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EXPLORATIONS IN SOUTHWESTERN UTAH
IN 1908

BY

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EXPLORATIONS IN SOUTHEASTERN UTAH
IN 1908

THROUGH the generosity of Colonel E. A. Wall of Salt Lake City the Utah Society of the Archaeological Institute of America is enabled to send an expedition into the field each summer to study the archaeological remains which are scattered thickly throughout the southern part of the State, and to make collections for the Museum of the University of Utah. It was my good fortune to be appointed Field Assistant for the year 1908, and put with Professor Byron Cummings of the University of Utah in joint charge of the summer's field campaign.

We were instructed by Dr. Edgar L. Hewett, Director of American Archaeology, to choose a region in Southeastern Utah, spend a couple of weeks in its exploration, and then select a site to be excavated during the remainder of the season. Having thus the freedom of action essential to successful field work, Professor Cummings and I met on June 11 at Monticello, Utah, and decided to explore the western tributaries of Montezuma Creek, in the southeastern portion of San Juan County, hoping not only to obtain some idea of the number and distribution of the prehistoric remains of that region, but also to find a ruin suitable for excavation.

We left Monticello on June 12, accompanied by Messrs. Neil Judd and Clifford Lockhart, students in the University of Utah, and James Hambleton, a cattleman, who was of great assistance to us as a guide. Later in the month, while we were engaged in excavations about Cave Springs, we were joined by Messrs. H. G. de Fritsch and Leavitt C. Parsons, both students in Harvard University. These gentlemen remained with us to the close of the season and, with Messrs. Judd and Lockhart, were constantly at the works, where they rendered valuable

assistance. I am indebted to Messrs. de Fritsch and Parsons for the map of the ruin given in Figure 2.

Our work closed on August 1.

Montezuma Cañon (see Fig. 1), or Montezuma Creek, as it is locally called, is a deep and rather narrow valley, which heads

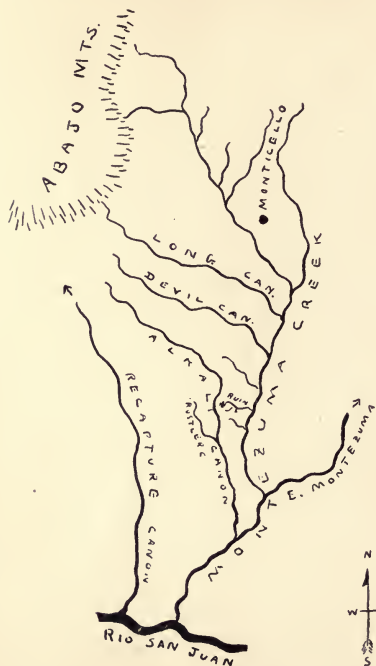


FIGURE 1.—SKETCH MAP OF WESTERN TRIBUTARIES OF MONTEZUMA CREEK. SCALE: 1 INCH TO 12 MILES.

(* Marks the ruin excavated.)

in the eastern slopes of the Sierra Abajo or Blue Mountains, and flows in a southerly direction some 45 miles before emptying into the San Juan River. Its eastern tributaries drain the long mesa which separates it from the McElmo - Yellow Jacket system, while on the west its upper tributaries all head against the eastern and southern slopes of the Abajos. The work of the expedition was confined to these upper western tributaries. According to the cattlemen of the vicinity the lower western cañons are short and contain few ruins.

Montezuma Creek itself contains running water throughout its whole course only in wet seasons. At other times the stream sinks into the sand far above its mouth, and continues to the San Juan in the form of an underflow which reappears here and there in the form of "seep springs." Along

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the course of the river there is a considerable growth of cottonwoods, but apart from these there is little vegetation in the cañon-bottom. The surrounding sandstone mesas, however, are thickly overgrown with dwarf cedar and piñon trees, replaced, as the country rises toward the Abajos, by spruce and yellow pine. The western tributaries are merely smaller replicas of the Montezuma itself, being, in most places, narrow, gorge-like cañons with barren, sandy bottoms and abrupt, cliff-like sides. None of them contain live water in their lower reaches during the summer except after heavy rains in the Abajos. By digging in the stream-beds, however, a small supply of rather alkaline water may usually be obtained. A few fine clear springs are to be found, chiefly in Alkali Cañon and its branches.

The first considerable upper western tributary of Montezuma Creek is Long Cañon. It heads against the Abajos and flows in a southeasterly direction, gradually becoming deeper and more barren, until it debouches upon a wide "bench" above Montezuma Creek. Devil's Cañon, the next valley to the south, follows practically a parallel course. Alkali Cañon, the largest western branch, again heads in the Abajos, but instead of flowing east during its whole course, soon turns nearly south, thence running parallel and close to Montezuma Cañon for some 15 or 20 miles before eventually entering it. This leaves a narrow mesa, called Alkali Ridge, between the two systems.

