely approximates the Hidden House form. It is evidently placed on the hatch or altar when in use, or carried in ceremonial processions, but whether this form is ever included in a burial is not known by this writer. It is described as a rod about 40

1. Fewkes, 1898a, p. 736.
3. Voth, 1912, p. 102.
1.8 cm. long and 1.3 cm. thick, "...with a dense cluster of hawk...wing feathers, twenty-five or thirty." According to Voth, a Marau prayer-stick of a different form is placed on the grave of women members of the Marau Society.1

Sticks stuck in clay cones are sometimes placed around altars in ceremonial rooms. These are sometimes painted black, and are either straight or crooked at the ends, about 30 to 45 cm. long, with a few feathers and packets of meal attached to their ends or along their length. There is much variation in form from village to village and according to what the ceremony or society is.2

There is some evidence that the stick had been used in a different form than when it was placed in the grave. It is probable that at one time it may have had a spiral wrapping at the pointed end which could have held feathers or other objects. The fact that the hole was certainly drilled some time after the black paint was applied, and that the paint and polish of the stick showed characteristics indicating long previous usage, suggests that the stick was

1. Parsons, 1936, pp. 868-869, 893, 911, 919, 1230, Figs. 470, 474; Fewkes and Stephen, 1892b, Pl. 1; Voth, 1912, p. 102.

2. E.g. Fewkes, 1894, pp. 23-24; Fewkes, 1900, pp. 968, 982.
adapted from another form for mortuary use. If so this complicates its interpretation still further.

Three possible interpretations of the Hidden House feathered stick in its final form have been suggested, based on context and general similarity in form to objects now in use as observed by ethnologists. The first, use as a mortuary prayer-stick dedicated to the God of Death, is the most likely. However, the ethnological descriptions of prayer-sticks are not detailed enough to draw a really close comparison. It must be remembered also that, even if such a detailed similarity is found, the uses and meanings of the same forms may change over a period of a few hundred years. To guard against this source of error the archaeologist must pay close attention to any clues the context may provide. With that in mind, the first two possibilities are more likely than the third so far as present information is a guide.

1. Stephen, discussing altar sticks, notes: "These prayer emblems are very old. Wiki says he has renewed the paint and feathers upon them several times, but the sticks were old in the time of his four predecessors, which is as far back as his actual chronology extends." (Stephen, 1940, p. 28)
Agave box. (ASM 20485) (Pl. 10) This specimen was on the chest of the body with the feathered stick (Pl. 1, b). It is a hollowed-out section of Agave (parryi or palmeri) stalk,¹ cut off near the base. It has a rectangular opening on the concave side of the curved stalk, which is closed by a folded piece of cloth with a piece of clay tied in one end; this is held in place by two pieces of cotton belting (pp. 52, 57-58). A V-shaped groove about 0.1 cm. wide has been cut around the outside about 8 cm. from the small end, evidently to mark the limit of the hollowing-out of the inside. Measurements: maximum length is 36 cm.; the diameter at the base is 12.5 cm., at the center 8 cm., and at the small end 6.5 cm.; the hollowed-out area is 23 cm. long, leaving the large end 4 to 5 cm. thick and the small end 8 cm. thick, with the sides of a fairly uniform thickness of about 0.3 cm. The opening is 7 cm. long and 4 cm. wide, and is 10 cm. from the large end of the stalk to its nearest edge. The hole in the small end is 1.5 cm. in diameter and 8 cm. long; it is 0.5 cm. from the convex outside surface at its outer end, parallels the outer surface, and enters the hollowed-out inside at the level of the bottom of the cavity. A hole 1 cm. in diameter and 8 cm. long branches off from the main hole 1 cm. in from the outside at about a 20° angle and also follows the outside

¹ Identification by J. J. Thornber, in 1938.
Agave box
surface, but it leads nowhere. It might have been a preliminary attempt to make the hole, with the second and successful attempt starting from the same place. The hole is described as "plugged," but nothing now remains of the plugging material and there is no description of it.

Cemented to the side of the interior of the box was a stick 12 cm. long and 0.5 cm. in diameter. The point of cementing is about even with the edge of the opening — the stick extends back to about the middle of the opening, and also extends into the small end where it is embedded in the soft wood 0.5 cm., enough to hold the stick temporarily in place without cement. The adhesive appears to be a lump of pinyon pitch, on which feather impressions and particles were found. The only other possible contents were small grass seeds, the remains of which were found adhering to the rough interior. Otherwise, the box was empty.

One specimen has been found which is so similar in every respect to the agave box from Hidden House that it merits first consideration. It was found by Dr. Byron Cummings in Medicine Cave (NA 663), in Medicine Valley, northeast of Flagstaff. The cave was used principally for

2. King, 1941, p. 27.
storage. Active use is placed between ca. 900 and 1070, with intermittent use as early as 700 and as late as this century. Colton's ceramic summary indicates the Sinagua, Kayenta, and Cohonina Branches, with emphasis on the Sinagua. A Pueblo II date is favored for the agave box, but the context is not clear. Colton has placed the specimen in the Cohonina Branch, ceramic group 5 (900 to 1050), early Pueblo II.

The Medicine Cave agave box was smaller in size, but otherwise similar to the Hidden House specimen in material, proportions, technique of manufacture, the plugged hole in the smaller end, and the covering over the rectangular opening, which, in the case of the Medicine Cave box, was a folded piece of buckskin held in place by a yucca cord. The contents of the Medicine Cave box were a smooth black pebble, five tufts of feathers attached to fine yucca cords, and a small cotton bag of fine (grass?) seeds. As noted above, King mentioned feather impressions on the pitch in the Hidden House specimen, and grass seeds adhering to the interior — this indicates the contents of the two may have been similar when the Hidden House box was in use, al-

though except for the perplexing stick, it was otherwise empty when found. Bartlett notes the similarity of the feather tufts to those used in Hopi ceremonials, and this, together with the other items, leads her to consider the agave box as a "medicine man's outfit."

The earliest specimen that might be considered a stage of the feather-box development is Basketmaker II, from DuPont Cave in southern Utah. The form is simple: a peeled cottonwood limb, 5 cm. in diameter and about 25 cm. long, had the ends rubbed smooth, and a cavity about 20 cm. long and 3 cm. deep was hollowed out. There are traces of a fret design in black paint at one end. Had it been "provided with a leather flap [it] would have made a very satisfactory receptacle for feathers or other fragile articles." This box is more similar to recent Pueblo feather-boxes than to the agave boxes.

Morris reports finding two Basketmaker III containers but he does not describe them other than to imply that they are wood, large, and cylindrical in shape, with lateral openings similar in size and shape to those of pottery specimens, described below, which in turn are similar to the agave boxes. "Moreover, both were filled to capacity with feathers, bird skins, gaming outfits, etc." One is

1. Nusbaum, 1922, p. 117, Fig. 20.
from Obelisk Cave, in the Prayer Rock District of northeastern Arizona, and the other from Canyon del Muerto.

There are no wooden forms reported from Pueblo I sites, however Roberts describes a Pueblo I black-on-red pottery jar from the Piedra district in southwestern Colorado that is evidently a copy of an agave box. It is about the size of the Medicine Cave box and tapers like an agave stem. The ends were flattened, leading Roberts, who wrote before the agave boxes and La Plata pottery specimens were published, to think it stood vertically on one end. The opening is similar in size and shape to that of the agave boxes, and has a small hole on each side, presumably to aid in lashing down a cover. The jar walls are "unusually thin" — 0.3 cm., the same as the Hidden House agave specimen — while the ends are 0.64 cm. thick. There is a design on the back, and there may have been one on the front, but this area is much worn.¹ This box was found in an isolated burial, which also included twenty-two fine arrow points, their flakes and core, bone flaking tools, a bird-shaped jar, and twenty other pieces of pottery, quantities of red ocher, a pallet for mixing paint, and the bones of a golden eagle. "This unquestionably was the sepulchre of an outstanding member of the community," who was apparently an

¹. Roberts, 1930, pp. 105-106, 139, Fig. 39, Fig. 19, n, Pl. 33, b.
expert flaker at least.¹

Morris found some Pueblo I pottery specimens nearby in the La Plata area which also are imitations of the agave boxes. One is much like Roberts' specimen, i.e. it is black-on-red pottery, is cylindrical, tapers, has a rectangular lateral opening with two perforations at opposite corners, and the one remaining end is somewhat rounded.² Another specimen is a miniature (length only 8.8 cm.) — a long cylinder, tapering toward its flattened ends, with a long, narrow lateral opening. "Around the mouth it shows much wear from repeated fitting and removal of some sort of cover," like the Piedra specimen. It is decorated with incising and punctation.³ The third vessel may not be a representation of an agave box, but since it was found in the same building as the other two the possibility of its relationship is strengthened. It is a flattened, oval black-on-red bowl or jar, with diameters of about 10 and 14 cm., and a height of 7.4 cm. The opening is oval, with a perforation on each side, like the other two large pottery boxes. As Morris suggests, the sharp angles needed to imitate the agave specimens have been modified to curves,

¹ Roberts, 1930, p. 164.
² Morris, 1939, pp. 180-181, Pls. 1, c, c₁, 255, c, c', Fig. 42, Y.
³ Morris, 1939, pp. 166-167, Pl. 233, a, a', a'."
which are more compatible to ceramic techniques. The opening and its perforations are the chief clues to its similarity to the other specimens.¹

The only possible Pueblo II box is the Medicine Cave specimen, described above.

