

A Reappraisal of the Fremont Culture

with

A Summary of The Archaeology of The Northern Periphery

by

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Supplementary Reports

Turner-Look Site Maize by Norton H. Nickerson
Human Skeletal Remains From The Turner-Look Site by Erik K. Reed
Pottery From The Collbran, Colorado, Area by Albert H. Schroeder
Archaeology of Southern Blue Mountain and Douglas Creek, North-
western Colorado by Gilbert R. Wenger

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To Al Look
With Sincere Thanks For Invaluable Assistance
In
Archaeological Investigations in Western Colorado and Eastern Utah
and

In Memory Of
Laura and Albert Turner
and
Ole Johnson

P R E F A C E

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Denver, Colorado,

H. M. WORMINGTON.

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Area shown on map in Figure 1.

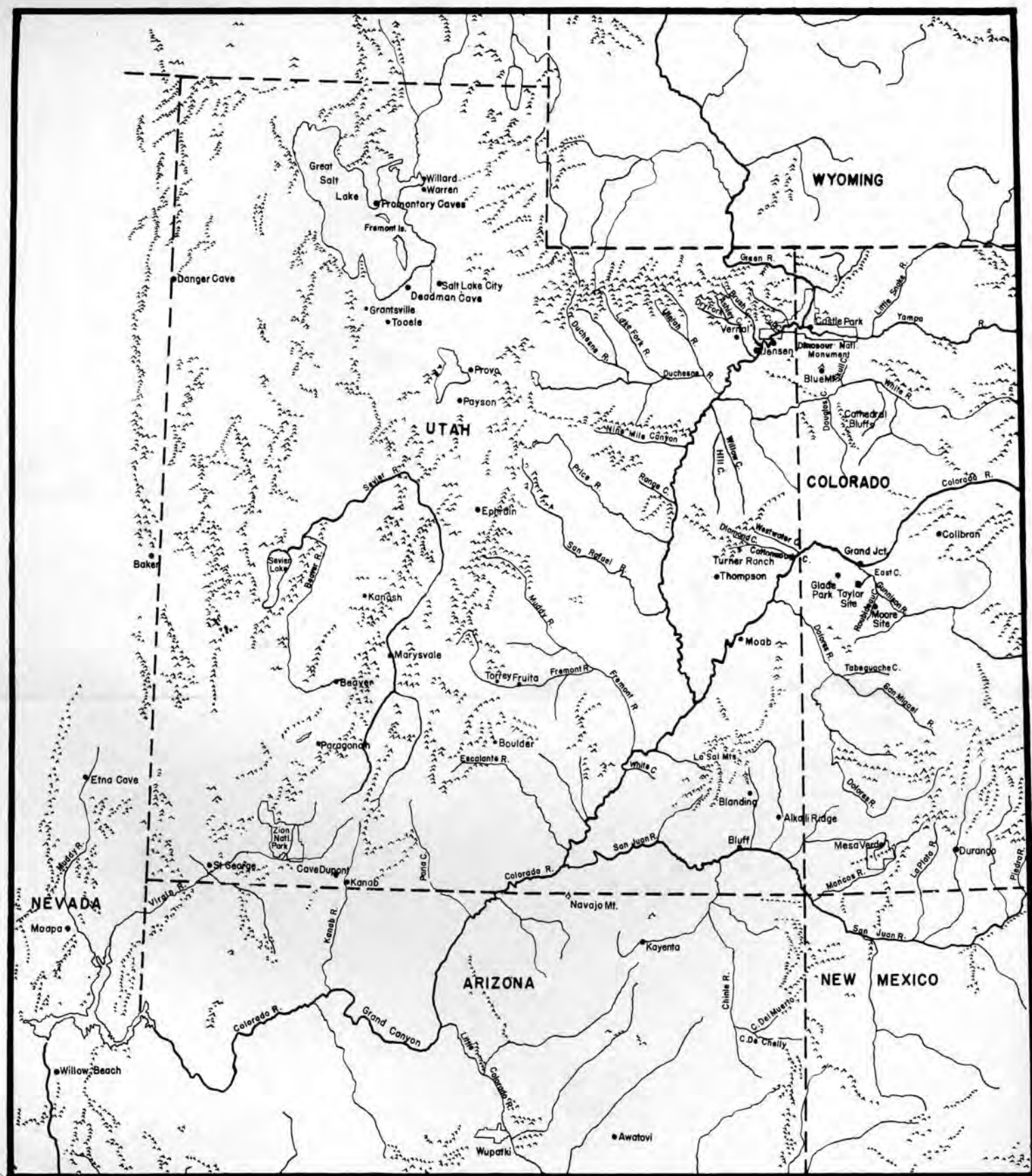


FIGURE 1—The Northern Periphery and adjoining areas.

A REAPPRAISAL OF THE FREMONT CULTURE

INTRODUCTION

In the Fremont Drainage of east-central Utah, during 1928 and 1929, Noel Morss found sites, occupied during Pueblo II times, which differed in certain respects from sites found elsewhere in the Southwest. He attributed these sites to a culture which he called the Fremont. Later work by Charles Scoggin, Robert Burgh, Robert Lister, and Herbert Dick, showed that an earlier phase of this culture was represented in sites in Castle Park in the Yampa Drainage of north-western Colorado. The name "Fremont Basketmakers" was applied to the inhabitants of the Castle Park sites. A site near Cisco, Utah, at the margin of the Book Cliffs, which was excavated by the writer, appears to represent a later manifestation of the Fremont Basketmakers of the Yampa Drainage. The importance of this site, which is known as the Turner-Look Site, and other nearby sites is such that special consideration seems warranted. Site reports are presented in Part I.

If these sites, those in the Yampa Drainage, and those in the Fremont Drainage, are related as they seem to be, it would be expected that essentially the same complex of traits might be found in intervening and adjacent areas. A search of the literature and a consideration of some unpublished reports indicates that such is the case, and enough new evidence is now available that it seems justified to re-appraise the Fremont Culture. However, if it is to be evaluated properly it cannot be studied out of context and it is necessary to know something of the archaeology of adjoining areas as well as of that occupied by the Fremont people.

The literature pertaining to the Basketmaker-Pueblo people who occupied the area to the south is well-known and has been summarized within recent years, so there is no need to present a summary of the archaeology of that section. "The Distinctive Features of the San Juan Anasazi Culture" (Reed, 1946) provides an excellent brief summary. In the following pages the term "Anasazi" is used, as suggested by Reed, to refer to the distinctive culture of the San Juan area which is found in pure or characteristic form only north of the Little Colorado River. A less technical summary and a more extensive bibliography will be found in "Prehistoric Indians of the Southwest" (Wormington, 1951).

The situation as regards the region which lies immediately to the north of the Pueblo Province, and which is commonly designated the Northern Periphery, is entirely different. Only the specialist working in this area is likely to have any extensive first hand familiarity with the widely scattered literature, and much of the information, which has become available since the last general summary was published more

than twenty years ago, invalidates many of the hypotheses which seemed reasonable at that time. Accordingly, it seems desirable to present a brief summary of the archaeology of the Northern Periphery. Three excavated sites on the Uncompahgre Plateau in western Colorado are treated in somewhat greater detail than are many others because site reports have not yet been published. A report on the "Uncompahgre Complex", which is represented in these sites will be Number 2 in this series. The archaeology of the Northern Periphery is summarized in Part II. Part III is devoted to an evaluation of the Fremont Culture.

PART I

INVESTIGATIONS AT THE TURNER RANCH IN EAST CENTRAL UTAH

INTRODUCTION

In the spring of 1939 Mr. Al Look of Grand Junction, Colorado, heard reports of prehistoric sites on the Albert J. Turner ranch near Cisco, Utah. A conversation with Mr. Turner disclosed that he and his wife had found five sites. Mr. Look, an enthusiastic and able amateur archaeologist, obtained permission to examine the three which were most readily accessible and to report them to the Denver Museum of Natural History for scientific investigation. The information, photographs, and artifacts sent to the Museum by Mr. Look indicated finds of unusual interest. This was confirmed through personal investigation by the writer.

Permission to excavate was generously granted by Mr. Turner and work was begun on August 1, 1939 and continued until August 22nd. All five sites were investigated but only one, a village site, warranted intensive excavation. During 1940 excavations were in progress there from July 6th to August 10th, and in 1941 from July 13th to August 5th. It was impossible to continue excavating during the war years but work was resumed in 1947. Mr. Turner had died during the intervening period and the ranch had been sold to Mrs. Eva Fitzpatrick who very kindly permitted the Museum to continue excavating. The 1947 expedition worked from August 4th to August 19th, and that of 1948 from July 19th to August 1st.

Although a program of excavation was carried on for a total of five seasons, inadequate funds limited the length of time which could be spent in the field during any given year and less than 100 actual working days are represented. In addition to the writer, who was in charge of the field work, the regular crew consisted of 6 people in 1939, 8 in 1940, 7 in 1941, 8 in 1947 and 5 in 1948. During the 1940 field season a 3 man crew, under the direction of Elmer Smith of the University of Utah, dug for 3 days at Site No. 2. During 1947, 2 members of the Carnegie Museum field party, directed by David W. Rial, participated in the work at the main site for a few days, and during the 1948 season Mr. Rial joined the Denver Museum party.

PHYSIOGRAPHY

The Turner (Fitzpatrick) ranch house lies 15 miles northwest of Cisco, Utah, in a direct line, or more than 20 miles by road. The ranch, which is a very large one covering over 300,000 acres, lies partially in the great shale "valley", commonly called the Grand Valley, and partially in the Book Cliffs. The former is a lowland which parallels the cliffs, but it is scarcely a river valley in the usual sense, since there

are various examples of superimposed drainage and several streams flow directly across it. At one time, probably during the Pleistocene, it was covered by a gravel apron that sloped away from the cliffs. Later periods of erosion have removed much of this material leaving three levels of remnants which appear as gravel capped benches or ridges. These are sometimes crescent-shaped.

The Book Cliffs consist of an "S" shaped escarpment, deeply cut by small streams, which forms the southern margin of the Tavaputs Plateau which slopes gently northward toward the axis of the Uintah Basin. They extend from Grand Junction, Colorado to Castle Gate, Utah, a distance of some 180 miles. In the eastern portion, the Roan Cliffs rise some distance to the north of the Book Cliffs but northwest of Cisco, Utah the two come together to form what is essentially a single escarpment. The cliffs vary in height from 2000 to 6000 feet. The lower portion of the Book Cliffs consists of steep, bluish-gray shale slopes of the Mancos formation. Above this lie massive sandstones of the Mesa Verde group.

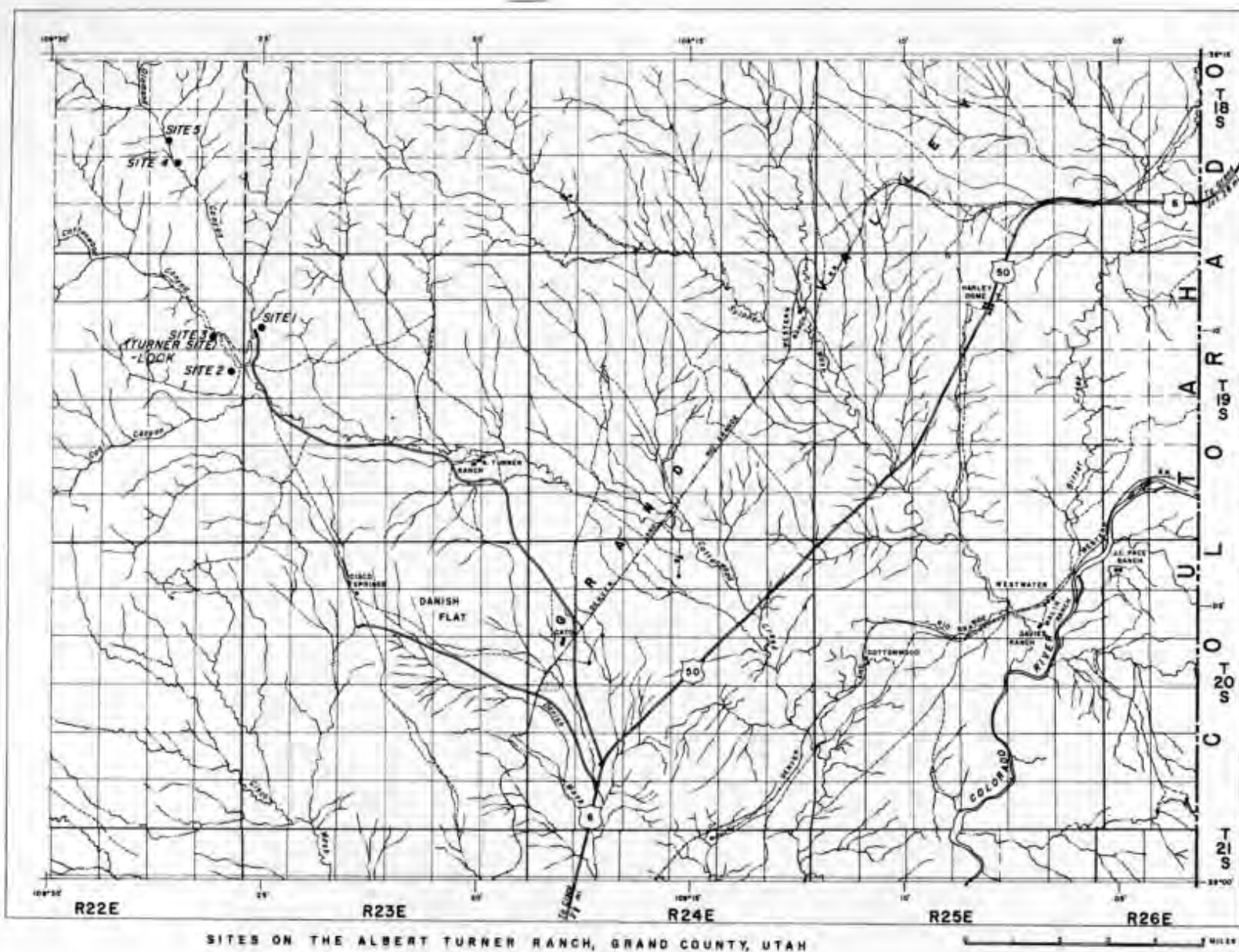
Cottonwood Creek, which heads in the cliffs, flows through the ranch. It continues to the southeast through the Grand Valley until it empties into the Colorado River near the Utah-Colorado line. A short distance from the ranch house it is joined by Diamond Creek. These streams have now cut deep into heavy silt deposits which underlie the gravel benches along the cliffs. Cottonwood Creek has cut into the silt for some 20 to 30 feet. The period of erosion which has resulted in the cutting of steep-sided arroyos is probably relatively recent and may be correlated with intensive grazing, first by cattle and later by sheep. Frequent flash floods, which turn these streams into raging torrents, would make flood water farming impractical now, even in the very limited sections where the creek bottoms are sufficiently wide to provide space for corn fields, but it is reasonable to assume that conditions were different before the introduction of great herds and flocks of hoofed animals.

CLIMATE AND NATURAL HISTORY

The area is arid to semi-arid. Climatic data for Cisco, which in general would be valid for the Turner Ranch, are as follows:

Average Annual Precip. Inches	Temperature (°F)					Average Annual Snowfall Inches	Killing Frosts	
	Mean Ann.	Mean Ann. Max.	Mean Ann. Min.	High	Low		First	Last
6.50	51.9	67.7	36.0	109	-26	17.3	Sept. 21	June 8

In this lowland area, vegetation in unirrigated areas is of Sonoran type. There is much sagebrush, greasewood, and cactus. Some scrubby junipers and pinyons grow on the ridges. Along the washes cottonwoods are found. Higher in the cliffs there is more rainfall and vegetation of the Transition Zone, which includes pine and oak, is encountered.



SITES ON THE ALBERT TURNER RANCH, GRAND COUNTY, UTAH

FIGURE 2.

In the more arid section rodents such as rabbits, prairie dogs, ground squirrels, and rats, are the animals most in evidence. Higher in the cliffs much game is to be found. Deer and bear are extremely common. Recently, mountain lions have become so numerous as to present a serious problem to the sheep ranchers. There are also many coyotes. At the present time deer often come down to graze in the alfalfa fields, but before irrigation was introduced they doubtless stayed more in the higher country.

SITES

The first 3 sites lie within a radius of 1 mile of the junction of Cottonwood and Diamond Creeks (Fig. 2).



FIGURE 3—Dry Laid Masonry Structure, Site I.

Site I

This site consists of a large circular structure of dry laid masonry atop a retreating sandstone escarpment just north of the ranch house. It overlooks the junction of Cottonwood and Diamond Creeks which come together at a point approximately half a mile south and a little west. The escarpment on which the structure stands is about 350 feet high and falls back in 4 levels, the building on top appearing from below as a fifth level. The circle is $24\frac{1}{2}$ feet in diameter and has an average height of about 5 feet. The scarcity of fallen rocks makes it appear unlikely that it was ever much higher. The wall varies in

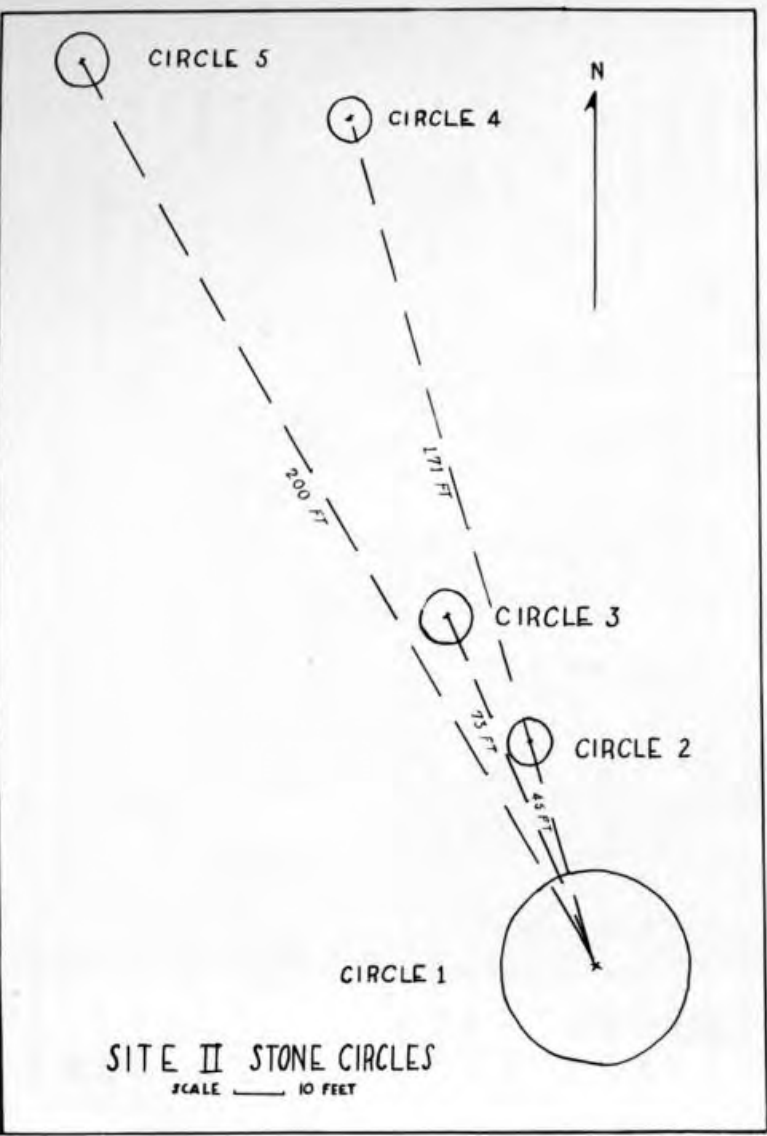


FIGURE 4—Right, Circle 3 before and after excavation.

width from a little over 1 foot to almost 2½ feet. It is constructed of tabular sandstone slabs laid one upon the other in rough courses. On the western side is a linteled doorway a little over 3 feet high and almost 3 feet wide (Fig. 3).

Although the term "fort" has been commonly applied to such structures, it is almost certainly a misnomer in this case. This site, although it could be defended easily from attacks from below, and while it overlooks the junction of two creeks which might give it some strategic importance, would be vulnerable to attack from higher ground on either side and in the rear. Furthermore, it could not be held for any length of time without facing a serious water shortage. It might advantageously have served as a look-out station since it so closely resembles an additional level of the escarpment that it is almost indistinguishable from below, but for such purposes the construction of so large and elaborate a structure seems unnecessary.

There was a complete absence of artifacts which might have provided clues as to the use or age of the structure. Testholes were dug where the deposit was thickest but it proved to be sterile, consisting only of shale blow and disintegrated sandstone. Bedrock was encountered at a depth of a little over 1 foot.

Site II

The second site lies 1 mile south and a little east of the first, on a low gravel bench which represents the lowest of the 3 levels of fan remnants in the Grand Valley. Here were found 5 stone circles lying in the order shown in Figure 4. The largest (No. 1) is 38 feet in diameter, the smallest (No. 2) 8. Numbers 3 and 5 are 10 feet wide and the diameter of Number 4 is 9 feet. The walls have largely collapsed but, on the basis of the fallen rocks which are left, it may be assumed that, unless building stones were removed for other construction, they were approximately a foot high. The type of construction was the same as at the first site. No mortar was used.

Circle 3 was cleared and several testholes were put down by a University of Utah field crew under the direction of Elmer Smith. The deposit covering the gravel was shallow and sterile. Not a single artifact was found. Within the circle were found flat stones placed in such a way as to suggest that the area had been paved.

Site III

The Turner-Look Site

Site III has been informally called the Turner Site and this name has been used in a few preliminary reports, but the possible danger of confusion with the more famous Turner Site of the Hopewell Culture in Ohio has suggested the need for another name. It is now called the Turner-Look Site. This name should eliminate all possibility of confusion and has the added advantage of providing some recognition of Mr. Look's contributions in bringing the site to the attention of archaeologists and assisting in the field.

The Turner-Look Site lies about 200 yards west of Cottonwood Creek near the point where the stream leaves the cliffs. It is a village

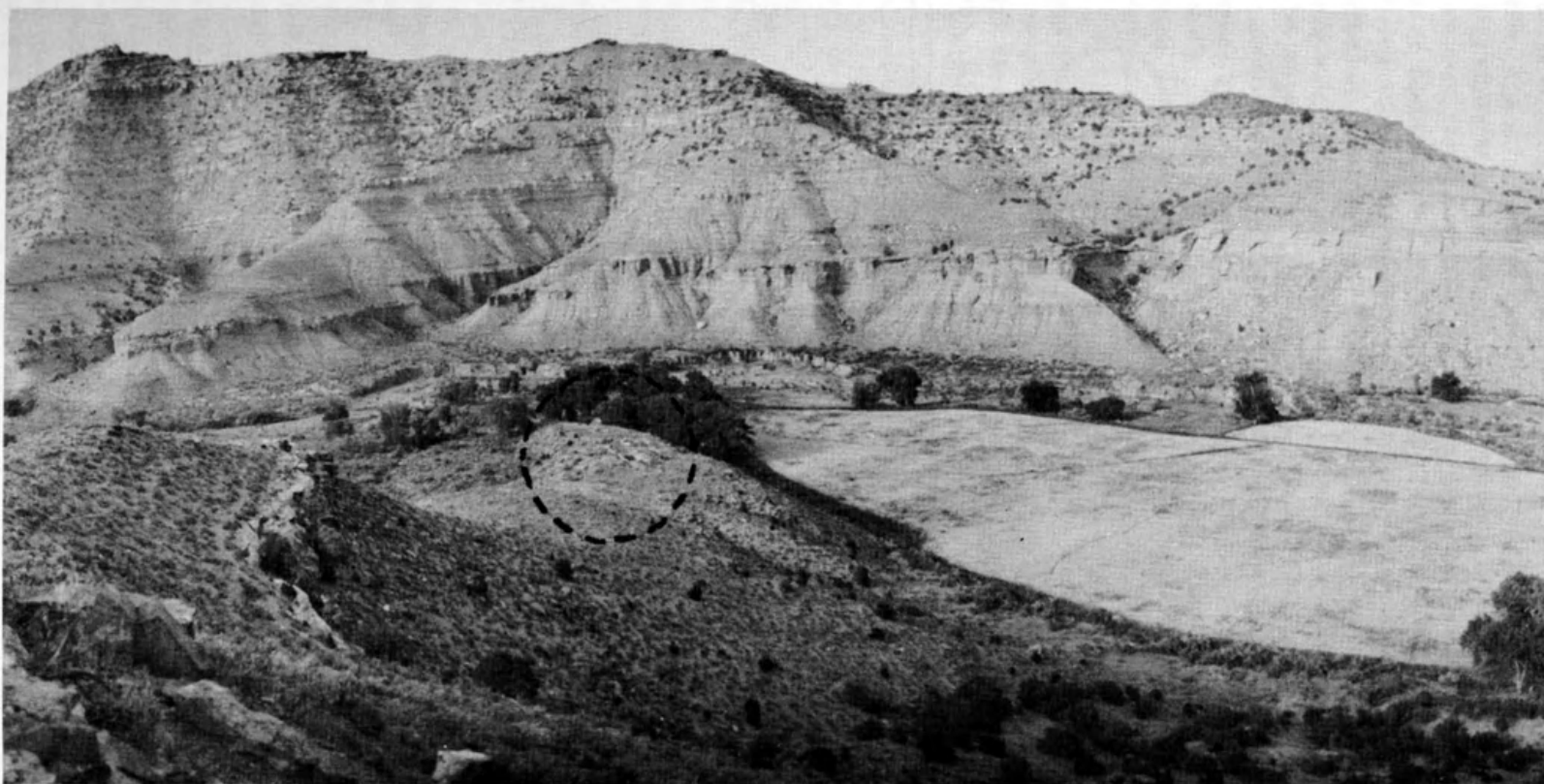


FIGURE 5—The Turner-Look Site, Site III.