Because of the narrowness of this ridge, all the cañons emptying into Montezuma Cañon between the mouths of Devil and Alkali cañons are short. The majority of them are little more than draws and probably contain few ruins. The country in that region is, however, so split up and broken, and presents such a tangle of steep gullies, cliffs, and precipitous ravines, that many weeks would be necessary for its complete exploration.

We confined ourselves, therefore, to a study of Long, Devil's, and Alkali cañons; and also examined the ruins about the heads of Rustler's and Ruin cañons. The former is a small western branch of Alkali Cañon; the latter one of the largest of the short draws which drain Alkali Ridge and run into Montezuma Cañon.

The prehistoric remains of the region fall into three well-defined groups: (1) Cliff-dwellings, (2) Cañon-head dwell-

ings, and (3) Pueblos. Cliff-dwellings are built in caves or on ledges of the cliffs. Cañon-head dwellings are loose aggregations consisting of a considerable number of separate small houses, which are always formed about the abrupt ends of small cañons. Pueblos are more or less compact settlements built in the open, either on the mesa-tops or in the cañon-bottoms.

Cliff-dwellings were found scattered thickly throughout the whole region explored, from the heads of the tributary cañons to their mouths, and all along the course of Montezuma Creek itself. They were, indeed, the only buildings found in the greater part of Long and Devil's cañons and in the headwaters of Alkali Cañon. The two or three pueblos which we noticed in those regions were very small, and had every appearance of having been merely temporary affairs.

Two cañon-head groups were found in the branches of Ruin Cañon, one at the head of Rustler's Cañon, and two in small western tributaries of Alkali Cañon.

There are many large pueblos about the middle and lower reaches of Alkali Cañon and along the side branches of Ruin Cañon. There seems to have been a great centre of population along the whole middle portion of Alkali Ridge. The majority of these large ruins are situated on the mesa, the few which are to be found in the bed of Alkali Cañon itself being rather small.

CLIFF-DWELLINGS

Cliff-houses are built in every conceivable sort of situation, and therefore cannot, of course, be classified by shape or location. The simplest type is a small natural cave made into a single room by the addition of a wall closing in the front. Between this and such buildings as Cliff-Palace and Sprucetree House on the Mesa Verde, which are really great pueblos built in caves, and hardly dependent at all on the cliffs, there is an endless variety of types. None of the cliff-houses in the region here under discussion, however, are of any great size. The largest of them do not contain over eight or ten rooms, while the majority are merely single- or double-room structures, their roofs and back walls usually being supplied by the cave in which they are built.

In spite of their small size these cliff-dwellings are nevertheless interesting in that they show great ingenuity of construction and bear testimony to the adaptability and resourcefulness of their builders. Their protected situations, also, have shielded them from rain and snow, and so preserved for our study certain architectural features, such as doorways, beams, and roofing, which, in the pueblo ruins in the open, have long since disappeared.

The masonry of the cliff-dwellings of the Montezuma Cañon district is much inferior to that seen on the Mesa Verde to the east and in Grand Gulch to the west. The building-stones were here simply cracked out or picked up at random, and at best very rudely shaped. Many of the walls consist merely of small, irregular stones set in adobe with no attempt at coursing. The surfaces, both inside and out, are usually coated with adobe roughly laid on with a wooden implement or with the hand. Beyond this there is little plastering, although all cracks and crevices in the back or cliff walls of the houses are carefully plugged up with small stones or corn-cobs set in adobe. The floors of the rooms are seldom levelled or filled in to do away with irregularities, the natural rock being left without modification. Wooden beams are sometimes incorporated in the masonry, usually along the foundations of walls, for the purpose, probably, of bridging spaces which it would be difficult to span with masonry. This use of wood is very uncommon on the Mesa Verde and McElmo, but I have been told that farther to the west, in White Cañon and Grand Gulch, it is a very common style of building, and that some of the houses are almost entirely constructed of logs and adobe.

Another feature which is comparatively rare on the Mesa Verde,¹ but of which we found a fine example in a small house in Devil's Cañon, is the wattle-work wall. This wall was begun after the manner of a picket fence by placing upright and about a foot apart a number of slim cedar poles. These poles were then wattled together with twigs and osiers, making a fairly close and basket-like surface, which was then coated inside and out with adobe until the whole had a thickness of about three inches. This construction appeared to form an

¹ It occurs in a ruin in Fewkes Cañon and in Long House.

addition to the house, and to have been built at a later time than the other walls.