In Pueblo III times, other than the Hidden House specimen, there are no agave boxes or copies in pottery. Roberts thought his Piedra jar was perhaps related to the cylindrical vases from Chaco Canyon.² However, as Morris³ points out, the similarities in form are so slight as to make any relationship very speculative.

Kidder describes a Pueblo IV cottonwood specimen from Pecos, which is badly decayed. The remaining portion is about the size of the feather-boxes still used by the Pueblo people.⁴

Ethnologists record examples from the Hopi pueblos,⁵ from Zuni,⁶ and from Isleta.⁷ Feather-boxes are of two

1. Morris, 1939, p. 181, Pl. 255, a, a'.
5. Stevenson, 1883a, Figs. 552, 554; Hough, 1919, Pl. 43, 2-5, Fig. 4; Fewkes and Stephen, 1892a, p. 192; Parsons, 1939, p. 278.
6. V. Mindeleff, 1891, p. 210, Figs. 103-104; Fewkes, 1891, fn. 1, p. 6; Parsons, 1939, p. 278.
7. Parsons, 1932, p. 274.
forms: cylindrical and rectangular. These are long and narrow, with countersunk wood lids, and a rectangular or terraced tab at one end with a hole for suspension. Instead of the wooden cover, skin or cloth may be bound over the long openings.¹ The use of these boxes may be dying out among the Hopi: Hough² in 1919 noted that they "...are by far the most common wooden vessels employed by these Indians," whereas Parsons³ in 1939 remarks: "Such boxes may be seen today among the Hopi; but they do not occupy a conspicuous place on the wall as at Zuni, and most people keep their feathers in paper boxes." For Jemez she notes in 1925: "Feathers are kept, not in a wooden box, as in the West, but wrapped in buckskin."⁴ The preceding remarks may suggest the feather-boxes are of little ceremonial importance but this is very tentative.

In summary, the simple Basketmaker II box is not clearly related to the later specimens, but the form represented by the Hidden House specimen occurs as early as Pueblo I, for the agave boxes must have been in existence in order that they could be copied in pottery, and may go back to Basketmaker III. The Basketmaker III boxes were

1. Hough, 1919, Pl. 43, 2-5, Fig. 4.
3. Parsons, 1939, p. 278.
4. Parsons, 1925, p. 104.
found in northeastern Arizona, and the Pueblo I pottery copies are from southwestern Colorado. The Pueblo II (?) and III boxes are from the western part of the Pueblo area, in central Arizona. No other examples are recorded from other areas or later times. With present evidence it must be concluded that these are a San Juan Anasazi development that died out in that area by Pueblo II and survived or was diffused to the Sinagua (and Cohonina?) Branch. With the possible exception of the Pecos specimen, there are no prehistoric examples of the historic feather-boxes, which seem to have a predominantly western distribution. The relation of the agave boxes to the recent ones cannot be inferred without further information. It is remarkable that more agave boxes have not been found, or at least reported. That they have not survived beyond Pueblo I in pottery imitations might be explained by noting that the Pueblo I period in the San Juan was a time of diversification of shapes, when several forms were made that did not survive into later periods. The time span and spatial distribution would certainly indicate that more specimens should be found, and such factors as lack of survival of perishable goods in certain areas, lack of exploration in key areas, and neglect of publication may partly explain their scarcity.
Decorated basket. This basket was found close to the left hip and partly over the trunk (Pl. 1, b). Measurements: 14.5 cm. high, 23.5 cm. diameter at the rim, and 11 cm. diameter across the base. It is deep with a flattened base (Fig. 8). The coil construction begins with a normal center, and the self-rim ends in 2 cm. of false braid. The wall-technique corresponds to the Morris and Burgh classification: Close coiling, #11; simple stitch, uninterlocked; foundation: three-rod, bunched, with the stitches from the upper coil piercing the upper rod; stitch slant /. The concave surface was the work surface, sewing proceeded from right to left. Split stitches are common on the convex surface, less frequent on the concave. There are 2 coils and an average of 4 stitches per cm. The foundation is wrapped with wood splints, and the black design stitches are probably devil's claw (Martynia). The design layout is three large triangles with three stepped elements between the points (Fig. 8). It had contained corn meal, some of which remains stuck to the inside; weaves bored many small holes in the basket, probably while eating the meal.

1. Terminology for basketry is based on Morris and Burgh, 1941; see especially pp. 61-63 and Fig. 2.

2. Morris and Burgh, 1941, pp. 14-15, Fig. 4, b. Also Weltfish, 1932, Fig. 11.

3. Identification not confirmed by a botanist.
Decorated basket, shape and decoration. Greatest diameter approximately 23.5 cm.
Whether the basket was filled with this material at the time of burial is not known.

**Plain basket.** (ASM 20482) The large undecorated basket was on the left side of the body near the feet (Pl. 1, b). Measurements: 17.5 cm. high, 13.5 cm. diameter at the rim, 29 cm. greatest diameter, and 21 cm. diameter across the base. It has a small mouth, curving in sharply from the greatest diameter, and the base is flat (Fig. 9). The coil construction begins with a normal center and ends like the decorated basket with a short length of false braid, only a few stitches of which remain. The wall technique is the same as that described above, except that the convex surface was the work surface, and there are occasional split stitches on the convex surface whereas they are common on the concave. There are 1.5 coils and an average of 3 stitches per cm. The basket was empty when found, and was probably empty when placed with the burial.

There are several difficulties connected with the analysis of three-rod, bunched foundation basketry. Morris and Burgh consider Weltfish's "two-rod-and-reed-triangular" to be the equivalent of their three-rod, bunched, and date it, with one possible exception, as more likely Pueblo III than Basketmaker.¹ They therefore list her Canyon del

¹ Weltfish, 1932, p. 38; Morris and Burgh, 1941, p. 7. It must be pointed out that Weltfish (1944, p. 388-389), reaffirms her "two-rod-and-reed" foundation type, but does not specifically contest the dating of the specimens.
Plain basket, shape. Greatest diameter 29 cm.
Muerto, Battle Canyon, Mesa Verde, Lake Canyon, and southeast Utah-southwest Colorado, as well as the three-rod Palatki, Chaves Pass, and Chevlon specimens, as three-rod, bunched, dating Pueblo III and IV.¹ They also list in the same category three specimens from Pueblo Bonito,² and twenty-nine from Mesa Verde.³ The charred fragments from Casa Grande⁴ can also be added. Since they are included in this category all of these specimens are evidently considered to have foundations of three rods, bunched, the stitches of the upper coil splitting and passing through the upper rod of the coil below. However Morris and Burgh and Weltfish seem to consider this the same as the type in which the stitch from the coil above passes under the upper rod of the coil below, since the Chevlon specimen, which they include with the others, is clearly the latter type.⁵ It is therefore quite possible that others of the specimens they list may be the non-splitting variety.

A three-rod, bunched foundation is reported from the Salt River Valley, with the stitch from the coil above

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¹ Morris and Burgh, 1941, p. 14.
² Pepper, 1920, p. 107.
³ Morris and Burgh, 1941, p. 14, Fig. 21.
⁴ Weltfish, 1932, p. 28.
⁵ Fewkes, 1898b, Pl. 33.
passing below the upper or apex rod, not through it.\textsuperscript{1} The same variation was found at Ventana Cave.\textsuperscript{2}

Both variations are found in the northern Great Basin.\textsuperscript{3}

A third variant of the three-rod, bunched foundation is reported from Winona and Ridge Ruin.\textsuperscript{4} It is three-rod, but the apex rod has been carefully split for its entire length before it was used in the coil, and the stitches from the coil above pass between the split halves. Most baskets were of this type, totalling nine or ten. They are late Pueblo II and Pueblo III.

The present writer feels that the most significant classification, i.e. significant in terms of historical studies, is the one in which the technique of manufacture rather than the physical appearance of the foundation structure is emphasized. It would seem best to separate out the three types of three-rod, bunched foundation since the Hidden House and Winona and Ridge Ruin types are more closely related in technique to two-rod-and-bundle, bunched, than to the Chevlon, Salt River, and Ventana Cave variety.

\textsuperscript{1} Haury, 1945b, pp. 170-171, Fig. 111.

\textsuperscript{2} Haury, 1950, p. 407. Haury (1945b, fn. 385, p. 170) noted the difference between this variation and the technique of passing the splint through the top rod, but in the discussions (1945b, p. 171; 1950, p. 407) he also considers them as the same technique. See also Cressman, 1942, pp. 47-50.