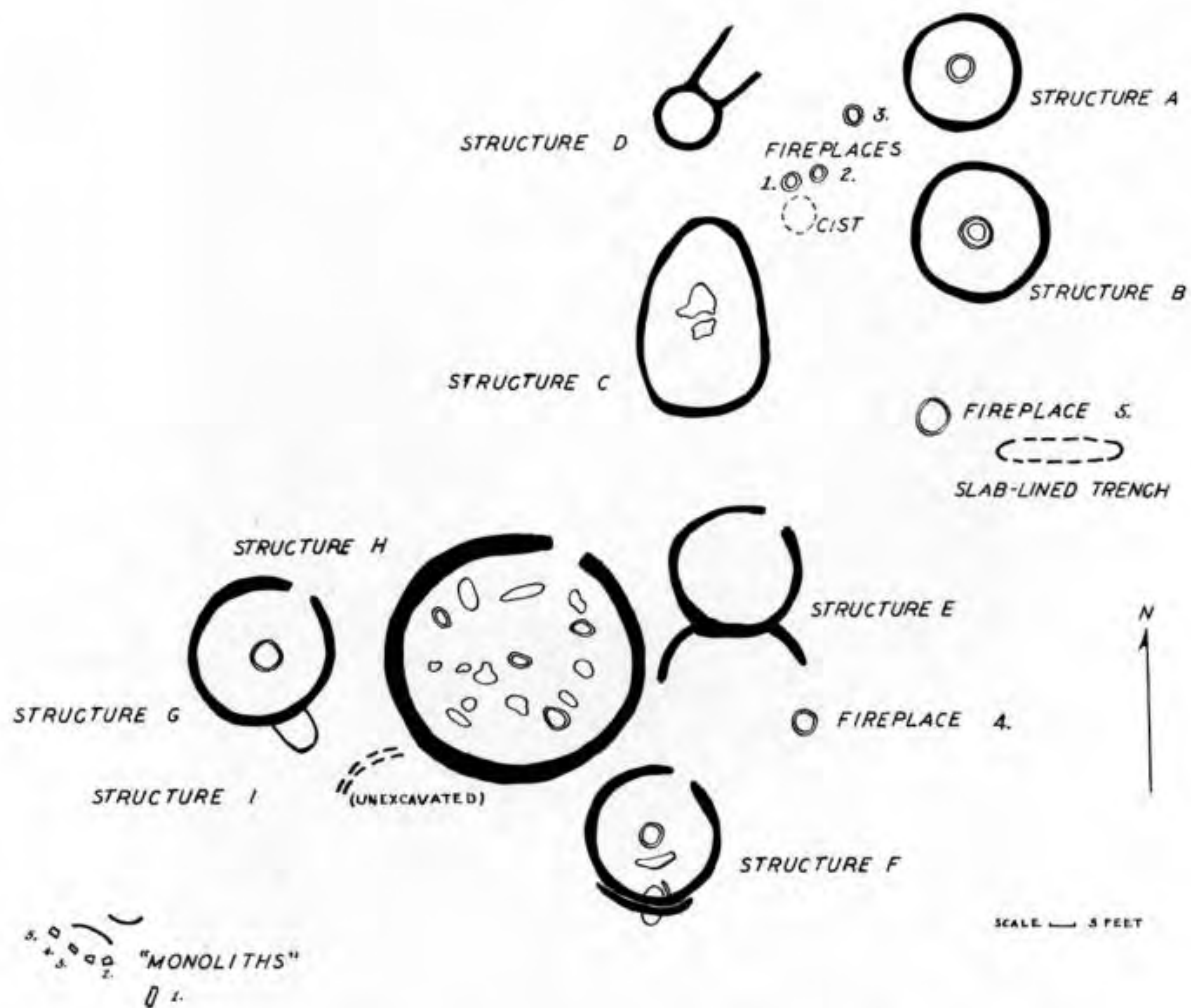


FIGURE 6—Plan of the Turner-Look Site (Site III).

built on a sloping crescent-shaped gravel bench which projects from the cliffs (Fig. 5). This ridge, which is some 90 feet high at its highest point, represents the second or intermediate level of fan remnants. It consists of sandy material containing sandstone pebbles and some boulders. Cementation has taken place, forming a very firmly compacted deposit. Chemical tests, made by Harvey C. Markman, Curator of Geology at the Denver Museum of Natural History, show that this compaction is due to the presence of lime and of iron oxide.

The nature of the deposit is important from the point of view of the archaeologist. Its extreme hardness makes it very difficult to penetrate even with metal shovels and, for people equipped only with stone tools, the digging of any sort of hole must have presented great problems. The building of cists appears to have been impractical and the inhumation of the dead in the village area must have been extremely difficult until refuse had accumulated to a considerable depth. The scarcity of post holes may also have been linked with the difficulties of penetrating this deposit.

General Description:

The village consists of 9 buildings, 8 of which have been cleared (Fig. 6). The units excavated were surface structures, circular or ovoid in outline. One consists of 2 circular rooms with a common wall. In outline it appears as a figure 8. Walls are of crude coursed masonry of tabular sandstone with a heavy mud mortar. The building stones were only slightly shaped. Structures A, C, D, E, and F contain yellow mortar. Red mortar was used in the construction of Structures B, G, and I. In one house, Structure G, a section of wall consisted of alternate courses of stone and brick-like forms of adobe. Abutting against the exterior of the south wall was a bin made of adobe loaves with one convex and one concave surface. Similar forms were used in the construction of a horseshoe-like projection from Structure D. Others were found on the floor of Structure F. In two instances, (Structures F and G) walls remained standing to a sufficient height that it was possible to determine that there had been a marked curvature resulting in a vaulted appearance. A plumb-bob dropped from the top of the walls fell some distance in from the base. Walls in other structures may have been similarly vaulted but they were not preserved to a sufficient height to make determination certain.

Doorways were lacking in 4 of the units and at least 3 of them must have been entered through the roof. These were clustered at the northeast end of the site around a plaza or courtyard in the center of which was a slab-lined cist. Four burials were found in the vicinity of the cist and there were also 3 fireplaces nearby. To the south of this group of buildings lay another firepit, much larger than those in the cist area, and a long slab-lined trench.

In the second group, 4 buildings had wall entrances all facing in exactly the same direction, slightly east of north. In two instances lintel stones were still in position. There is no way of determining how the unexcavated structure, which is part of the same cluster, was entered, but its proximity to a large structure to the north (Structure

H) suggests that there would scarcely have been sufficient space between the buildings for entry into an opening in the wall if it were in the same position as those in the other structures. The smaller units, thought to be houses, are grouped about Structure H, a large building which is not believed to have been a dwelling. Fifteen firepits occur on the same floor level and the space between them is sufficiently limited that it appears unlikely that it served a domiciliary function. One outdoor firepit was found near Structure E.

To the southwest of this cluster of buildings is one of the most interesting features of the site—4 large upright sandstone blocks imbedded in the earth. A fifth was lying on its side when first seen by the writer, but Mr. Look reported that it was standing when he first visited the site.

Method of Excavation:

When the site was first examined by the writer some preliminary digging had, unfortunately, been done by Mr. and Mrs. Turner. A hole 5 feet in diameter and 1½ feet deep had been dug to the north and west of the cist. Two small holes had been dug in the vicinity of 4 upright stone blocks which stand to the southwest of the village. Another had been dug around the lintel stone of Structure G which appeared on the surface. Digging in a fourth hole had destroyed part of the wall in the south room of Structure E. Fallen building stones were present over the entire area, but there were no indications of walls except in the hole dug by the Turners where a small portion which was cleared had escaped destruction.

For the most part, it was impossible to determine where buildings lay except by trenching until a wall was encountered. In only two cases was it possible even to guess at the outlines of structures before they were excavated. This situation appears to have been due to the practice of the inhabitants of disposing of trash around their houses until the spaces between structures were filled to a considerable height. In some cases the houses, although originally built on the surface, must have taken on essentially a subterranean character as the refuse material built up around the walls. Because of this there were no sterile areas, and cultural remains were found in all sections around the buildings as well as within them, for refuse piled against the walls had fallen into the structures as the walls collapsed.

When excavations were begun by the Denver Museum of Natural History party a datum point was arbitrarily established, a base line run north and south, a guide line run east and west and a grid of yard squares established which enclosed the entire site. Letters were assigned to lines running east and west and numbers to those running north and south, thus giving a double index symbol for each square.

The first step was to clear away the material in the holes left by the previous excavators and to straighten the walls of the excavations so that the position of artifacts and features in each square could be established. In many areas no clear-cut stratification with easily differentiated layers could be established, so excavation was on the basis of 8 inch levels. Where natural strata could be distinguished, these

were followed. Vertical profile drawings were made whenever a change was noted.

All material was screened through quarter inch mesh. Shovels were employed for much of the trenching, but in particularly productive or important sections, when fragile material was being removed, or when a floor was encountered, hand troweling and brushing were the rule. Sacks were labelled with the index symbol of the square yard and the level, and artifacts found in each designated section were placed therein.

Once a wall was reached in the course of trenching, excavation was begun within the structure. At least one test pit was dug through each floor. In the case of floors where there was some evidence of disturbance more than one pit was put down. All structures were completely cleared with the exception of Structure I. The exterior of a small section of wall was cleared and then re-covered since it was felt that one building should be left unexcavated in case there should be some need for later checking when new techniques may have been developed.

Buildings:

Every structure exhibits certain distinctive features, so each must be described individually. The first to be considered will be those without doorways, which are grouped about the open space containing the cist and the burials (Fig. 7).

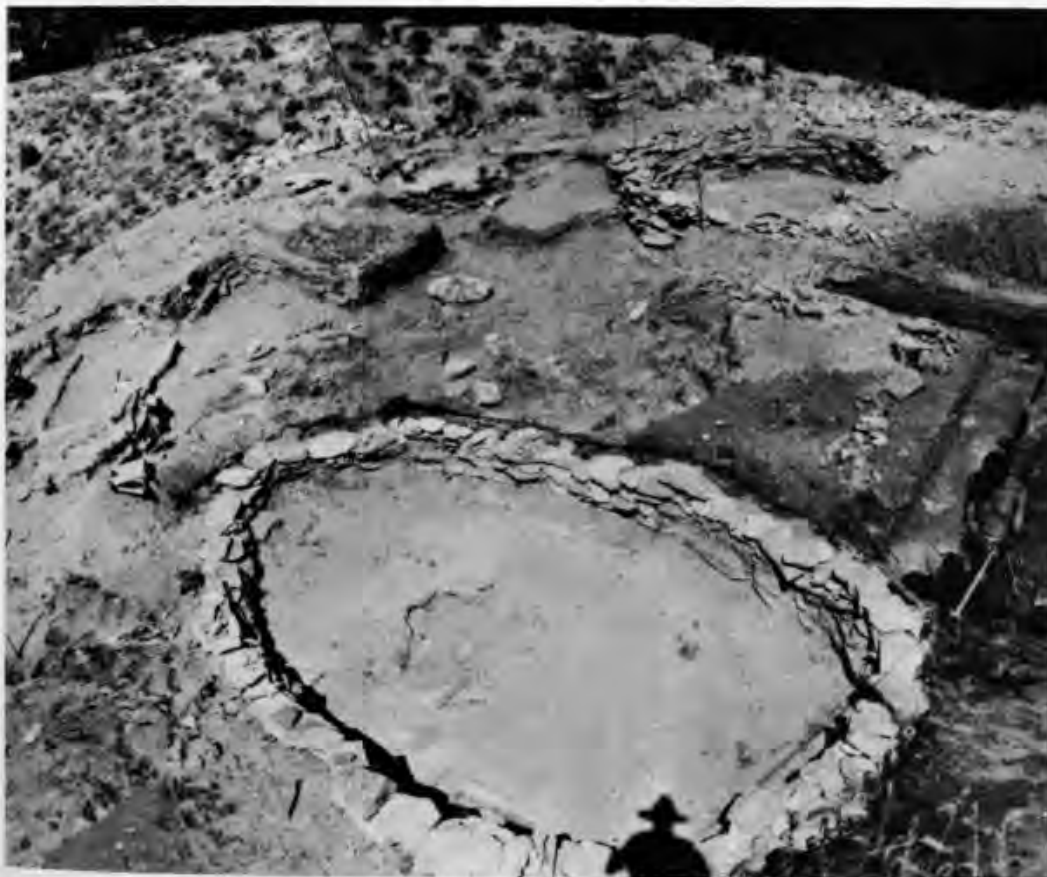


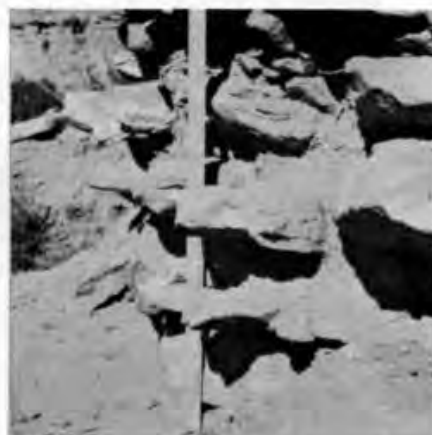
FIGURE 7—Cluster I. This is a montage and the slope is less than indicated.



a.



b.



c.

FIGURE 8—a. Structure B. b. Fireplace and Post, Structure B.
c. Exterior, Structure A.

Cluster I

STRUCTURE A.

This building lay at the northeastern corner of the cluster. It was a one room circular house 13 feet in diameter. The maximum wall height was 3 feet 6 inches and the minimum was 2 feet 2 inches. There was some slight evidence of vaulting. An interesting feature of the wall construction was the relative smoothness of the interior surface and the roughness of the exterior from which pointed ends of building rocks projected for some distance (Fig. 8-C). This can only be described as a surface structure, although, due to the slope of the ridge at this point, the builders apparently found it necessary to dig 6 inches into the ground on the south side in order to produce a level floor.

Two floors were encountered. One lay 6 inches below the other and was separated from it by a thin layer of ash covered by 3 inches of material consisting largely of unburned disintegrated wood. In the upper floor was a fireplace, a little to the west of the center of the structure. The pit was 27 inches in diameter and 4 inches deep. The adobe rim surrounding it was $1\frac{1}{2}$ inches high.

To the north of the fireplace was a partially rock-lined ovate pit 38 inches long, 30 inches wide, and 14 inches deep, filled with sand and charcoal. It had been dug through both floors and continued into the underlying gravels. Resting on the fill in the pit was a human mandible. It was not burned. To the east of the fireplace lay the shaft of a robust human femur with a heavily marked *linea aspera*. The condyles had been broken off, leaving sharp, jagged edges. The bone was hard and well preserved. A fragment of the left portion of an upper jaw containing 2 pre-molars was found in the trash outside the building at a depth of 30 inches.

To the south of the fireplace lay a triangular stone, pointing 10 degrees east of north. It was imbedded in the upper floor and extended down to the ash level which overlay the lower floor. The length was 25 inches, the height $5\frac{1}{2}$ inches and breadth at the base 9 inches. Below the tip, in a hole extending through the lower floor, was a piece of post so completely disintegrated that it crumbled into powder at the slightest touch. The post hole was 9 inches in diameter and 8 inches deep.

STRUCTURE B.

The second structure lay 4 feet to the south of the first (Fig. 8-a). The two were quite similar in appearance although Structure B was somewhat larger with an inside diameter of 15 feet. The maximum wall height was 3 feet 5 inches and the minimum was 2 feet 6 inches. It varied from 1 foot to 1 foot 6 inches in width.

This was the only building which showed any evidence of burning. Probably only the roof was involved, for the walls and floor did not appear to have been exposed to heat and an unburned post was found imbedded in the floor (Fig. 8-b). It appears likely that the house had been unoccupied for some time and possibly served as a dumping place before the roof burned, for 23 inches of debris, composed of rocks, ash, and mud, and containing artifacts, underlay the level containing burned timbers and adobe. This level, which was encountered 15 inches below the surface, contained 2 rows of timbers each approximately 3 inches wide. Viewed horizontally, they were separated by some $3\frac{1}{2}$ inches of adobe, and vertically by about 4 inches. Above lay scraps of burned wood, so badly disintegrated that little information could be gained, but it seems possible that this may represent a third row of timbers placed at right angles to the other two.

Many large flat stones lay above the level containing the timbers. There was no definite pattern. There are two possibilities that may be considered. One is that they may have been placed over the roof by the builders. The other is that the walls of this structure were originally vaulted, as were those of some of the other houses which

were found standing to a greater height, and, after the roof collapsed, the building stones of the wall fell over it.

The floor consisted of a layer of hard packed adobe overlying a level of soft grey ash which varied in thickness from 1 to 2 inches. The latter rested on the terrace gravel. Floor features included a center firepit with a double rim of adobe. The outer rim was separated from the inner one by a depression 3 inches wide and 2 inches deep. The inner rim was approximately 3 inches wide and the outer 6 inches. The inside diameter of the firepit was 1 foot 8 inches. It was $4\frac{1}{2}$ inches deep. Seven fragments of human skull were found scattered through the bottom 8 inches of the fill. Five appear to have been those of an adult and 2 seem to be a part of a child's skull.

Against the outer rim, on the west side, a post was found projecting $18\frac{1}{2}$ inches above the floor and imbedded to a depth of 12 inches in the underlying deposits. It was 8 inches in diameter. Another post hole $4\frac{1}{2}$ inches in diameter and 6 inches deep, which contained some wood, lay a foot to the north of the firepit. Two feet to the south of the pit was another hole 14 inches in diameter and $10\frac{1}{2}$ inches deep. It seems unlikely that it could have been a posthole, not only because of its size, but also because it was filled with loose soil and ash which contained sherds and flakes. There was no evidence of burning.

Against the south wall the floor reached a thickness of 5 inches, although in the remainder of the house it averaged about 1 inch. Here was found a carefully shaped and smoothed depression 6 inches across at one end, 8 inches at the other, 15 inches long and ranging from 2 to 4 inches in depth. It seems probable that it once held a metate.

In the west wall 3 inches above the floor was a rounded adobe brick, 9 inches long and 2 inches thick, which projected beyond the building stones for a little more than an inch.

STRUCTURE C.

Structure C lay 18 feet to the west of B. It was the only ovoid structure in the village. The length was 23 feet and the width 14. The height of the wall ranged from 1 foot 2 inches to 2 feet 6 inches and the average width was 1 foot. Part of the east wall was built on a massive boulder more than 4 feet long. Presumably it was in that position and was considered too heavy to move when the house was built. The boulder projected some 2 feet into the room and the floor, which rested directly on the gravel, was built up around it.

There was no rimmed firepit, but a little to the north of the center of the room were 2 depressions in the floor which were filled with heavy black ash and charcoal. The larger one, which was irregularly shaped, was 4 feet long and 2 feet across at the widest point. The smaller, which lay just to the south of the first, was roughly kidney shaped and was 2 feet long. Both extended through the floor and into the underlying gravels to a depth of 5 inches. To the northeast of the larger depression was a circular hole, 5 inches in diameter which may once have contained a post.

STRUCTURE D.

Structure D, which lay 9 feet to the north of House C, was one

of the most interesting in the village and presented some of the most baffling problems. It consisted of three quarters of a circle of masonry with a low "U" shaped wall made of adobe bricks (or perhaps more accurately—loaves of mud) which projected from the unfilled portion of the stone circle which opened to the northeast (Fig. 9).



FIGURE 9—Structure D.

The "U" shaped annex was 5 feet 5 inches wide at the point where it joined the masonry wall; at the opposite end it reached a width of 6 feet 2 inches. The west wall was 8 feet 4 inches long, the east wall was 6 feet 6 inches long. It was made of adobe loaves which resembled those sometimes referred to as "turtlebacks". The upper surface was convex and the lower somewhat concave. These brick-like objects differed somewhat in size but all fell within a rather limited range. They varied from 1 foot 1 inch to 1 foot 10 inches in length, from $4\frac{1}{2}$ to 6 inches in height and 6 to 7 inches in breadth. They were somewhat wider in the center than at the ends.

The west wall consisted of a single course of the mud loaves while the east wall was 2 courses high. The south wall sloped from east to west. Except in the extreme southwest corner, it consisted of 2 courses and the slope was obtained by a slight reduction in the size of the bricks. In the section where it joined the west wall it was only one brick high. Although the outlines of the adobe masses were clearly discernible, it was apparent that a thin layer of mud had been put over them and carefully smoothed in order to give a more finished appearance. The ends of the projecting walls were smoothed and rounded. The floor area contained no depressions or postholes.

The problem arises as to the reason for the almost perfect preservation of this unfired adobe wall which might be expected to disintegrate or at least show some roughening due to rain action if exposed to the elements for any great length of time. An analysis of the stratigraphy provides some clues. Directly above the wall, but extending only a short distance on either side of it, lay some 9 inches of sterile mud. Above this lay ash and refuse material containing sherds and stone artifacts and flakes. It appears possible that the layer of mud was placed over the wall in an effort to protect it. Presumably this would indicate a plan to uncover it at a later date, but this was not done and the area came to serve as a dumping place for refuse.



FIGURE 10—Structure E.

Cluster II

The second group of buildings, in which those which have been excavated have doorways, may be considered next.

STRUCTURE E.

This building differed from the others in the site in that it was composed of two units which had a portion of a wall in common. It is unfortunate that much of the wall and floor of the south room were destroyed in the course of unsystematic digging by the owners of the ranch. It is impossible to determine how this room was entered.

There is no opening between it and the other room. A break in the northern portion of the east wall may represent a doorway, or this part of the wall may have been removed in the course of the earlier digging. Due to the destruction of much of the floor there is no way of knowing whether this unit had a central fireplace. An adobe rimmed fireplace lay to the southeast. Unless the wall which was destroyed straightened abruptly, this fireplace must have lain outside the structure. The curvature of the western portion of the wall, which was not as badly damaged as the eastern part, suggests that the room was probably roughly circular and that the fireplace lay outside. A fragment of a human skull, that of an adult, lay in the upper 8 inches of the fill, near the north wall.

The north room was circular and had an inside diameter of 13 feet (Fig. 10). The maximum wall height was 2 feet 9 inches and the minimum was 2 feet 3 inches. A doorway opened to the northeast. The lintel stone was not in position but the building stones were so placed as to provide a perfectly straight-sided opening 3 feet wide. On the exterior, building stones on either side of the aperture suggested some form of small vestibule.