The cliff-dwellings of the region are, as a rule, very small and for the most part placed in caves so low that their roofs are also the roofs of the rooms. For this reason artificial roofs were seldom necessary, and as all traces of the roofs of the pueblos in the open have long since rotted away, our study of this feature of the architecture was limited to a single example offered by a cliff-dwelling in Devil's Cañon. This house, built on a ledge some 15 feet above the talus slope, consists of a series of seven or eight rooms, the westernmost of which are partly protected from the elements by a projection of the cliff overhead. The last room of the house is excellently preserved. It is 8 feet long by 4 feet wide, the back wall being formed by the cliff. At a height of 7 feet 6 inches from the floor a cedar beam 8 inches in diameter at the small end runs the length of the middle of the room parallel to the cliff. Its two ends are set into the masonry of the walls without projecting through. At right angles to this main beam and resting upon it are four smaller beams about 2 inches thick. Their outside ends are set in the masonry of the outer wall, the inner ends resting against the cliff, where they are held in place by daubs of adobe. Upon this second series, and at right angles to it, or parallel to the main beam, are laid slabs of split cedar of about the length and thickness of ordinary "shakes." They cover the entire roof, and a layer of adobe some 3 inches thick is placed directly upon them. There is no coat of cedar-bark between the adobe and the wooden part of the roofing, such as usually occurs in Mesa Verde houses. The top of the roof is carefully levelled off, the walls rising a few inches higher than its upper surface. A trapdoor leads from the room below to the open housetop. This door is 20 inches long by 15 inches wide and was coped about by flat stones, one of which is still in place. The other rooms of the building seem to have been covered in the same way, although they are in a so much more advanced state of ruin that the beams have nearly all rotted away.

For statistics as to doors also we are dependent on the cliff-dwellings, for in them alone are the entrances sufficiently well

preserved for measurement and study. We found them to differ little from those of the Mesa Verde and McElmo. They are rectangular, and an average of the many examples that we examined gives the following dimensions: height $22\frac{1}{2}$ inches, width 15 inches, thickness of wall 11 inches, height from floor of room 20 inches. They are usually fitted with a single large slab of sandstone for a sill, while the lintels are made either of a similar slab or of several small wooden rods sunk in the masonry of the jambs. A single rod about an inch below the middle of the lintel served as a rest for the stone slab which was used to close the door. The Tau-shaped door does not, so far as I know, occur in the western tributaries, although in Montezuma Creek itself we noticed one example.

What the purpose of such large numbers of cliff-dwellings could have been is more or less a puzzle. That they were of the same culture as the pueblos seems proved by the potsherds found in both. With the exception of two houses in Devil's Cañon, one in Ruin Cañon, and one or two in Alkali Cañon, none of them contain more than two or three rooms, while the great majority are nothing more than single chambers hardly large enough to hold a man, and usually built in caves so low that one cannot sit upright in them. Even the larger examples just mentioned contain only six or eight rooms, and even these groups do not contain the kiva or ceremonial room. The relation of the kiva to the religious and tribal life of the prehistoric people is as yet not clearly understood, but it nevertheless seems probable that no permanent dwelling-place could exist without it. For this reason the absence of the kiva from even the largest of the cliff-dwellings makes it seem improbable that these buildings were ever continuously inhabited. Whether they were lookout places, granaries, or shelters from which to watch the cornfields, are questions which it is better to leave open until more complete data as to their exact topographical situation and their relations one to another and to the larger pueblo groups can be collected.

CAÑON-HEAD GROUPS

The cañon-head groups differ, as has been stated above, from the pueblos chiefly in being scattered aggregations of small

houses, rather than many houses or groups of rooms brought together to form a more or less compact, or at least contiguous, whole. The component buildings, none of which are individually of any great size, form, nevertheless, collectively a considerable group. In at least three cases, *i.e.* at the head of Rustler's Cañon and in the two branches of Ruin Cañon, they are only a few hundred yards distant from large pueblos. This fact suggested to us that they might have been block-houses or watch-towers to guard the springs which at one time certainly existed directly below the buildings and which must have formed the chief water supply of the near-by pueblos. A fourth group, although a small one and not directly at the head of a cañon, guards Cave Springs, a locality which, from its abundant supply of water and its propinquity to several large ruins, must have been strategically very important.

Further evidence that tends to strengthen the theory that these structures were fortifications rather than regular dwelling-places is offered by the fact that they do not often seem to contain kivas, have no well-defined burial places, and are almost all built on the edge of the rim-rock, on the tops of large boulders, or in other easily defensible places. They are now so badly ruined, however, that little can be said of their original ground plan or architecture. Excavation would conclusively prove whether or not they are of the same culture as the other remains of the region. From the potsherds found about them there seems no reasonable ground for supposing them to be the work of a different people or a different period.

PUEBLOS

The larger pueblos are nearly all to be found on the tops of the cedar-covered mesas between the cañons. We mapped over twenty good-sized groups in a small section of Alkali Ridge alone, as well as a very large settlement above the head of Rustler's Cañon. These pueblos are so badly ruined that they are now merely low mounds thickly strewn with fallen building-stones and heavily overgrown with sagebrush and greasewood. They are usually situated on the crest of a ridge some distance back from the ruins of the cañons, thus occupying the highest

ground in the immediate vicinity with a view out over the cornfields that must once have surrounded them.

