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The 1929 Archaeological Expedition of the State Historical Society of Colorado in Co-operation with the Smithsonian Institution

PAUL S. MARTIN

FOREWORD

During the field season of 1928, while engaged in excavation near Ackmen in Montezuma County, Colorado, the writer found many opportunities to study nearby ruins, with a view to further exploration in 1929. It was plain to any observer that there existed in that immediate area two types of ruins: the first being of the unit-type, located on open mesas and presenting a uniform appearance of low mounds, kiva depressions and refuse heaps; the second being of the rim rock type, situated, as the name would suggest, on the edge of a canyon. This last mentioned type nearly always reminded one of the larger or so called "great houses," such as Hovenweep Castle.

In view of the discoveries of 1928 (see Vol. VI, No. 1, of *The Colorado Magazine* for 1929) of round towers and adjacent kivas connected by subterranean passages, and since this phenomenon is uncommon if not unique, it was felt that more work should be done in similar ruins situated at some distance away, in order to see whether or not this kiva-tower-passage arrangement was confined only to the ruins excavated or whether other similar ruins might possess this same curious feature.

In addition to this interest in unit-types, the author became interested in rim rock ruins. Therefore a program was devised which provided for about one-half of the field season to be devoted to a continuance of the work of 1928, and the balance of the time to be spent in cleaning out a rim rock site.

Much of the work of 1929 would not have been possible had it not been for the fact that under an Act of Congress the Smithsonian Institution of Washington joined in the entire work and shared the expense with the State Historical Society of Colorado. For this the Society expresses its thanks. The writer also wishes

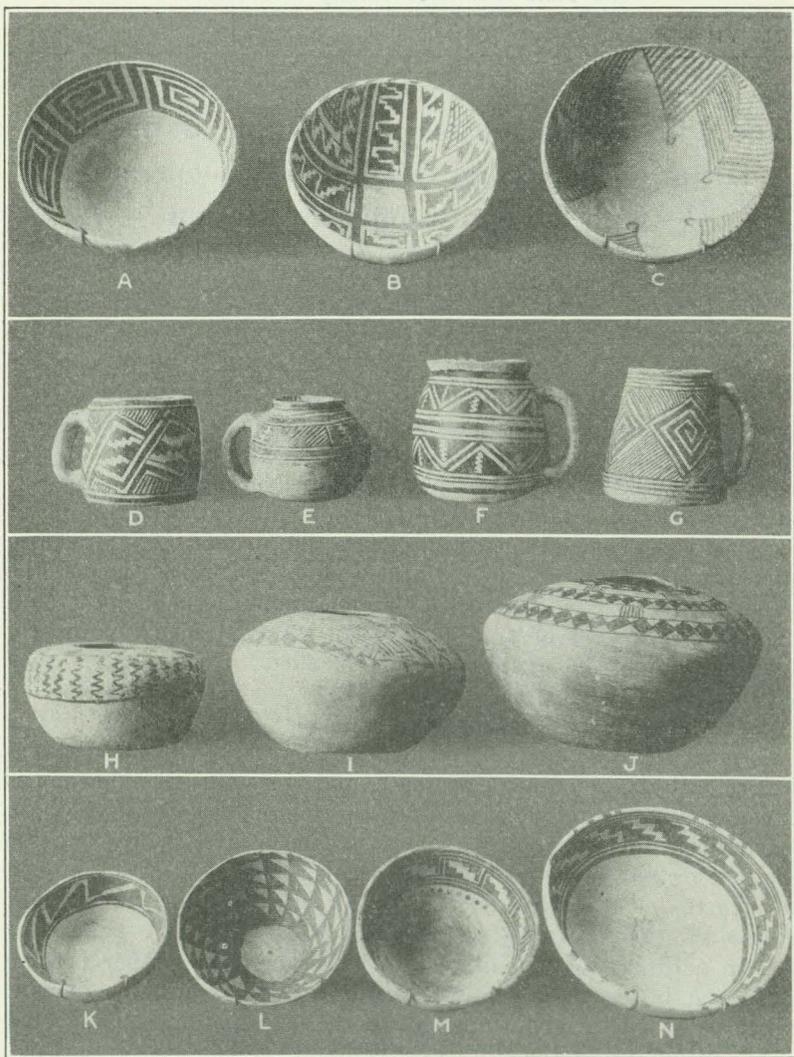


PLATE I.

Mortuary pottery found in burial-refuse mounds, Montezuma County, Colorado (diameter of A is 7½ inches).

Photographs by P. S. Martin.

to express his gratitude to the members of the Spargo community for their interest and generous aid in a region which is naturally harsh and where water is scarce; and to the following men who actually bore the brunt of hard daily work even in the face of great odds: Mr. Courtney Dow, Mr. Al Lancaster, Mr. Roy Herren, Mr. Marion Clark, Mr. Charles Givens, Mr. Horace Denton, Mr. Calvin Long and Mr. Lois James. Mention should likewise be made of the writer's assistant, Mr. Carl T. Lloyd, who took over many arduous routine duties and who helped map and sketch.

This article constitutes not only a formal report to the government, covering the season's campaign, but is also intended for general reading, and the dissemination of information concerning the archaeological work of the State Historical Society of Colorado.¹

At the Pecos Archaeological Conference of 1927 it was decided to divide the cultural levels of the Southwest into eight flexible divisions, three for the older or the Basket Maker group, and five for the Pueblo.

Basket-Maker I is as yet a postulated period. Presumably the people of this period were nomadic, and did not know pottery nor agriculture.

Basket-Maker II has definitely been recognized. The culture was rude, but in it are found the germs for much of what followed, such as sunbaked pottery, primitive corn, baskets, fur cloth, atlatl or spear thrower, and slab-walled cave-cists.

Basket-Maker III is a time of transition. Fired pottery; subterranean houses, as well as slab houses with pole and brush roofs; corn, beans and gourds; twine-woven bags, fur cloth blankets, scallop-toed sandals, feather cloth, bow and arrow, and long as well as round-headed skulls are found.

Pueblo I or proto-pueblo people were physically somewhat different from the Basket Makers. The art of making pottery had improved, although the coiled technique was embryonic and neck-coiled ware existed. Pit dwellings were common; these were houses with more or less fragile walls, round, oval, or rectangular rooms, built in such a way that the lower parts were sunk in the ground. Corn, beans, squash and turkeys were the principal foods. The atlatl disappeared and cotton was introduced.

Pueblo II. This was the hey-day of small or unit-type houses. The pottery became more stylized and was better made. Corrugated ware was common.

Pueblo III was the period in which larger "urban" centers developed. Architecture had reached its height, for it was during this time that Balcony House, Cliff Palace, and Spruce Tree House

¹A definition of archaeological terms employed may be found in *The Colorado Magazine*, VI, 1-2.

(not to mention others) at Mesa Verde; Chetro Kettle and Pueblo Bonito in Chaco Canyon; Aztec, and other great mesa or cliff houses, were constructed. The ceramic art was so specialized that pottery centers sprang up.

Pueblo IV represents a decadent phase of pueblo culture. The fine buff wares from Sikyatki and other prehistoric Hopi sites were probably made at this time.

Pueblo V is meant to designate the time from the arrival of the Spaniards in 1538 to the present day.

GEOGRAPHY

The 1929 archaeological expedition chose for its field of work the region thirty-two miles north and west of Cortez, Colorado, in which the 1928 work was carried on, and permits from the Department of the Interior and the Department of Agriculture of the United States Government were obtained. The work was carried on during June, July, August and September, with a field force of eight men.

Climatic conditions within this area have probably remained nearly the same for the past two or three thousand years. The Indians of yesterday probably had the same factors of environment against which to struggle as do the ranchers of today. Rainfall is scanty as a rule, although some seasons may be abnormally wet, as was that of 1929, while others may be unusually dry. Droughts are the rule, however. Springs are extremely scarce at present, although there is some evidence for believing that water in favorable seasons could be obtained in limited quantities by digging shallow wells in the canyon bottoms. The soil of the region is good, and when cleared of the omnipresent, useless sagebrush, will yield a fair crop if properly ploughed and tended. It is an uphill struggle, however, for the modern farmer, and it must have been equally hard, if not more difficult, for the prehistoric farmer with his limited knowledge of the science of agriculture and his lack of tools. Irrigation, in the sense of introducing water into cultivated areas by means of ditches, was unknown in ancient times, and even today no irrigation is possible in the area west and north of Ackmen.