The floor was of hard packed adobe. In two sections there was evidence that, as in the case of Structure A, the builders found it necessary to dig into the underlying deposit in order to produce a level surface. There was no definite fireplace, but a shallow depression south of the center contained heavy black ash and small fragments of charcoal. There were no post holes. It was impossible to determine whether both rooms were occupied at the same time.

STRUCTURE F.

Structure F lay south and a little west of Structure E. It was only roughly circular, for the eastern and southern portions of the wall were almost straight. It was 16 by 14 feet in diameter. This building had the highest standing wall of any in the site and most clearly showed the principle of vaulting employed in construction (Fig. 11). Where the wall reached its maximum height of 5 feet 9 inches on the northwest side a plumb-bob dropped from the top fell 14 inches in from the base of the wall. At the height of 5 feet 2 inches the weight fell 9 inches in from the base. There was no sharp break or sudden projection in the line of the wall but rather a smooth inward curve.

There were 2 floors separated from each other by 20 to 30 inches of debris containing building stones, adobe turtlebacks, and a few unburned timbers. The upper floor, which was overlain by masses of sterile adobe and building stones, was hard and well packed and some 3 inches thick, but exhibited no features such as a firepit or post hole. On the lower floor, however, were encountered some of the most interesting features of any structure in the village.

The entrance lay a little to the east of north as did the others. The lintel stone was cracked in two. Apparently the occupants became aware of the flaw in the stone before the break was complete for the entrance was roughly filled with unshaped stones, adobe turtle-

backs and unshaped masses of mud, and the lintel stone remained in position (Fig. (12-a). The entrance was 3 feet high and 2 feet 7 inches wide. One foot 10 inches of wall remained standing above the lintel stone.



FIGURE 11—Wall of Structure F.

The loss of the entrance possibly accounts for the presence of another unusual feature in the southeast portion of the wall which may represent a form of ventilator shaft which was added at a later date. This consists of 3 connecting depressions, one in the house, one under the wall, which had been made of double thickness at this point, and one outside the structure (Fig. 12-b and c, Fig. 13).



a.



b.



c.

FIGURE 12—Structure F. a. Entrance. b. Interior Basin, south wall.
c. Exterior Basin, south wall.

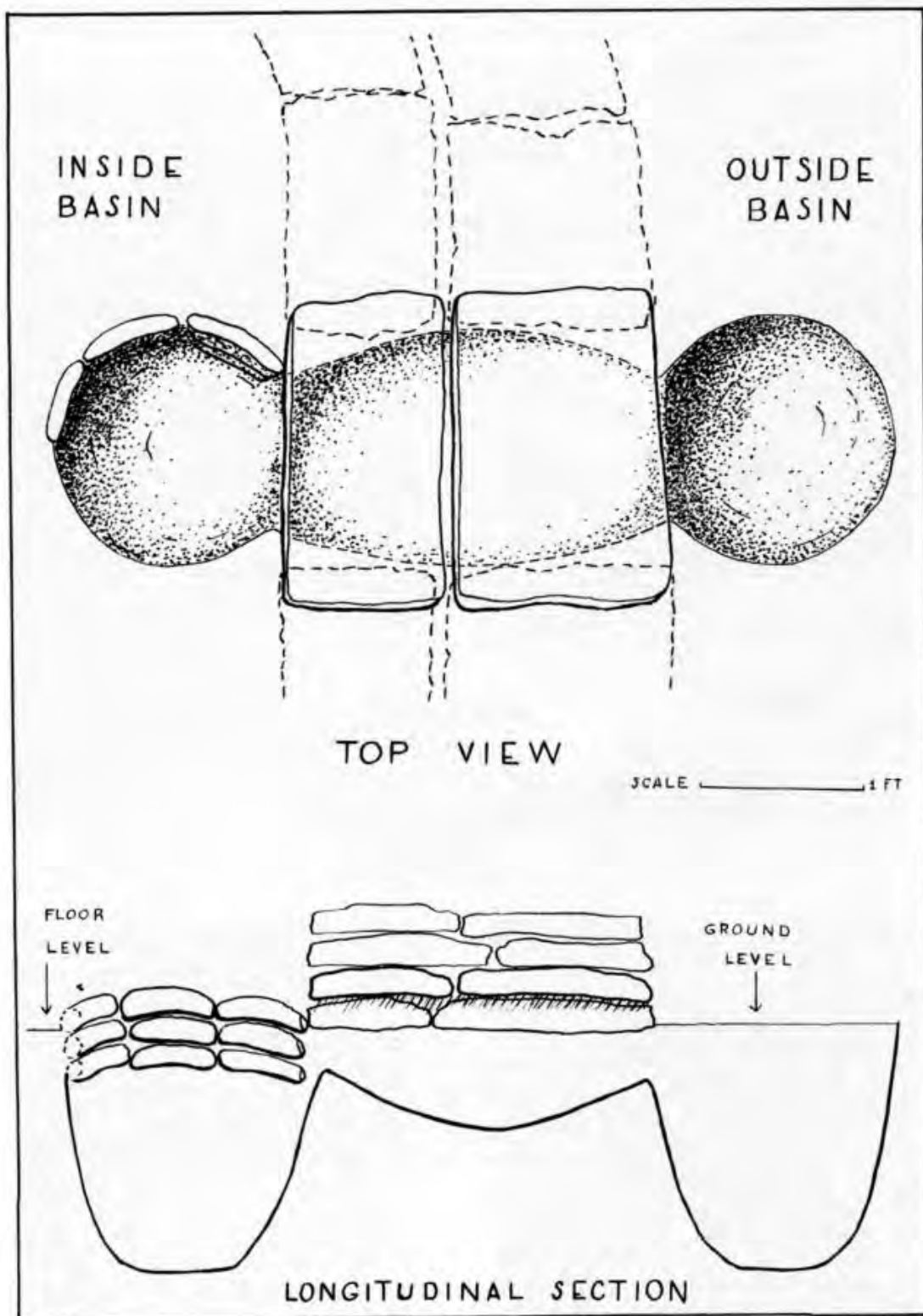


FIGURE 13—Putative ventilator shaft in Structure F.

The production of a level area for the lower floor was accomplished, not by excavating, as in the case of Structures A and E, but by building up the sloping portion of the original surface by the use of fine sand which must have been carried up from the creek bed. In the southern part of the structure, where the downward slope was greatest, the sand reached a depth of 1 foot. The bowl-shaped depression which lay within the house was $1\frac{1}{2}$ feet deep and extended 6 inches into the original terrace gravels which underlay the sand. It was $1\frac{1}{2}$ feet in diameter at the top. The left half was formed by 3 rows of 3 adobe bricks. The top row and the one below it were separated from each other by a layer of ash 1 inch thick which contained 1 unburned bone bead. The upper row projected above the floor, producing a partial rim resembling those placed around the fireplaces. No use was made of bricks in the right half. The entire depression had been smoothly plastered with adobe.

Underlying the double walls was a more shallow oval depression which connected those inside and outside the structure. The overlying wall stones were supported by stones on either side, as are lintels. This depression was 1 foot 5 inches wide, 2 feet 2 inches long, and 6 inches deep. It, too, was smoothly plastered with adobe and 5 separate layers of adobe could be distinguished, each separated from the other by a very thin layer of black ash. There was no evidence of burning or exposure to heat.

The third connecting hole, which lay outside the wall, was the same shape and size as the first. It had been dug into the terrace gravels and there was no use of bricks. It had apparently once been plastered but exposure to the elements had roughened the surface. The double wall extended 3 feet beyond the eastern edge of this opening and 10 feet beyond the western edge.

It is impossible to be sure of the function of this feature. The possibility may be considered that it represents a form of ventilator shaft. It might have been added after the house had been constructed. It probably would have been possible to remove 1 or 2 stones and the mortar underlying a long wall stone supported at either end and have produced an opening without seriously weakening the wall. The double section of wall may not have been part of the original structure. Some 3 feet north of the inner depression and between it and the fireplace, which was in the center of the room, lay a confused jumble of adobe turtlebacks and a few stones. No clear pattern could be established but the general appearance suggested that this might represent a low wall or deflector, some 3 or 4 feet long, which had collapsed.

Just north of the brick and stone concentration was found a hole 5 inches in diameter and 12 inches deep. The east face of the hole consisted of an upright adobe brick, while on the south and west sides were 2 upright stones. To the north the sand was hard packed and solidified, possibly by heat from the fireplace. The whole interior was smoothly plastered with adobe. Around the hole was a rim of adobe, containing small pebbles, which was built up to a height of 3 inches

above the floor. The hole contained loose, ashy material. There was no evidence of disintegrated wood.

The fireplace, which lay $1\frac{1}{2}$ feet farther north, had an adobe rim 4 inches wide and 2 inches high. The inside diameter was 27 inches and the depth 5 inches. Three and a half feet south and a little east of the firepit, a post 5 inches in diameter and 16 inches long was found. It was imbedded in the floor to a depth of 6 inches. In the southeastern side of the post hole was an upright stone which extended 2 inches above the floor. Nearby were found 3 partially disintegrated timbers $1\frac{1}{2}$ inches in diameter. Two were 1 foot long and one was 6 inches long. Another post hole 18 inches deep, with an upright rock shoring up one face was found $1\frac{1}{2}$ feet out from the center of the western quadrant of the wall. It contained decomposed wood and loose, ashy material.



FIGURE 14—West wall, Structure F. A. Anvil stone. B. Hammerstone and concentration of flakes.

To the west of the entrance was a concentration of rocks and adobe bricks. Underneath these lay several ropes of unfired clay. It is thought that this represents a small storage bin in which pottery making materials were stored.

In the west wall, $5\frac{1}{2}$ feet from the entrance, a large flat rock which rested on the floor projected from the wall (Fig. 14). It had obviously been placed in this position at the time of construction. This rock was heavily scarred as if it had been repeatedly struck with another stone. To the north were 5 other stones, 3 of them upright. One leaned against the wall and the others rested against it. In the space between the flat stone which projected from the wall and the unattached stones lay a pile of 615 flakes and a battered hammerstone made of chalcedony. Most of the flakes were small. Some reached a length of 2 inches but most were less than an inch in length and some were less than a quarter of an inch long. Among the materials represented were chalcedonies, cherts, quartzites, the same materials used in the production of projectile points, knives and other tools.

South of the "anvil" stones there were two breaks in the floor. One was an oval depression 30 inches long and 24 inches wide which extended into the underlying terrace gravels to a depth of 6 inches. It was filled with loose debris which included much charcoal, a number of flakes, and 1 unburned bone awl. Between this and the fireplace was a circular hole 14 inches in diameter. It contained 5 adobe bricks. Three lay side by side on the bottom and the other 2, which extended above the floor, rested on them.

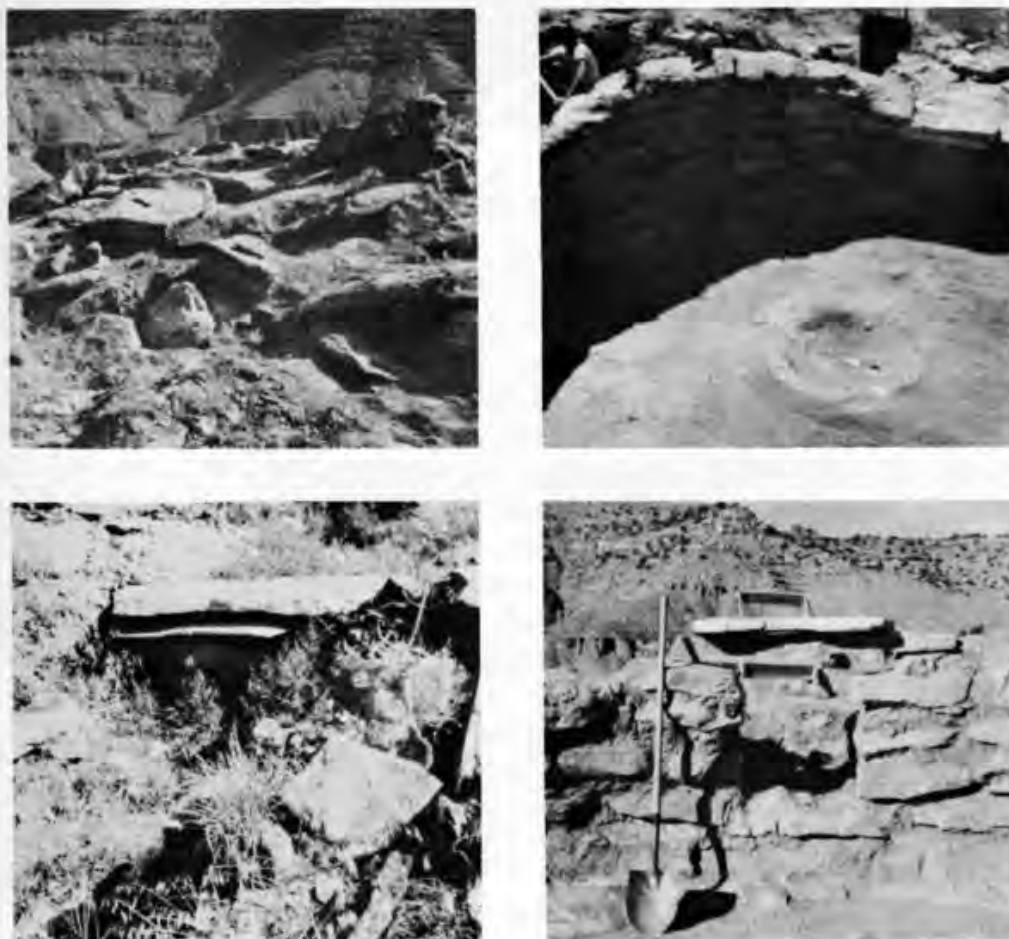


FIGURE 15—Structure G, before and after excavation.



FIGURE 16—Adobe granary attached to Structure G.

STRUCTURE G.

Structure G lay the farthest west of those of the second group (Fig. 15). It was roughly circular, with some straightening of the wall to the north and west. The average diameter was 15 feet. On the east side the wall was still standing to a height of 4 feet 5 inches while to the south and east it was only 2 feet high. Here again was clear evidence of vaulting. A plumb-bob dropped from the highest point of the wall fell 12 inches in from the base. Along the east wall the second and fourth courses from the bottom consisted, not of stones, but of adobe bricks with an average length of 7 inches. In the upper portion of this section of wall, great quantities of adobe were used in construction and there were sections of mortar which were as thick as the lower courses, but no brick outlines could be discerned. A small niche was built into the southeast section of the wall, $2\frac{1}{2}$ feet above the floor.

The building was entered through a linteled doorway which, as in the structures previously described, lay a little to the east of north (Fig. 15, c and d). It differed from the others, however, in that it was almost square, 22 inches wide and 25 inches high, and did not extend all the way to the floor. A section of wall 22 inches high rose from the floor to form the base of the aperture. Over the opening lay 2 stones, the lowest 6 inches thick and 4 feet 4 inches long. Above this lay a smaller stone 2 inches thick and 3 feet long.

The only floor feature consisted of a fireplace lying a little south of the center. It had an inside diameter of 2 feet 8 inches and was surrounded by an adobe coping 5½ inches wide. By the fireplace lay the fragments of a jar, with a doubly recurved neck, which has now been largely restored. On the floor were found splashes of asphalt such as would be present if some of this material in a liquid state had been spilled. The fill consisted of refuse material containing a large number of grinding stone fragments. Two whole and 30 fragmentary metates and 3 manos were recovered. It contained a very large number of fallen building stones. A small fragment of a child's skull lay on the floor. A fragment of the left portion of the maxilla of an adult, containing molars, pre-molars, and an incisor, was found in the first 8 inches of fill below a level of sterile adobe which overlay the southern portion of the structure.

Attached to the southeast portion of this building was a small addition in the shape of a "U" with contracting sides (Fig. 16). It was made of adobe bricks and then covered with a thin layer of the same material. The interior dimensions were: length 5 feet 2 inches, maximum breadth, 4 feet 4 inches, and minimum breadth at the point where it joined the wall of the masonry building 3 feet 8 inches. The wall had an average thickness of 5 inches and varied in height from 1 foot 10 inches to 2 feet.

Within this structure was found a confused jumble of adobe bricks, unshaped adobe masses, and some cultural debris. On the floor were found pieces of adobe bearing semi-circular depressions varying from one half to one inch across. They appear to represent impressions of slender poles laid across the walls and covered with adobe in order to provide a roof or covering.

To the southeast of the adobe addition lay a mass of sterile hard packed adobe 5 feet long and varying in height from 8 inches to 1½ feet. In an oval depression in the adobe lay an infant burial. The skeleton was in a semi-flexed position, lying on the left side and facing to the east. The adobe pile lay against the wall of the unexcavated building which was called Structure I.



FIGURE 17—Pair of metates imbedded in adobe above southern portion of Structure G.

Covering the southern portion of Structure G and the annex and extending to Structure I was a concentration of rocks and a level of sterile yellowish adobe with an average depth of $1\frac{1}{2}$ feet. Imbedded in this mass, 3 inches below the surface and just inside the south wall of the masonry building, were 2 metates (Fig. 17). The lower one, which was thin and which had a shallow oval depression, lay right side up. The second, which was thick and which had a deep oval basin, lay upside down directly above the first. Both had been rather carefully shaped and were of approximately the same size. The mud covering over the structure must have been intentionally placed there. This is the highest point on the site and there is no place from which such material could have washed. The pair of metates was imbedded in the adobe while it was still soft. Overlying the adobe cover were masses of building stones. They lay in no recognizable order.

STRUCTURE H.

This structure was the largest in the village with an inside diameter of 28 feet 6 inches (Fig. 19). The wall was thicker than in any of the other structures and varied in width from 2 feet to 2 feet 8 inches. In some sections wider stones were used, while in others 2 long stones were placed lengthwise in a parallel position and other stones were placed above them running in the opposite direction. Nine large upright slabs rested against the exterior of the eastern portion of the wall at an angle of 20° . The space between was filled with mortar. The maximum wall height was 3 feet 4 inches, the minimum 1 foot 6 inches. The entrance lay slightly to the east of north. It was 3 feet 6 inches wide.

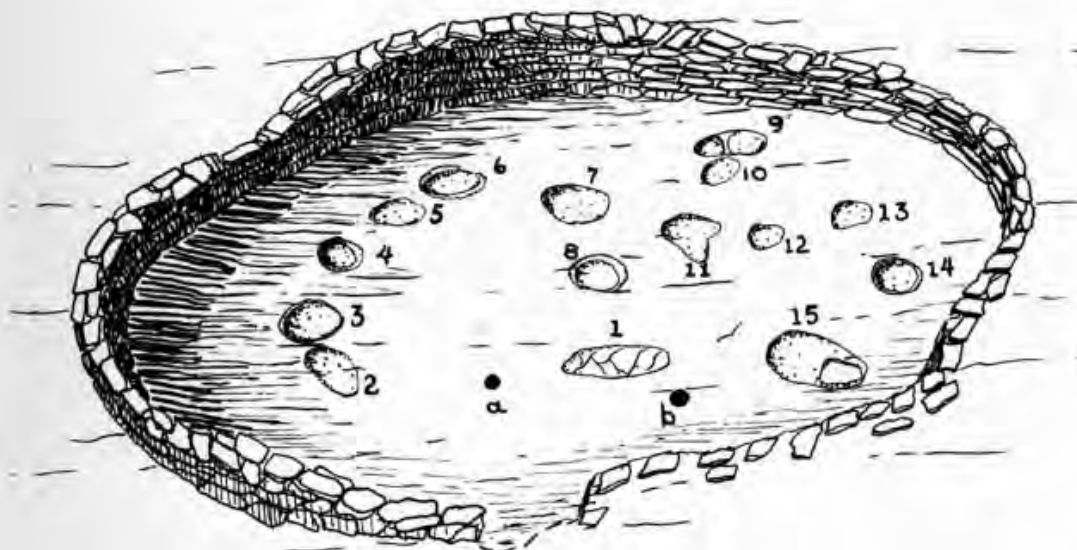
Within the room, in the southeastern quadrant, a niche was built in the wall 8 inches above the floor. It was 1 foot 2 inches long, 8 inches high, and 1 foot deep.

Floor features consisted of 2 post holes and 15 fireplaces containing ash and charcoal (Fig. 18). Post hole A, which was 8 inches in diameter, lay 9 feet southwest of the east side of the entrance and post hole B, which was 9 inches in diameter, lay 8 feet to the southwest of the west side of the entrance.

Firepits 1 and 3 were filled with stones which were laid flat and roughly fitted together. Number 15 contained 1 large stone. Numbers 1, 2, 9, and 15 were oval. Number 9 was divided by an adobe ridge. Number 11 was in the shape of a figure 8. The remainder were roughly circular. Numbers 3, 6, 8, and 14 had built up adobe rims. The others were simply basin-shaped hollows in the floor. All were lined with adobe. The dimensions were as follows:

- No. 1—2 feet 3 inches by 1 foot 8 inches. 5 inches deep.
- No. 2—2 feet by 1 foot 8 inches. 7 inches deep.
- No. 3—1 foot 6 inches in diameter. 6 inches deep.
- No. 4—1 foot 4 inches in diameter. 3 inches deep.
- No. 5—1 foot 5 inches in diameter. 4 inches deep.
- No. 6—2 feet in diameter. 4 inches deep.
- No. 7—2 feet 2 inches in diameter. 7 inches deep.

- No. 8—1 foot 10 inches in diameter. 4 inches deep.
 No. 9—2 feet 8 inches by 1 foot 2 inches. Adobe bar 14 inches in from east side.
 No. 10—1 foot 3 inches in diameter. 3 inches deep.
 No. 11—2 feet 9 inches long. Larger portion of depression 1 foot 11 inches in diameter, 4 inches deep. Smaller portion of depression 10 inches in diameter, 6 inches deep.
 No. 12—1 foot 3 inches in diameter. 3 inches deep.
 No. 13—1 foot 2 inches in diameter. 3 inches deep.
 No. 14—1 foot 4 inches in diameter. 4 inches deep.
 No. 15—3 feet 4 inches by 1 foot 10 inches. 3 inches deep.



FIREPLACES AND POSTHOLES IN STRUCTURE H

FIGURE 18.

On the floor, $1\frac{1}{2}$ feet west of Firepit 3, lay 14 bone gaming pieces and 1 gray pottery disc. These artifacts are described on page 58. Between Firepit 3 and the east wall a sub-floor burial containing an infant was found. The presence of the burial was indicated by a slight disturbance of the floor surface. A shallow hole had been dug into the ridge gravels, which appeared to be less fully cemented in this section, and the floor built up over it. The skull was crushed and the skeleton poorly preserved and poorly articulated. It was impossible to determine the exact position of the body, but the head faced to the east. There were no burial offerings.



FIGURE 19—Structure H.

"MONOLITHS"

To the southwest of this group of buildings was a row of 5 large sandstone blocks which, for want of a better term, have been referred to as monoliths (Figs. 20 and 21). Mr. Look and Mr. Turner reported that all 5 were standing when first observed but when excavations were begun by the Museum party the stone designated No. 1 on the map had fallen and only 4 were upright. In the course of excavations, the stone marked 5 collapsed. The dimensions are as follows:



FIGURE 20—"Monoliths."

No. 1—41 x 14 x 17 inches.

No. 2—20 inches above the surface, width 18, breadth 14.

No. 3—20 inches above the surface, width 12, breadth 14.

No. 4—21 inches above the surface, width 15, breadth 13.

No. 5—Total height 51 inches. 30 inches above surface, 21 inches below surface. Width 21, breadth 12.

The exposed surfaces have been changed by erosion but the base of No. 5, which had been protected, was found to be definitely shaped by pecking.

Flat stones plastered with mud lay in the area between the upright stones and Structure G in the form of two half circles. One extended from Stone 1 to Stone 4. The other lay to the northeast with the open part of the crescent facing toward Structure G. At the western end it was 3 rocks high. Within the semi-circles the underlying ridge gravels were heavily burned.