The smaller pueblos always seem to have consisted of a single or double row of rooms running roughly east and west, with one or more kivas, which appear as shallow circular depressions 15 or 20 feet across, lying just to the south of them. To the south of the kivas again is found the cemetery, a low mound thickly covered with potsherds. The larger ruins are merely multiplications of the unit just described, with a correspondingly greater number of kivas and cemeteries.

As the burial mounds are unfortunately quite obvious, they have been much pillaged by "pot-hunters," relic-seekers, and other vandals, who, digging carelessly, have broken fully as much as they have recovered, and who have also entirely destroyed the skeletal remains. We were fortunate, therefore, to find for our excavation a large ruin with two burial mounds, one of which had been only partially dug over, while the other one was practically untouched.

This pueblo, quite typical of the larger examples of its class, is built upon a cedar-covered ridge some 200 yards from the head of one of the terminal branches of Ruin Cañon. At that point there is a large cañon-head group, which must have protected the water supply for the community and was perhaps built for that purpose. The pueblo itself is a straggling structure of many wings and additions, 500 feet long and, at its widest part, about 300 feet across. The wings, it will be noticed (Fig. 2), run for the most part east and west; the kivas lie to the south of the two largest lateral wings.

We made our camp at Cave Springs, a mile and a half west of the ruin. The water of that spring is fresh, cold, and abundant, and there is ample feed for a few horses in the cañon below. We remained at this ruin for nearly five weeks, laying bare seventeen rooms and three kivas. We also completely dug over the two burial mounds and spent several days on the mounds of two small ruins to the east.

The task of excavation was slow and arduous, as we were unable to secure proper picks to pry out the quantities of tightly packed fallen stones which filled the rooms and kivas; and having only one wheelbarrow we were often forced to handle

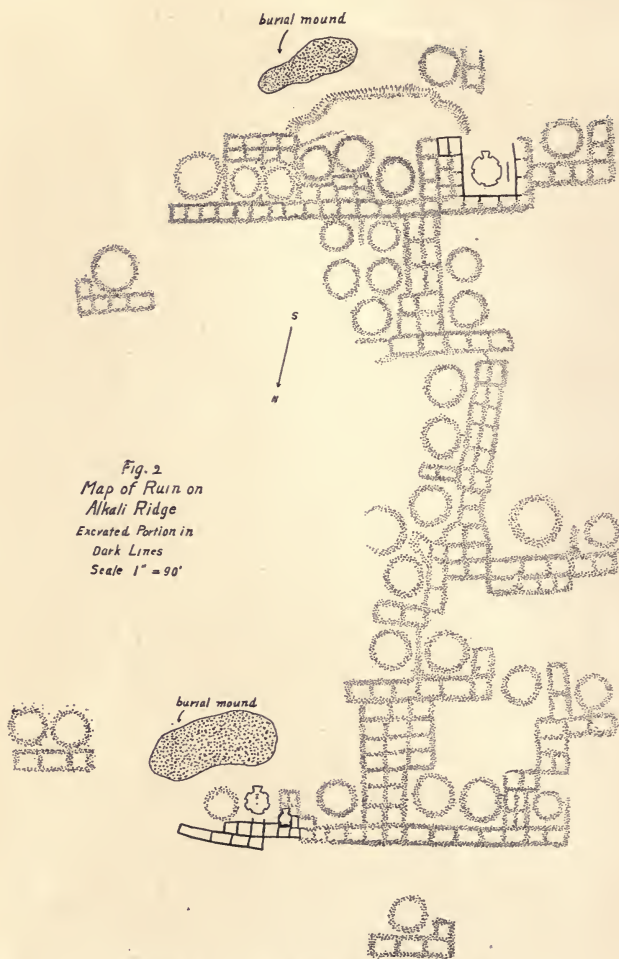


Fig. 2
 Map of Ruin on
 Alkali Ridge
 Excavated Portion in
 Dark Lines
 Scale 1" = 90'

FIGURE 2.—PLAN OF RUIN ON ALKALI RIDGE.

our back dirt two or even three times. The results were, nevertheless, fairly satisfactory; we procured about four hundred museum specimens, among them thirty pieces of unbroken pottery, besides many pieces in fragments, which Professor Cummings has since successfully restored. We also recovered a considerable series of crania and other skeletal remains. A report on these last by some competent somatologist will, we hope, be presented at an early date.