Game is not abundant even in good seasons. It consists mainly of deer, rabbits, sage hens, coyotes, and an occasional bear. In former times, as evinced by the animal bones found in the ancient houses and refuse heaps, there were turkey, deer, quail, bear, coyote, rabbit, wolf, mountain lion, and wild cat; bison bones were also found, but they may have come from farther east or south.

Trees (juniper and scrub pine) are scarce, and grass is conspicuous by its absence. Sagebrush flourishes everywhere and is a

hindrance to farming today, as it must have been in former times. The country is essentially a desert, although there is much of beauty to attract the tourist.

The region around Ackmen is about 8,500 feet in altitude. The topography is that of gently rolling mesas, gashed everywhere by innumerable arroyos and deep canyons.

Ruins abound in the region, as shown by the countless mounds strewn with cut stone, pottery, and other debris. It is virtually impossible to examine one square acre without finding some mute evidence of a once great community and population. It is certain that where there are barely a hundred people living today in an area ten miles square, there must have been five to eight hundred in prehistoric times.

THE RUINS

BEARTOOTH PUEBLO

On the north rim of Ruin Canyon, in Twp. 38 N., Range 19 W., Sec. 18, lot 9, northeast $\frac{1}{4}$, is a large ruin, which we called Bear-tooth Pueblo because of a quantity of bear teeth found in one of the rooms. This ruin is on land owned by Mrs. Emma Huffington and managed by her son, Mr. Dane C. Huffington, to whom thanks are due for giving the Society permission to dig.

The canyon's course is tortuous, but at this particular spot it runs about northeast and southwest. Ordinarily no water runs in the stream bed at the bottom of the canyon, but a hard rain of four or five hours will cause a small bit of water to trickle its way down towards the San Juan River.

The ruins, as first seen, would remind one of a large mound of quarried stones, tossed into a more or less evenly distributed heap, about 100 feet long, 35 feet wide, and 15 feet high. Here and there could be made out a depression or a bit of wall, but no adequate idea of the ground plan could be had from a superficial examination. To make matters worse, sagebrush grew in large clumps over the whole pile. (Plate III, A and B.)

Work was started at what appeared to be the extreme eastern end of the pueblo, but later excavations showed that there was an extension of the rooms still farther east. After a wall was discovered it became easy to trace it as it turned this way or that. The type of debris encountered slowed up work considerably, because great, heavy stones were mixed with the dirt to such an extent that shovels were often useless.

Upon digging downwards in one of these rooms, which averaged about 7 feet square and 8 to 10 feet deep, we found that the work became slower in proportion to the depth. The masonry

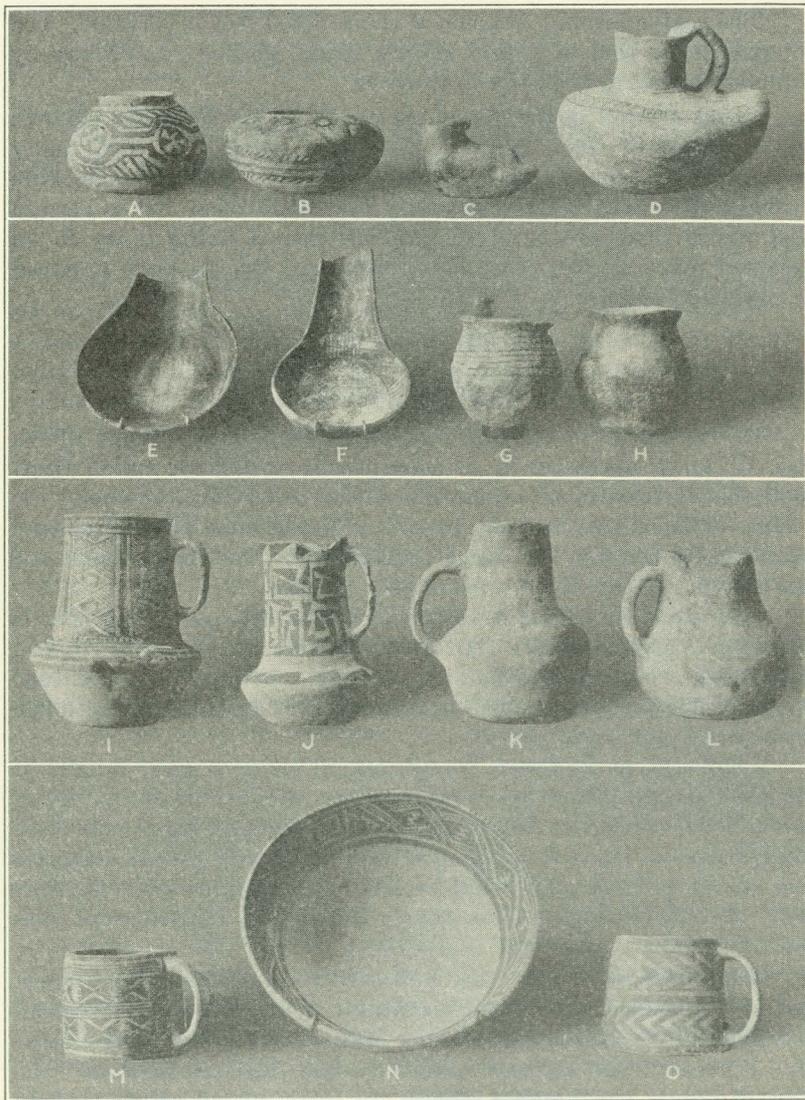


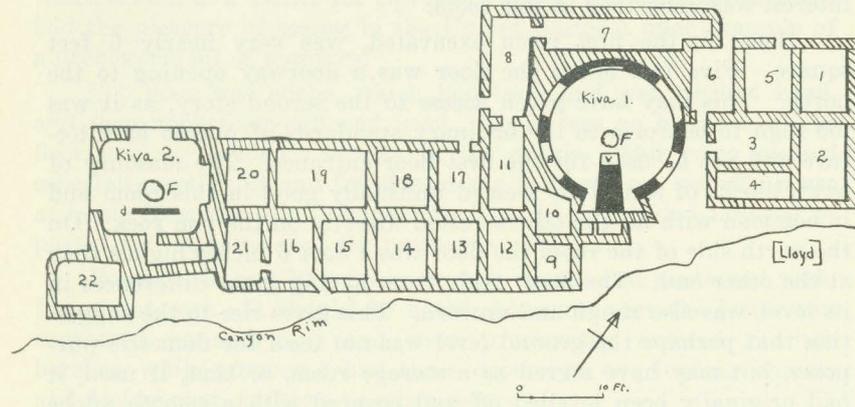
PLATE II.

Pottery found in two sites, Montezuma County, Colorado (height of A is 3 1/4 inches). Photographs by P. S. Martin.

rested directly on the cliff rock, which, due to a shelving formation, made very uneven floors (Plate IV, A).

Description of Rooms²

Room 1 was rectangular with walls yet standing 9 feet high. Judging from the ledges on which the floor joists had rested, the ceilings had been about 5 1/2 feet apart. In the debris, one directly over the other, and about 2 feet apart, were the remnants of what had been three fireplaces, the telescoping of which was due, no doubt, to the rotting of the floor beams and the subsequent caving in of the floor. These remnants consisted of flat slabs on which the fire had originally rested; some besmoked rocks, which had probably formed a circle in which the fire was confined; and ashes and charcoal. Of course the second and third floors had entirely disappeared.



Bear Tooth Pueblo, Ruin Canyon, Colo.

FIG. 1. GROUND PLAN OF BEARTOOTH PUEBLO.

B, Bench; d, Deflector; F, Fireplace; v, Ventilator (drawing by C. T. Lloyd).

All through the debris were many portions of cedar logs which had once been parts of the upper stories. Some of these were in an excellent state of preservation.

In the east wall of what was the ground floor was a small, rectangular, stone lined niche about 6 inches deep, 5 inches high and 8 inches long. It was empty.

A grinding bin in the shape of a plus sign was located in the center of the ground level room. Near it and lying about at various angles were three metates and eight manos. No corn was found in the grinding bin nor anywhere in the debris.

²Rooms 2, 3, 13, 14 and 15 were never excavated.

A few potsherds were found all through the dirt, mostly of the black and white Mesa Verde type.