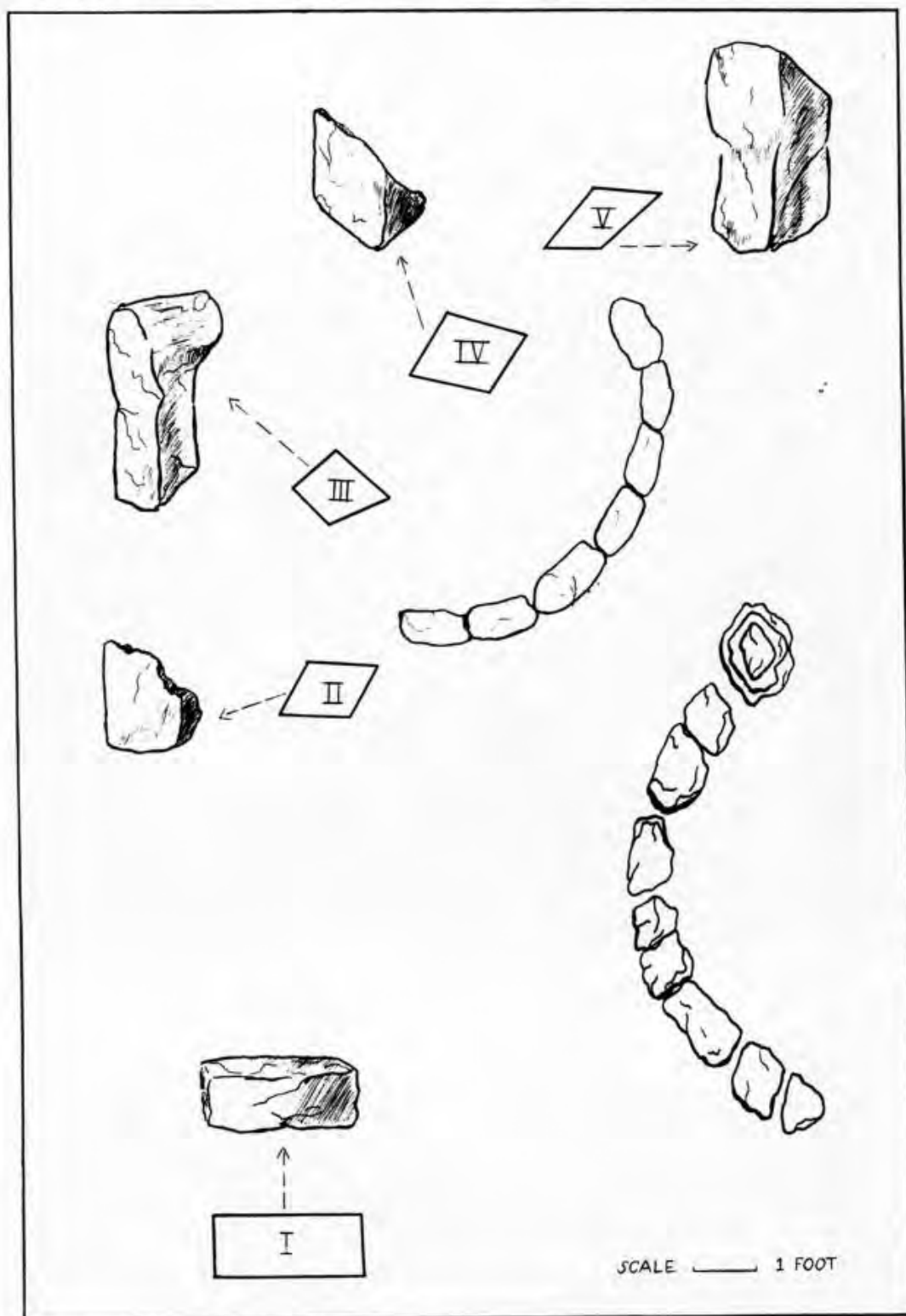


FIGURE 21—"Monoliths" and stone semi-circles.

OUTDOOR LIVING AREAS

Southwest of Structure E and on the same level as the base of the building lay a fireplace. It was 2 feet 8 inches in diameter and 8 inches deep. The rim, which extended only around two-thirds of the circumference, was 2 inches wide. Beside it lay an elk antler from which the prongs had been removed. Much of the hard surface portion on one side had been cut out and grooves had been made in preparation for the removal of other pieces.

One foot below the surface of the ash and refuse, which lay to the south of Structure B, the top of a slab-lined trench 15 feet long was encountered (Fig. 22). Seven large boulders had been placed over the top at right angles to the long axis of the trench and it seemed certain that it would contain something of importance. Excavations revealed, however, that it was filled with refuse comparable to that which made up the deposit surrounding it. This material contained much ash, small pieces of charcoal, and a few artifacts which included potsherds and a bone awl.



FIGURE 22—Slab-lined trench and large outdoor fireplace.

Along the sides, stone slabs were set at such an angle as to make the trench narrower at the bottom than at the top. The width at the top was 2 feet and at the bottom 1 foot 3 inches. It was 1 foot 8 inches deep. Nine slabs were used on the south face and 6 on the north. In some sections no slabs were present. The west end was formed of adobe.

Six feet northwest of the western end and 16 inches below the top of the trench lay a large rimmed fireplace filled with charcoal (Fig. 22). The inside diameter was 2 feet 11 inches and the rim was 6 inches wide. Within the pit were stones so placed as to form a sort of pavement. One large semi-circular stone had been intentionally shaped. Two stone slabs lay on the southern portion of the rim. A fragment of an adult human skull lay a foot to the east on the same level as the firepit.

Between the structures which make up the first cluster of buildings was an open space which appears to have served as a plaza or outdoor living area but in which refuse was allowed to accumulate. Some random digging had been done before the Museum party undertook investigations. Due to this disturbance there were sections where the picture was not as clear as would have been desirable but it was possible to determine the general stratigraphy of the area. A stratigraphic cross-section is shown in Figure 23.

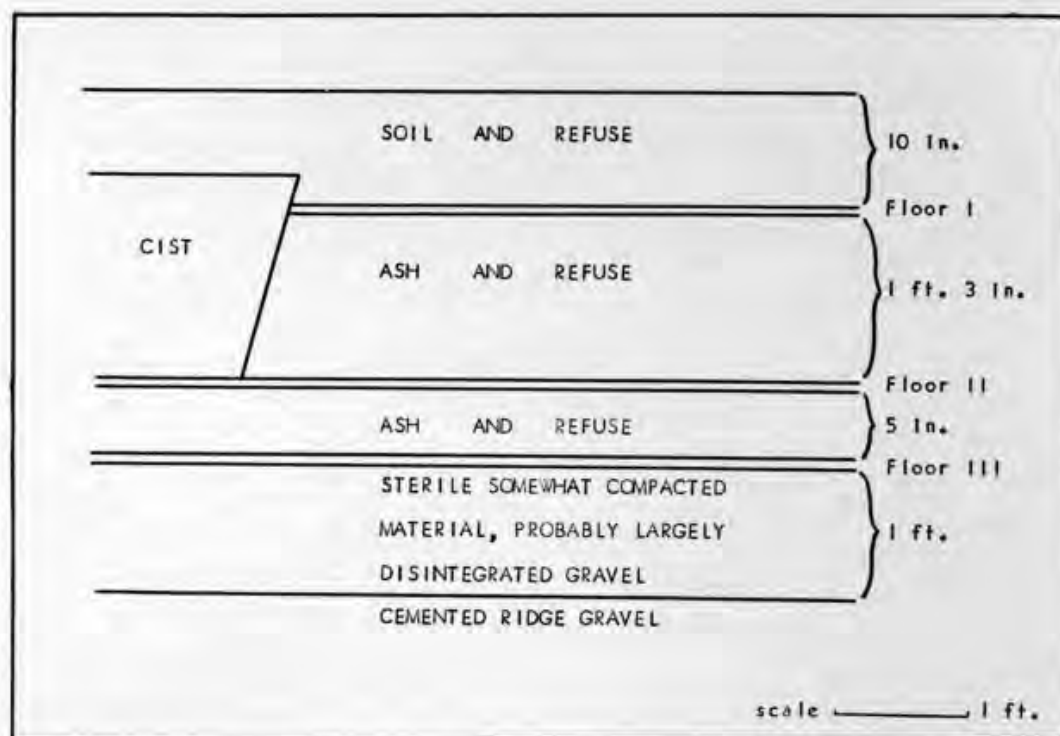


FIGURE 23—Stratigraphic cross-section, cist area.

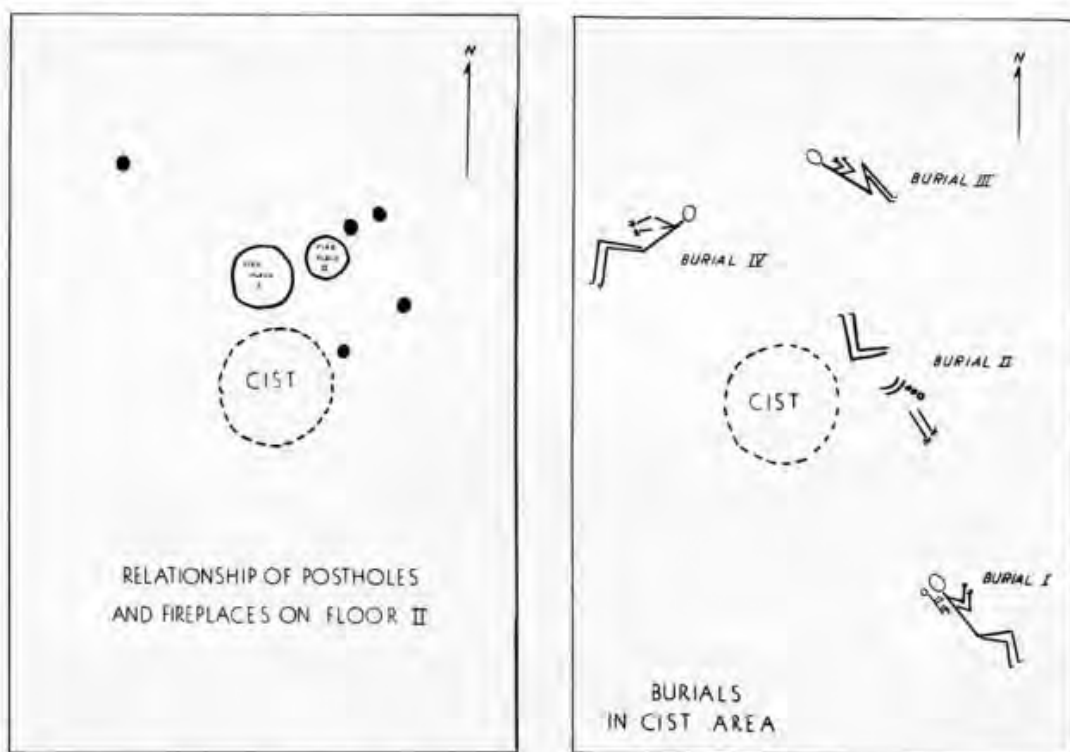


FIGURE 24.

In the approximate center was a slab-lined cist which lay 8 inches below the present surface. It had been dug by the Turners who reported that it had been covered by a circular sandstone cover and was empty. Beside it they found a large trough metate and a mano. The cist was formed of 10 slabs so placed as to provide sloping sides. It was 3 feet 6 inches in diameter and 18 inches deep.

Some 3 feet of trash had accumulated in this area and it was in these deposits that the hole for the cist was dug. The refuse material was divided by at least 3 floors of hard packed adobe. There was some evidence that there may have been another floor 7 inches above the one called Floor I but this could not be established with any degree of certainty.

Floor I, which lay 2 inches below the cist top, must have been in use at the same time as the cist. Presumably the metate and the mano reported by the Turners lay upon it. Below this was 1 foot 3 inches of ash and refuse lying on a second floor (Fig. 24). Floor features included 2 adobe fire places and 5 post holes. Fireplace I was 2 feet 4 inches in diameter and 5 inches deep. Number 2 was 1 foot 6 inches in diameter and 5 inches deep. The position of the post holes in relation to the firepit is shown in Figure 24. They ranged between 6 and 7 inches in diameter.

Between the second and third floor lay 5 inches of trash. In this, 3 layers of somewhat hardened material could be distinguished. These could not be regarded as floors in the sense of having been intentionally constructed, but they might have resulted from people walking on the material during a period when the ash and refuse were not accumulating in the area.

The third floor contained 1 firepit. It was 2 feet in diameter and 10 inches deep. There was no adobe rim but the pit was outlined by

fire burned rocks. This floor lay at the base of the structures in the area. It can be equated with the bottom of the adobe annex of Structure D which was also covered with ash and rubbish.

BURIALS:

Four burials were found in these deposits. Their location is shown in Figure 24. Numbers I and II lay below Floor I. Numbers III and IV lay below Floor III.

Burial No. 1 was a double one (Fig. 25). The skeleton of an adult lay on its left side in a semi-flexed position with the skeleton of a child between 4 and 6 years of age lying against its back. Both faced to the east. A circular plaque carved out of slate lay on the child's head and a small perforated shell was found among the rib bones. Overlying both bodies was a shaped rectangular sandstone slab which extended from the top of the head to the pelvis of the adult. A large boulder extended from the pelvis to the knees. Eight inches north of the skulls lay a large metate resting on its side.



FIGURE 25—Burial I.

There are various problems connected with Burial II which lay to the east of the cist on Floor II. Legs and lower arms of an adult were found perfectly articulated but the skull, the pelvis, the humerae, 1 scapula, and all but 5 vertebrae and 4 ribs were missing. A few teeth lay among the hand bones. Large boulders lay over the legs and forearms. Unfortunately, the upper levels had been removed in the course of the earlier unscientific digging and it was impossible to evaluate evidence of disturbance in the overlying material. As far as could be determined, however, the hole dug by Mr. Turner was not deep enough to have reached the skeleton. In any case, although he might have failed to recognize some of the other bones and have thrown them away, he would certainly have recognized a human skull and have preserved it. It must therefore be assumed that the disappearance of these bones preceded the discovery of the site.

The third burial had been made in an oval pit dug into the disintegrated gravels which underlay Floor III. An adult skeleton lay on its right side in a semi-flexed position. It faced to the west.

In Burial IV the skeleton lay in a similar pit. The section around the head was lined with rocks. This individual, also an adult, lay face up with the head to the northwest. The knees were elevated.

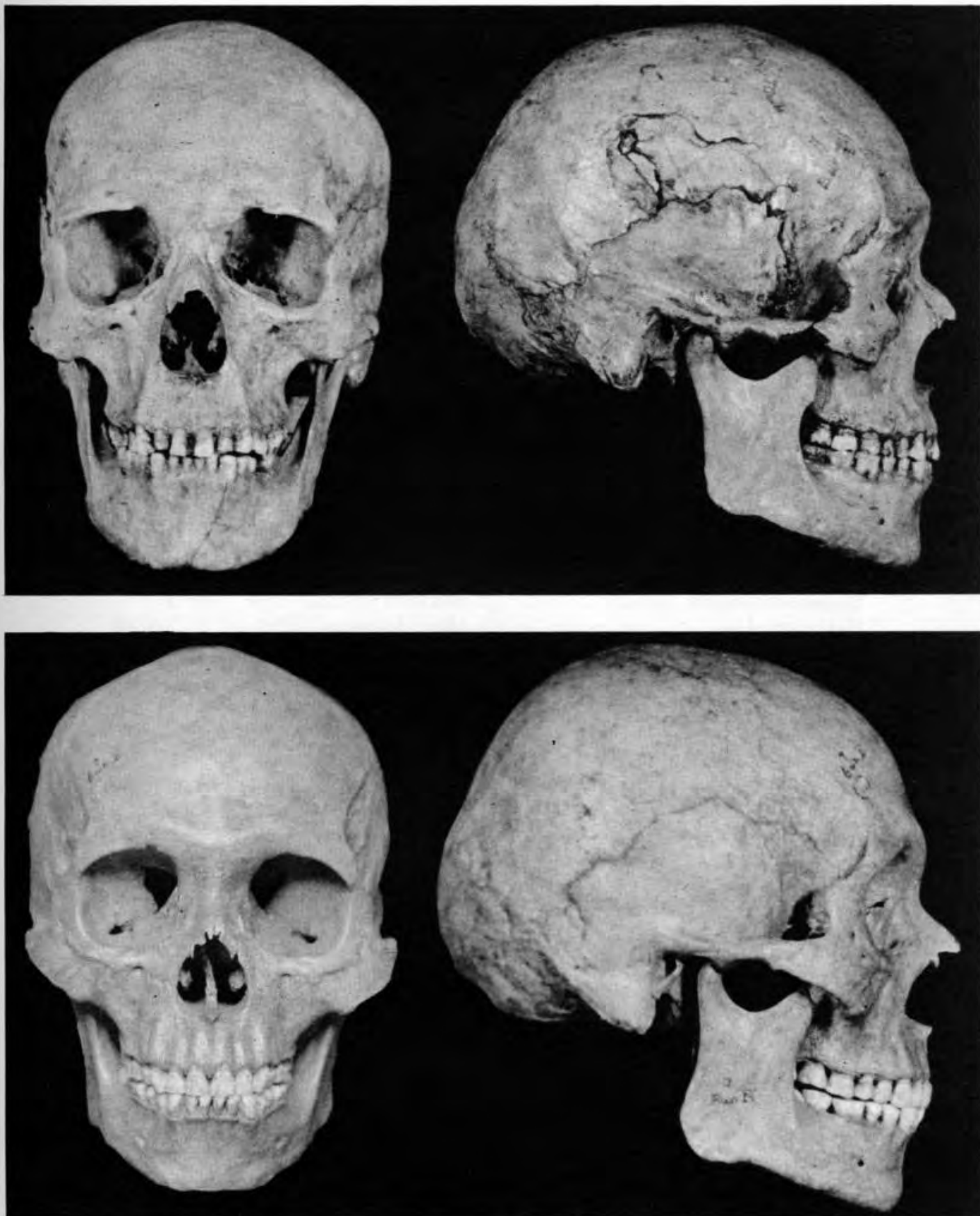


FIGURE 26—Crania. Above, Burial I; Below, Burial IV.

"Human Skeletal Remains from The Turner-Look Site"

by

ERIK K. REED

Cranial Measurements:	Burial I	Burial III	Burial IV
Max. length (from glabella).....	189	(165)	179 (to inion 177)
Max. breadth	141	154	144
Cranial Index		74.1	80.4
Auricular height	118	.....	115
Height (basion-bregma)	136	.....	132
Height-length index		77.9	73.8
Height-breadth index		96.4	91.7
Min. frontal diameter.....	91	93	96
Max. bizygomatic breadth (approx.)	138	.....	146
Total face height.....	125	107	117
Upper face height.....	78	66	74
Total facial index.....		90.6(?)	80.1
Upper facial index.....		56.4(?)	50.7
Nasal height	55	50	53
Nasal breadth	24	25	27
Nasal index		43.6	50.0
Basion-prosthion	106	.....	96
Basion-nasion	106	.....	100
Gnathic index		100.0	96.0
Orbit height			
Left	32	33	37.5
Right	34	36	38
Orbit breadth			
Left	36	39	41
Right	38	39	40
Mean orbital index.....		89.2	88.5
Interorbital width	24	22	22
External palate			
Length	53	.....	54
Breadth	69	.....	66
External palatal index.....		130.2	122.2
Mandible length	110	.....	93
Mandible breadth (bicondylar width)	121	.....	124
Mandibular index		90.9	75.0
Symphysis height	40	31	34.5

BURIAL I, ADULT MALE (Fig. 26)

Criteria of sex on skull and long bones agree (pelvis not available). The advanced degree of sutural obliteration would indicate an age of perhaps 50 or somewhat more, but, owing to the unreliability of this method (Singer, 1953), the general assignment "middle aged"

is preferred. The general appearance of the long bones and the wear on third molars, equalling that of other teeth, are in accord with this assessment.

The cranium was x-rayed at Denver General Hospital and the films interpreted by Dr. George Ogura, Pathologist for the City and County of Denver, and by Dr. Robert Wurtzbach. They noted the following features: Break in the right zygomatic arch. Posterior portion depressed. Depressed fracture in right temporal-parietal area. Depressed fracture fairly large, roughly 6x8 centimeters in diameter. The upper posterior part of the depressed fragment is more depressed than the segment in general, and may represent the point of entrance of a sharp instrument. There is no evidence of bony union above the fracture site, which would tend to indicate that the subject did not live long after incurring the fracture, assuming, as seems probable, that the fracture is not of post-mortem origin. The basilar views of the skull reveal an extension of fracture lines into the occipital bone and into the right lateral margin of the foramen magnum.

CRANIUM:

No artificial deformation. A long, moderately high vault, with well-developed parietal bosses; ellipsoid in outline from above; with a protruding occiput. General muscularity is medium or above, but the mastoids are small and supramastoid crests undeveloped.

A long narrow face with strong features, under a low retreating frontal, with well-developed brow-ridges and quite prominent glabellar area; rectangular orbits, quite sloping; high-bridged, prominent, long nose, with concavo-convex nasalia; projecting malars; deep jaw and sharp chin; a high, small parabola-shaped palate with a very small palatine torus.

Dolichocranial, ortho- and metrio-cranial, leptoprosopic and leptene, hypsiconch, leptorrhine, and brachyuranic.

MANDIBLE AND DENTITION:

A large, deep, narrow jaw with a prominent chin, only very slight gonial eversion, moderate general muscularity, no mandibular torus. Tooth wear is extreme, but no dental pathology was observed. The incisors are so badly worn that shovel shape is not determinable.

LONG BONES:

Large—long, not particularly stout; the tibia slender—and of moderate muscularity, straight. No perforation of the olecranon in the humerus; no bowing and pilastering of the femur, no development of third trochanter; no retroversion of tibial head. A slight growth on ulnar heads which might be osteoarthritis. Estimated stature about 161-162 cm, or 5 feet 3½ inches, from Pearson formulae, which are considered best for short-statured material.

BURIAL I—CHILD:

Bones in extremely poor condition. First molar (permanent), formed but not erupted.

BURIAL II:

No skull; leg bones and lower arm bones only. A sub-adult or a quite young adult—all epiphyses of limb bones fused, except the distal of radii and ulnae, which properly should precede, at about 19, those above the knee (proximal epiphyses of the tibia and fibula, distal of the femur, at about 20) but lines of union in all not yet obliterated.

Considered to be probably male, on the basis of size and muscularity—diameter of femoral head as well as overall length. (In U. S. negro skeletal material, a femoral head diameter of less than 44 mm. is female (F. Thieme at the 1954 meeting of the A.A.P.A.), but in American Indian material, at least in the Southwest, the crucial size appears to be about 39 for both femur and humerus.)

The femora and tibiae are long, straight, and slender, of sub-medium to moderate muscularity. No bowing, pilaster, or third trochanter of the femur; the head of the tibia is not retroverted, but there is a "squatting facet" on the anterior edge of the distal articular surface.

Estimated stature (calculated from Pearson formulae for male femur and tibia) probably between 165 and 167 cm., or around 5 feet 5½ inches. Identification as probably male is perhaps a little supported by the fact that a reconstructed stature, calculated by formulae for females is about 5 feet 3 inches, which would be pretty tall (but see Burial III, below).

BURIAL III:

Young adult; sex uncertain, questionably female. The skull is extremely thin and the sutures extremely wide and intricately serrated. The left temporal bone was not attached to the skull when found. The skeleton, including the largely disintegrated pelvis, was examined by Dr. A. R. Buchanan of the Department of Anatomy, University of Colorado Medical School, and by Dr. Horace Campbell, who regarded it as female. They stated that the individual was mildly hydrocephalous. Hydrocephaly is a disease in which there is an abnormal accumulation of cerebro-spinal fluid in the skull, which results in an abnormal enlargement of the head. The bones of the skull are thin and the sutures wide. The shape of the head is generally brachycephalic. Usually there is some degree of mental impairment, but hydrocephaly is not incompatible with normal intelligence, and may even be associated with brilliance (Cecil, Ed., 1940). All bones were very soft, porous, and easily crumbled. This is probably due to a pathological condition since skeletons of comparable age, buried under the same soil conditions, were much better preserved.

CRANIUM:

Lambdoid cranial deformation, presumably artificial and intentional rather than pathological. Sphenoid in outline, low vault, sub-medium general muscularity. Very low retreating frontal, with marked glabellar prominence and rather strong brow ridges. High-bridged nose, concavo-convex profile. Small but very projecting malars. Alveolar prognathism.