Digging was begun at the east end of the northernmost wing (Fig. 3), and here we occupied ourselves for nearly two



FIGURE 3. — SOUTHEAST END OF NORTH WING.

weeks in clearing rooms and kivas. We not only emptied the rooms themselves, but ran trenches all along the outside of the house, laying bare the walls to their foundations. Even in the best preserved sections these walls did not stand, when excavated, to a height of over 4 feet, but such large quantities of fallen building-stones were present that it seems safe to assign a height of two stories to the entire building. On the other hand, its narrowness throughout argues against the former presence of more than two stories; so that we seem to have here a fairly low and much spread-out structure which must have been

quite different in appearance from the more common, terraced type of pueblo, which was compact in ground plan and rose to a considerable height. Such a village as the one under discussion could not have been easily defended.

The need for defence, apparently not so keenly felt here, was met in the Mesa Verde district, in the Cañon de Chelly, and elsewhere, by building in caves and on ledges difficult of access and easily defensible; while the pueblos of the McElmo were placed upon the edges of precipitous rim-rocks, their otherwise unprotected mesa or back wall being high and without ground-floor doorways.¹ In the Chaco Cañon, as well as in other parts of the Southwest, pueblos, where built in the open, are made safe from marauders by their compact form. In this case, however, the buildings are in no way protected by the configuration of the land, and the various component wings are so loosely strung together that no combined resistance to a sudden attack could have been made.

Living-rooms. — The excavation of the living-rooms gave very little insight into the minor features of the architecture of the pueblo. As only the lower courses of the walls were standing, we were unable to recover any evidence as to the system of roofing or the method of door construction, while the floors could only here and there be made out. They seemed to be, as usual, of hard-packed adobe. The plastering, too, had almost entirely disappeared from the walls.

The rooms were fairly uniform in size, averaging about 10 feet long by 5 feet wide. The easternmost chamber, however (Fig. 4), which had apparently been used as a granary, was longer than any other that we observed (23 feet). A violent conflagration had raged in this room, oxidizing a large quantity of corn on the cob. The heat of the fire had been great enough to vitrify, and in some places even to turn into a sort of iridescent slag, parts of the adobe of the walls and ceiling. Fragments of black-and-white pottery had been burned to a reddish yellow color, the black paint becoming a rich brick-red. The body of the ware was greatly hardened and in spots vitrified. Such conditions as this may possibly account for the rumors

¹ S. G. Morley, 'The Excavation of Cannonball Ruins,' *American Anthropologist*, Vol. X, N.S. 1908, p. 597.

which one hears in the Southwest of the finding of cliff-dwellers' remains imbedded in volcanic ash or lava, rumors that are sometimes quoted to prove the immense age of the prehistoric period.

The masonry throughout the pueblo is much inferior to that of the buildings of the McElmo and the cliff-dwellings of the Mesa Verde. Little attempt had been made to shape the stones,

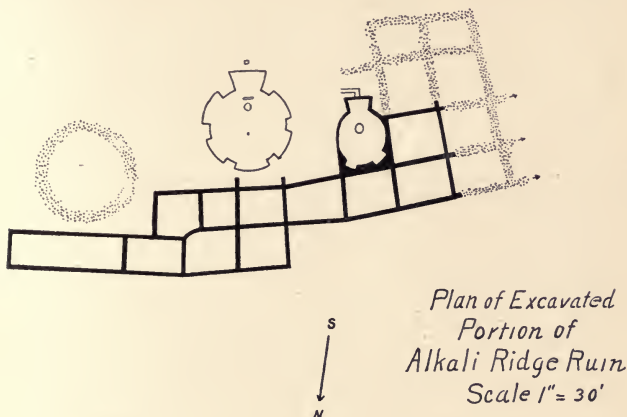


FIGURE 4.—PLAN OF EXCAVATED PORTION OF RUIN.

the rough blocks and fragments, quarried in the near-by cañon, being merely hammered or cracked out and laid up in adobe with scarcely a semblance of coursing.

In several places cedar posts were incorporated in the lower parts of the walls. They were driven several feet into the ground, their upper ends sunk in the masonry. The lower parts of these stakes had been sharpened by fire, their charred portions and the marks of their bark in the adobe of the walls being usually the only evidence of their former presence. All roof beams and other objects of wood were reduced, unless charred, to mere reddish streaks in the earth.

The finds in the living-rooms were very meagre. Because of their extreme dilapidation and from the fact that no "mano" or "metate" were unearthed in them, it seems not unlikely that

that portion of the pueblo had been deserted and all such utensils moved to some other place.