Room 4 was perhaps a little deeper than number 1, but differed from it by having a direct entrance into the ground floor. The doorway was narrow and about 3 feet above the floor level. Several niches of the type described for room 1 were situated in each wall, but they were empty.

A puzzling feature was found in this room, and many others, namely, the presence of a ledge for floor joists on one side of the room and the absence of it on the opposite wall. Sometimes a series of holes in the masonry still retaining the butt ends of what had once been floor beams, could be observed on one wall, while on the opposite one there would not be a single indication as to how the floor was upheld.

With the exception of a few potsherds, nothing of particular interest was unearthed in this room.

Room 5, the first room excavated, was very nearly 6 feet square. Five feet above the floor was a doorway opening to the north. This may have given access to the second story, as it was too high to conform to the ordinary standards of pueblo architecture and yet be used for the first floor entrance. The masonry of hewn blocks of sandstone seemed unusually good in this room and in common with all the others rested directly on the rim rock. On the north side of the room the floor was 1 foot 6 inches higher than at the other end. The floor, aside from having great differences in its level, was also rough and unworn. This gives rise to the suggestion that perhaps the ground level was not used for domestic purposes, but may have served as a storage room, or that, if used, it had originally been levelled off and covered with a smooth adobe paving. However, no such adobe floor was found.

Room 6 promised to be interesting because of its two doorways, one opening to the north, the other to the south, the latter being carefully sealed with rectangular blocks of masonry. Excitement ran high for a while, but soon subsided in the toil of removing great rocks and tough roots. This cubicle, the size of which was about the same as its companion rooms 1 and 5, proved as barren as the others. Two or three pieces of cedar beams, a few corrugated and painted potsherds, and a metate were the sole rewards of many hours of digging. The sealed doorway, when closely examined, was very evidently blocked off from the inside. Further work disclosed to the disappointed group that it was merely an entrance or exit to the south and did not lead to any other room. No reason can be assigned for blocking off this entrance.

Room 7 deserves mention if for no other reason than its un-

usual shape. By glancing at the ground plan of Beartooth Pueblo (Fig. 1) one may easily see that the south wall of this chamber composes the north section of kiva 1, and that the room was very long and narrow, measuring 20 feet long and 3½ feet wide. There were two doorways, one at either end; the first permitted direct outside communication and the other access to room 8. The doorway at the west end leading into room 8 was especially well built and beautiful. It measured 3 feet high and 1 foot 6 inches wide. The lintel and sill consisted of single slabs. One could not help being impressed with the skill with which the builders of these ancient houses could fashion some doorways when they wished to take pains. As a contrast, however, some entrances were merely holes in the walls, crudely placed.

The walls were still standing 12 feet high and were well built. In one corner was a large, perfectly cut and polished block of stone which served as a corner for two heavy walls. The author has never had the pleasure of seeing in the United States a finer example of a prehistoric bit of masonry.

The floor was adobe, which had been laid wet, packed hard, and then rubbed smooth and level. There was no fireplace in the floor nor any evidence of any in the debris. This room seemed especially well built and for this reason to have been set off, in use at least, from the other chambers. The debris yielded nothing of particular interest; even the potsherds were fewer.

Rooms 8, 9, and 10 were in no way unusual and contained nothing of interest. It should be noted, however, that the latter two contained no doorways and were presumably entered through hatches, while number 8 had three doorways, one leading outside and facing west, and two to other rooms.

Room 11 was the first to cheer up a thoroughly disheartened crew, for to dig, day after day, merely to find out the dimensions of a space and yet find nothing of real interest is discouraging, to say the least.

Digging was proceeding as usual, two men working together. The day was very hot and damp—an unusual condition in the Southwest. Ten feet down inside the cubicle no breeze penetrated. The excavation was almost complete; so nearly so that the writer had given up hopes of finding anything on the floor—the last hope of a series—and had turned his attention to kiva 1, which was slowly emerging.

An unusual lull in all conversations and joking aroused his suspicion that something unusual had occurred—and justly—for the men had found resting in a corner a large inverted food bowl, and nested beneath it, another. The top one had been badly broken

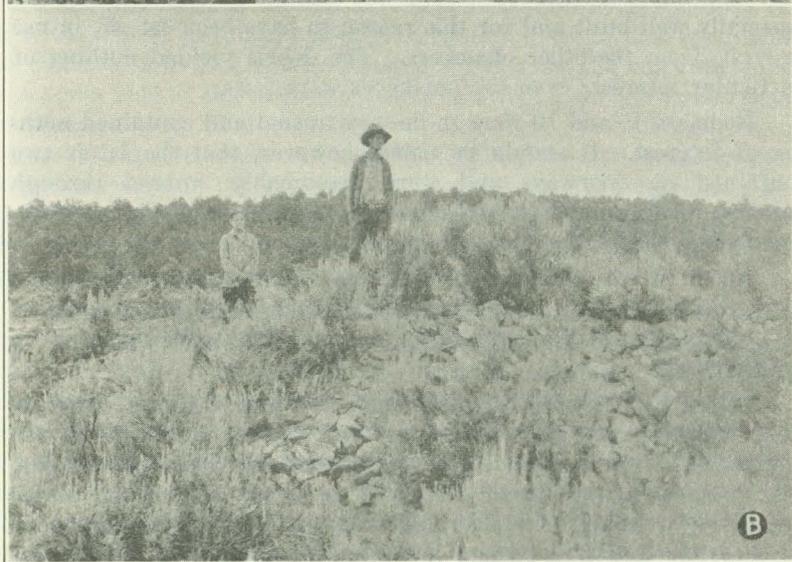
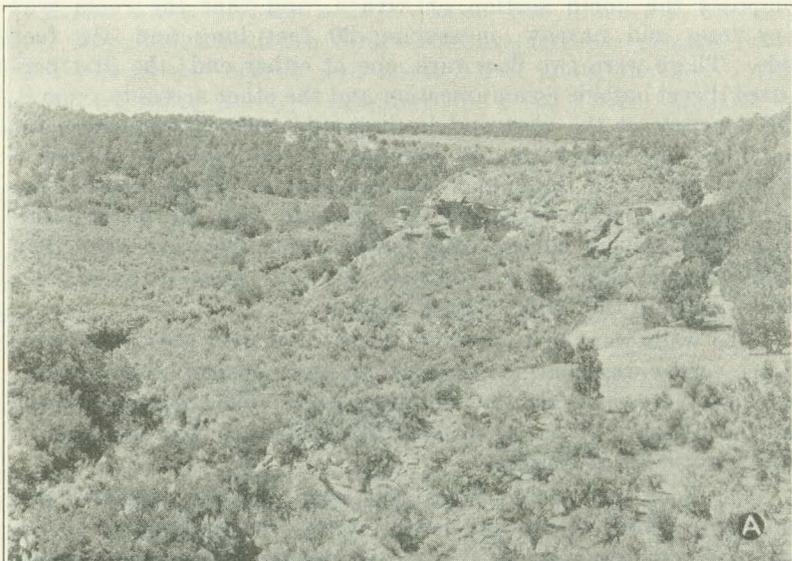


PLATE III.

- A. Beartooth Pueblo viewed at a distance of one-half mile.
 B. Beartooth Pueblo before excavation. Underneath mound were rooms 1, 5, and 6.

Photographs by P. S. Martin.

by a large rock, but the under one was safe. The larger measured 1 foot 1 inch in diameter and 9 inches in height; while the smaller, more beautiful one was 10 inches in diameter and 6 inches high. (Plate II, n.) The latter is a typical bowl of the "classic period" of Mesa Verde ware. These fine specimens were probably forgotten by their former owners, as there was no burial nor anything else with them which would indicate a reason for their lying there.

The floor in this chamber was like that of the others described, rough and uneven. However, it emitted a hollow sound when struck with a shovel or pick, although no reason for this was found at the time. A careful search for an entrance or a passageway ended fruitlessly. Later work in an adjacent room, however, revealed the fact that the common corner for rooms 11, 12, 13, and 17 rested on a very large rock, placed there by the builders to cover a natural crevice or gap of some kind, and this it was that produced the hollow sound.

It might be well to note here that frequently one would find small apertures about 5 inches square running completely through from one room to another. Occasionally these contained a log which had formerly penetrated into two rooms. These may have served as continuous floor beams, as it was easier to slip a log of a given length through a hole provided for it and thus serve two rooms simultaneously, than it was to make two cuttings. However, strange though it may seem, a row of such holes which one would naturally expect to find in such rooms for roof support, never materialized. In other words, one beam and one only was made to serve two rooms. The remaining joists were provided for in the orthodox manner, i. e., by means of a ledge of masonry or by small holes, which did not go through from one side to the other.