MANDIBLE AND DENTITION:

A small, short jaw, of sub-medium muscularity, with slightly projecting chin, no gonial eversion. Tooth wear is extreme (but much less on third molars). No pathology. Shovel incisors.

LONG BONES:

Again long, rather slender, and straight, of sub-medium muscularity, with no special features. Most of the bones are somewhat damaged, and only the left tibia can be positively measured. The left femur is approximately the same length as in Burial I, with a diameter of the femoral head (left, about 41 mm.—slightly damaged) only a trifle smaller than in Burials I and II, but not definitely too large to be female. The tibia falls between Nos. I and II in length, at 366 mm. Consequently I am somewhat inclined to suspect that No. III actually is male, but I have not seen the pelvis.

Reconstructed stature would be, by the Pearson formulae for the tibia alone, 159 cm. (5 feet 2½ inches) if a female, or 165.6 cm. (5 feet 5¼ inches) if male. I note, however, that calculations from the tibia alone generally seem to work out a couple of centimeters (about an inch) taller than those from the femur or the combination of tibia and femur. A stature of around 5 feet 2 inches would be a bit on the tall side for a female, but certainly not extreme; around 5 feet 5 inches would be very reasonable for a male.

BURIAL IV (Fig. 26):

An adult male, fairly young, probably in his late 20s (lower left M3 not erupted, lower right M3 just appearing, impacted; upper right M3 present, much less worn than other teeth, because of lack of opposition). Criteria and indications of sex in skull and long bones agree.

CRANIUM:

No artificial deformation (or slight, unintentional?). Ovoid shape. Moderately high vault, well-developed parietal bosses, some occipital protrusion. Moderate general muscularity. Again a low and retreating frontal with marked prominence of the area of glabella, and strong brow-ridges. Again, the prominent nose is high-bridged, with concavo-convex well-arched nasalia, with slight nasal over-growth (Birdsell, 1951, pp. 58-60). The malars are of moderate size but very projecting, not angulated, the zygomata well bowed out (in contrast to No. 1). Alveolar prognathism is definite but moderate. Orbits and palate, like the nasal details, resemble No. I.

Brachycranial, ortho- and metrio-cranial, euryproscopic and mesene, hypsiconch platyrrhine (just), and brachyuranic.

MANDIBLE AND DENTITION:

Not as deep and long a jaw as No. I, rather small, of sub-medium general muscularity and chin prominence, with slight gonial eversion. Tooth wear marked (except on M3), a little caries. Shovel incisors.

LONG BONES:

Large and straight, fairly stout and rather muscular. No retroversion of tibial head, a slightly developed "squatting facet". Femora and one tibia were seriously damaged in shipment from the camp to the Museum. The left tibia, somewhat less damaged, probably just about 37 cm. long. Stature as calculated from the right humerus and right radius (not very dependable), between 161 and 165 cm., or probably somewhere around 5 feet 4 inches.

DISCUSSION

The population represented, if these few specimens constitute a fairly typical sample, would have been of small stature (the males around 5 feet 5 inches) and slight build, only moderate muscularity. Aside from the notable wear of teeth, which is usual in American Indian material, dental health appears rather good, with no abscesses noted and little caries, and almost no pre-mortem loss of teeth (lower left M1 in Burial I). Nor is other pathology observed, except for the little exostoses on the heads of the ulnae of No. I, the etiology of which I am unable to discuss, and the reported case of hydrocephaly and abnormally soft bones (No. III).

In attempting to make comparisons to defined types, described series, or other individual specimens, and to discuss possible affiliations, only the two skulls which are definitely male and normal, and undeformed, Nos. I and IV, will be considered. As these two individuals are quite different metrically, and in some respects morphologically, I shall refrain from giving any means for this "series" of two.

The two skulls present a bothersome problem in being so different and yet sharing a number of distinctive features. The conformation and details of the face, particularly nasal morphology (in spite of quite different overall nasal dimensions), orbit shape and slope, and size, shape, and slope of supraorbital ridges, with low retreating forehead, are very similar in the two skulls. The major exception is the contrast between the compressed zygomata of No. I and the wide bowed zygomata of No. IV, with a corresponding considerable difference in face width and facial indices. No. I has a quite long and moderately wide head, with a protuberant occiput and a high-dolichocephalic index; while No. IV has a decidedly shorter and broader head, ovoid in outline, with a low-brachycephalic index.

In studying comparative tabulations of measurements I am perturbed by finding that No. I is metrically fairly close to Neumann's "Otamid" series (from the Texas Gulf coast) and "Ashiuid" series (Basketmakers), while No. IV compares instead to his "Deneid" (Athapaskan) and "Lakotid" (Sioux) types (Neumann, 1952). Either one of these might be all right, but not both at once. And the obvious inference of a freshly mixed heterogeneous population is made less likely by the resemblance between the two in details of facial morphology. In attempting purely metrical comparison with various other standard groups, including the arbitrary morphological "types" of the Pecos Pueblo series (Hooton, 1930), I have arrived at no solution.

General morphological comparison—subjective and impressionistic—with specimens and illustrations, however, leads me to assign these skulls, tentatively and broadly, to the “Ashiuid” (or “Southwest Plateau” or “Basketmaker”) type. The recently published Durango Basketmaker series (Snow and Sanders, 1954), to my relief and gratification, turns out to be metrically reasonably close as well as morphologically quite similar to the Turner-Look crania, especially No. I (lacking the breadth of vault, of frontal, and of zygomata, distinctive in No. IV), but quite variable in these and other dimensions. Admixture of some Plains or Northern element may well be indicated, after all, by the divergent traits of No. IV.

The crania from the Warren Mounds near Ogden, Utah (Enger and Blair, 1947 and Blair, 1949) apparently differ in certain features from this general category. The material from Deadman Cave, Utah, near Salt Lake City (Buettner-Janusch, 1954) may be less divergent.

Farther to the northwestward, the skull of the Butte Creek Cave skeleton, from the John Day River region of Oregon, resembles our people in general and in a number of specific features, measurements, and indices, but is distinguished by certain other traits, notably the long narrow nose which Dr. T. D. Stewart points out as a feature of Northwestern affiliation (Stewart, 1950).

Whatever the proper interpretation of Great Basin material to the west, like the Utah specimens cited above and others (Hansen, 1934; Smith, 1940), it seems to me, after prolonged reflection, that, if these few skulls represent the bearers of Fremont Culture at all fairly, the Fremont people were a regional variant of the Basketmakers rather than a totally distinct unrelated people among whom percolated Anasazi elements through contact with San Juan Basketmakers. These specimens appear to compare reasonably well with early Basketmaker crania from pipe-line excavations near Ignacio, Colorado (report by Fred Wendorf, and others in preparation) and from Earl Morris's cave work near Durango, Colorado, although living several centuries later and evidently somewhat infiltrated with other, non-Southwestern elements.”

* * * * *

ARTIFACTS:

GRINDING TOOLS

Metates (*Fig. 27*):

Specimens Found: 9 whole, 5 fragmentary but classifiable, 37 unclassifiable fragments.

Technology: Basic shaping by fracturing. Further shaping by pecking.

Materials: All but one specimen of extremely hard sandstones. Number 4 is of granite.

Type A: Trapezoidal, platform at one end, other end open. Five whole specimens, 4 broken.

Dimensions:	Body				Grinding Surface		
	L	Max.B.	Min.B.	T	L	B	D
Spec. 1	1'5"	10"	8"	3"	11"	8"	1"
2	1'3"	11½"	10"	3½"	11½"	7½"	1½"
3	1'10"	1'	10"	6"	1'5"	2"	2½"
4	1'4"	8½"	7"	2"	1'	6¼"	1"
5	1'7"	10½"	6½"	5"	1'2"	8"	3"

Provenience: Specimens 1 and 2, and 4 broken specimens which could not be measured, from refuse in Structure G. Number 3 outside of east wall of adobe horseshoe of Structure D, level 2. Number 4 Structure H, level 3. Number 5, identifying number illegible.

Type B: Parallel sided with small platform and rim all the way around. Elongated parallel sided depression. One whole, 1 broken specimen.

Dimensions:	Body			Grinding Surface		
	L	B	T	L	B	D
	1'11"	1'	4"	1'5"	10"	3½"

Provenience: This specimen lay on its side 8 inches to the north of the skulls in Burial I.

Type C: Parallel sided; oval, basin-like depression. One specimen from Structure E, level 2. Slab with pronounced slanting of upper surface.

Dimensions:	Body				Grinding Surface		
	L	B	Max.T	Min.T	L	B	D
	11"	10"	5½"	3"	7½"	5"	½"

Pair found together imbedded in adobe overlying Structure G. Put in position while adobe was soft.

Dimensions:	Body			Grinding Surface		
	L	B	T	L	B	D
Upper	1'6½"	1'	5"	1'½"	7"	2½"
Lower	1'8½"	1'½"	2¾"	11"	6¼"	¾"

Manos (*Fig. 28*):

Specimens Found: 23 whole, 20 broken but classifiable, 7 unclassifiable fragments.

Technology: Shaped by pecking and grinding.

Materials: Cobbles of hard quartzitic rock and granite.

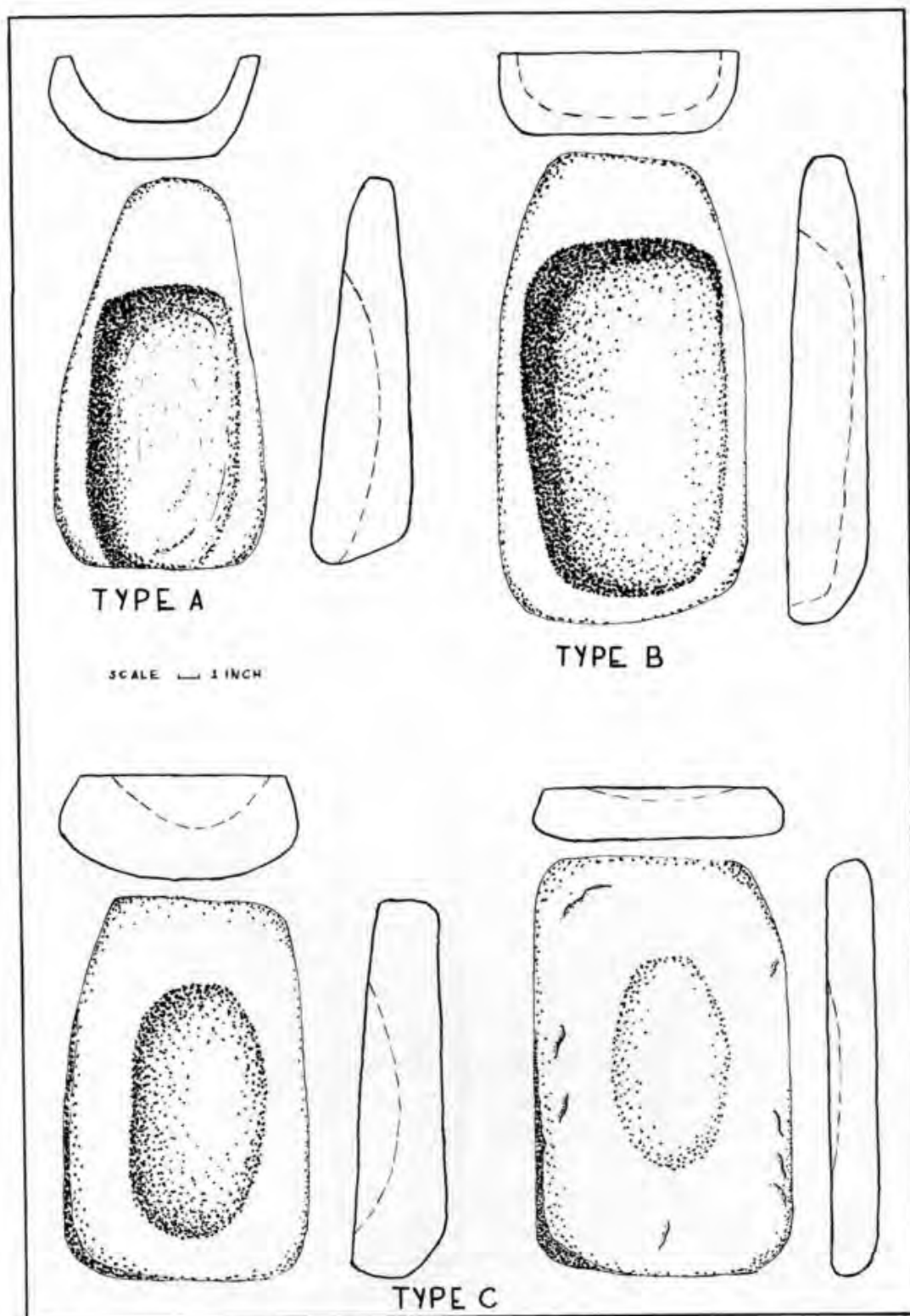


FIGURE 27—Metate types.

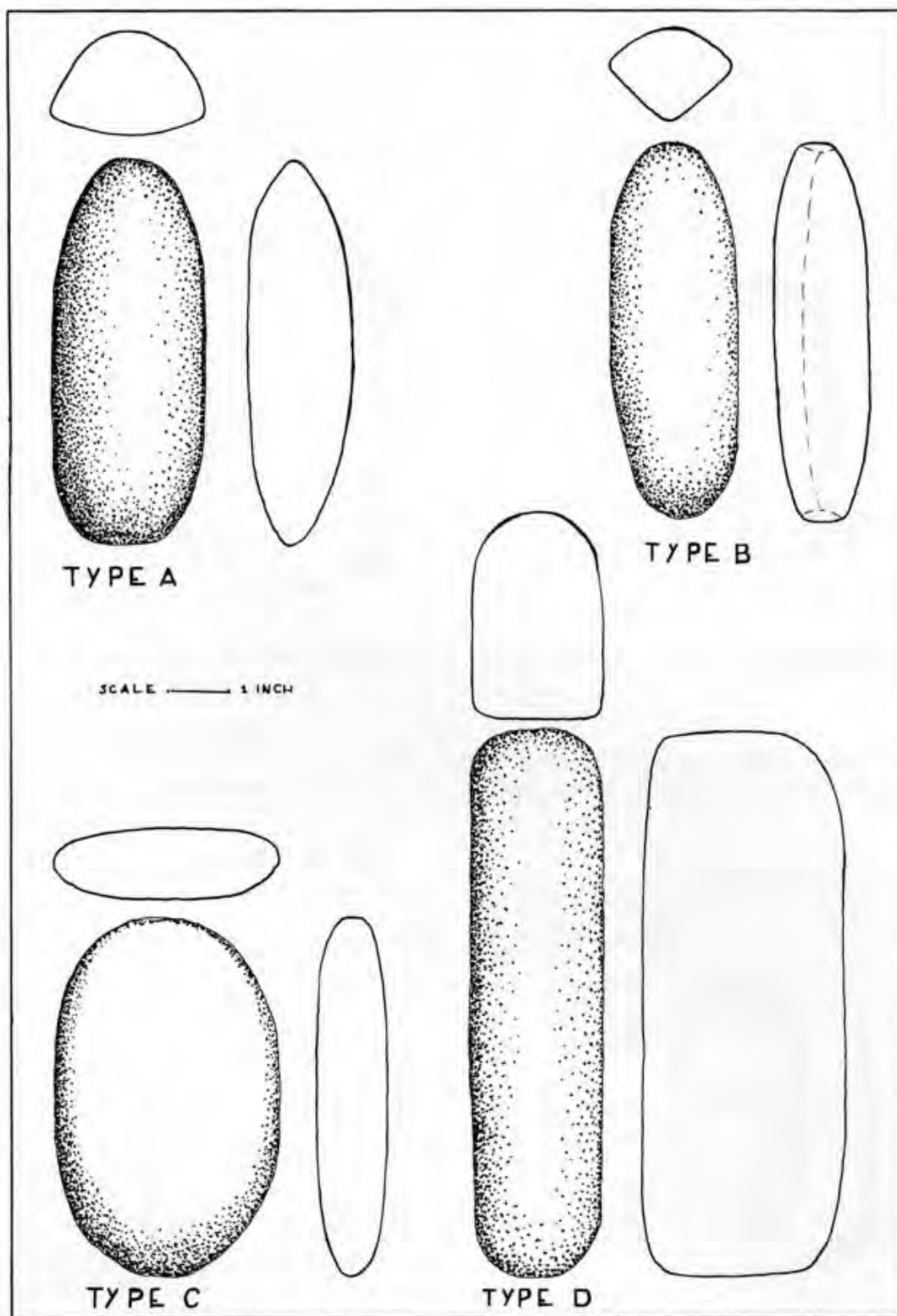


FIGURE 28—Mano types.

Type A: Made from ovoid cylindrical cobbles. One grinding surface, slightly convex from side to side and more pronouncedly convex from end to end. Upper surface markedly convex. Sometimes pecked but otherwise unmodified. Twelve whole and 9 fragmentary specimens.

Dimensions: Largest Specimen— $7\frac{1}{2}'' \times 2'' \times 2\frac{1}{2}''$

Smallest Specimen— $5\frac{1}{4}'' \times 2\frac{1}{2}'' \times 2''$

Provenience: One was found on the floor of Structure G and one on the upper floor of Structure F. Remainder found in refuse.

Type B: Two grinding surfaces which meet to form a ridge. Remainder convex. In cross-section the shape is essentially that of a triangle with one convex side. In most cases the two grinding surfaces are of equal size and the convex portion, although pecked, does not appear to have been used for grinding. In one example, however, there is one broad and one narrow ground surface and the convex surface also shows some slight evidence of grinding. Three whole and 6 fragmentary specimens.

Dimensions: Largest Specimen— $6'' \times 2\frac{1}{2}'' \times 2\frac{1}{2}''$

Smallest Specimen— $5\frac{1}{2}'' \times 2\frac{3}{4}'' \times 2\frac{1}{2}''$

Provenience: One found on floor of Structure B, remainder in refuse.

Type C: Made from flat ovoid river pebbles. Two grinding surfaces on broad faces. Slightly convex from side to side. Six whole and 5 fragmentary specimens.

Dimensions: Largest Specimen— $6'' \times 3\frac{1}{2}'' \times 1\frac{1}{4}''$

Smallest Specimen— $4'' \times 3\frac{1}{2}'' \times 1''$

Provenience: One found on lower floor of Structure F, remainder in refuse.

Type D: Essentially rectangular with rounded corners. Two broad and one narrow surfaces which show evidence of smoothing although only the narrow portion, which is flat, appears to have been used in grinding. Three whole specimens.

Dimensions: Largest Specimen— $8\frac{1}{2}'' \times 3\frac{1}{4}'' \times 2''$

Smallest Specimen— $5\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1\frac{1}{2}''$

Provenience: All found in refuse. Two in Structure G, 1 near cist.

Discussion:

Corn cobs were found throughout the deposits and it is thought that Metate Types A and B were used for grinding corn. Type A Manos were probably used with the Type A Metates. Manos of Type B may have been used with Type B Metates. One of the smoothed faces may have been used in scraping the ground grain from the milling stone which was not open at the end. Type C Manos and shallow Type C Metates have been found in non-horticultural sites and may have been used together here, possibly in the preparation of wild seeds. One Type C Mano, however, is stained with hematite which would suggest use in the preparation of pigments. No nether milling stones were found which would appear to be suitable for use with Type D Manos. The largest specimen, which weighs 5 pounds, would probably have required the use of both hands.

CHOPPING AND POUNDING TOOLS

Grooved axes and mauls were lacking at the Turner-Look Site as in most of the remainder of the Northern Periphery. Some artifacts were found, however, which might have served somewhat similar functions although they could not have been hafted.

Choppers (*Fig. 29*):

Specimens Found: 42.

Technology: An edge was produced on one side of a core by the removal of large flakes from either face. These edges are heavily battered. The butt end was usually blunted, presumably to make it easier to grasp. In some cases a portion of the surface crust was permitted to remain, in others sharp edges appear to have been removed by flaking.

Materials: Chert, dolomite, quartz.

Dimensions: Largest Specimen—5"x4½"x2½"
Smallest Specimen—2"x2"x¾"

Discussion:

Some of the larger specimens might have served for chopping wood or preparing building stones although they would, of course, not have been as effective as hafted axes.



FIGURE 29—Choppers.

Mauls(?):

Specimens Found: 4.

Technology: Little modification of stream cobbles. Some pecking along the sides, presumably to make the implement easier to grasp. Ends heavily battered. One specimen contains a pit in one end.

Material: Hard quartzitic sandstone.

Dimensions: Largest Specimen—6" long, 4" diameter.

Weight—5½ pounds.

Smallest Specimen—5" long, 3" diameter.

Discussion:

These implements might have been used in breaking building stones or for driving stakes. They might also represent movable anvil stones upon which flaked implements were prepared. Held between the legs of the workman, they would provide a suitable working surface.

Hammerstones (Fig. 30):

Specimens Found: 73.

Technology: Roughly circular or discoidal stones with surfaces heavily battered and pitted except for two or three small unscarred sections where the fingers of the user probably rested.

Materials: Hard quartose rocks such as chalcedonies and jaspers.

Dimensions: 2" to 3½" in diameter.

Discussion:

Earl Morris referred to similar specimens as 'pecking stones' and suggested that they were probably used whenever stone reduction was attempted without chipping or fracture (Morris, 1939, p. 128). They may well have been used for this purpose but they may have had multiple uses and also served in the production of chipped implements. One of these artifacts was found associated with more than 600 flakes behind the "anvil stone" in Structure F. These flakes are relatively large, the size which would be knocked off a stone by percussion to produce a crude blank which might then be shaped by pressure flaking.



FIGURE 30—Hammerstones.

SHAFT SMOOTHERS

Specimens Found: 2.

Technology: Rectangular pieces of sandstone with grooves running longitudinally.

Materials: Fine grained sandstone.

Dimensions: Largest Specimen—4"x1½"x1½"

Smallest Specimen—3¼"x1¾"x¾"

Grooves—5/8" wide, 1/8" deep.

STONE BALLS

Specimens Found: 3.

Technology: Apparently concretions slightly modified by grinding.

Material: Concretions of hard sandstone.

Dimensions: 1¼" to 2" diameter.

UNCLASSIFIED IMPLEMENT

Specimens Found: 1, may be fragmentary.

Technology: Triangular in outline. One surface and one edge marked by the removal of large shallow spalls. One surface extremely smooth with a somewhat greasy appearance. Fine striations running longitudinally.

Material: Hard shaley rock.

Dimensions: 7" long, 3" maximum breadth.

PIERCING, CUTTING AND PERFORATING TOOLS

Materials: Chalcedonies, jaspers, cherts, predominate. Limited use of fine grained quartzite.

Arrow Points:

Specimens Found: 636 whole or broken but classifiable, 219 unclassifiable fragments.

Technology: With eight exceptions all specimens have secondary chipping on all major faces. Good pressure flaking. Eight, made on curved flakes, flaked on only one face.



FIGURE 31—Arrow points, Type A.

Type A: (Fig. 31) Unstemmed, basically triangular. Some have more rounded bases than others but it is impossible to make any clear-cut distinction between them. One hundred and seventy-eight specimens.

Dimensions: Range in length between $\frac{5}{8}$ " and $1\frac{7}{8}$ ". Greatest number $1\frac{1}{4}$ ". Breadth usually less than half of length. Some specimens relatively broad.

Provenience: Found in all levels.

Discussion: This may not be a homogenous group. Some points in this group are so finely flaked that it seems probable that they are finished pieces. Others, however, may be unfinished blanks or rejects. Some of the relatively broad specimens may be small knives rather than projectile points.



FIGURE 32—Arrow points. Above, Type B; below, Type C.

Type B: (Fig. 32) Slender, laterally notched, with stems as large or larger than the shoulders. Bases often slightly convex, sometimes straight, occasionally very slightly concave. The differences are too slight to appear meaningful. Eight made on curved flakes, flaked only on one side. Three hundred and ninety-four specimens.

Dimensions: Range in length between $\frac{3}{4}$ " and 2". Greatest number about $1\frac{1}{4}$ ".

Type C: (Fig. 32) Slender, corner notched, expanding stems smaller than shoulders. Barbing varies from pronounced to almost absent. Sixty-three specimens.

Dimensions: Range in length between $\frac{3}{4}$ " to $1\frac{1}{2}$ ". Greatest number about $1\frac{1}{4}$ ".