Kiva. — It will be seen by consulting the plan of the pueblo (Fig. 2) that its forty or more kivas are very evenly distributed among the rooms in a proportion that may be roughly estimated at one kiva to seven ground-floor chambers. The majority of the kivas lie to the south of, and immediately contiguous to, the groups of rooms to which they belong. In making the plan, only large and well-marked circular depressions were called kivas, and it is possible that there exist many small examples of the intramural type (Figs. 4, 6, and 7), which, before excavation, could not be distinguished from an ordinary dwelling-room. The greater number of the ceremonial rooms of this ruin, and, so far as we could determine, of all the sites in the Montezuma drainage, are structurally quite independent of the buildings to which they belong. They are not enclosed in a square or rectangular walled-up space, as was found by Mr. Morley to be the case on the McElmo,¹ nor are they set among the rooms as they are in the cliff-dwellings of the Mesa Verde.² This fact is quite in accord with the straggling and loose-knit plan of the Alkali Ridge ruin.

As is the rule in the San Juan, the kivas are subterranean. They are round, and, like those of the neighboring regions, have a plain lower wall some $3\frac{1}{2}$ feet high, surmounted by six pilasters which divide the space above the lower wall into six niches (Fig. 5). These pilasters also served to carry the entire weight of the roof.³ They are usually about $2\frac{1}{2}$ feet high, thus making the ceiling of the chamber approximately 6 feet above the floor. The outside of the roofs of these subterranean rooms apparently formed a kind of plaza, which was on about the same level as the floors of the living-rooms. There is a slight inward trend of both walls and pilasters. The kivas here average about 16 feet in diameter.

Of the six niches or recesses, which are divided from each other by the pilasters, the south one is always the deepest and

¹ *Loc. cit.*, p. 600, and pl. XXXVII.

² J. W. Fewkes, *Bulletin* 41, *Bur. Am. Ethnol.*

³ W. J. Fewkes, 'Ventilators in Ceremonial Rooms,' *American Anthropologist*, N. S. Vol. 10, 1908, p. 385.

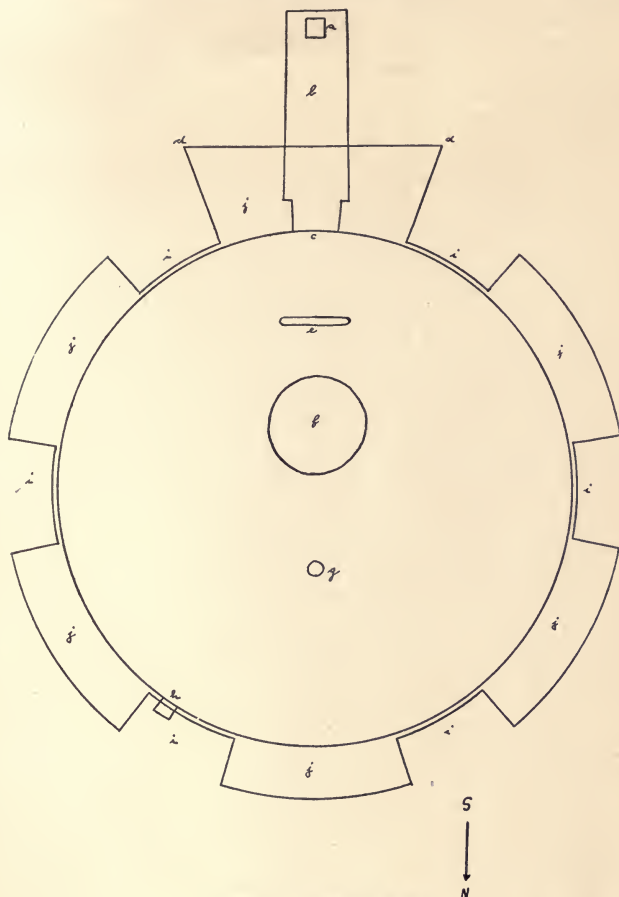


FIGURE 5.—NORMAL KIVA.

broadest (Fig. 5, *d d*). The other five are almost exactly of the same width and depth. Under the south recess there runs a horizontal passage $2\frac{1}{2}$ feet high by $1\frac{1}{2}$ foot wide, roofed with planks of split cedar (Fig. 5, *b*). Its floor is a continuation

of the floor of the kiva. At a distance of 7 feet from the lower wall, this passage turns upward at right angles and, rising vertically just behind the back wall of the south niche, it emerges from the ground at the level of the kiva roof. The vertical passage grows quickly smaller as it rises, until at its mouth it is less than a foot square (Fig. 5, *a*).

In front of the opening of the horizontal passage into the kiva and about $2\frac{1}{2}$ feet from its mouth, there is an upright slab of stone 2 feet wide, $2\frac{1}{2}$ feet high, 2 inches thick.¹ (See Figs. 5, *e*, 8, and 9.) A line drawn from the entrance of the passage through the centre of the slab and continued across the floor would bisect the other two principal features of interest; namely, the fireplace and the "sipapu." The firepit is a round depression in the floor 3 feet in diameter and 8 inches deep, filled with tightly packed wood ashes. The "sipapu" is a small hole in the floor, barely large enough to admit the hand and 5 or 6 inches in depth. It lies about midway between the fireplace and the back or north wall of the kiva. (See Figs. 5, *g*, and 9.)