\textsuperscript{3} Cressman, 1942, pp. 47-50.

\textsuperscript{4} McGregor, 1941, p. 240, Pl. 76, III.
Then again, there may be no significance if the apex rods in the latter category are so thin as to make splitting or piercing difficult. Since most of the specimens listed by Morris and Burgh have not been published so as to show this detail, the question can only be settled by further analysis.¹

At any rate the foundation of the Hidden House baskets is most similar to that of Pueblo specimens. Morris and Burgh point out that it seems to have been prevalent in Pueblo III, dominant in Pueblo IV, and characteristic of historic tribes, excepting the Pueblos and Pima and Papago.²

In center, rim, and mechanics of decoration, the Hidden House baskets are typical of Anasazi Pueblo III.³

The shape of the Hidden House decorated basket is probably characteristic of Pueblo III, and came in as early as Pueblo II.⁴ It is evidently found near Wupatki and at Ridge Ruin also.⁵

³ Morris and Burgh, 1941, pp. 21, 22-23, and 25.
⁴ Morris and Burgh, 1941, pp. 28, 58, Fig. 11, B17, B18.
⁵ Smith, 1952, p. 146; McGregor, 1941, p. 241.
The plain basket is most similar in shape to the Morris and Burgh Class Cl. "The globular form (Cl), despite its obvious usefulness, did not survive beyond Basket Maker III."¹ Either not enough later specimens were available to demonstrate the survival of the form, or it died out in the San Juan and continued in the Sinagua area. However it may also be an independent development since it only involves carrying the wall beyond the hemisphere to constrict the mouth.

The design on the Hidden House basket, considering the whole design, is most similar to the Pueblo III coiled basketry design style as based on Mesa Verde specimens.²

With few specimens from the Anasazi and even less from other areas, the most that can be said at the present time is that in all features considered, excepting the shape of the plain basket, those from Hidden House more closely resemble Anasazi Pueblo III baskets than those of any other area or time.

¹ Morris and Burgh, 1941, p. 28, Fig. 11, Cl.
Basketmaker examples of this shape are illustrated in Kidder and Guernsey, 1919, Pls. 76, n, 77, d.

² Morris and Burgh, 1941, pp. 43, 45, Figs. 17, b, 29, g, h, 18, c.
Gourd container. (ASM 20481) (Pl. 11, b) This object was on the left side, over the trunk (Pl. 1, b). It is made from a globular gourd identified as *Lagenaria leucantha* (= *vulgaris*, = *sicerearia*). The gourd is about 12 cm. in diameter and 10 cm. at its greatest height. A roughly circular hole about 4.5 cm. diameter has been cut in the top; tool marks are visible on its edges. A Z-twist 2-yarn yucca strand is attached as a bail or handle by passing it through two small holes drilled across from each other near the edges of the opening; the ends of the cord are tied together with a reef knot. The gourd contained "a handful of mesquite beans mixed with catclaw seeds."2

Although gourd vessels are not uncommon in archaeological reports,3 only a few specimens have been reported to have bail handles.4 Gourds which are enclosed in nets, with handles attached to the net, are reported for historic groups5 and from the Pueblo IV Awatovi murals,6 but it is

1. Identification by J. J. Thornber, in 1938.
3. E.g., Fewkes, 1909, p. 50 (Mesa Verde); Nordskiold, 1893, p. 94, Pl. 45, 4, 5, (Mesa Verde); Haury, 1934, Pl. 47 (Canyon Creek).
4. Green, ca. 1891, p. 16 (Grand Gulch); Montgomery, 1894, p. 228 (southeast Utah, Basketmaker).
5. E.g., Fewkes, 1903, Pl. 43; Stevenson, 1904, p. 153, Pl. 108, m; Hough, 1919, Pl. 24, 2.
A, Bird-shaped jar, Walnut Black-on-white, 17.5 cm. long; B, Gourd vessel, 12 cm. diameter.
surprising that such an apparently simple modification of a gourd vessel as a cord ball has not been reported more often. This may well be due to inadequate publication.

Pottery bowl. (ASM 20480) This Walnut Black-on-white bowl was found close to the left hip and partially over the trunk (Pl. 1, b). The deep bowl has a rounded bottom and slightly incurved rim (Fig. 10), a shape which was also found in Walnut Black-on-white among vessels from Winona and Ridge Ruin. Since it was warped out of shape before firing, the greatest diameters (3 to 4 cm. below the rim) are 26 and 23.5 cm. It is about 13.5 cm. high. A crack is mended near the rim: two holes were bored from the exterior on each side of the crack and lashed with S-twist 2(?)-yarn cotton cord, which is now badly worn; the knot is on the exterior. There is no exterior decoration, but that on the interior has some elements similar to those on the painted blanket. The design is badly abraded, which suggests considerable usage.

Wendorf notes that Walnut Black-on-white can be divided into two varieties based on the style of design: "A", similar to Sosi Black-on-white style, and "B", typical of Flagstaff Black-on-white. The Hidden House bowl design seems more similar to Flagstaff than to Sosi Black-on-white and may therefore be Walnut "B". The approximate dates of

1. McGregor, 1941, Fig. 10, 3.
Walnut Black-on-white bowl, shape. Greatest diameter approximately 26 cm.
Flagstaff Black-on-white are 1120 to 1225, whereas Sosi Black-on-white is 1075 to 1150. Walnut Black-on-white is dated from 1120 to 1275.\textsuperscript{1} It is therefore suggested that this Walnut Black-on-white bowl falls in the later range of the type.

Pottery effigy jar. (ASM 20479) (Pl. 11, a) This piece was in the bowl described above (Pl. 1, b). It is a bird effigy jar, approximately 11.5 cm. deep and 17.5 cm. long; the opening is 7.8 cm. (lateral) by 6.5 cm. (front to back) in diameter and the handle is 3 cm. wide. The stubby wings, breast, head, and tail are hollow. The eyes bulge slightly, and two small holes were punched close together in the front of the head as nostrils. It also was identified as Walnut Black-on-white and is probably contemporary with the bowl. A piece of bone was found in it. (p. 16).

Duck- or bird-shaped vessels are by far the most common effigy forms in the Pueblo area, and have a widespread, though not continuous, distribution over the Southwest, from southern Utah and Colorado to Chihuahua, from Nevada to Pecos, from Basketmaker III to the present. There is much variation in form. Some bird vessels can be identified as to the species intended, and include representation

\textsuperscript{1} Wendorf, 1948, p. 32; Colton and Hargrave, 1937, pp. 211-213, 225-226; Colton, 1946, p. 253.
of head, eyes, feet, wings, tail, breast, feathers, and other features; these grade into others which are merely pots with an elongated body vaguely suggesting the form of a bird. Some show features by modelling, some by painting, or by both in combination. There is a tendency for the most elaborate or naturalistic forms to be painted wares, and the most simple to be plain wares, but this is not entirely consistent. The uses and meanings of bird-shaped vessels have not as yet been worked out. Fewkes thought the simple plain-ware shapes may have been used on a dutch-oven principle for cooking, but this cannot explain all of them and does not seem likely on present evidence. Nor is Smith's explanation of them as lamps probable. Some of the more elaborate painted forms have been thought to be ceremonial, and one was found partially filled with charred corn-meal, another with quartz crystals. Stevenson believed that some of the bird vessels from modern Pueblos were used as canteens or water vessels.¹

"Effigies" are included in the list of shapes for Walnut Black-on-white,² and bird effigies are in all pro-

¹. Fewkes, 1898a, p. 651; Haury, 1945b, p. 70; Kidder and Shepard, 1936, pp. 338-341; Roberts, 1925, p. 72; Roberts, 1930, p. 102; Smith, 1893, p. 8; Stevenson, 1883a, pp. 365, 387, 406, 409; Stevenson, 1883b, pp. 454, 458, 460, 463. The writer has notes on several hundred bird vessels in the literature; this is only a fraction of those in museum collections. A more extensive analysis is in preparation.

bability included. The Hidden House effigy seems most closely related to Pueblo III forms.