On the other hand apertures such as described above (i. e., piercing one wall completely) were found at various levels above the ledge rock floor. Thus, between rooms 9 and 10 there was one 13 inches above the floor; between rooms 10 and 11, one 8 inches above the floor; between rooms 12 and 13, another 3 feet above the floor.

It has been suggested that these were holes for ventilation or for conversations between rooms. They may have served as air vents, but if so they must have functioned badly. The real purpose is unknown.

Rooms 12, 17, 18, and 22 were in no way unusual and so may be omitted from this discussion.

Room 16 possessed what might be termed a diagonal doorway (Fig. 1). It opened directly out on the canyon rim. The angles were surprisingly sharp and well constructed. A large, well-

cut stone door slab lay on the floor and when placed at the opening fitted perfectly. While speaking of doorways, one might state at this point that no T-shaped doorways were encountered in this ruin.

Room 19 was the largest rectangular room of Beartooth Pueblo, although number 7 contained the same number of square feet. Hopes ran high while this room (19) was being excavated. An unusual number of beams helped make up the debris. On the floor and also at various levels above it were found a number of metates and manos, 6 of the former and 12 of the latter. This suggested the idea that this room may have been devoted more to corn grinding than any of the others. Aside from the roof beams and grain grinders nothing extraordinary came to light.

Room 20, as contrasted with number 19, was small. The only burial found in the entire village was here discovered. Lying in the southeast corner on the floor were the cremated remains of an infant of not over 4 years of age. The word cremation is used with caution, for it was impossible to tell whether or not the burning was intentional. Certainly the process had been incomplete, for only the ends of the long bones were burned, while the skull had not even been smoked. No pottery or any other artifacts were discovered. The burial, if such it may be termed, had been placed directly on the stone floor with no attempt to cover it with dirt or stones.

This discovery raised many questions, particularly the one concerning the uses of the ground floor. As has been stated earlier, in all rooms except number 7 the floors were like steps or shelves because of the cliff on which they were constructed. Rarely had any attempt been made to remedy this situation, by leveling with rocks and dirt. Most of the doorways were so placed that they might just as easily have served as mediums of ingress and egress for the second story as the ground floor. Finding the infant skeleton laid on the bare floor of room 20, without covering, so far as could be seen, made the author wonder whether the lowest rooms had ever served as actual living quarters. True, they may have served for storage of food, skins, water (in jars, of course), or as turkey runs, although the last named is extremely dubious. Nothing may be said definitely one way or the other, but all the evidence points to the suggestion that the ground floor rooms were not lived in.

Kivas of Beartooth Pueblo

Beartooth Pueblo possessed only two kivas, one of which was more or less "normal," while the other presented interesting anomalies. Kiva 1 was the first to be found and will therefore be first considered.

Kiva 1, as may be seen by consulting the ground plan for this ruin, is a round structure built within a rectangular space. One might at first guess that it was an afterthought, as it were, and so was not provided for in the original village plan, if any ever existed. However, such was not the case. A round kiva surrounded by rectangular rooms is common and not at all unusual.

The kiva debris contained surprisingly few rocks, an indication, in the writer's opinion, that there never had been any structure over it. Many unburned, though much decayed, timbers were continually encountered, so that an accurate idea of the form of the roof was obtained.

The walls above the banquette were not circular, although the banquette was. Five pilasters or pillars (for roof support) were *in situ*; the sixth had tumbled into the canyon. The banquette measured 4 feet high and averaged about 1 foot in depth except for the space on the north side, which measured a scant 4 inches. The inside diameter of the kiva measured 15 feet (Plate IV, B).

The floor was smooth and did not rest directly upon the cliff ledge but was elevated, by means of rubble and hard packed dirt, 1 foot 6 inches on the south or canyon side, and 3 inches on the north side. Slightly south of the true center of the kiva was the fireplace, 1 foot 8 inches in diameter, and was filled to a depth of 10 inches with white, fine ash free of charcoal. No *sipapu* could be located.

The ventilator tunnel and shaft were well constructed and differed from that found in the ordinary San Juan type of kiva. For example, in the kivas excavated last year, the ventilator tunnel was so built as to introduce fresh air at the floor level. A deflector (generally of stone) prevented the air current from striking the fire directly. This kiva, however, had been so constructed that the ventilator tunnel lay 1 foot 6 inches below the floor level. All but a space 12 inches square, nearest the firehole, was covered over with logs, many of which, though fragile, were still *in situ*, so that the air entered the room proper through a kind of register, similar to those employed by many hot air furnaces in modern homes. This kind of ventilating apparatus possessed the advantage of having no deflector, for with this arrangement the air currents were supposed to rise directly upwards and could not strike the fire.

The ventilator shaft (or the vertical portion) must have been stubby, for it probably never rose to a height of over 3 feet.

On the southern side was the altar, or deep recess, which many San Juan kivas possess. This one, however, differed from the ordinary altar, by being placed at the level of the kiva floor, instead of being elevated to the banquette height, as is so common (Plate IV, B).

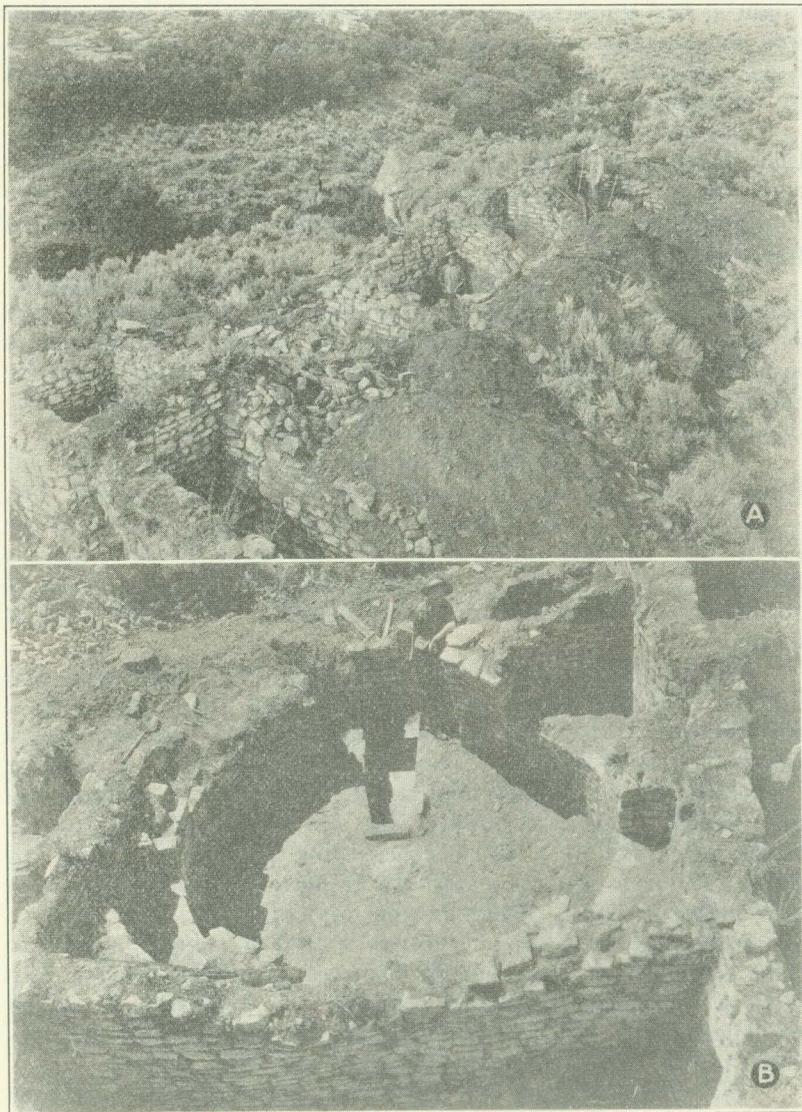


PLATE IV.

A. Beartooth Pueblo, looking southwest, showing rooms 11 to 22.

B. Kiva I, Beartooth Pueblo, after excavation.

Photographs by P. S. Martin.

Two niches were found, a large one (1 foot 3 inches high, 1 foot wide, and 10 inches deep) located in the northeast circumference of the banquette 1 foot above the floor, and a small one (4 inches square) which was placed in the south wall of the deep southern recess and opened, strangely enough, directly into the ventilator shaft. Both of these niches were empty.