Bone Point: One laterally notched point made from a scapula fragment.

Dimensions: One and one-sixteenth of an inch long.

Discussion:

In Pueblo sites excavated by Roberts (1929), Morris (1939) and Brew (1946) there was a clear-cut distinction between the arrow points of the Pueblo I period and those of the Pueblo II period. The former were corner-notched (Type C) and the latter were side-notched (Type B). At the Turner-Look Site, although 62% of the points were side-notched and only 10% were corner-notched, there is no evidence of chronological variation. The corner-notched variety continued to be made throughout the entire period of occupation. Side-notched points were abundant in all levels.



FIGURE 33—Large stemmed points or knives.

Large Stemmed Points or Knives (Fig. 33):

Specimens Found: 9 whole or broken but classifiable, 3 unclassifiable fragments.

Technology: Eight side-notched, stems as broad or broader than shoulders. Bases slightly convex. Relatively broad. One straight stemmed, base concave. Lacks pronounced barbs.

Dimensions: Range in length between 1 $\frac{3}{4}$ " and 2 $\frac{1}{2}$ ".

Unstemmed Knives (Fig. 34):

Specimens Found: 53 whole or classifiable, 184 unclassifiable fragments.

Technology: Broad, thin, bifacial, well flaked. Would provide good cutting edges.



FIGURE 34—Unstemmed knives.

Dimensions: Many have broken tips so the size range is difficult to determine. The smallest whole specimen is 2" long and the largest 3" long. Some of the larger pieces, if complete, would probably have reached a length of 4" or more.

Type A: Roughly triangular. One end somewhat pointed. Maximum breadth at bottom. Edges more rounded in certain instances than in others but this could be simply the result of individual variation. Twenty-seven specimens.

Type B: Sides essentially parallel or slightly broader in mid-section. In two cases there is a slight tapering above the point of maximum breadth and the end is more pointed. Sixteen specimens.

Type C: Asymmetrical. Seven have one straight and one oblique or somewhat curved side. One of these is alternately bevelled. Two are roughly triangular but with the base at an oblique angle. The remaining specimens taper to a point from an expanded base.

Scrapers (Fig. 35):

Specimens Found: 111.

Technology: Flakes with one or two retouched edges. The naturally sharp edge of a flake was further sharpened by the removal of a few chips but the remainder of the flake was not modified to any appreciable extent. No end scrapers and no well shaped side scrapers. One turtle back scraper.



FIGURE 35—Scrapers.

Saws(?) (Fig. 36):

Specimens Found: 5.

Technology: Flakes with one serrated edge. Otherwise not retouched.



FIGURE 36—Saws(?).

Drills (Fig. 37):

Specimens Found: 17 whole or classifiable, 6 unclassifiable fragments.
 Dimensions: Difficult to determine since most tips are broken. Estimated range of length $\frac{3}{4}$ " to $2\frac{1}{8}$ ".

Type A: Expanded base. In 2 cases little modification of basal end. Three bases so thick that hafting would have been impractical. Thirteen specimens.

Type B: Plain shaft, slightly wider at the base. Two specimens.

Type C: Made from reworked points; 1 made from small side-notched point, 1 made from large corner-notched point with convex base.

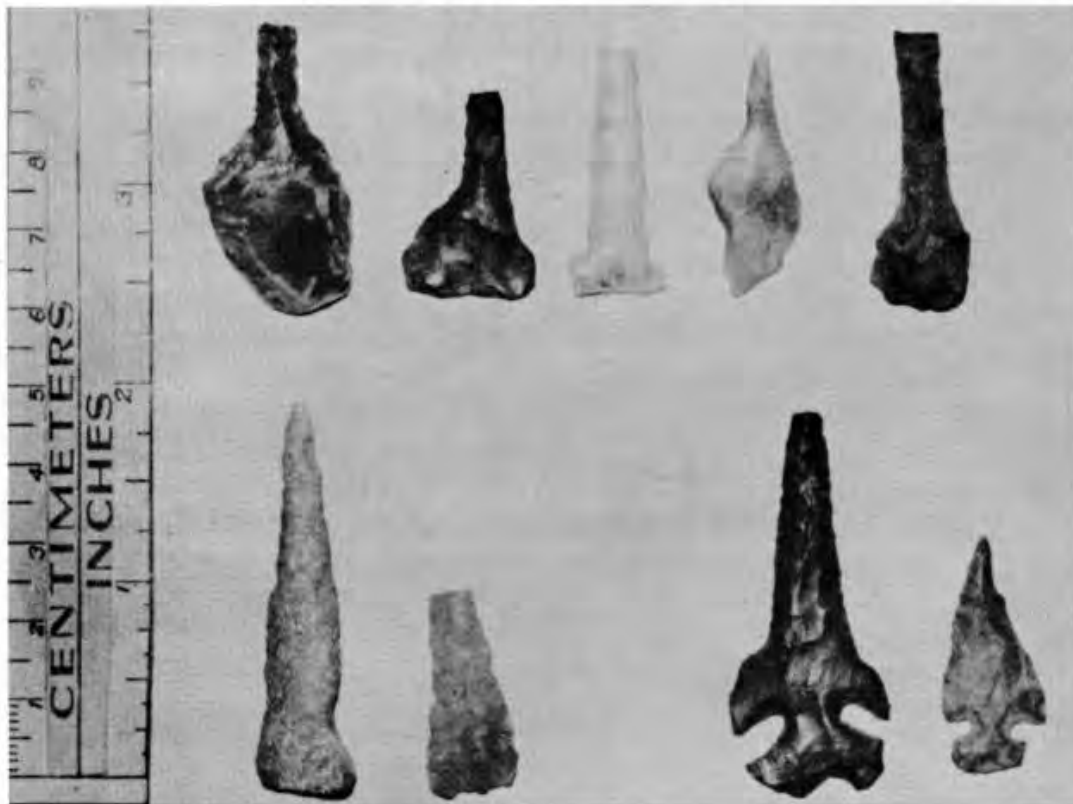


FIGURE 37—Drills.

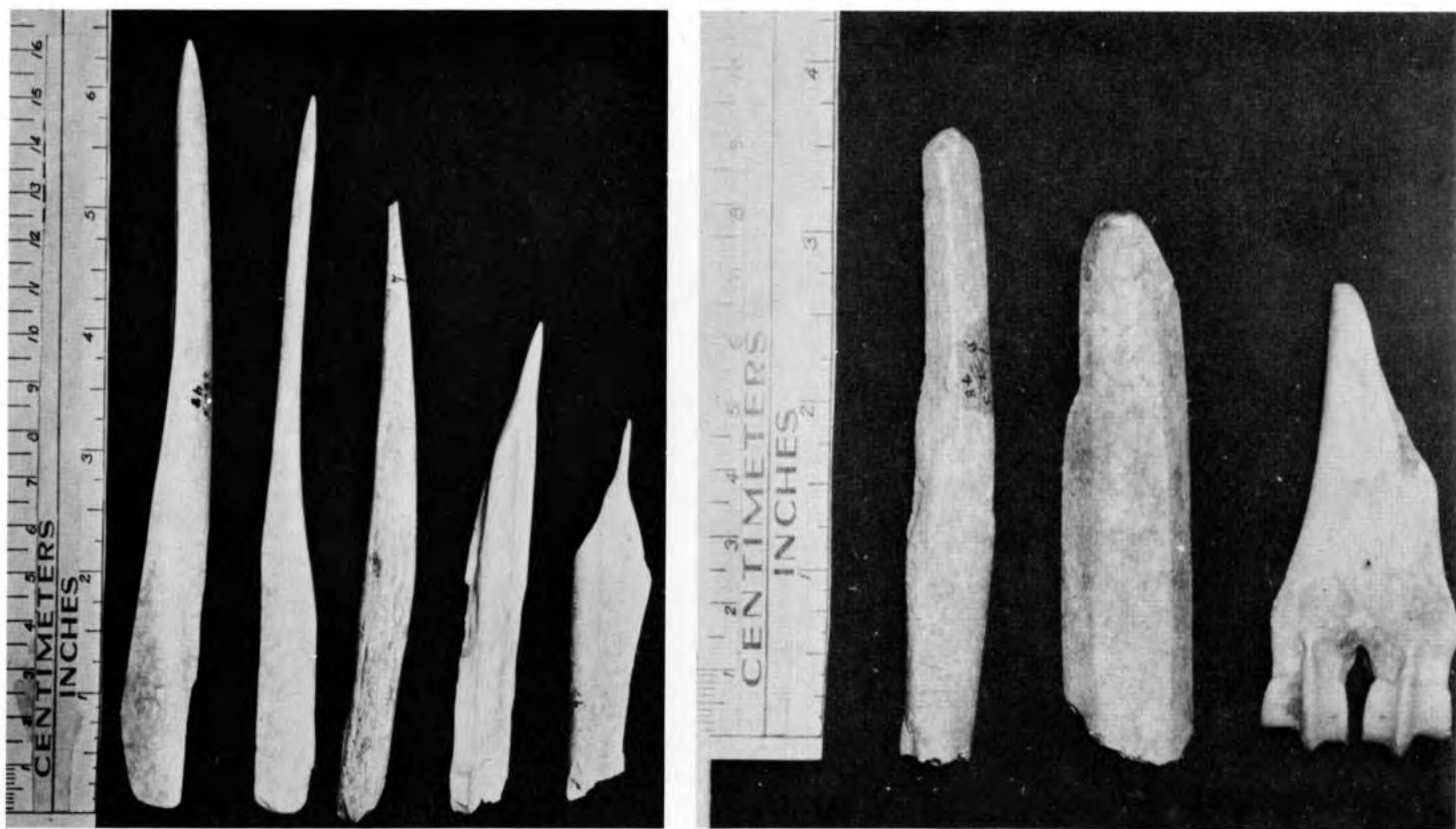


FIGURE 38—Left; Type E awls; right, implements with rounded ends.

BONE AND ANTLER TOOLS

Bone Awls:

Specimens Found: 158 whole or classifiable, 65 unclassifiable fragments.

Materials: Mammal leg bones, primarily deer metapodials.

Type A: Head of bone left intact; 11 specimens.

Dimensions: Range in length from $3\frac{3}{4}$ " to $4\frac{1}{4}$ ".

Type B: Head of bone unworked except by original splitting; 27 specimens.

Dimensions: Range in length between $3\frac{1}{2}$ " to $4\frac{1}{2}$ ".

Type C: Head of bone partly worked down; 16 specimens.

Dimensions: Range in length from $1\frac{3}{4}$ " to $5\frac{1}{2}$ ".

Type D: Head of bone wholly or almost wholly removed; 2 specimens.

Dimensions: Range in length from 3" to $5\frac{3}{4}$ ".

Type E: Splinter awls, made from splinters of leg bones, possibly deer; 63 specimens (Fig. 38).

Dimensions: Range in length from $3\frac{1}{2}$ " to $3\frac{5}{8}$ ".

Miscellaneous:

Thirteen specimens made from ribs of large animal, possibly deer.

One made from fragment of scapula, possibly from deer.

One made from bird leg bone.

One made from whole rib, possibly bird.

Dimensions: Range in length from $1\frac{5}{8}$ " to $6\frac{1}{4}$ ".

Discussion: Classified according to system used by A. V. Kidder for the bone awls found at Pecos (Kidder, 1932).

Miscellaneous Bone Tools and Implements:

1. Slender cylindrical object with pointed end. Resembles a needle but lacks an eye. Smooth, highly polished. Length— $3\frac{1}{8}$ ".
2. Two small spatulate objects from bone splinters, both fragmentary. Other ends may have been awls.
3. Implements with smooth rounded ends. Seven made from splinters of massive long bone, 4 made from splinters of heavy ribs. Five similar specimens made from deer metapodials. Less pointed than specimens from Pecos tentatively classified as weaving or matting tools, and lack high polish on the shaft which characterized the former (Kidder, 1932) (Fig. 38).
4. Two broad flat objects made from ribs of large animals, possibly bison. Pointed at one end but tips not very sharp. One edge fairly straight and the other, which shows signs of use, at an oblique angle.
5. Notched scapulae; 3 fragmentary specimens. Deeply grooved teeth, highly polished edges. Notches vary in size. At the base of large notches are grooves extending over the face of the bone. Experiments conducted by Earl Morris have shown that such implements are wholly effective in freeing yucca fibers from the bark and pulp of the leaf and leaving them in condition to be twisted into cord.

A similarly notched rib found in a Basketmaker II site near Durango retained some of the fibers (Morris, 1954) (Fig. 39).

6. Fragment of large barbed object. Expanding stem with rounded base. Made from a section of long bone of large animal, possibly bison or elk. Deep grooves worn into the surface of both faces at point where the barb projects from the stem (Fig. 39).



FIGURE 39—Above, notched scapulae; below, fragment of large barbed object.

Antler Tools:

Remarkably little horn was used. Deer antlers must have been available in quantities but none was found in the refuse. One fragmentary tine was found with the tip worn smooth at an oblique angle.

Gaming Pieces:

Fourteen bone objects and 1 pottery disc, believed to have been used in playing a game, were found together on the floor of Structure H, $1\frac{1}{2}$ feet west of Firepit 3 (Fig. 40). Eleven were made of flat pieces of bone, carefully smoothed and polished, and were remarkably uniform in appearance. The largest was $1\frac{1}{2}$ " long and the smallest $1\frac{1}{4}$ " long; all were $\frac{1}{4}$ " wide. All bore traces of hematite on one surface. This surface was marked by tiny striations, usually diagonal, but horizontal in 2 cases. Another piece, in the same size range, was incised. On 1 face were 4 diagonal grooves in the center and fine lines at cross angles to each other at either end; the other side had incised triangles at both ends. There were also 2 larger pieces. One, $5\frac{5}{8}$ " long and $\frac{3}{8}$ " wide, bore similar designs running lengthwise over 1 face. On the other side

3 diagonal grooves were incised near 1 end. This was the only piece that was not tinted with hematite. Another piece of the same length but $\frac{1}{2}$ " wide was undecorated, only roughly shaped, and the concave surface of the inner part of the bone was clearly visible. Hematite was found on this face which was marked by fine striations along the edges. The ceramic piece was $\frac{3}{4}$ " in diameter and was made of a sherd of gray ware. The edges were smoothly ground and the surfaces polished.

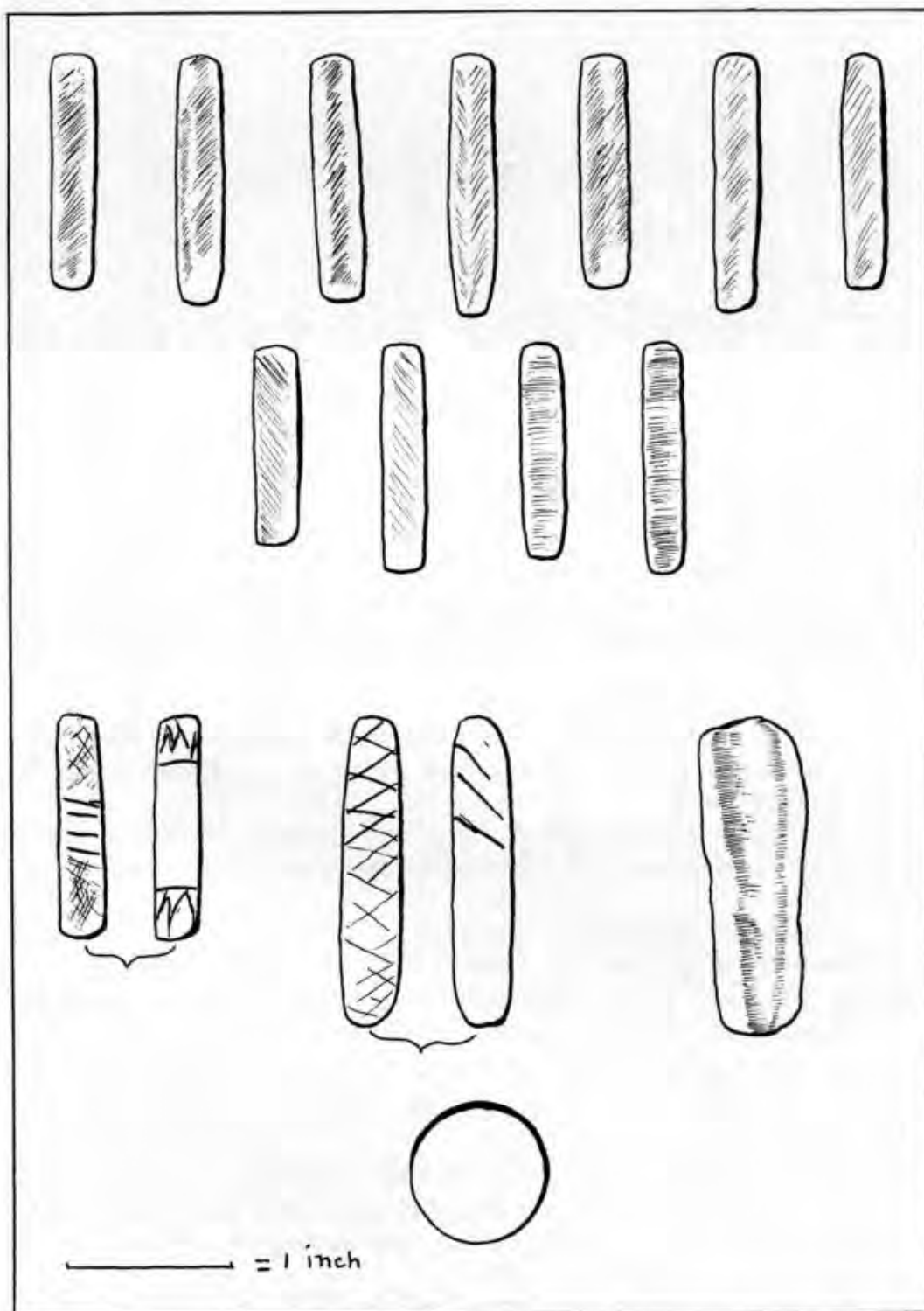


FIGURE 40—Gaming pieces found together on the floor of Structure H.



FIGURE 41—Bone gaming pieces.

Other Bone Gaming Pieces (Fig. 41):

Specimens Found: 160.

Provenience: Found in refuse.

Type A: Flat, rectangular, made from pieces of long bones. Carefully smoothed and polished. Eighty-eight specimens, subdivided as follows:

Plain: 25 specimens.

One face with striations and tinted with hematite; 35 specimens.
Horizontal grooves on one face which is tinted with hematite; 9 specimens.

Miscellaneous decorations, dots and grooves, shown in Figure 42; 18 specimens of which 10 have hematite on undecorated face.

Perforated in center; 1 specimen.

Dimensions: Range in size from $\frac{3}{4}$ " by $\frac{1}{4}$ " to $2\frac{5}{8}$ " by $\frac{1}{2}$ ".

Type B: Flat oval pieces made from long bones. Carefully smoothed and polished. Twelve specimens, 9 with hematite on one surface.

Type C: Rectangular, made from ribs. Cancellous structure on one face. Twenty-one specimens, 4 with hematite on rough surface.

Dimensions: Range in size from 1" by $\frac{5}{16}$ " to $2\frac{3}{8}$ " by $\frac{3}{4}$ ".

Type D: Rectangular, made from long bone fragments, one surface concave the other convex. Less finely finished than flat pieces. Edges often fairly rough. Thirty-seven specimens, 10 colored on the concave surface with hematite.

Dimensions: Range in size from $1\frac{1}{2}$ " by $\frac{5}{16}$ " to $2\frac{3}{4}$ " by $\frac{5}{8}$ ".

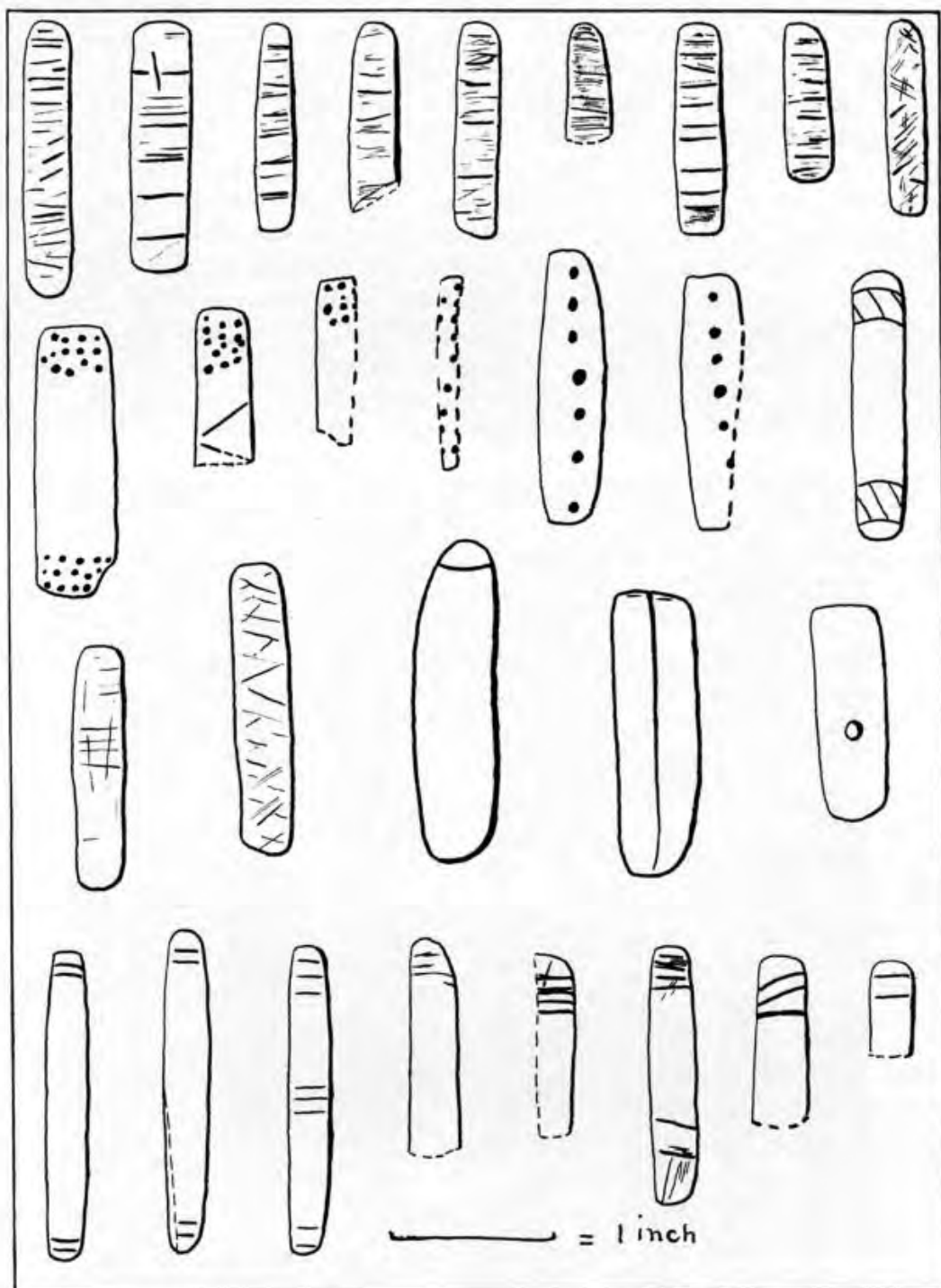


FIGURE 42—Decorated bone gaming pieces.

Antler Gaming Pieces(?):

Specimens Found: 13.

Technology: Smoothed and polished. Some are slender and some broad. The method by which such pieces were produced is probably shown by an elk antler with tines removed which lay by outdoor Fireplace No. 4. The basal portion, where the horn joins the skull, was sawed but the tines had been broken off leaving rough edges. A section of the center portion had been removed down to the cancellous layer. Apparently it was taken off in narrow strips after the section to be removed had been outlined with deep grooves, for one such strip was still in position. With a little additional shaping after removal this would provide an object like the specimens made of antler which have been tentatively classified as gaming pieces.

Dimensions: Range in length— $1\frac{1}{4}$ " to $2\frac{1}{2}$ ".
Range in width— $\frac{3}{8}$ " to $\frac{3}{4}$ ".
Range in thickness— $\frac{1}{4}$ " to $\frac{1}{2}$ ".