Decorated sherds. The sherds picked up at the ruin, but not included in the burial, were Walnut Black-on-white, Moenkopi Corrugated, Verde Black-on-gray, and Tusayan Black-on-red.¹ Mr. King remembers that Walnut Black-on-white "was by far the most plentiful, perhaps three to one over the others." Moenkopi Corrugated and Verde Black-on-gray were next in abundance, but relative proportions were not known. "Very little Tusayan [Black-on-red] was noted by me."²

Walnut Black-on-white was probably made in the eastern part of the San Francisco Mountain area. Verde Black-on-gray was probably made in the Prescott area to the west. Moenkopi Corrugated and Tusayan Black-on-red were probably made north of the Little Colorado. Pottery was traded to the Verde Valley from these areas.³

The following are the approximate dates for the decorated sherds: Walnut Black-on-white, 1120-1275; Verde Black-

¹. King, 1933, p. 18. E. H. Spicer identified the painted pottery in 1933.
². King, letter, Dec. 1, 1951. There was no indication of numbers of sherds or proportions in the 1933 or 1941 notes.
³. Colton, 1941, pp. 33, 49, 55; Colton, 1946, pp. 23, 32.
on-gray, 1150-1400; Moenkopi Corrugated, 1050-1275; Tusayan Black-on-red, 1050-1150.¹ Walnut Black-on-white and Tusayan Black-on-red, the only two of the above types which are found in Colton's listing of ceramic groups, occur together in ceramic group 7, dated 1130-1210, early Pueblo III.²

Using only the total collection of decorated sherds from the site, with no evidence of ceramic stratigraphy, association, or length of occupation, an extreme range of 1050 to 1400 is possible. If the types were used together a date of 1120 or 1150 to about 1275 or 1300 is possible. The ceramic group date of 1130 to 1210 is most significant because of the absence of types in groups 8 and 9. A date for the ruin based on ceramics is probably best estimated as 1200 ± 50 or 75 years.

King remarks that these types are "typical of numerous pre-Jeddito ware sites in the rim of the Verde Valley and in Sycamore Basin," and he also includes Tusayan Black-on-white (1225-1300) and Deadmans Black-on-red (800-1060).³

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¹ Colton, 1946, p. 253; Colton and Hargrave, 1937, p. 185. These types are described in Colton and Hargrave, 1937, pp. 237-240, 184-186, 197-198, and 74-75, respectively.
² Colton, 1946, pp. 20, 254.
³ King, 1933, pp. 15, 18; King, 1941, p. 23.
Caywood and Spicer add as typical of this period Flagstaff Black-on-white (1120-1225) and Tusayan Polychrome (1150-1300). These additional types, with the exception of Deadmans Black-on-red, fall within the general Pueblo III period indicated by the Hidden House sherds.

King and Caywood and Spicer contrast the sites that have the above pottery types with those that have Jeddito Black-on-yellow (1325-1600, Pueblo IV), a widely-traded type which was brought in probably from what is now the Hopi area. These sites are mainly large open pueblos near the Verde River, but a few, such as Honanki and Palatki, were built in cliffs near Pueblo III sites. There is no evidence available to indicate whether Honanki and Palatki had an earlier occupation.

Plain sherds. Mr. King remembers that "a good deal of plain-ware sherds were found; mostly rather crude gray-ware; some red-ware sherds of rather coarse tempering but hard burning, with fire marks showing." Plain-ware sherds


2. King, 1933, pp. 15, 18; Caywood and Spicer, 1935, pp. 9, 12-13, 63.


4. King, letter, Dec. 1, 1951. There was no mention of plain-ware sherds in the 1933 or 1941 notes.
more abundant than painted.¹

In the system of classification developed by the Museum of Northern Arizona the plain wares are found to be the most useful as indicators of branches. Since there remain no sherd collections from the Hidden House excavations and the plain sherds were not identified in the original reports, the plain-ware types and wares can only be inferred. Caywood and Spicer note that in the upper Verde Valley in most of the sites of the period in which Hidden House falls, Tuzigoot Red, Prescott Gray Ware, and "a coarse undecorated brown ware" were found.² The gray-ware mentioned by King is probably Prescott Gray Ware and the red-ware may well be Tuzigoot Red. About ten years ago, Dr. Colton visited Hidden House and found only seventeen sherds: nine Alameda Brown Ware, seven Verde Gray (Prescott Gray Ware), and one Deadmans Gray (San Francisco Mountain Gray Ware).³

Prescott Gray Ware is characteristic of the Prescott region and may have been traded to the Verde Valley from the west. Tuzigoot Red is a type in the Verde Series, which is indigenous to the Verde Valley. The Verde Series


². Caywood and Spicer, 1935, pp. 10, 12. See also Colton, 1939, p. 45.

belongs to Alameda Brown Ware, the most reliable single determinant of the Sinagua Branch, to which the Pueblo sites of the Verde Valley have been assigned.¹ For the most part these are the wares found at Panorama and Kittredge Ruins, however plain pottery from the Hohokam was also found there.²

Grass pot-rest. In the bottom of one of the cists described on p. 5, and therefore not to be included in the burial furniture, was found a grass pot-rest, "still conforming to the shape of a large olla."³ This specimen is not in the Museum collections.

Pendant. (TM 1801, see fn. 2, p. 5) This came from Hidden House, but not from the burial. Measurements: 2.9 cm. long, 1.9 cm. wide. The material from which the pendant was made is called "pipestone" on the catalog card, but Mr. Richert remarks: "I would classify it as argillite traded from Chino Valley." "Numerous pipestone pendants" were found at Tuzigoot, and Jackson mentions "Several pipestone or catlanite [sic] pendants," with "carving in straight lines...on some of these, but without definite design

¹. See especially Colton, 1946, pp. 225, 303-304; Colton, 1941, p. 34.
². Shutler, 1951.
³. King, 1933, p. 3.
forms.\textsuperscript{1} These also may be argillite. The argillite was probably traded from north of Prescott.\textsuperscript{2}

Problematical object. (TM 1802, see fn. 2, p. 5) A "problematical object," made of "reed," is probably from Hidden House, but not from the burial. There is no further description.

Food remains. In the bottom of one of the cists, described above, there were a few scattered grains of corn and one complete ear (ASM 20484). The ear of corn is large: 19.5 cm. long by 6 cm. greatest diameter. The grains are reddish and spaced in even tightly-packed rows. There were many corn cobs in the debris of Hidden House, most of them similar to the one described, and larger by far than cobs from other sites in the same district which King observed.\textsuperscript{3} There are twenty-five kernels of corn from Hidden House in the Tuzigoot Museum (uncataloged, see fn. 2, p. 5). In the Museum of Northern Arizona are three kernels of corn cataloged as coming from Hidden House (MNA 692/A.86).\textsuperscript{4} These

\begin{itemize}
\item 1. Caywood and Spicer, 1935, p. 89; Jackson, 1933, p. 93.
\item 2. Bartlett, 1939, pp. 75-78.
\item 3. King, 1933, p. 33.
\item 4. Katharine Bartlett, letter, February 6, 1952. The Museum of Northern Arizona specimens mentioned in this sec-
are "flint corn (brown, perhaps originally yellow and darkened with age)."¹ Cornmeal was found in the decorated basket (p. 126).

The seeds from the various containers found with the burial have been identified as: juniper seed (Juniperus utahensis),² pink bean (Phaseolus vulgaris), catclaw acacia or devilscowl (Acacia greggii), corn, and cotton.³

Elsewhere in the ruin were found "beans, various seeds, grasses, etc." (see fn. 2, p. 5). In the Museum of Northern Arizona is a collection of seed of some wild grass (MNA 692/A.87) which filled a cist 91 by 107 cm., and one seed of Cucurbita moschata (MNA 692/A.86).

There are also two small beans (MNA 692/A.86). Dr. Carter notes concerning the beans that "One is small, fat,

¹ Dr. George F. Carter, letter, July 24, 1951. Dr. Carter examined the botanical materials in the Museum of Northern Arizona collections and kindly furnished his notes on those from Hidden House.

² Perhaps the "mesquite beans" of the gourd vessel (p. 131). Mesquite beans were not included in Thornber's list.

brown faintly mottled, tiny seed scar; probably *Phaseolus* acutifolius, tepary bean. The other is larger, brown, with deep brown striping and a white seed scar; *P. vulgaris*, common bean. This bean's pattern of marking is like one of the Hopi beans, though its shape is somewhat different." In Murder House, a nearby ruin of the same period, *P. vulgaris* and *P. lunatus* (the lima bean) are reported (MNA 692/A.85).1

A yucca quid (ASM 20510?) was also reported from Hidden House,2 but it cannot be found in the Museum collections.

It may be postulated that the corn and pumpkin (*C. moschata*) may be typical of Anasazi agriculture, whereas the tepary bean, lima bean, and *Lagenaria* (p. 135) may have been derived ultimately from the Hohokam. Evidence for prehis­toric plant distributions is as yet unsatisfactory, but at least the Hidden House collection can be matched by botani­cal materials from other Western Pueblo sites.3

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2. King, 1941, p. 7.