Two complete cedar roof beams lay on the kiva floor, just as they had rolled from the pilasters on which they had once rested. One measured 7 feet 6 inches long and the other 8 feet. The diameter of both was 10 inches, and both bore the axe marks of the woodsmen who felled them.

There was every indication that the pilasters yet stood at their former height, namely 6 feet 2 inches. By close observation of the many bits of logs that were turned up, it is safe to say that this kiva was cribbed roofed; that is to say, logs were laid from pilaster to pilaster, the row above being drawn nearer the center of the chamber and cutting across the corners of the first series, so that finally the structure resembled a dome.³

The masonry was a splendid example of aboriginal skill. The individual stones, instead of being small, brick-like objects, were large, almost massive, well cut, rectangular stones. The walls back of the banquette were, of course, of masonry.

Two features, which are not easily seen from the ground plan, are the angular, deeper recesses on the northeast and northwest corners of the kiva. These are caused by the fact that a round room had been fitted into a rectangular space and that apparently there was no feeling which demanded that the rear walls of the banquette and all spaces always be round, so long as the bench itself were circular.

Kiva 2, situated at the far west end of the pueblo, differed in some respects from Kiva 1. It was not a round structure but square, with four rounded corners.

The walls were of good masonry (although the individual stones were not so well cut) and still stood to a height of 12 feet. The dirt which filled the room was loose and very black, and as it contained but few large stones, presented no great difficulties in excavating. In common with Kiva 1, there was probably no superstructure, as evinced by the type of debris.

There were no benches nor pilasters, as such, but of course there were substitutes—at least for the pilasters. On each side of the kiva, with the exception of the south, was a recess 1 foot deep, 5 feet wide and 4 feet above the floor. The kiva roof extended over

³See J. W. Fewkes. *Bulletins* 41 and 51 of the Bureau of American Ethnology—Reports on excavations in Spruce Tree House and Cliff Palace, Mesa Verde National Park.

these narrow benches, and as it was just 6 feet high at this point, it would leave but 2 feet clearance between the roof and the bench. Clearly, then, these spaces could not have been utilized as seats, for they were too shallow, although they may have been intended merely as shelves. Nothing was found on them.

Three niches, two of which were very large, were built into the walls. Niche number 1, the largest, and located in the southwest corner, was flush with the kiva floor, and measured 3 feet high, 2 feet wide and 1 foot 8 inches deep. Number 2, in the northeast corner, was just 6 inches above the floor and measured 1 cubic foot. Number 3, the smallest, was recessed in the north wall just 4 inches below the bench level and measured 7 inches long, 4 inches high and deep. Not a solitary specimen was found in any of them.

The floor was composed of hard, smooth adobe. A large fire pit, 3 feet in diameter, occupied the center of the room, and was packed with white ash free of any charcoal. Just to the south of it lay an unusually large deflector or fire screen, 4 feet 8 inches long and 2½ feet high.

The ventilator tunnel, which opened flush with the floor, had at one time also been as wide as the deflector was long, i. e., 4 feet 8 inches, but in later times (due to the fact, perhaps, that too much of a draft rushed in) this opening was blocked off by means of masonry, so that the space is now only 1 foot 2 inches wide.

The roof timbers, as they were encountered in the debris, afforded excellent opportunity for study in a hypothetical reconstruction. From this it was plain that in lieu of the cribbed roofing, common to most San Juan kivas, the builders had employed, rather, a plan by which the timbers were laid in criss-cross fashion, the north and south beams being the heavier, measuring, as they did, 8 inches in diameter, as contrasted with a 4 or 5-inch diameter of the east and west series.

This room was the only one of the whole pueblo which bore the marks of a conflagration. The fire could not have been very serious—as only the west side showed any of its effects, and as the room was undoubtedly used after the accident.

Brief mention should be made of the ventilator apparatus. As was stated above, the ventilator tunnel opening into the kiva had formerly been much wider and had at a later time (perhaps after the conflagration) been narrowed considerably.

The same phenomenon was also noted in the "throat" of the ventilator tunnel. A narrow wall had been thrown across the aperture at the bend or turn to the east, which the tunnel makes (Fig. 1), so as to close off the opening laterally as well as vertically. Evidently two "shut-offs" or "dampers" were needed, or at least felt to be necessary.

Curious, also, were the tunnel and shaft. Instead of proceeding in a straightforward manner as do similar ventilator shafts in other kivas of the region, the horizontal portion was built to run first more or less south and then east 8 feet, where the vertical shaft descended. No reason can be ascribed for this complicated arrangement. Certainly other buildings would not have interfered in any way with an apparatus such as kiva 1 possessed, namely a tunnel which ran southward far enough to clear the kiva building and then a shaft directly over it. The only guess the writer is willing to hazard is that this shaft and tunnel might have been used as a means of entrance or exit. Certain it is that the dimensions of the shaft and tunnel are such as to make this entirely possible.

Four specimens were discovered in kiva 2. In the ventilator tunnel, close to where it enters the kiva, were found two excellent stone axes, made of diorite and well sharpened.

On the floor of the kiva and near the north wall were two mugs (Plate II, m and o). Both had been ceremonially "killed" (i. e., a small hole about 1 inch in diameter had been punched out of the bottom of each). These specimens did not accompany any burial, so that it is difficult to account for this particular treatment of them.

Attention should be called to the fact that kivas 1 and 2 are not truly subterranean, a character which one usually associates with most prehistoric kivas. They were built on the same rim rock and on the same level as the secular rooms. How can one account for this apparent transgression of the rules of custom?

First, it must be remembered that the secular rooms, which formed a part of at least two sides of the kivas, probably rose two or three stories above the natural ground level. In other words, the third story may have been 10 to 14 feet above the level of the kiva roof, thus making the kiva proper subterranean in appearance, if not in reality. Then, too, the fact that the kivas are built on the same level as the ground floor rooms lends color to the idea expressed above, namely, that these last mentioned rooms were not used often as living quarters, because the prehistoric inhabitants of the pueblo wished to feel that their kivas, although not subterranean, were below them.

Extensive excavations were carried on below the rim rock in the talus of the canyon. Great piles of cut stones indicated that here, too, were many rooms. Time did not permit of much work, but enough information was gleaned so that the writer feels reasonably sure that the upper and lower pueblos were probably lived in contemporaneously.

The rooms of the talus-pueblo were of about the same dimensions as those on the rim rock. The masonry was likewise similar.

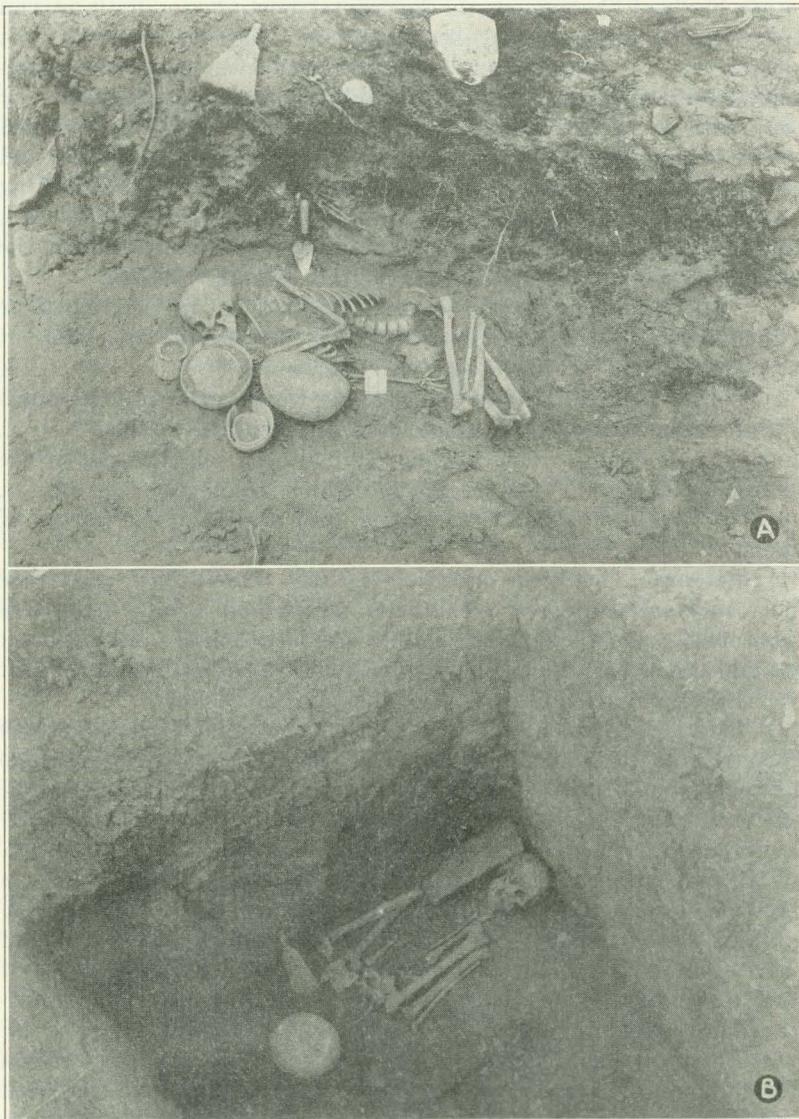


PLATE V.