Ceramic and Lithic Gaming Pieces:

Specimens Found: 18.

Dimensions: $\frac{7}{16}$ " to $\frac{5}{8}$ " diameter; $\frac{1}{8}$ " to $\frac{3}{16}$ " thick.

Technology: Edges smoothly ground, surfaces polished.

Materials:

Circular: 9 of gray ware sherds, 5 of thin bedded shaley rock, 1 of hematite, 1 of limonite, 1 of alabaster.

Oval: 1 of Tusayan Black-on-red.

PERFORATED DISCS**Small Perforated Discs (Fig. 43):**

Probably beads.

Specimens Found: 10.

Dimensions: $\frac{7}{16}$ " to $\frac{5}{8}$ " diameter; $\frac{1}{8}$ " to $\frac{3}{16}$ " thick.

Materials: 8 of thin bedded shaley rock, 1 of calcite tempered gray ware sherd, 1 of hematite.

Large Perforated Discs:

Probably spindle whorls.

Specimens Found: 6, all fragmentary.

Dimensions: $1\frac{1}{4}$ " to 3" diameter; $\frac{3}{8}$ " to $\frac{5}{8}$ " thick.

Materials: 2 of gray pottery; one with thumbnail decoration on one side, 2 of slate, 2 of sandstone.

Discussion:

One artifact found may have served as a base on which beads or whorls were perforated. It is a roughly rectangular nodule of chalcedony $4\frac{1}{2}$ " long, $1\frac{1}{2}$ " wide and 1" thick. On 1 end there is a hemispherical depression $\frac{1}{8}$ " in diameter. One broad face is covered with a natural encrustation, the other bears minute striations which suggest that it was used for smoothing and polishing.

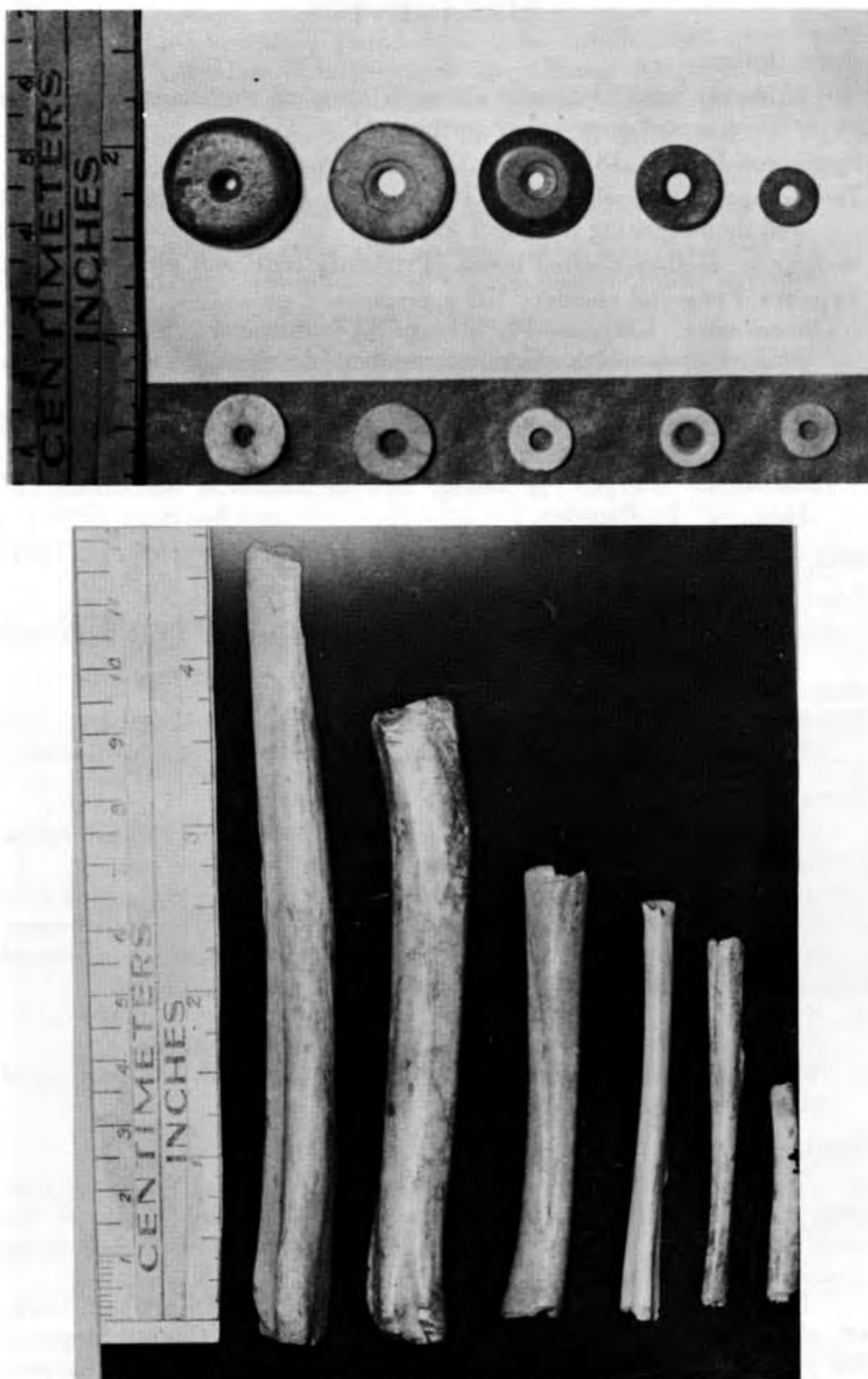


FIGURE 43—Upper, perforated discs of stone, above; bone disc beads, below.
Lower, bone tubes.

ORNAMENTS

Bone Tubes:

Probably used as beads, although some of the longer specimens might have served some other purpose (Fig. 43).

Specimens Found: 137.

Technology: Cut probably made by incising a groove around the shaft and then breaking it. Edges ground.

Materials: Hollow shafted bones. Primarily radii and ulnae of birds.

Type A: Long and slender; 107 specimens.

Dimensions: Largest— $4\frac{3}{4}$ " long, $\frac{1}{2}$ " diameter. Smallest— $\frac{1}{2}$ " long, $\frac{1}{8}$ " diameter. Greatest number—between 1" and 2" long, and about $\frac{3}{16}$ " in diameter.

Type B: Broad in relation to length. Thirty specimens, of which 6 were ground at one end to give a bell-like shape.

Dimensions: Largest $\frac{1}{4}$ " long, $\frac{1}{2}$ " in diameter. Smallest— $\frac{3}{8}$ " long, $\frac{1}{4}$ " in diameter.

Bone Disc Beads (Fig. 43):

Specimens Found: 32.

Technology: Disc produced by grinding and polishing. Drilled through the center.

Materials: Flat pieces of bone.

Dimensions: Most specimens are $\frac{5}{16}$ " in diameter, $\frac{1}{8}$ " thick. Perforations $\frac{1}{8}$ " in diameter. Largest specimen, $\frac{7}{16}$ " in diameter.

Bone Pendants:

1. Distal ends of rodent humeri, probably rabbit, perforated below the condyles. Two specimens, one 1" long, one $\frac{3}{4}$ " long.
2. Roughly rectangular pieces of bone, slightly narrower at one end, which is perforated. Edges ground. Two specimens, both broken so impossible to determine total length. One piece has a second perforation at the point of the break.
3. Roughly oval piece of flat bone, one end narrower than the other. Edges ground. Perforated at narrow end. One specimen.
4. What appears to be a mastoid process, cut, ground, and perforated at the broad end.

Shell:

Ten whole and fragmentary shells, 3 perforated at the lower end. One perforated olivella shell was found in the thoracic cavity of the child in Burial I. It had probably been suspended on a cord worn around the child's neck.

Eight specimens were identified by Dr. George P. Kanakoff, Curator of Invertebrate Palaeontology at the Los Angeles County Museum. Six were *Olivella biplicata* Sowerby, one was *Olivella baetica* Carpenter, one was *Mitra catalinae* Dall. All three species are very common on the Pacific Coast, but the genus *Mitra* is found in deeper water and was rarely used by the Indians.

SLATE PLAQUES

One whole specimen found resting on child's head in Burial I (Fig. 25). Circular. Edges shaped by flaking. Slight evidence of grinding. Four and one-half inches in diameter, $3/16$ " thick.

A fragmentary piece was found on the floor of Structure H. This specimen was probably of the same size as the complete specimen.

PIGMENTS

Fragments of hematite and limonite, often smoothed and marked by fine striations. Hematite, 32 specimens. Limonite, 24 specimens.

PIPES (Fig. 44)

Tentative classification, since none show evidence of burning.

1. Tubular object of alabaster, slightly smaller at one end. One and five sixteenths inches long; outside diameter—broad end $1\frac{1}{8}$ ", narrow end 1". Hole roughly parallels flare of the exterior, but walls are thicker at the small end. Walls $1/4$ " thick at small end, $1/8$ " thick at broad end.
2. Fragmentary mouthpiece of alabaster. Constricted neck $1/2$ " below rim. Hole flaring. One-half inch wide at top, $3/16$ " at bottom.
3. Fragmentary mouthpiece of shaley stone. Part of lower portion of tube present. Hole narrow at constricted portion of neck, widens above and below. Estimated aperture at top— $3/4$ ".



FIGURE 44—Pipes. Above, alabaster; below, shaley stone, steatite, pottery.

4. Fragment of steatite; probably part of an unfinished pipe. Grooves on exterior surface, edge rough. Grooves appear to represent an attempt to cut off a section and provide a smooth edge.

5. Elbow Pipe. Fragmentary portion of bowl and stem. Drill marks are clearly visible and the material is extremely hard so it was assumed that it was made of stone. However, geologists to whom it was submitted for examination were unable to identify the material. It was then sent to Anna O. Shepard who reported that it was made of pottery but that she was unable to identify the type. It is reddish in color.



FIGURE 45—Figurines.

FIGURINES OF UNFIRED CLAY (*Fig. 45*)

Two heads, complete, but made without bodies. One with a band of clay across the upper portion. No features indicated. One with mouth and one eye indicated by incision. A small pellet of clay on the left side suggests an ear.

One fragmentary piece, body missing. Head broadest at top. Two planes meeting to form a pronounced ridge. Similar specimens illustrated Plate 25, Morss, 1931.

Two possible termini. One specimen roughly cylindrical. Slightly constricted just above the base. One fragmentary piece, flattened on one side, slightly convex on the other. The convex surface is marked by 6 rows of small punctations.

CEDAR BARK

Masses of decomposed material, thought to represent cedar bark, were found throughout the deposits but positive identification could not be made. On the northwest side of Structure F, just outside the building where the wall gave some additional protection, was found a concentration of shredded cedar bark.

BASKETRY

Specimens Found: 55 fragments.

Discussion: The fragments are too small, rarely more than an inch square, to permit determination of basket forms. The basketry is covered with gilsonite. This protective coating resulted in the preservation of material which would normally have disappeared in an open site. Unfortunately, though, the coating is sufficiently thick that it has been possible to determine the technique of weaving employed in only one instance. This piece, identified by Robert F. Burgh, was coiled and had a single split rod foundation with interlocked stitches. Other specimens have been submitted to Kate Peck Kent for study. She has not been able to determine the techniques and is not certain that she will be able to do so. She feels, however, that further study, to be undertaken at a later date, is desirable. Efforts have been made to dissolve the gilsonite but the basketry elements have disintegrated.

POTTERY

The Turner-Look Site yielded no complete pots but 3 partially restorable vessels and 4416 sherds were recovered. Sherd frequencies were as follows:

TABLE I

<i>Type</i>	<i>Number</i>	<i>Percentage</i>
Plain Gray	3875	87.7490
Gray with Coffee Bean Applique.....	12	.2717
Corrugated	267	6.0462
Gray Exterior, Black Interior.....	37	.8378
Mancos Black-on-white	161	3.6458
Tusayan Black-on-red	21	.4755
Middleton Black-on-red	7	.1585
Deadmans Black-on-red	36	.8152

Totals4416 99.9997

Provenience of sherds is shown in Tables 2, 3, 4, pp. 76 and 77.

Plain Gray Ware:

When some plain gray sherds were placed in an acid bath to clean them, the coarse white temper which showed through on the surface was completely eaten away. In 1940 samples were submitted to Stanley Stubbs of the Laboratory of Anthropology for microscopic examination. He reported that the tempering material consisted of crushed calcite crystals.

At that time calcite tempered pottery had not been reported from the Southwest. It appeared to be a most unusual choice of material in an area where there are no limestone formations. The following year an effort was made to find a source for this material near the site. After much careful searching some calcite geodes were found in the Mancos Shale deposits of the Book Cliffs, but they were far from plentiful. Calcite has the advantage of being easily pulverized but it is an extremely unsatisfactory tempering agent, for it decomposes if heated over 600° Centigrade. Since more suitable material was readily available and calcite was not easy to obtain, the use of this material appeared to be significant.

An effort was made to determine how many of the plain gray sherds were calcite tempered. This was done by making a fresh break on a sherd and touching it with hydrochloric acid. Those that released CO₂ were regarded as containing calcite. The possibility that some calcareous clays would produce such a reaction was considered and a number of Southwestern types were tested, but there were no positive reactions. Accordingly, the test appeared to be valid.

In 1953, however, some western Utah types which were not calcite tempered were tested with acid and some of these fizzed as did the calcite tempered specimens. By this time a more detailed study of the site and the artifacts had been made and it was obvious that there was a close relationship between the Turner-Look Site and the earlier Fremont Basketmaker sites of the Castle Park area of northwestern Colorado which also produced calcite tempered pottery. In this area too, calcite was a far from obvious choice for a tempering agent so the whole problem of calcite tempering appeared increasingly important. Since the simple test originally used was inadequate, it was decided to examine and test all of the plain gray and corrugated sherds under a binocular microscope. Marianne Stoller undertook the microscopic examination of the sherds and Dr. Harold S. Colton of the Museum of Northern Arizona examined representative specimens and conducted two experiments oxidizing sherds in combustion tubes.

Microscopic examination revealed that 60% (2385 sherds) of the plain gray pottery was tempered with pulverized calcite, 29% (1123 sherds) was tempered with crushed gray rock and 11% (427 sherds) contained an angular quartz temper. A new type with three varieties may be described.

Turner Gray—VARIETY I.

Illustrations: This report, Fig. 46.

Type Specimens: Denver Museum of Natural History Collections.

Specimens Nos.	TS	1-12
	100	

Type Site: Turner-Look Site, Grand County, Utah.

Time: Late 11th Century.

Description:

Constructed: Coiled and scraped. Structural coils sometimes clearly visible on interior. Wide coils. Some as much as an inch wide.

Core Color: Buff to gray. Clay sedimentary or alluvial.

Fired: Reducing atmosphere. Not very well controlled.

Temper: Angular, white or light gray, pulverized calcite, abundant. Shows through on surface. Probable source of material, calcite geodes in the Mancos Shales.

Core Texture: Very coarse.

Vessel Walls: Weak.

Fracture: Friable.

Surface Finish: Unslipped. Eighty-two per cent rough, irregular, undulating, some shaping possibly done with fingers. Some scraping with a stick or bundle of grass. Eighteen per cent smoother, some evidence of rubbing, but not polished. Decoration extremely rare. Out of 2385 sherds, 2 rims with incised lines on lips, 2 handles with finger nail incisions, 1 handle with horizontal incised lines, 1 handle with small punctations. Fragments of two vessels with appliqued clay pellets, in one case plain ovals, in the other circular with center punctations.

Surface Color: Exterior—light to dark gray. Interior—light gray or buff.

Fire Clouds: Common.

Thickness of Walls: Maximum 8mm, minimum 3 mm, average 6 mm.

Forms: Large wide mouthed jars with globular bodies and rounded or slightly flattened bottoms. Many with rim to body handles, usually flattened cylindrical. Some have doubly recurved necks.

Rims:



Comparisons: Similar pottery has been found in Hells Midden (Lister, 1951), and in Marigold's, Mantle's, and Barn Caves (Burgh and Scoggins, 1948) in Castle Park, Colorado, in 12 sites in the Uintah Basin investigated by Reagan, in 2 sites in Nine Mile Canyon investigated by Reagan, and in 11 sites in the Douglas Creek drainage of Colorado (2 investigated by Reagan, 9 by Wenger). The Castle Park sites are older than the Turner-Look Site. The other sites have not been dated.



FIGURE 46—Partially restored pot, Turner Gray, Variety I.

“EXPERIMENT No. 161, (Museum of Northern Arizona)” by Harold S. Colton (August 3, 1953).

“Problem: To oxidize sherds in Combustion Tube to 800° C.

Material: Calcite tempered sherds from Turner-Look Site at Cisco, Utah.

1. A, $\frac{N4-1}{41}$: C, $\frac{K8-1}{41}$: F, $\frac{St. 3}{41}$ $\frac{L5-2}{41}$

2. Kanosh, Utah, from Julian Steward. Nos. 9150, 9389, 9393:

3. Black on red sherds, misc. sites Elden Pueblo, NA1160, AT 4729.

Methods: Heated 33 minutes to 820° C.—Combustion Tube.

Results:

1. Calcite tempered sherds Cisco, Utah, all crumbly.

A $\frac{2.5\text{YR}}{7/4}$ Pink

C $\frac{2.5\text{YR}}{7/4}$ Pink

F $\frac{2.5\text{YR}}{7/4}$ Pink

2. Kanosh, Utah sherds:

No. 9150 $\frac{7.5\text{YR}}{8/4}$ Pink

No. 9389 $\frac{10\text{YR}}{6/3}$ Light yellowish Brown

No. 9393 $\frac{7.5\text{YR}}{8/4}$ Pink

3. Misc. Red sherds:

Elden Pueblo: Unaffected

NA1160: Black did not burn off.

AT4729: Black partly burned off.

Conclusions:

1. Calcite tempered sherds from Cisco, Utah—Sedimentary or alluvial clay.
2. Kanosh, Utah sherds—Basalt cinder temper—alluvial or sedimentary clay.
3. Elden Pueblo sherd—San Lorenzo Red-on-brown.
NA1160—Nutrioso Black-on-red.
AT4795—Walnut corrugated."

Turner Gray—VARIETY II.

Synonym: Plain Gray, Type C, Nine Mile Canyon (Gillin, 1936). Some similar sherds found in Range Creek Canyon by Leonard L. Leh have been called Range Creek Gray by Lyndon Hargrave, but he has applied the same name to other sherds found in the same locality which have a darker temper. The latter closely resemble Gillin's Type A.

Type Specimens: Denver Museum of Natural History Collections.

Specimen Nos. $\frac{\text{TS}}{101}$ 1-12.

Type Site: Turner-Look Site, Grand County, Utah.

Time: Late 11th century.

Description:

Constructed: Coiled and scraped.

Core Color: Usually gray but ranges from buff and reddish brown to black.

Fired: Reducing atmosphere.

Temper: Angular fragments of light gray rock, occasionally in varying proportions mica and shiny black material. Abundant. Possible source of gray rock, siltstones of the Mancos Shales.

Carbon Streak: Usually absent. Present in a few cases.

Core Texture: Variable, fine to coarse.

Vessel Walls: Medium strong to weak.

Fracture: Friable to dense.

Surface Finish: Unslipped. Twenty-six per cent rough like predominant type of Turner Gray. Seventy-four per cent smooth. Rarely polished. Decoration extremely rare. One thousand one hundred and twenty-three sherds, 3 with applied clay pellets, 2 circular, 1 oval.

Surface Color: Exterior—light to dark gray. Interior—light to dark gray, rarely buff.

Thickness of Walls: Maximum 6mm, minimum 2mm, average 5mm.

Forms: Wide and narrow mouthed jars. Some with rim to body handles. Some with doubly recurved necks. Few bowls.

Rims:



“EXPERIMENT No. 160 (Museum of Northern Arizona)” by Harold S. Colton (August 1, 1953)

“Problem: To compare sherds from Turner-Look site near Cisco, Utah, with similar sherds from other parts of Utah.

Method: To oxidize sherds of Range Creek Gray from Eastern Utah collection made by Dr. Leh and those from Cisco, Utah.

Fired: One Range Creek sherd and four Turner-Look sherds in Combustion Tube, one-half hour to 800°. Burned out carbon and oxidized the paste.

Results: 4 Cisco sherds all 7.5YR/ $\frac{8}{4}$ (“Pink”)

Range Creek Gray—5 YR/ $\frac{6}{4}$ (“Light reddish brown”)

Conclusions:

Range Creek Gray rock temper.

Cisco A. 4, 4b + 2 b angular quartz temper.

B. 2, 8, 10, 12, oxidized, show gray rock temper.

C. 1, 2a, 3, 4a, 5, 6, 6a, 6b, 7, 9, 10a, 10b, 11, not oxidized. Appear to have rock temper similar to the four sherds tested (2, 8, 10, 12)."

Variety II differs from Variety I in that it is tempered with crushed gray rock instead of calcite crystals, the core texture tends to be finer, the fracture less friable, and the vessel walls are somewhat stronger. Furthermore, 74% of Variety II sherds were smoothed and a few were polished, while only 18% of those of Variety I were smoothed and none were polished. Some Variety II sherds came from bowls but all Variety I sherds are fragments of jars.

The classification of the quartz tempered gray pottery involves serious problems. Seventy-eight per cent of it is roughly finished and resembles Variety I. Rim sherds indicate the presence of wide-mouthed jars with rim to body handles. There are, however, some bowl fragments and some polished sherds which more closely resemble Variety II. It seems desirable to try to consider the matter from the possible point of view of the potter. The probable source of this tempering material is quartz geodes which occur in the Mancos Shales. These resemble calcite geodes and a potter seeking geodes to pulverize for temper might collect both types without being aware of the difference. The analysis of sherds from bowls with lustrous gray exteriors and polished black interiors suggested that quartz temper was perhaps used interchangeably with calcite. Of the 37 specimens recovered, 22 were gray rock tempered, 12 were calcite tempered, and 3 were quartz tempered. An analysis of the corrugated pottery, however, suggested that possibly the potters did differentiate between calcite and quartz geodes, perhaps on the basis of ease of pulverization, that the quartz, which provides a better temper, was used intentionally, and that the quartz tempered ware should be recognized as a third variety. There was no calcite tempered corrugated. Seventy-two per cent was tempered with quartz and, apart from the surface treatment, resembled the quartz tempered plain gray pottery. The remainder was tempered with gray rock and resembled Variety II.

Corrugated Pottery (Fig. 47):

Of the 267 corrugated sherds found at the Turner-Look Site, 8 represented trade wares. There were 5 pieces of Tusayan Corrugated and 3 sand tempered specimens which had an indented corrugated exterior and a black-on-white interior. Of the remainder, 198 (77%) were characterized by indented corrugation and 60 (23%) were plain or Clapboard Corrugated. Only one sherd showed both plain and indented coils. Over-all corrugation was the rule. On the whole, the pottery was not very well made.

One partially restorable pot was found on the floor of Structure D. It is a wide mouthed jar with an orifice approximately $6\frac{1}{2}$ inches wide. It tapers gradually from the rim to the girdle. The rim is a plain band $\frac{1}{2}$ inch wide. Below are indented coils which range from $\frac{1}{4}$ to $\frac{1}{2}$ inch in width. This specimen was quartz tempered.

On none of the indented sherds is the relief very high and on some there seems to have been some smoothing which partially obliterated the coils and the indentations. A few show fingernail incisions. Coils range from $1/8$ to $5/16$ inches in width.

Plain corrugated sherds were not smoothed and the overlap is clearly visible. Three rim sherds were found which showed corrugations ending at the base of a plain rim band $3/4$ of an inch wide. On another rim sherd the corrugations continued to the lip. Three sherds bore incisions, made with a sharp tool, which cut through the corrugations.



FIGURE 47—Corrugated Sherds.

Painted Wares:

All painted sherds found at the Turner-Look Site represent named types. They make up approximately 5% of the total sherds.

BLACK-ON-WHITE (Fig. 48) :

All black-on-white sherds can be designated Mancos. No vessels could be reconstructed but some groups of sherds could be isolated which appeared to have been parts of the same vessel. It is estimated that between 10 and 15 bowls, 3 jars, and 2 ladles are represented.