3. Carter, 1945, pp. 21, 40, 58-68, 70, 76, Fig. 11; Castetter and Bell, 1942, pp. 28-37; Haury, 1950, pp. 165, 425; Whitaker, 1948, Table 5; Zingg, 1940, pp. 38, 54-56. However, lima beans and tepary beans may have been found in a Pueblo I site at Alkali Ridge in southern Utah, but the identifications are not certain (Jones, 1946, p. 333).
CONCLUSIONS

Since the preservation of such unusual perishable material (from time and especially from vandals) is rare, the importance of the individual and comparative elaboration should not be overemphasized. If the Hidden House burial had been placed in an open site, rather than in a dry cave, it is probable that nothing would have been preserved but the skeleton, the two pieces of pottery, five arrowpoints, and, with exceptional luck, a few fragments of the hardwood bow and feathered stick, and perhaps some basketry and textile impressions. Judging from the remains at Tuzigoot, had the burials there been preserved in dry caves they might have yielded even more elaborate grave goods as indicated by a few fragments of cloth, basketry, and prayer-sticks. It may be that the Hidden House burial was even poorer than many others judging by the quantity of stone, turquoise, and shell jewelry found in the Tuzigoot graves.¹ As King points out, the lack of jewelry is peculiar since turquoise and other ornaments are frequently found in burials in the Verde Valley.²

². King, 1933, p. 5.
As there is little evidence for exceptional wealth, comparatively, there is also little reason to postulate a specific function or important status for the man. Most of the artifacts are assumed to be personal (clothing and weapons) and household equipment (bags and containers). A special ceremonial function is possible if the feathered stick is considered to be an insignia of some religious body and if the agave box or turban had special religious meanings. As yet there is no conclusive evidence to support or deny these connotations. It might be well to point out however that an isolated Pueblo I burial found in the Piedra district in Colorado, widely separated in space and time from Hidden House, included an imitation in pottery of an agave box, a large number of pottery vessels including a bird-shaped jar, red paint, the bones of a golden eagle, and twenty-two fine arrow points, their flakes, core, and implements used in making them.\footnote{Roberts, 1930, p. 164} It might have been the grave of an arrow-maker who was also of considerable ceremonial importance. But basing the similarity on the agave box and bird-jar is little evidence indeed to interpret the Hidden House burial as a ceremonial personage.

The most elaborate burial yet reported from the Southwest was found in Ridge Ruin and is assigned to the early
part of the twelfth century. There was a rich collection of ceremonial equipment and jewelry, as well as baskets, pottery, and other artifacts. Cerements, if any, were not preserved. This burial emphasizes the comparative poverty of the Hidden House man and his relatives, or his less important status.¹

The presence of hair and yucca hanks might possibly indicate that men made the cordage.

At best it may be said that the individual from Hidden House was a middle-aged man who may have had some ceremonial function. Judging from circumstances surrounding the burial and the design on the painted blanket, he probably died at about 1275 A.D. ± 25, late Pueblo III, toward or at the close of the occupation of Hidden House.

The general outlines of the archaeology of the upper Verde Valley and neighboring areas have been constructed mainly from surveys and relatively little excavation.²

¹ The reader should see the description and interpretations in McGregor, 1943. Other burials which the reader will find of interest for comparison are reported in: anonymous, 1896; Guernsey, 1931, pp. 51-52; Harrington, 1933, pp. 31-37; Haury, 1933; Haury, 1950, pp. 464-466; Hodge, 1918, pp. 66-67; Jackson, 1933, pp. 74-86; King, 1949, pp. 67-84; Lumholtz, 1902, p. 72; Morris, 1924; Morris, 1948; Spicer and Caywood, 1936, pp. 71-75; Vickrey, 1939, p. 21; Wilson, 1916, pp. 34-35.

brief summary can begin with a division of the Indian popu-
lation into several groups: the late prehistoric and his-
toric Northeastern Yavapai, the Sinagua (a Pueblo group
that made Alameda Brown Ware pottery), the Hohokam of sou-
thern Arizona, and a possible pre-pottery occupation.

Sites in this region characterized by a crude brown
ware utility pottery are dated at about 500-700 (Basket-
maker III). This earliest pottery-making occupation of the
area suggests relationships with the Sinagua Branch and the
Patayan Root.

In the period 700-900 (Pueblo I) a few sites have been
found which suggest a dual occupation of the area by the
Hohokam and Sinagua. The Sinagua lived at the base of the
plateau at elevations of 4500 to 5000 feet and practised dry
farming, whereas the Hohokam (Santa Cruz Phase) lived 10 or
12 miles away near the river, at elevations of 3000 to 3500
feet, depending on irrigation for watering their crops.

The same dual occupation is found in the period 900
to 1125 (Pueblo II). The Hohokam (Sacaton Phase) reached
their greatest expansion in the Verde Valley at this time.

In the period 1125-1300 (Pueblo III) the Hohokam with-
drew and were replaced by the Sinagua. At this time the
Sinagua lived below the escarpment mainly in small cliff
pueblos, such as Hidden House, practising dry farming.
They also moved down to the area near the river and began
to water their crops by irrigation as their Hohokam pre-
decessors had done. The large pueblos such as Tuzigoot began in this period.

During the period 1300-1400 (Pueblo IV) the area of the northern Sinagua southeast of Flagstaff was for the most part abandoned, perhaps because of the 1276-1299 drought, and it is surmised that many of these people moved into the Verde Valley about 1300 A.D. increasing the previous Sinagua population. It is also thought that the small scattered open sites and cliff pueblos in the cliffs at the edge of the plateau were abandoned, and people gathered together to build up large settlements such as Tuzigoot, Honanki, and Palatki.

At about 1400 the Sinagua abandoned the Verde Valley, perhaps moving into the Salt River area to join with the Hohokam and their possible Sinagua predecessors. Some may have moved north to Hopi. They were replaced by nomadic tribes, such as the Northeastern Yavapai, who may have been a cause of the Sinagua abandonment.

Placing the Hidden House ruin in this general picture of Verde Valley history is not difficult. But deciding which items are indigenous and which were traded from other areas is more difficult. The conclusions arrived at in preceding sections, most of which are very tentative, will be summarized below.

The pottery, architecture, and location clearly show that Hidden House is Pueblo III, probably dating from between 1150 and 1275 or 1300, and belongs to the southern
division\(^1\) of the Sinagua Branch in terms of the Museum of Northern Arizona classification. Reed\(^2\) has placed the Sinagua Branch in a wide grouping of sites in the central and eastern mountainous portions of Arizona, which is tentatively referred to as "Western Pueblo," and may finally be called Mogollon. The Western Pueblo archaeological complex contrasts with the Anasazi, and the two together, referred to as the general Pueblo pattern, contrast with the Hohokam. The following general summary of the conclusions reached in previous discussions will be largely in these terms.

There were several things from Hidden House which, for reasons discussed in the body of the text, do not seem to have been made in the upper Verde area. Those which were probably traded into the Verde Valley from the northeast include Walnut Black-on-white, Tusayan Black-on-red, and Moenkopi Corrugated pottery, probably the painted blanket, and possibly some of the other decorated textiles. The pendant and Prescott Gray Ware were probably traded from the Chino Valley area to the west. The only things which suggest trade with the Hohokam are the turban and macaw

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1. The southern division was formerly known as the Los Reyes Branch, however on further study it was found to be so similar to the northern Sinagua east and southeast of Flagstaff, the Los Reyes Branch was dropped (Colton, 1946, p. 15, fn. 5).

2. Reed, 1950.
feathers, neither of which are positively identified. It is surprising that so few sherds of the late Pueblo III types, such as Kayenta Black-on-white, are found in the Verde Valley. Caywood and Spicer postulate a decline in importance and popularity of painted pottery at Tuzigoot in the period just preceding the great expansion of the pueblo at about 1300. Other artifacts from Hidden House, such as the baskets, show closest relationships to the northeast but there is as yet no reason to consider them trade items.

The exact routes of trade are difficult to establish since items may have passed through many hands before reaching Hidden House. The easiest route to the west is through the Verde River gorge, and most of the Verde's tributaries to the north and east would have given fairly easy access to the Flagstaff region.

Those items which are not suspected of being traded into the area were probably made in Hidden House or nearby. As far as is known plain Alameda Brown Ware was the only pottery made in the Verde Valley at this time. This ware is the only trait which is exclusively Sinagua — indeed this is so far the basis upon which the Sinagua Branch is defined, with occasional aid from architecture and location.

The best guess at the present time for the original

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derivation of the Hidden House textile collection as a whole is that the weaving was most closely associated with the northern area, with a suggestion, however, of a possible Western Pueblo weaving tradition. The warp-face belting technique may ultimately prove to have diffused from the Hohokam. Those things which seem to be mainly Western Pueblo include: the indigenous pottery, the style of breech cloth, the belting, the location of the burial, the extended position of the skeleton and the arm over the pelvis, the possible vertical-occipital skull deformation, and perhaps the body painting and hair-do. The basketry, sandals, agave box, and feathered stick may be indigenous to the Western Pueblos, and present evidence suggests they were derived from the Anasazi. The agricultural complex may indicate a mixed derivation due to the position of the Western Pueblos between the Anasazi and Hohokam.

If the agave box and feathered stick were derived from the Anasazi the argument for similarity of Sinagua and Anasazi religion is stronger than the arguments for a difference in religion based on the supposed absence of that complex of architectural features by which the archaeologist identifies a kiva or ceremonial chamber.¹ Both arguments are weak in both logic and data, however.