- A. Typical burial of Pueblo II period (burial number 11).
 B. Stone-lined burial chamber (looking northeast).

Photographs by P. S. Martin.

Four rooms were cleaned out. The most interesting one of the group was a room in which excavations were carried down 20 feet below the surface. In order to be sure that nothing would be missed, it was the custom, where conditions permitted, to dig at least 1 foot 6 inches below what was thought to be a floor. This often entailed an extra burden of work, but in many cases yielded interesting results as well as negative information. In this case, much to the writer's surprise, three sub-floor levels were found, which were indicated by a hard plaster of adobe, a streak of ash or dust, and charcoal. These floor levels were about 4 or 5 feet apart. On each floor were found bits of crude pottery and pieces of bone awls and scrapers. It should be noted, however, that the stone walls of the last houses extended downwards only about 5 feet, and that probably the sub-floors were in no way connected with the last or upper culture. It was evident, however, that earlier settlements had been made on this spot, although they may not represent separate cultures.

Summary of Beartooth Pueblo

One of the most interesting things about this pueblo is the question, which constantly arises, as to the disposal of the dead.

Even if the pueblo had only been inhabited a short time, there must surely have been some deaths; and there was much evidence to cause one to believe that the occupancy of that house was of considerable duration—possibly fifteen to twenty years or more.

Refuse heaps were found and were excavated. They consisted of ash, charcoal, bone implements, and a few potsherds. Not a human bone was found in them.

Intra-mural burials below the floors were out of the question, because the floors were solid rock. Extra-mural burials were searched for, but without success.

Trenches were cut in likely as well as unlikely spots around the pueblo and below in the talus and near the arroyo. No burial was discovered, and this pueblo now enters the lists of other greater ruins, such as Cliff Palace, Spruce Tree House, and Pueblo Bonito, which have baffled archaeologists when they searched for the cemeteries.

Attention should be called to the fact that Beartooth Pueblo possessed doorways opening to the four cardinal points and placed near the ground. This fact (of easily reached entrances) may indicate that a nomadic enemy did not exist and that therefore high, inaccessible doorways were not necessary.

It is often assumed by students of the Southwest, because of present day customs, that the women built the living quarters or secular rooms, and the men the kivas or ceremonial rooms. A

question which has often bothered the writer is this: how could the men, not having to build secular rooms, of which there are twice or three times as many as kivas, and who therefore presumably did not have much chance to become expert masons, suddenly become very adept and construct such excellent examples of aboriginal architecture as the kivas represent? Surely this skill was not born of a moment. Of course, not all kivas are well built, but in some cases, as in Beartooth Pueblo and in other pueblos which the author has helped excavate, the kivas were more perfectly built than any single secular room. This "perfection" does not only apply to dimensions, but applies also to the individual cut stone, to the regularity of the courses, to alignment of *sipapu*, fireplace, deflector and ventilator apparatus, to the plastering, and to the floors. Either it must be admitted that the men helped the women build the houses; or that the women built the kivas as well as the houses, putting forth more effort in the former case, since the ceremonies on which depended tribal existence were to be performed therein; or that both men and women worked on the kivas.

The question of the relation of the number of kivas to the number of secular rooms is always interesting. In the case of Beartooth Pueblo, there are twenty-two ground rooms. If, as the writer supposes, there had formerly been three stories, sixty-six rooms would be the total. In that case, then, there would be an average of thirty-three rooms to a kiva. As was brought out by the writer in an earlier study,⁴ this proportion, if it means anything, holds true more often for the later or more advanced large ruins than it does for the earlier, smaller ones. In other words, when judged by this criterion, Beartooth Pueblo would seem to belong to the later type.

It has been suggested many times by many people that a large, well-built pueblo like Beartooth might have been used for a winter home only, and that when spring came it was abandoned, or largely so, in order that the people might hunt and tend their crops, which may have been planted in a river valley some distance from their permanent home. Since there was no evidence for or against such a supposition, the writer feels that it would be beyond the scope of this paper to make any guesses on such a subject.

In the course of ordinary excavation in secular rooms, one might expect to find a few household artifacts scattered about. In a village that has burned, one does find many articles, which were probably left behind because of the occupant's haste to flee. In Beartooth Pueblo no fire occurred, except a minor one in kiva 2. With the exception of two food bowls from room 11, and two mugs

⁴P. S. Martin. "The Kiva, A Survival of an Ancient House Type." Unpublished manuscript. University of Chicago Library.

from kiva 2, not a room contained anything. They were stripped bare. It would certainly look as if the last inhabitants had moved out in a very leisurely fashion, taking everything movable with them. It was a wonder to all the workmen that the roof beams were permitted to remain behind at a time when thrift and saving seemed to be the byword of the day!

LITTLE DOG RUINS

In order to extend and amplify the work done in 1928 in small house sites, a ruin was chosen which was situated about 5 miles in an airline from the Herren farm where work was carried on last year.

This new site, which we called Little Dog Ruins because of an artifact found in them, was located in the N. W. $\frac{1}{4}$ of N. E. $\frac{1}{4}$ of S. E. $\frac{1}{4}$, Sec. 3, Twp. 38, R. 19 W., Montezuma County, Colorado. For a period of six weeks work was carried on here.

Superficially, Little Dog Ruins looked like the sites worked last year and like hundreds of others in that immediate region. However, nothing could have been further from the facts. Actually this site was complex (so much so that much remains unknown), and the writer felt swamped by unexpected daily developments.

The working crew was divided in half: one of which was to clean out a kiva; the other to continue explorations in the refuse-burial mounds. The latter group, however, felt dissatisfied with the place to which they had been assigned and chose to move elsewhere. This change brought results far surpassing what was hoped for. It might be well to consider first, however, the kiva group.

Interest in kiva A was stimulated by the fact that a baby's skeleton had accidentally been found interred in the bottom of the ventilator shaft. This burial was probably made after abandonment of the kiva.

A very wet summer made the first four feet of excavating in the kiva easy. A team and scraper were employed to carry away the dirt. Rocks were so infrequently encountered that the digging progressed rapidly.

When finished, Kiva A (Plate VI, A) was found to be quite regular with respect to its pilasters, fireplace, and *sipapu*. The diameter from bench to bench was exactly 13 feet. As can be seen from the plate, the masonry was regular and still bore bits of plaster on the southwest portion. The banquette stood 3 feet 8 inches above the floor level. The bench proper measured 2 feet wide and was covered with stone slabs. The outer walls above the banquette were earthen.