BLACK-ON-RED:

Black-on-red sherds include small numbers of Deadmans, Tusayan and Middleton. It is estimated that these fragments represent 1 or 2 bowls of Middleton Black-on-red, possibly 3 bowls of Deadmans Black-on-red, and 2 or 3 bowls of Tusayan Black-on-red. Deadmans Black-on-red and Tusayan Black-on-red sherds were found with holes bored in them, presumably to permit the binding together of broken pieces. In some cases there is a dark material on the edge of the drilled sherds which may be gilsonite.

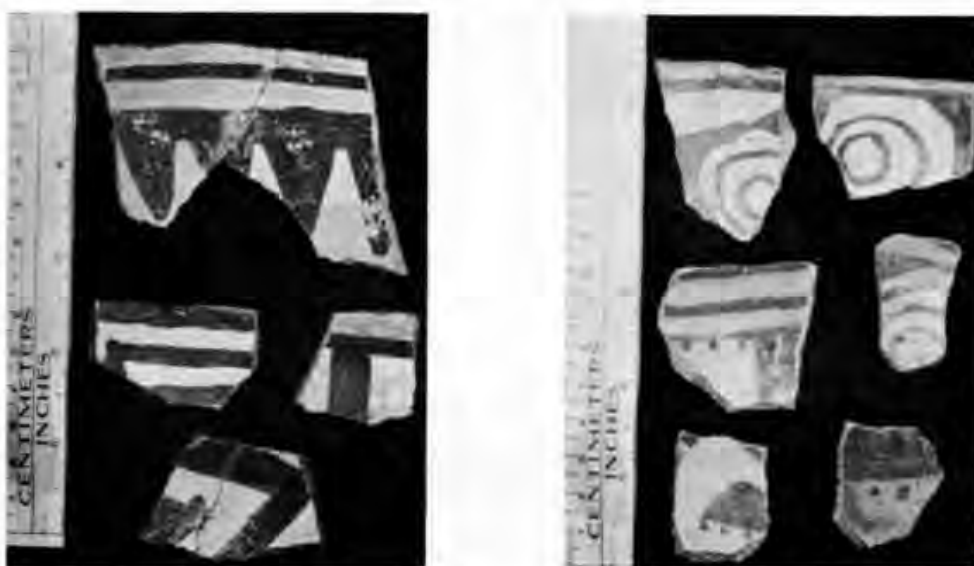


FIGURE 48—Black-on-white Sherds.

Dates:

Wood found at the Turner-Look Site was submitted to Dr. Edmund Schulman of the Laboratory of Tree-Ring Research. He reported:

"One of the beams from the site near Cisco seemed promising on preliminary examination, and its growth curve was derived and minutely compared with the full range of the appropriate master chronologies. I regret to say that no unqualified match was obtained" (Schulman, 1951).

In the absence of tree-ring dates, the age of the site can be estimated only on the basis of sherds of dated pottery types. The presence in a site of obviously brief occupation of Tusayan Black-on-red and Middleton Black-on-red, for which Colton gives beginning dates of 1050 A.D. (Colton, 1952), indicates that it was not occupied until about that time or later. The occurrence of Deadman's Black-on-red, with an end date of 1060 A.D. (Colton, 1952), places the occupation of the Turner-Look Site as beginning not long after 1050 A.D. Presence of Mancos Black-on-white fits with a late 11th century dating (O'Bryan, 1950; Reed, 1944).

Sherd Distribution:

Sherds found in the refuse in House Cluster I which contained structures without side entrances were analyzed separately, and so were those found in the refuse in House Cluster II which contained structures with side entrances. Sherds found in the fill of structures were also analyzed. It was thought that some age difference between the two houses types might become apparent, but no significant results were obtained. All pottery types represented at the site were found in each cluster. Cluster II contained a somewhat smaller percentage of calcite tempered gray ware and a larger percentage of corrugated, but the sherd count is so small that the presence or absence of a single vessel would make an appreciable change in the percentage. These sherd counts are presented in the following Tables.

TABLE II
ANALYSIS OF SHERDS FOUND IN REFUSE AROUND HOUSES
Cluster I

Type	1	2	Level			5	Totals	Approx. %
			3	4				
Plain Gray Ware								
Calcite Tempered	198	366	306	199	57	1126	52%	
Plain Gray Ware								
Gray Rock Tempered.....	92	291	156	107	16	662	30%	
Plain Gray Ware								
Quartz Tempered	17	52	54	46	7	176	8%	
Gray with Coffee-								
Bean Applique		3	1	5		9	.5%	
Black Exterior								
Gray Interior	4	6	6	7		23	1%	
Corrugated	23	24	41	6		94	4%	
Mancos Black-on-white ...	13	33	14	10	1	71	3%	
Deadmans								
Black-on-red	6	7	2	1	1	17	1.5%	
Tusayan								
Black-on-red	1	1	4	1		7		
Middleton								
Black-on-red			3			3		
Totals	254	783	587	382	82	2187	100%	

TABLE III
ANALYSIS OF SHERDS FOUND IN REFUSE AROUND HOUSES
Cluster II

Type	1	2	Level				6	7	Totals	Approx. %
			3	4	5					
Plain Gray Ware										
Calcite Tempered	84	54	60	16	16	5	2	237	41%	
Plain Gray Ware										
Gray Rock Tempered.....	45	39	28	22	11			145	25%	
Plain Gray Ware										
Quartz Tempered	29	11	19	5	5			69	12%	
Gray Exterior										
Black Interior		2	2		2			6	1%	
Corrugated	13	9	56	3	2			83	15%	
Mancos										
Black-on-white	8	10	2	2	3			25	4%	
Deadmans										
Black-on-red	1	3						4	2%	
Tusayan										
Black-on-red	1	1						2		
Middleton										
Black-on-red	3							3		
Totals	184	129	167	48	39	5	2	574	100%	

TABLE IV
ANALYSIS OF SHERDS FOUND IN FILL IN BUILDINGS

Type	Structures								Totals
	A	B	C	D	E	F	G	H	
Plain Gray Ware									
Calcite Tempered	81	63	217	10	75	108	104	304	962
Plain Gray Ware									
Gray Rock Tempered.....	14	27	39		40	43	30	123	316
Plain Gray Ware									
Quartz Tempered	5	22	32		24	37	35	27	182
Gray with Coffee-									
Bean Applique				1			2		3
Gray Exterior									
Black Interior				1	2	2	2	1	8
Corrugated	1	3	17	2	29	8	4	26	90
Mancos									
Black-on-white	17	3	8		15	10	3	4	60
Deadmans									
Black-on-red		2	3		2	3	1	4	15
Tusayan									
Black-on-red		3	1		1		3	4	12
Middleton									
Black-on-red		1							1
Totals	118	124	317	14	188	211	184	493	1649

ANIMAL BONES

The bones of the following mammals were found in the site. The identifications were made by Dr. Richard G. Beidleman, Department of Zoology, Colorado A. and M. College. The most common remains were of Mule Deer and Cottontail Rabbits.

Class Mammalia:

Order Canivora

Family Canidae

Genus *Canis* Coyote (?)

Family Felidae

Genus *Felis* Cougar (?)

Genus *Lynx* Bobcat (Probably *Lynx baileyi*)

Order Rodentia

Family Sciuridae

Genus *Cynomys* (Undoubtedly *C. leucurus*,
White-tailed Prairie-dog)

Order Lagomorpha

Family Leporidae

Genus *Lepus* Jack Rabbit

Genus *Sylvilagus* Cottontail

Order Artiodactyla

Family Cervidae

Genus *Cervus*Wapiti or American Elk (*C. canadensis*)Genus *Odocoileus*

Mule Deer

Family Bovidae

Genus *Bison*(*B. bison bison*)Genus *Ovis*Mountain Sheep (*O. canadensis*)

Bird bones have not yet been identified except for the toe bone of a Golden Eagle.

PLANT REMAINS

Maize was the only plant represented in the refuse but conditions were not ideal for the preservation of plant materials and others may also have been used. Only charred cobs were found. They were sent to the Henry Shaw School of Botany at Washington University. Dr. Edgar Anderson made a brief preliminary examination. A more detailed study was made by Dr. Norton H. Nickerson who prepared the following report for use in this publication.

"Turner-Look Site Maize"

by

NORTON H. NICKERSON

"The sample consisted of 50 cobs and fragments. There are nearly equal numbers of tapered and cigar-shaped cobs in this collection; some were not used in this study because of their fragmentary nature. Cobs are short, 3-8 cm long, charred, with medium shank diameters and medium wide kernels in an average number of 12 rows. Twenty-seven cobs were examined. The following average measurements were determined. Values are in millimeters unless otherwise indicated. For an explanation of these items, see Nickerson (1953).

Row Number:	8	10	12	14	16	18	20
	3	5	13	2	3		1
Cupule width:							5.5
Cupule depth:							0.0
% of 8-rowed cobs:							11.0
Shank diameter:							8.0
% of straight cobs:							12.0
Height of Rachis-flaps:							1.0
Kernel thickness:							3.0
% of cobs tapered:							50.0
Lower glume width:							3.7

These data show Turner-Look Site maize was a thin-kerneled race with pyramidal ears. It thus closely resembles the maize found by Burgh and Scoggin (1948) in the Yampa Canyon area. Anderson (1948) has pointed out the extreme "Mexican" qualities of this maize. The data show the Turner-Look Site maize also is Mexican, and that it has had some mixture with maize from the south (cigar-shaped cobs)

and east (cupule depth of zero, 8-rowed straight cobs). Maize from Luster Cave, a site on the western Colorado border, has a definite Eastern (Carter and Anderson, 1945) influence, and is dated at 900-1000 A.D. by Lister and Dick (1952). The maize from the Turner-Look Site, farther to the west, which was probably occupied late in the 11th century was definitely, but not greatly, modified by this type.

There is no evidence that this very Mexican-like maize came to southern Utah by any direct route from the south. Neither is there any direct evidence that it came from the Plains area. There is some evidence that the latter route is the one to consider, because maize from Plains finds is generally more variable than that found in the Southwest or Yampa Canyon area. Evidence indicates a spread of Eastern influence (reported at the Davis Site by Jones (1949) at 700 A.D., and Johnson (1951) at 400 A.D.) northward, and both westward and southwestward from the Plains into the Anasazi and Mogollon areas. This wave had apparently barely reached the Turner-Look Site before it was abandoned. A counter-wave of Anasazi maize, probably before the Eastern wave reached the Southwest, spread some features of Basket-maker maize northward into Utah. Thus the Turner-Look Site peoples had an ancient Mexican maize which had been only slightly modified by both Anasazi and Eastern types. This Mexican maize has not been reported from any other site except Yampa Canyon, where it apparently existed in an even purer state."

SITE IV

Site IV lies on Diamond Creek approximately $3\frac{1}{2}$ miles north of Site I. It consists of a cist within a small overhang in a shale and conglomerate formation about 250 feet above the creek. The cist had an inside diameter of 3 feet and was 3 feet deep. It was formed of sandstone slabs imbedded in gray adobe; in two sections, adobe formed the wall face. It was covered by a roof of slightly burned cedar beams about 2 inches in diameter, chinked with gray adobe, and covered by a layer of red adobe. When found by Mr. and Mrs. Turner the cist was filled with rat refuse. No artifacts were recovered.

SITE V

A second cist was found under a similar overhang approximately one-half mile to the north. It appeared to be of the same type as the first with the same form of superstructure. It was examined a few days before the end of the 1939 season. Time was limited and excavation could not be undertaken then. Unfortunately, by the time it was possible to return to this site, a large portion of the ceiling of the rock shelter had fallen and covered the cist and it was impossible to excavate.

PICTOGRAPHS

Rock surfaces which would provide a suitable base for painting or pecking designs were lacking in the immediate vicinity of the Turner-Look Site but some pictographs were found a few miles away along Diamond Creek.

The first pictograph examined lies half a mile from Site 1 (Figs. 49, 62d). It is a red figure, 15 inches long, painted on the sandstone about 25 feet above the creek. The lower portion is circular and the upper consists of a smaller oval form surmounted by plume-like objects. It is painted in red—save for the designs on the body of the figures which are white. To the right are 2 figures with headdresses. One is a horned figure while the other has 3 projections, one from the top and one from either side. These are also painted in red but are greatly faded.



FIGURE 49—Shield pictograph, Diamond Creek.

Three miles up the creek from Site I are 2 small pictographs painted red. The first has a key-hole shape. Above it is some indecipherable pecking. The other is in the shape of a trapezoid with the broadest portion at the top marked by knob-like projections on either side. Only the outline is painted.

A mile farther on is an exceptionally beautiful picture of an owl painted on sandstone in 2 shades of red, pink, and yellow (Fig. 50). It is over 3 feet high and stands 15 feet above the nearest ledge. Unless it was originally reached by ladders, a portion of the face of the cliff must have crumbled since it was painted.



FIGURE 50—Owl pictograph, Diamond Creek.

Westwater Creek:

Eight miles to the northeast on Westwater Creek, a tributary of Cottonwood, another series of pictographs was found on smooth surfaces of sandstone cliffs. No artifacts were recovered and there is no proof that there is any connection with the Turner-Look Site. However, there are certain shield-bearing figures which somewhat resemble the first pictograph found on Diamond Creek and which resemble pictures found in areas where the Fremont Culture is represented. Since it is felt that the Turner-Look Site is basically Fremont, these pictures, which lie at no great distance from the site, merit description. Within a distance of one-half mile were found 8 panels of pictographs and a few petroglyphs.

PANEL A (Figs. 51, 62e):

There is a human figure, approximately 4 feet high, wearing a horned headdress and carrying a shield with a design which somewhat resembles an hour-glass. It is painted in light red. To the right is a light red animal and various designs in red and white. There is a large inverted triangle with some indistinguishable designs. There are also 4 roughly circular objects, one above the other, with connecting lines between. The lower circle has a dot in the center and 4 pendant lines below. It is possible that these might also represent shields.



FIGURE 51—Pictographs, Westwater Creek. Above, Panel A; below, Panel B.

To the left of the shield-bearer are other paintings done in a darker red which appear to be fresher. Above and slightly to the left of the figure is an oval, approximately the same size as the shield, which bears some amorphous designs. Below it is the figure of a man with a bow or shaft facing a group of 4 horned animals below a symbol which resembles the Greek letter Omega. Higher and to the left are 2 designs which may represent conventionalized bear paws. Further to the left are very faint traces of red paint which are largely indecipherable although one does appear to represent a square-shouldered human figure.

PANEL B (Figs. 51, 62f, g) :

Two shield-bearing figures, one of which has horns, are associated with various lines and circles which cannot be interpreted. All are in red paint. A figure of a mounted horseman, wearing what appears to be a war bonnet, and 2 pecked figures which may represent horses and riders, are superimposed on some of the red lines. These and other mounted figures are probably Shoshonean.

PANEL C (Figs. 52, 62h, i) :

This is probably an extension of Panel B but there is a sharp projection of the cliff and these paintings are around the corner. All are in light red paint. The first painting is a very graceful and skillfully executed animal figure, 2 feet high, thought to be an elk. It would compare favorably with some of the cave art of France and Spain. Next to it is another shield-like symbol, a circle divided into 6 segments with 4 groups of lines extending from the edge. Next comes a figure like a cartoonist's version of a ghost. This is followed by another circle which resembles the first but which has a bar down the center. Each half bears a semi-circle divided in two, and lines extending from the edge. A projection at the base probably represents a leg. There are other amorphous red designs which may represent animals.

PANEL D (Fig. 62a) :

A stick figure in light red is shown with a shaft in the right hand and a shield in the left. There are 2 large hand prints to the left. The thumb is missing from the right hand but it was probably obliterated by weathering. What appears to be a mounted figure in faint white paint is superimposed on a faint red design which cannot be deciphered. Also in faint red is a vague design which might be a mounted figure but which is largely indistinguishable.

PANEL E (Fig. 62j) :

There is a circle, approximately 3 feet in diameter, painted in light faded red with a white dot in the center. Below is a figure on horseback done in bright fresh red. In front of the horseman are 2 pecked hands and a pecked bison.

PANEL F:

A figure on horseback is shown apparently pursuing a bison. Both are painted in bright fresh red.



FIGURE 52—Pictographs, Westwater Creek. Above, Panel C; below, Panel G.

PANEL G (Fig. 52) :

There are 3 figures in dark, but not vivid, red paint with hands with widely extended fingers. Two are small and rather amorphous but the center figure, which is some 18 inches high, is quite clear. The body is trapezoidal. No legs are shown. Two lines extend from the top to 2 white dots which resemble eyes. Above are 2 horns. On the breast are 4 long parallel rectangles painted white.

PANEL H (Fig. 62k) :

There is a circle in dark and light red and white. The center portion is divided with 2 semi-circles in much the same manner as is the second circle in Panel C. There are projecting lines around the edge of the lower portion. To the left is a small square-shouldered human figure painted red and a design in white paint which might represent a mounted horseman.

On the other side of the canyon is the inscription carved by Antoine Roubideau in 1837. Below it is another shield painted in red and white but now, unfortunately, defaced by shots (Fig. 62l).

The presence of paintings showing horses might indicate that these pictographs are of relatively recent origin. It should be noted, however, that in most cases there is a very definite difference in color, and the designs with horses are much darker and more vivid in color and, also, there is one case of superimposition of mounted figures on designs in light faded red. In Panels D and H there are no marked color differences and it is possible that these are of more recent origin. However, the design on the circle in Panel H closely resembles some of the other shield-like paintings found here and in other areas where the Fremont Culture is known to have existed.

Drawings which show design elements of these and other similar pictographs and petroglyphs of shields will be found in Figures 62 to 65.

CONJECTURES CONCERNING THE INHABITANTS OF THE TURNER-LOOK SITE

If archaeologists are to make any valid contribution to anthropology, some effort must be made to reconstruct the way of life of the people whose physical remains, buildings, and artifacts, they have excavated and studied. In the previous section, factual data have been presented; in this section, an effort will be made to interpret some of these facts. No attempt will be made to establish the affinities of these people until data pertaining to other sites of the Upper Colorado Plateau have been presented. It should be noted here, however, that the writer believes that the Turner-Look Site represents a manifestation of the Fremont Culture. Evidence from other sites which are thought to be related will be utilized.

Physical Attributes:

Since only 2 normal adult skeletons were uncovered, little can be said about the appearance of the people. Available evidence suggests that they were of short stature and slight build. The group does not appear to have been an entirely homogenous one, and there was

probably some diversity in facial appearance. With so small a sample, one cannot be sure whether artificial cranial deformation was common. The two normal skulls were not flattened, but the skull of the hydrocephalous individual exhibited lambdoidal deformation. If, as seems possible, the undeformed skulls reflect the local tradition, this skeleton may be that of an Anasazi who had been captured or who had married into the group, or this individual could have been the child of a member of the group and an Anasazi. One can only be sure that this person was reared by someone who followed the child care traditions of the south. However, the porous, crumbling, condition of the bones, which is not necessarily characteristic of hydrocephalous individuals, suggests a possible dietary deficiency. Since the other skeletons show no evidence of such a condition, it may be that this individual was not a member of the group from birth.

The presence of one case of hydrocephaly is only of passing interest in connection with the interpretation of the culture of the inhabitants of the Turner-Look Site. The pathogenesis of the disease is not well known. It is impossible to be sure that this person was mentally defective. The intelligence of most hydrocephalous individuals is below normal, and imbecility and idiocy are not uncommon. Sometimes, however, the mentality is normal and, rarely, with mild degrees of hydrocephaly such as this, even supernormal (Wechesler, 1940).

Economy:

The inhabitants of the Turner-Look Site practiced agriculture and hunted. Corn is the only crop for which there is evidence, but it is entirely probable that other domesticated plants were also used. The earlier Fremont people cultivated cucurbits and beans and they were probably grown here. The presence of a far larger number of arrow-points than is usual in Southwestern sites occupied by agriculturists probably indicates a much greater dependence on hunting. It might simply indicate a lesser use of sharpened foreshafts of hard wood, but the large number of animal bones found in the refuse would suggest that hunting was quite important. It would have been desirable to keep an accurate count of the food bones found in the refuse, but this was not done. In any case data from other sites would not have been available for comparison. Warfare might also contribute to the production of an unusually large number of projectile points.

Social Organization:

The following conjectures are based on the data provided by "Social Structure" (Murdock, 1949).

Hunting is normally a male activity and it seems probable that agricultural pursuits were left to the women and the corn plots may have belonged to them. The inheritance of corn plots by women might have served to unite nuclear families into extended families with matrilineal descent and matrilocal residence. However, emphasis on hunting and possibly on warfare would tend to enhance the status of men and descent may have been bilateral or patrilineal.

It is likely that the contributions of both sexes were more or less

equal, which would suggest that monogamy may have been the preferred form of marriage. Houses are of a size to accommodate a nuclear family. The size of the village would indicate the possibility of an extended family. The community cannot have been very large at any time. The number of dwellings is small and there were times when only a portion of them were occupied. In Structures A and F there were 2 floors with refuse between. Refuse accumulated in Structure B before the roof burned. Structure G contained a great deal of refuse including many metates and fragments which cannot be accounted for by collapse of the walls. People living in other houses must have used these structures for dumping grounds.

Warfare:

Pictographs showing individuals bearing large shields, which resemble the hide specimens reported by Morss, are consistently found wherever there are sites which may be attributed to the Fremont. The circular pictograph on Diamond Creek appears to be a variant of this motif and the shield figures found on Westwater Creek are thought to be part of the same complex.

If shields were used, some strife is indicated. There is also some evidence which suggests the practice of cannibalism and it is slain enemies or captives who are most likely to be eaten. A number of human bones which seem to have been deliberately cracked or broken were found in the vicinity of fireplaces. The human femur, from which the condyles appear to have been removed by chopping, which lay by the fire-pit in Structure B, is certainly suggestive.

The possibility that trophy heads were taken may also be considered. Pictographs in the Uintah Basin illustrated by Reagan show individuals wearing necklaces or collars such as are shown on Fremont pictographs and carrying what appear to be severed heads. In this connection the mandible found on the floor of Structure A is of interest. A number of fragments of human skulls which seem to have been intentionally broken were found in the refuse. Possibly the brains were eaten and the mandibles retained as trophies.

In this connection, the finding of the incomplete skeleton in Burial II is of interest. If only the skull were missing one might suspect that it had been taken as a trophy. A great many other bones were missing, however, and they appear to have been removed after the body had decayed. It is barely possible that the skull had been removed before interment and that the other bones were destroyed by Mr. Turner in his digging. As has been noted previously he would not have failed to recognize and preserve a human skull although he might not have identified other bones. It seems more probable, however, that the burial was disturbed during the time of occupation.

The finding of an individual whose death was due to violence might throw some light on the question of peace or strife, but Burial I is such an anomaly that it is of little value for this purpose. Why an adult in late middle age, thought to have been a male, presumably killed by a blow on the head, should be buried with a child between 4 and 6 years of age is not easily explained. It is interesting that

this is the only grave which contained any burial offerings. It should be noted that although the child lay along the back of the adult, as it would had it been carried in a cradle board, it was of an age at which children are not normally carried in this manner. The condition of the child's bones made it impossible to determine if it had also met death by violence. Perhaps it had not developed normally and was carried on the back. Upon the death of the individual who had cared for it, it too was put to death. The metate which lay near the head would be more likely to be found in a woman's grave than in a man's and it is possible that the skeleton may have been incorrectly sexed although all those who have examined it regard it as male. One other possibility which might be considered is that this was a berdache. Normally the care of children is not undertaken by berdaches but it does happen on occasion, as among the Papago (Underhill, 1953).

Structures: Architecture and Function

The smaller structures, with the possible exception of Structure D, must represent houses. These buildings appear to have had flat roofs. The burned portion of the roof of Structure B indicates that 2 or possibly 3 rows of timbers were laid across the tops of the walls and plastered with adobe. With vaulted walls the aperture would be relatively small, timbers would not have to be very long, and upright poles would not be required. It is possible that sandstone slabs were placed over the roofs, as they were on granaries found farther north and west. Postulated reconstruction of house with side entrance (Fig. 53).



FIGURE 53—Postulated reconstruction of house with side entrance.