¹ Colton, 1943, p. 267.
In summary, the people of the upper Verde Valley would seem to have had least contact with the Hohokam, somewhat more with the Prescott Branch to the west, most contact with the Winslow and Kayenta Branches to the northeast, to have been basically Western Pueblo, and specifically Sinagua. With the exception of the shape of the plain basket and perhaps the agave box, nothing in the ruin contradicts the placing of Hidden House in the Pueblo III period. The data presented in the discussions shows that in general the Hidden House material is most closely similar to the modern Western Pueblos.

Two foci of the Verde Valley division of the Sinagua Branch are of most interest in placing Hidden House in the Museum of Northern Arizona classification — the Honanki Focus (Pueblo III), occupying the Verde Valley and East Verde drainage from about 1100 to 1300 A.D., and the Tuzigoot Focus (Pueblo IV) in the Verde Valley from Sycamore Canyon south to Bloody Basin from 1300 to 1400 A.D.\(^1\)

Colton lists only two distinctions between these foci about which there is enough data to make them significant — architecture and pottery.

Colton lists the "associated" or trade pottery of

\(^1\) These foci are defined by Colton, 1939, pp. 44-46. Further reference in this section to Colton's views on these foci is from this source.
the Honanki Focus as Walnut Black-on-white (1120-1275), Tusayan Black-on-red (1050-1150), Citadel Polychrome (1075-1175), and Flagstaff Black-on-white (1120-1225). These contrast with the Jeddito Yellow (1250-1937), Winslow Polychrome (1350-1400), and Prescott (Verde) Black-on-gray (1150-1400) of the Tuzigoot Focus.¹

Caywood and Spicer and King characterize the early Pueblo sites by the pottery types discussed on pp. 139-141, which also fall within the period of Colton's Honanki Focus. They clearly distinguish these sites from those in which Jeddito Black-on-yellow (1325-1600) is found, and speak of them as "pre-Jeddito." There is little question then that the pre-Jeddito sites mentioned by Caywood and Spicer and King correspond to Colton's Honanki Focus (Pueblo III), and the Jeddito sites correspond to his Tuzigoot Focus (Pueblo IV). The division in time between these two periods can be placed at about 1300 ± 25.

Colton contrasts the cliff pueblos and open masonry pueblos of the Honanki Focus with the large pueblos of the Tuzigoot Focus, a distinction noted by Caywood and Spicer and King (pp. 9-10). Only one exception was reported: a pre-Jeddito open pueblo of thirty rooms, the same number they report for Pueblo IV Honanki. Shutler recently re-

¹ Dates' from Colton, 1946, p. 253; Colton and Hargrave, 1937, pp. 139, 147, 185.
ported eighteen rooms for the Honanki Focus Kittredge Ruin, the same number as in Pueblo IV Palatki.\footnote{1}

If this distinction of foci as based on pottery and size of site is acceptable, one further problem is raised. Under excavated sites of the Honanki Focus, Colton lists Honanki (which the focus is named for), Palatki, the early components of Tuzigoot and Montezuma Castle, and Hidden House; Shutler's Kittredge Ruin and Panorama Ruin may now be added. (Tuzigoot Focus excavated sites are the late components of Tuzigoot and Montezuma Castle.) However Honanki, with thirty rooms, and Palatki, with eighteen rooms, are larger than is typical for the pre-Jeddito sites as indicated above. But what is more significant, Honanki and Palatki are listed as Jeddito Black-on-yellow sites.\footnote{2} Since the writer can find no suggestion of an earlier occupation of Honanki and Palatki, the known components of these two sites must be assigned to the later Tuzigoot Focus. We are now in the odd position of designating a focus by the name of a ruin that, using Colton's own distinctions, belongs in the next later focus. Since it has not as yet had wide usage, this writer suggests that the name "Honanki Focus" be changed to "Hidden House Focus," after a site which

\footnote{1. Caywood and Spicer, 1935, pp. 10, 12-13; Shutler, 1951, p. 5.}

\footnote{2. Caywood and Spicer, 1935, pp. 9, 12-13.}
surely falls in this period. It is also suggested that Hidden House serve as the "type site" for this focus.¹

There is a need for amplification of the original definition of the Pueblo III focus of the southern Sinagua. Using data provided herein and by Caywood and Spicer and Shutler,² certain changes are suggested. Colton's general outline of the determinants for this focus is given below, with this writer's suggested changes in parentheses.

**FOCUS DETERMINANTS:**

**Pottery:**

(a) Indigenous utility type: Tonto Red.

(b) Indigenous table type: Tonto Red and Tonto Smudged, bowls.

(c) Associated types: Flagstaff Black-on-white, Walnut Black-on-white, Citadel Polychrome, Tusayan Black-on-red, (Moenkopi Corrugated, Verde Black-on-gray, Tusayan Polychrome, Tusayan Black-on-white).

**Architecture:**

(a) Cliff pueblos.

(b) Pueblos in open, masonry.

(c) No kiva.

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¹ "In selecting a type site to illustrate a focus, a small site should be chosen, one in which the time of occupancy was so short that the focus will not be blurred by the mingling of traits from components older or younger than the focus to be described." (Colton, 1939, p. 11) It should be noted that both Caywood and Spicer (1935, p. 11) and King (1933, p. 2) have considered Hidden House to be "typical" of the small cliff ruins of this focus.

² Caywood and Spicer, 1935, p. 12; Shutler, 1951.

Bone: Turkey bone awls.

Shell: Glycymeris.

Wood: Reed arrows, bow.

Fiber: Yucca sandals, cotton, (cotton textiles, yucca, cotton, and human hair cordage, coiled basketry; omit: "Fine painted cotton blankets").

Food: (Corn, pink bean, tepary bean, lima bean, pumpkin, grass seed, and juniper and catclaw acacia seed)

Disposal of dead: Inhumation, extended, with offerings.

Physical type: Brachycephalic, (often) deformed.

The full publication of reports on Kittredge and Panorama Ruins\(^1\) should make possible a more complete and detailed revision of the determinants of the "Hidden House Focus" than is advisable at the present time.

\(^1\) Briefly described in Shutler, 1951.
BIBLIOGRAPHY

Abbreviations


AAM American Antiquity, Society for American Archaeology, Menasha and Salt Lake City

AF-P Papers of the Amerind Foundation, Inc., Dragoon

AMNH American Museum of Natural History, New York
-AP Anthropological Papers
-HS Handbook Series
-NH Natural History

BAE Bureau of American Ethnology, Washington
-AP Anthropological Papers
-AR Annual Report
-B Bulletin

CIW-P Publications of the Carnegie Institution of Washington

EP El Palacio, Santa Fe

FMNH Field Museum of Natural History, Chicago
-AS Anthropological Series
-AM Anthropological Memoirs

GP-MP Medallion Papers, Gila Pueblo, Globe

MNA Museum of Northern Arizona, Flagstaff
-B Bulletin
-LN Museum Notes
-P Plateau

PM-P Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Cambridge
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<td>United States National Museum, Washington Proceedings</td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY

Aginsky, B. W.
1943 Culture Element Distributions: XXIV, Central Sierra, UC-PAR Vol. 8, No. 4.

Alexander, H. G. and P. Reiter

Amsden, C. A.
1949b Prehistoric Southwesterners from Basketmaker to Pueblo, Southwest Museum, Los Angeles.

anonymous

Ayer, M. Y.

Baldwin, G. C.
1939 The Material Culture of Kinishba, AAnt Vol. 4, No. 4, pp. 314-327.

Bartlett, K.
1934 The Material Culture of Pueblo II in the San Francisco Mountains, Arizona, MNA-B 7.
1939 A Prehistoric "Mine" of Red Argillite Resembling Pipestone, near Del Rio, Arizona, MNA-MN Vol. 11, No. 12, pp. 75-78.
1949 Hopi Indian Costume, MNA-P Vol. 22, No. 1.

Beaglehole, E. and P.
1935 Hopi of the Second Mesa, AA-M No. 44.

Beals, R. L., G. W. Brainerd, and W. Smith
Birdsall, W. R.

Boies, L. C.

Brew, J. O.
1946 Archaeology of Alkali Ridge, Southeastern Utah, PM-P Vol. 21.

Bunzel, R. L.
1932a Introduction to Zuni Ceremonialism, BAE-AR 47.
1932b Zuni Katcinas: An Analytical Study, BAE-AR 47.

Burgh, R. F., and C. R. Scoggin

Carter, G. F.
1945 Plant Geography and Culture History in the American Southwest, Viking Fund Publications in Anthropology, No. 5, New York.

Castetter, E. F. and W. H. Bell
1942 Pima and Papago Indian Agriculture, University of New Mexico Press, Albuquerque.

Caywood, L. R. and E. H. Spicer
1935 Tuzigoot, the Excavation and Repair of a Ruin on the Verde River near Clarkdale, Arizona, Field Division of Education, National Park Service, Berkeley.

Chapman, K. M.

Clarke, E. P.