Kiva A was the first one out of eight excavated to have a real

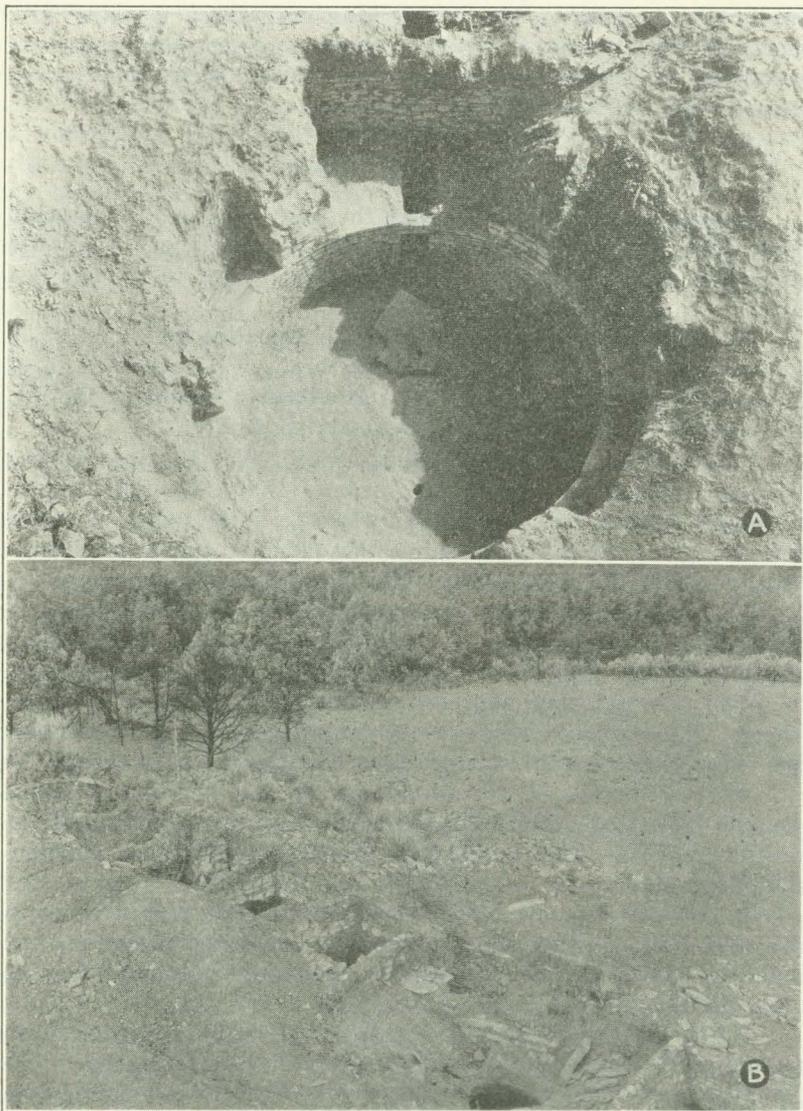


PLATE VI.

- A. Kiva A, Little Dog Ruins.
 B. Pueblo of Little Dog Ruins, showing typical unit-type ground plan.

Photographs by P. S. Martin.

sipapu. This one stood forth in such a manner that no one could miss it.

In the center of the kiva floor was a deep fire pit, one foot eight inches in diameter, full of ash. Just to the south of it was a smaller, cruder one surrounded by slabs. The latter had apparently fallen into disuse, as it contained only a small quantity of ash which was mixed with dirt. Immediately behind this abandoned fire pit was a pyramidal-shaped deflector.

The ventilator shaft, tunnel, and deep southern recess were in no way unusual. With the exception of two stone arrow points and a few bone awls, nothing important was found.

A round tower, which was situated just to the north and east of the kiva, attracted our attention because of its proximity. It may be recalled that during the excavations of 1928 it was ascertained that towers lying adjacent to kivas were always connected to the latter by means of underground passages. It was in the hope of finding similar structures that work was commenced in Little Dog Ruins. When kiva A was finished no evidences of a passage were visible. Not discouraged, however, the writer arranged to have this tower excavated.

Work had not proceeded far when the object of our search showed itself. On the side nearer the kiva a stone-lined manhole appeared. When completely cleaned out, it proved to be a shaft 2 feet square, the bottom of which was 2 feet 6 inches below the tower floor. Thence the tunnel, the dimensions of which were exactly the same as the shaft, continued southwest for a distance of 15 feet, at which point it pierced the earthen wall of the kiva between pilasters two and three, 1 foot 8 inches above the banquette.

For the purpose of continuing research in the connection between towers and kivas two more towers were excavated. The first was within Little Dog Ruins, but belonged to a different unit. It was called "Metate Tower" for reasons that will subsequently appear.

Metate Tower was situated between two kivas, about eighty feet northeast of kiva A. A day's work revealed what at first was thought to be a stone-lined manhole, but which proved to be a secondary structure, two sides of which met at a right angle, while the circular part of the tower against which the two walls abutted formed the other portion of this bin-like room. The writer was considerably puzzled by this compartment. On the floor, which was three and one-half feet below that of the tower, were found four large metates and manos and one mortar and pestle. This immediately suggests to one's mind that this curiously shaped room was used for corn grinding.

When no passage within this bin was found, a close search was

instituted on the other side of the tower with the result that another passageway was discovered, which ran northwest into a kiva. This one had never been stone-lined, and for some reason had been filled in at a later date.

The second tower to be excavated (in addition to the one adjoining kiva 1) was situated about a quarter of a mile south of Little Dog Ruins. The diameter of this structure was about 2 feet greater than those of the two described above, which were 10 feet across.

Across the north and south diameter a thick wall had been built. The east side of the tower was barren. Excavations were carried two feet below the floor in order to be sure that nothing had been missed.

The west side of the tower contained the opening to the underground passage for which the writer was looking. It was 2½ feet square. The sides and floor of both tunnel and shaft were faced with cut stone.

Pueblo of Little Dog Ruins

A low mound, 75 feet long, covered with broken bits of pottery and loose rocks, and oriented about east and west, constituted what afterwards proved to be the secular rooms or pueblo of Little Dog Ruins.

When excavated the rooms resembled those which were examined last year, being mostly rectangular (7 feet by 6 feet) with smooth adobe floors, 1 foot below the surface. They had been crudely built and had never been more than one story in height (Plate VI, B). The highest standing portion of the walls was 1 foot 8 inches, while the greatest thickness was 1 foot 2 inches. It is not surprising, however, that the walls did not bear well the ravages of time, for the lower portions only had consisted of crudely trimmed sandstone blocks laid in courses, while the upper portions were composed of small, irregular stones imbedded in adobe. No fireplaces were found within the walls of these rooms.

In the quest for something new, the writer suggested that after the floors were carefully cleaned off the workmen might carry down the excavations a foot or so. This was done, with astonishing results, for another lower wall was discovered.

This was again the signal for feverish digging. Indeed, the writer had difficulty in persuading his helpers to go slowly enough so that he might take notes and measurements.

It was not long before it was apparent to everyone that another set of rooms had been found. These rooms had been built earlier than the ones just described, for they lay under them and were separated from them by 1 foot 3 inches of dirt. Moreover, the

walls of this newly discovered pueblo extended under those of the preceding period and ran more southwest and northeast and were composed of "chipped slabs." By "chipped slab" the author means a long, flat piece of stone, ovaloid in shape, never less than 1 foot 6 inches long and 1 to 3 inches thick, chipped like an arrowhead, although never worked smooth. The ends were generally unshaped, although chipped in some instances.

The floors of this second period were about 2 feet 4 inches below the floors of the preceding period. Interestingly enough, many of these rooms were built over cistern-like holes which may have served as cellars or places for storage. Frequently they were bottle shaped, with narrow necks 2 feet in diameter, a large base 3 feet across and 4 feet in diameter. The tops or openings to these storage cists had been covered with stone slabs supported in part by timbers, fragments of which were found. Turkey bones and burned corn were found in one cist.

In cleaning out these storage places, another set of rooms was discovered below those of period two. Only three of these were cleaned out and examined, but these sufficed to show that an earlier culture had utilized this spot and that its building features were somewhat different.

The walls of these earliest houses had consisted of wooden poles, three or four inches thick, planted upright like a stockade. The butt ends only of these uprights remained, for the upper portions had burned to the ground. Fortunately the charred nature of these posts plus the enduring qualities of cedar helped preserve this information. It is impossible to state just how high the walls formerly were, but it is possible to say that the roof was made of small twigs and branches covered over with thick masses of adobe, and that the walls had been chinked with the same sort of mud, for on the floors were found vitrified chunks of adobe bearing imprints of twigs, branches and poles. Near the corner of each room was a small firepit filled with ash.

It was plain from the stratigraphic nature of this site, as well as from structural differences of the houses, that here had existed three separate periods of occupancies, the earliest of which may represent an earlier culture. In each case one foot or more of dust separated the floors of each set of rooms and the nature of this debris (sand, animal dung and water streaks) caused the writer to believe that considerable time may have elapsed between each settlement. Certain it was that the pole and brush houses of period one were cruder than the stone houses; and that the chipped slab type of masonry of the houses of period two was different from that of period three.