The purpose of these various features of kiva construction is very difficult to determine. There seems, however, to be both a ceremonial and a utilitarian object served by each of them. For instance, the six recesses have been taken by some students of the subject to represent the six cardinal directions which are recognized by the pueblo peoples of to-day; *i.e.* north, south, east, west, the zenith, and the nadir. This may very well be the case, but the six buttresses which separate the said niches are strictly utilitarian in purpose, in that they support the entire weight of the roof in a way most economical of space and masonry.

In the case of the passage also we are confronted by the same difficulty. It is obvious, from the extreme smallness of its ascending part, that it could not have been used as an entrance to the chamber; while its position, and the fact that its walls are seldom smoked, proves that it could not have been a chim-

¹In other localities this slab is sometimes replaced by a masonry wall of about the same height and width, and in a few cases by a low curving wall. See Fewkes, *loc. cit.*, also Morley, *loc. cit.*, p. 602, and Nordenskiöld, *Cliff Dwellers of the Mesa Verde*.

ney. It has been called both a "ceremonial entrance" and a "ventilator."

Without entering into a discussion on this subject, which has been most efficiently treated by Dr. Fewkes in a recent paper,¹ in which he puts forward the ventilator theory, it may be remarked that when the roof is in place, and a fire is lit in the fireplace, the passage *does* act as a ventilator and aids very greatly in keeping all the air of the chamber fit to breathe. On the other hand, the highly specialized form of the passage and its almost invariable southern orientation have led others to believe that it may have had some ceremonial significance. It seems probable that the truth is to be found in a compromise. Ceremonial observances might easily connect themselves with so necessary a part of the kiva, and this process once started, religious conservatism would tend to fix and specialize features which were primarily utilitarian.

The slab of stone or masonry wall, which is found between the passage entrance and the firepit, has been called both an "altar" and a "deflector." Here again it seems that the use of this object may have been twofold: it no doubt tended to spread the fresh air which came down the ventilator, and it also corresponds closely to the altars of modern Rio Grande Pueblo kivas. There is nothing incompatible in the two functions.

The purpose of the firepit is sufficiently obvious, but the small opening in the floor, which, following Dr. Fewkes, I have called the "sipapu," is more puzzling. This little hole, often made by sinking the neck of a broken olla in the adobe, is a very constant feature, not only here, but also in other parts of San Juan. In the modern Hopi kivas, a hole, not unlike these ancient examples, is called the "sipapu" or symbolical entrance to the Underworld, and plays an important part in many ceremonies.

Under the northeast buttress or pilaster of all the ceremonial rooms examined there is let into the lower wall a small niche or cupboard, about 10 inches long by 6 inches high and 10 deep (Fig. 5, *h*, and Fig. 6, *h*). This may be seen in the photograph (Fig. 9); on the left another photograph (Fig. 7) also shows clearly the difference in level between the

¹ Fewkes, 'Ventilators in Ceremonial Rooms.'

regular kivas and the living-rooms. The kiva at the left of the picture is an intramural example built on a higher level.

The masonry of the kivas is superior to that of the living-rooms, the stones being better shaped and laid up in fairly regular courses. In one feature the kivas here differ markedly

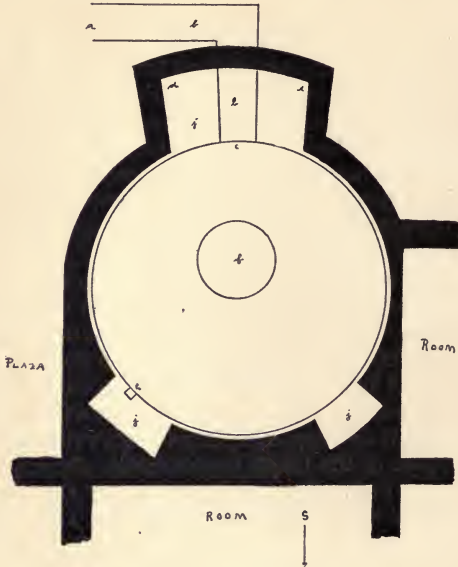


FIGURE 6. — INTRAMURAL KIVA.

from those to the east. On the Mesa Verde and McElmo an excavation was made and a kiva was built in it—a solid structure of stone. Here, however, it is really little more than a hole in the ground, the lower wall and the six pilasters which support the roof being merely a veneer of masonry on the naturally close-packed earth. The backs of the recesses, except the large southern one (Fig. 8), the floors of all of them, and the sides of the pilasters are left in the native clay soil. This was kept from caving in by baking it with fires to the consistency

of soft brick, and then coating the hardened surfaces with many layers of plaster. This process was apparently perfectly efficient, as the back walls of the recesses are still firm and strong, and, although quite unsupported by masonry, have not in any case given way or crumbled in. Upon removal of a section of the lower wall, which was not over three inches thick, the ground behind it also was found to have been baked in the same manner as the upper parts. This had been done before



FIGURE 7. — INTRAMURAL KIVA.

the building of the wall. Such a method as this could only have been employed in a clayey soil, and is probably a purely local development.