Coffin, E. F.
1932 Archaeological Exploration of a Rock Shelter in Brewster County, Texas, Indian Notes and Monographs No. 48, Museum of the American Indian, Heye Foundation, New York.
Colton, H. S.
1932  Walnut Canyon National Monument, MNA-MN Vol. 4, No. 11.
1939  Prehistoric Culture Units and their Relationships in Northern Arizona, MNA-B 17.
1941  Winona and Ridge Ruin, Part II, MNA-B 19.
1946  The Sinagua, a Summary of the Archaeology of the Region of Flagstaff, Arizona, MNA-B 22.

Colton, H. S. and L. L. Hargrave
1937  Handbook of Northern Arizona Pottery Wares, MNA-B 11.

Corbusier, W. M.

Cosgrove, C. B.
1947  Caves of the Upper Gila and Hueco Areas in New Mexico and Texas, PM-P Vol. 24, No. 2.

Cosgrove, H. S. and C. B.

Crawford, M. D. C.

Cremony, J. C.

Cressman, L. S.
1942  Archaeological Researches in the Northern Great Basin, CIW-P 538.
Cummings, B.
1910 The Ancient Inhabitants of the San Juan Valley,
2, Salt Lake City.

1915a The Textile Fabrics of the Cliff Dwellers, National
Association of Cotton Manufacturers, Boston.

1915b Kivas of the San Juan Drainage, AA Vol. 17, No. 2,
pp. 272-282.

1940 Kinishba, A Prehistoric Pueblo of the Great Pueblo
Period, Tucson.

Cushing, F. H.
1895 The Arrow, AA, o.s. Vol. 8, No. 4, pp. 307-349.

Dorsey, G. A. and H. R. Voth
1901 The Oraibi Soyal Ceremony, FMNH-AS Vol. 3, pp. 5-
59.

Douglas, F. H.
1938 Two Plains Bison Hair Ropes, Material Culture Notes
No. 5, Indian Art Department, Denver Art Museum,
Denver.

1940 Main Types of Pueblo Cotton Textiles, Denver Art
Museum Leaflets 92-93, Denver.

Douglass, W. B.
1915 Notes on the Shrines of the Tewa and Other Pueblo
Indians of New Mexico, 19th International Con­
gress of Americanists, Proceedings, pp. 344-378,
Washington.

Drucker, P.
1941 Culture Element Distributions: XVII, Yuman-Piman,
UC-PAR, Vol. 6, No. 3.

Ekholm, G. F.
1942 Excavations at Guasave, Sinaloa, Mexico, AMNH-AP
Vol. 38, pt. 2.

Ferdon, E. N., Jr.
1946 An Excavation of Hermit’s Cave, New Mexico, SAR-
M 10.
Fewkes, J. W.


1896b The Prehistoric Culture of Tusayan, AA, o.s. Vol. 9, No. 5, pp. 151-173.


1897b Tusayan Snake Ceremonies, BAE-AR 16, pp. 267-312.

1898a Archaeological Expedition to Arizona in 1895, BAE-AR 17, pt. 2, pp. 519-742.

1898b Preliminary Account of an Expedition to the Pueblo Ruins near Winslow, Arizona, in 1896, SI-AR for 1896, pp. 517-539.

1900 Tusayan Flute and Snake Ceremonies, BAE-AR 19, pt. 2, pp. 957-1011.

1903 Hopi Katcinas, Drawn by Native Artists, BAE-AR 21, pp. 3-126.


1911 Antiquities of the Mesa Verde National Park: Cliff Palace, BAE-B 51.
Fewkes, J. W.
1912b Antiquities of the Upper Verde River and Walnut Creek Valleys, Arizona, BAE-AR 28, pp. 181-220.
1914 Archaeology of the Lower Mimbres Valley, New Mexico, SI-MC Vol. 63, No. 10.

Fewkes, J. W., and A. M. Stephen

Forde, C. D.
1931 Ethnography of the Yuma Indians, UC-PAAE Vol. 28, No. 4.

Fulton, W. S.
1941 A Ceremonial Cave in the Winchester Mountains, Arizona, AF-P 2.

Gifford, E. W.
1932 The Southeastern Yavapai, UC-PAAE Vol. 29, No. 3
1936 Northeastern and Western Yavapai, UC-PAAE Vol. 34, No. 4.
1940 Culture Element Distributions: XII, Apache-Pueblo, UC-PAR Vol. 4, No. 1.

Gladwin, H. S., E. W. Haury, E. B. Sayles, and N. Gladwin
1937 Excavations at Snaketown, Material Culture, GP-MP 25.

Gladwin, W. and H. S.

Goddard, P. E.
1927 Indians of the Southwest, third edition, A:\N\H-HS 2.
Goodwin, G.  

Graumont, R., and J. Hensel  

Green, C. H.  
ca. Catalogue of a Unique Collection of Cliff Dweller Relics: taken from the Lately Discovered Ruins of Southwestern Colorado and Adjacent Parts of Utah, New Mexico, and Arizona; Chicago.

Guernsey, S. J.  

Guernsey, S. J., and A. V. Kidder  
1921 Basket-maker Caves of Northeastern Arizona, PM-P Vol. 8, No. 2.

Hall, S. M.  

Harrington, M. R.  


1933 Gypsum Cave, Nevada, SM-P 16.

1937 Excavation of Pueblo Grande de Nevada, TAPS-B 9, pp. 130-145.
Haney, E. W.
1934  The Canyon Creek Ruin and Cliff Dwellings of the Sierra Ancha, GP-MP 14.
1940  Excavations in the Forestdale Valley, East-Central Arizona, UA-SSB 12.
1945a The Excavations of Los Muertos and Neighboring Ruins of the Salt River Valley, Southern Arizona, PM-P Vol. 24, No. 1.
1950  The Stratigraphy and Archaeology of Ventana Cave, Arizona, University of New Mexico Press, Albuquerque.

Hawley, F. M.

Hibben, F. C.
1938  A Cache of Wooden Bows from the Mogollon Mountains, AAnt Vol. 4, No. 1, pp. 36-38.

Hodge, F. W.
1910  Handbook of American Indians North of Mexico, two volumes, BAE-B 30.
1918  Excavations at Hawikuh, New Mexico, SI-MC Vol. 68, No. 12, pp. 61-72.

Hough, W.
1903  Archaeological Field-Work in Northeastern Arizona, the Museum-Gates Expedition of 1901, USNM-AR for 1901, pp. 279-358.
1907  Antiquities of the Upper Gila and Salt River Valleys in Arizona and New Mexico, BAE-B 35.
1910  "Prayer sticks" in Hodge, F. W., 1910, p. 304.
Hough, W.  
1914  Culture of the Ancient Pueblos of the Upper Gila River Region, New Mexico and Arizona, USNM-B 87.
1930  Exploration of Ruins in the White Mountain Apache Indian Reservation, USNM-P Vol. 78, art. 13.

Hovey, H. C.  

Jackson, A. T.  
1937  Exploration of Certain Sites in Culbertson County, Texas, TAPS-B 9, pp. 146-192.

Jackson, E.  

Jeecheon, J. A., and F. H. Douglas  
1931  Hopi Indian Weaving, Denver Art Museum Leaflet 18, Denver.

Jones, V.  
1936  A Summary of Data on Aboriginal Cotton of the Southwest, in Symposium on Prehistoric Agriculture, UNM-BAS Vol. 1, No. 5.
1945  Plant Materials, Appendix II in Beals, Brainerd, and Smith, 1945.
1946  Plant Materials from Alkali Ridge Sites, Appendix C in Brew, 1946.

Judd, N. M.  
1926  Archaeological Investigations North of the Rio Colorado, BAE-B 82.
1930  The Excavation and Repair of Betatakin, USNM-P Vol. 77, art. 5.

Kasha, M.  
Hough, W.  
1914  
Culture of the Ancient Pueblos of the Upper Gila River Region, New Mexico and Arizona, USNM-B 87.

1919  

1930  
Exploration of Ruins in the White Mountain Apache Indian Reservation, USNM-P Vol. 78, art. 13.

Hovey, H. C.  
1893  

Jackson, A. T.  
1937  
Exploration of Certain Sites in Culbertson County, Texas, TAPS-B 9, pp. 146-192.

Jackson, E.  
1933  

Jeancon, J. A., and F. H. Douglas  
1936  
Hopi Indian Weaving, Denver Art Museum Leaflet 18, Denver.

Jones, V.  
1936  
A Survey of Data on Aboriginal Cotton of the Southwest, in Symposium on Prehistoric Agriculture, UNM-BAS Vol. 1, No. 5.

1945  
Plant Materials, Appendix II in Beals, Brainerd, and Smith, 1945.

1946  
Plant Materials from Alkali Ridge Sites, Appendix C in Brew, 1946.

Judd, N. M.  
1926  
Archaeological Investigations North of the Rio Colorado, BAE-B 82.

1930  
The Excavation and Repair of Betatakin, USNM-P Vol. 77, art. 5.

Kasha, M.  
1948  
Chemical Notes on the Coloring Matter of Chihuahua Textiles of Pre-Columbian Mexico, appendix in O'Neale, 1948.
Kelemen, P.

Kent, K. P.

Kidder, A. V.
1932 *The Artifacts of Pecos, Papers of the Phillips Academy Southwestern Expedition* No. 6, Yale University Press, New Haven.

Kidder, A. V. and S. J. Guernsey
1919 *Archaeological Explorations in Northeastern Arizona*, BAE-B 65.

Kidder, A. V. and A. O. Shepard

King, C. R.
1933 *Notes on Hidden House on file in the Anthropology Department, University of Arizona, Tucson."
1941 *The same, with amplified notes on the artifacts incorporated into the manuscript and edited by E. B. Danson.*

King, D. S.

Kluckhohn, C. and F. Reiter, eds.

Kroeber, A. L.
1922 *Elements of Culture in Native California, UC-PAAE Vol. 13, No. 8.*

Loud, L. L. and K. R. Harrington
1929 *Lovelock Cave, UC-PAAE Vol. 25, No. 1.*

Lumholtz, C.
1902 *Unknown Mexico*, two volumes, New York.
Martin, G. C.

Martin, P. S., and E. S. Willis
1940 Anasazi Painted Pottery in the Field Museum of Natural History, FMNH-AM 5.

Mason, O. T.

McGregor, J. C.

Mearns, E. A.

Mera, H. P.
1943 Pueblo Indian Embroidery, Laboratory of Anthropology, Memoirs, Vol. 4, Santa Fe.

Mindeleff, C.

Mindeleff, V.
1891 A Study of Pueblo Architecture: Tusayan and Cibola, BAE-AR 8, pp. 3-228.
Montgomery, H.

Morris, E. H.
1919a Preliminary Account of the Antiquities of the Region Between the Mancos and La Plata Rivers in Southwestern Colorado, BAE-AR 33, pp. 155-206.

1919b The Aztec Ruin, AMNH-AP Vol. 26, pt. 1.

1924 Burials in the Aztec Ruin, AMNH-AP Vol. 26, pt. 3.


1928b Notes on Excavations in the Aztec Ruin, AMNH-AP Vol. 26, pt. 5.

1939 Archaeological Studies in the La Plata District, Southwestern Colorado and Northwestern New Mexico, CIW-P 519.

1941 Prayer Sticks in Walls of Mummy Cave Tower, Canyon del Muerto, AAnt Vol. 6, pp. 227-230.

1948 Tomb of the Weaver, AMNH-NH Vol. 57, pp. 66-71, 91, February.

Morris, E. H., and R. F. Burgh
1941 Anasazi Basketry, Basket Maker II Through Pueblo III: A Study Based on Specimens from the San Juan River Country, CIW-P 533.

Morss, N.
1925 Archaeological Explorations on the Middle Chinlee, 1925, AA-M 34.

1931 The Ancient Culture of the Fremont River in Utah, PM-P Vol. 12, No. 3.

Nesbitt, P. H.
1931 The Ancient Mimbrenos, New Mexico, Logan Museum Bulletin 4, Beloit.

Nordenskiöld, G. E. A.
1893 The Cliff Dwellers of the Mesa Verde, Southwestern Colorado; their Pottery and Implements, trans. by D. Lloyd Morgan, P. A. Norstedt & Soner, Stockholm.
Nusbaum, J. L.
1922 A Basket-Maker Cave in Kane County, Utah; With Notes on the Artifacts by A. V. Kidder and S. J. Guernsey, Indian Notes and Monographs No. 29, Museum of the American Indian, Heye Foundation, New York.

O’Neale, L. M.
1948 Textiles of Pre-Columbian Chihuahua, Contributions to American Anthropology and History, No. 45, CIW-P 574.

Parsons, E. C.
1918 War God Shrines of Laguna and Zuñi, AA Vol. 20, No. 4, pp. 381-405.
1925 The Pueblo of Jemez, Phillips Academy, Department of Archaeology, Yale University Press, New Haven.
1932 Isleta, New Mexico, BAE-AR 47.
1933 Hopi and Zuni Ceremonialism, AA-M 39.
1939 Pueblo Indian Religion, two volumes, Chicago.

Pepper, G. H.
1909 The Exploration of a Burial Room in Pueblo Bonito, New Mexico, Putnam Anniversary Volume, pp. 196-252, New York.
1920 Pueblo Bonito, AMNH-AP Vol. 27.

Pope, S. P.
1923 A Study of Bows and Arrows, UC-PAAE Vol. 13, No. 9.

Ray, V. F.
1942 Culture Element Distributions: XXII, Plateau, UC-PAR Vol. 8, No. 2.

Reed, E. K.
1950 Eastern-Central Arizona Archaeology in Relation to the Western Pueblos, SJA Vol. 6, No. 2, pp. 120-138.
Reiter, P.
1938 The Jemez Pueblo of Unshagi, New Mexico, with Notes on the Earlier Excavations at "Amoxium-qua" and Giusewa, Parts 1 and 2, SAR-M 5 and 6.

1940 Preliminary Report on the Jemez Excavation at Nanishagi, New Mexico, UNM-BAS Vol. 3, No. 3.

Roberts, F. H. H., Jr.
1930 Early Pueblo Ruins in the Piedra District, Southwestern Colorado, BAE-B 96.

Russell, F.

Sayles, E. B.

Schroeder, A. H.

Shutler, D., Jr.

Smith, H. Jay, Exploring Company
1893 The Cliff Dwellers, World's Columbian Exposition, Chicago.

Smith, V. J.
1940 Cordage of the Caves in the Greater Big Bend, TAPS-B Vol. 12, pp. 175-194.
1941 Some Unusual Basketry and Bags from the Big Bend Caves, TAPS-B Vol. 13, pp. 133-151.

Smith, W.
Uber die Bahos der Hopi, Archiv für Anthropologie, N.F., Bd. 4, H. 1, pp. 48-74, Braunschweig.

Spicer, E. H., and L. R. Caywood
1936 Two Pueblo Ruins in West Central Arizona, UA-SSB 10.

Spier, L.
1928 Havasupai Ethnography, AMNH-AP Vol. 29, pt. 3.

Spinden, H. J.

Stephen, A. M.

Stevenson, J.
1883a Illustrated Catalogue of the Collections Obtained from the Indians of New Mexico and Arizona in 1879, BAE-AR 2, pp. 307-422.
1883b Illustrated Catalogue of the Collections Obtained from the Indians of New Mexico in 1880, BAE-AR 2, pp. 423-465.

Stevenson, M. C.

Stewart, J. H.
1941a Archaeological Reconnaissance of Southern Utah, BAE-B 128-AP 18, pp. 277-356.
1943 Culture Element Distributions: XXIII, Northern and Gosiute Shoshoni, UC-PAR Vol. 8, No. 3.

Stewart, O. C.
1941 Culture Element Distributions: XIV, Northern Paiute, UC-PAR Vol. 4, No. 3.
1942 Culture Element Distributions: XVIII, Ute-Southern Paiute, UC-PAR Vol. 6, No. 4.
Tanner, C. L.  

Tichy, M. F.  
1947 A Ceremonial Deposit from the Pajarito Plateau,  

Tourney, J. W.  
1892 Cliff and Cave-Dwellers of Central Arizona,  

Tschopik, H., Jr.  
1939 Artifacts of Perishable Materials, in Kluckhohn  
and Keiter, 1939, pp. 94-130.

Tuthill, C.  
1947 The Tres Alamos Site on the San Pedro River,  
Southeastern Arizona, AF-P 4.

Underhill, R. M.  
1948 Pueblo Crafts, Indian Handcrafts 7, Education  
Division, United States Indian Service, Haskell  
Institute, Lawrence.

Vickrey, I.  
1939 Besh-Ba-Gowah, The Kiva, Vol. 4, No. 5, Arizona  
Archaeological and Historical Society, Tucson.

Voth, H. R.  
1912 Brief Miscellaneous Hopi Papers, I: Notes on  
Modern Burial Customs, FMNH-AS Vol. 11, No. 2.

Weltefish, G.  
1932 Preliminary Classification of Prehistoric South-  
western Basketry, SI-MC Vol. 87, No. 7.

1944 Review of Morris and Burgh, 1941, AA Vol. 46,  
No. 3, pp. 387-391.

Wendorf, F.  
1948 Early Archaeological Sites in the Petrified Forest  
National Monument, MNA-P Vol. 21, No. 2.

Wheeler, S. K.  
1942 Archaeology of Etna Cave, Lincoln County, Nevada,  
Nevada State Park Commission, Carson City.
Whitaker, T. W.

White, L. A.

Wilson, L. L. W.

Wood, S.
1891 Wonderful Discoveries of Great Scientific Value, Great Divide, February, in Green, ca. 1891, pp. 31-35.

Wormington, H. M.

Zingg, R. M.
1940 Report on Archaeology of Southern Chihuahua, University of Denver, Contributions No. 3, Center of Latin American Studies, No. 1, Denver.