Intramural Kiva.— The room somewhat to the right of the middle in the plan of the building (Fig. 4) and shown at the left of Figure 7 was found, on excavation, to be a kiva (Fig. 6). It is somewhat smaller than the other ceremonial rooms, having a diameter of 21 feet 6 inches. It also differs from them in that it is built above ground, on the level of and directly among the living-rooms, and lacks several characteristic features.

In common with the others it has the circular shape, the large south recess with the horizontal passage under it, the fireplace and the small niche in the lower wall. On the other hand, it differs from the others in that it is built in a square chamber, having been made round by filling in the corners with masonry; it has only two recesses besides the southern one, and it did not contain either altar or "sipapu." The horizon-



FIGURE 8. — INTERIOR OF KIVA.

tal passage, moreover, opens to the side instead of in a vertical direction. (See Figs. 4 and 7.)

How many other ceremonial rooms of this nature may be scattered through the pueblo it is impossible to say, but it would seem that the religious needs of the people must have been amply cared for by the great number of kivas in the open.

Burial Mounds. — The burial places of the community lay to the south of the south and north wings. They were both well-defined, low mounds of dark earth, easily distinguishable from the reddish adobe soil of the mesa. The southern mound had been somewhat dug over by pottery hunters and the burials much disturbed; bones and broken pottery lay everywhere on

the surface. We nevertheless examined the place carefully, recovering a fair number of crania and a few pieces of pottery. The north mound, however, had been left practically undisturbed, and here we uncovered twenty-eight burials and with them a considerable amount of pottery, ornaments, and other objects. There must have been other cemeteries in the neighborhood of the pueblo, as the number of skeletons found by us



FIGURE 9. — INTERIOR OF KIVA.

was quite disproportionate to the size of the settlement. Diligent search and much fruitless trenching failed, however, to hit upon them.

The north mound, which was about 80 feet long and 30 feet wide, was perhaps 5 feet thick at the centre, sloping off at the edges to the level of the surrounding ground. It was composed of dark earth, quite distinct from the red soil of the neighborhood. This darkness appears to come from the admixture of organic substances such as would naturally be present in the refuse of the village. Broken and split bones of animals and birds, quantities of charcoal, and numberless potsherds were everywhere present, particularly in the upper

layers of the mound. From this it would appear that the cemetery was also used as a refuse heap, and owes, perhaps, the greater part of its mass to débris from the pueblo.

The burials were almost all placed just upon the top of the red subsoil; several, however, were found in shallow depressions scraped in it, but in no case was the body covered by the red soil. No definite orientation of the burials was observable. The bodies were placed here and there without relation one to another. The majority of the individuals were laid on the



FIGURE 10. — GRAVE AND CONTENTS.

side, the knees drawn up toward the chest, the elbows flexed on the knees, and the hands placed in front of or beside the face (Fig. 10).

Pottery was buried with about one skeleton in five, but where it was present there were enough pieces to bring the general average up to about one piece for every skeleton unearthed. One burial had no less than ten pieces placed with it in the grave.

When one or two pots only were deposited with a body they

were set in front of the face; if more were to be interred, they were usually laid beside the hips, either in front or behind; while with the skeleton mentioned above, the pieces were disposed in such a way as nearly to encircle the body, several large bowls being nested together in front of the face. We found no example of the practice, common in certain localities, of inverting a bowl over the head.

Articles of personal adornment of an imperishable nature were limited to beads made of olivella shells and of sections of hollow bone. Such objects were taken from the earth below the head and shoulders, indicating their use as necklaces. A few bone scrapers and chipped knives were uncovered in the neighborhood of skeletons, but not close enough to warrant definite association. No arrowheads, club-heads, or axes were found in the immediate vicinity of any burial. From this it would seem unlikely that weapons were placed with the dead.

Collections. — The collections from the excavation consist of skeletal remains, pottery, vessels and pipes, ceremonial objects of stone and pottery; bone awls, skin-scrapers, and needles; beads of shell, bone, stone, and pottery; stone axes, polishing stones, sandal stones, and various kinds of clipped implements such as knives, spear-heads, and projectile points.

Because of the exposed position of the ruin there were recovered no objects of basketry, textiles, or wood. No trace of metal was found.

The material is now deposited in the Museum of the state University of Utah. A report upon it will be presented as soon as I am able to visit Salt Lake City and study the collections adequately.

A. V. KIDDER.

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