It will be remembered that mention was made earlier of the

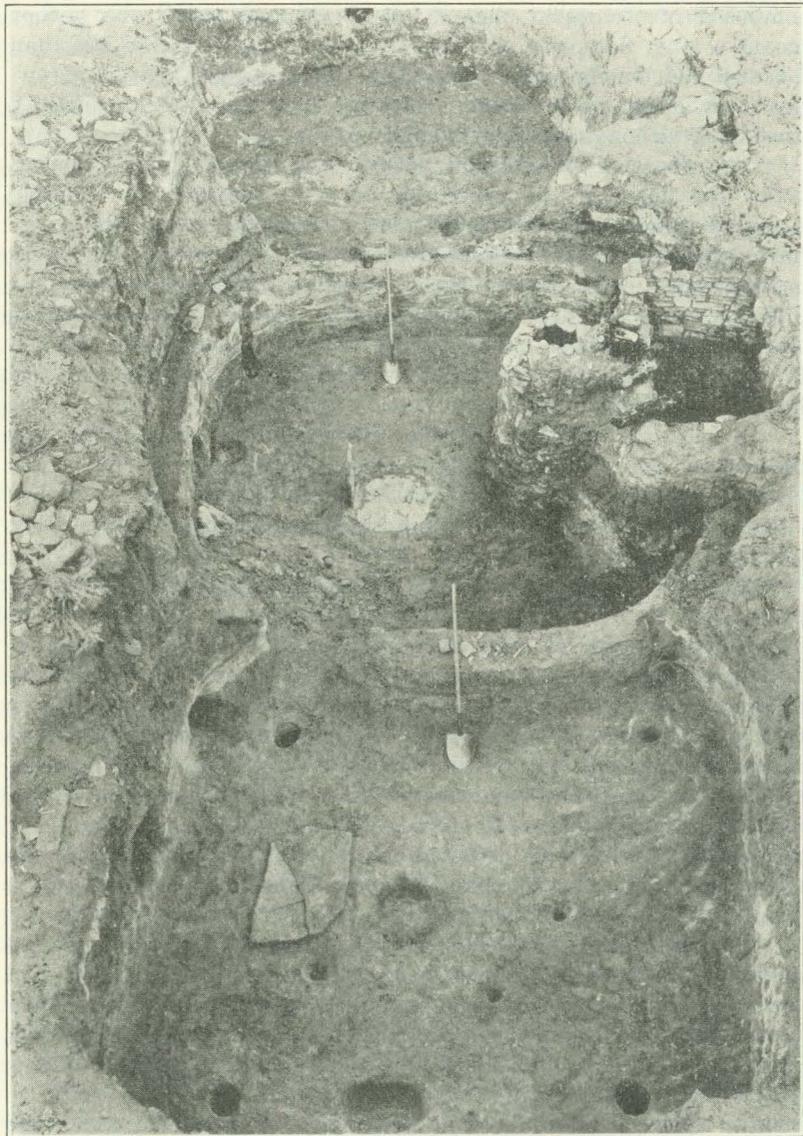


PLATE VII.

Early house-kivas, which probably belong to Basket-Maker III, or to Pueblo I period. Looking west.

Photograph by P. S. Martin.

men who were working on burial mounds and because of a "hunch" decided to change their place of digging. What they found was surprising to all and still puzzles the writer as to its exact place in the cultural sequence.

Digging had not proceeded far when large masses of burned adobe began to turn up. This was first interpreted to be merely the remnants of burned houses. But the deeper the shovels went, the larger these masses of vitrified adobe became. It became more and more apparent that a large, hot fire had once raged on this spot.

The test hole went deeper and deeper, but still no walls appeared. At a depth of 6½ feet a hard adobe surface was encountered, so much in contrast to the soft, charcoal-streaked debris that it was at first believed to be a floor. When cleaned off and examined carefully it was found to be a bench 1 foot 3 inches wide. It was immediately conjectured that this was a crude kiva or an early house. Further digging showed this to be true.

When entirely cleaned out it was found that this room was more or less irregularly shaped, being neither round, square, nor oval (Fig. 2, kiva 1). It looked more like a kiva than a house, but seemed to be a hybrid. For this reason the writer temporarily designated it as a house-kiva.

The floor, 10 feet below the surface, was hard and smooth. A banquette, 3 feet 6 inches high, followed the irregular circumference of the outer walls. This banquette was composed entirely of dirt, except on the east side where it was built of slabs exactly like the chipped slabs of the houses of period two, described above. The sides had been carefully plastered over with four successive coats of adobe mixed with gypsum. On the east surface were eight or ten pictographs which had been punched into the plaster when it was yet damp. These pictographs were geometric and were so crudely executed or possessed such an esoteric significance that the writer was unable to identify any one of them as representing anything known to man today.

Set in the "corners" of the banquette and extending downward 1 foot 2 inches below the floor level were the remains of four large cedar posts, which had probably been the main roof supports. Immediately above the banquette and to the rear of each of the posts were the charred remains of horizontal poles. It is not absolutely clear in the writer's mind what purpose these latter may have served, but it is possible that they had been forked or notched in such a way as to prevent the upright posts from being pushed wallward by the weight of the roof.

The roof of this house-kiva, as has been indicated, was probably borne by four upright posts, which may have forked on the upper ends and on which may have rested cross beams. The latter would

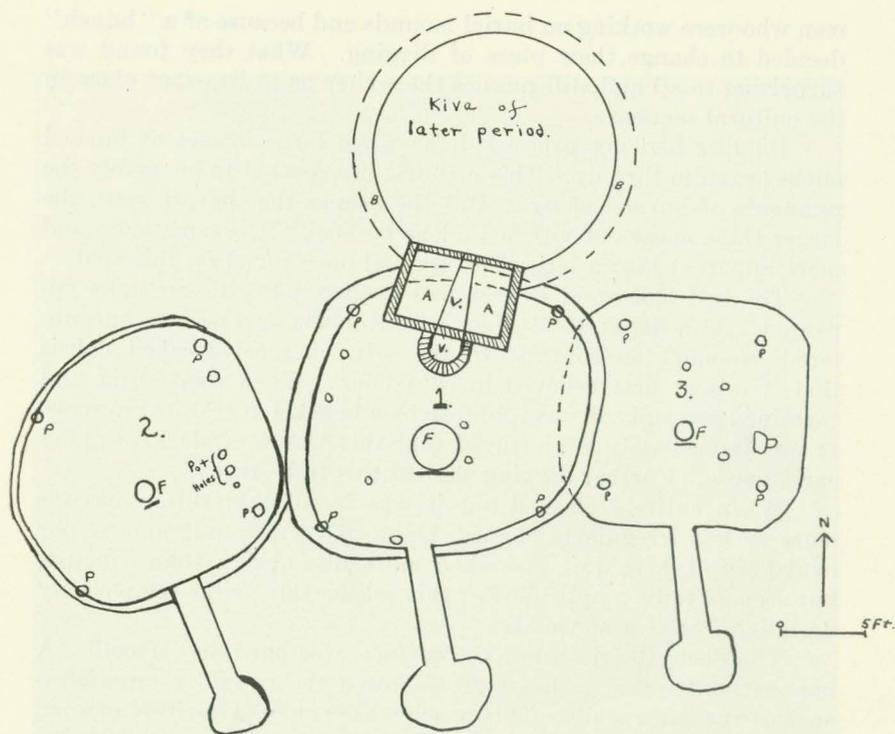


FIG. 2. GROUND PLAN OF HOUSE-KIVAS, LITTLE DOG RUINS.

A, Altar; B, Banquette; F, Fireplace; P, Postholes; V, Ventilator.

then form a rectangular framework across which smaller poles could have been laid. There was nothing to indicate that the upper walls of the room had ever consisted of poles and brush, but it was clear that they were merely the earthen sides which would result from a deep excavation of this sort.

A little south of the center of the room was a large firepit, three feet in diameter. On the south side of it were the pieces of what had been a stone slab deflector. Still farther in the same direction appeared the opening of the ventilator passage, which proved to be 7 feet long and 1 foot 8 inches wide and high. At the far end it widened out so as to form a small room $3\frac{1}{2}$ feet in diameter, into which opened the vertical part of the ventilator shaft. It may be that this shaft, room, and passage were used for entrance and exit, although there was nothing positive or negative which would enable one to say definitely. The shaft, room, and tunnel were not faced with stone. A slab, evidently made to close off the tunnel from the kiva, lay directly in front of it. A crude

wooden casing had enframed the doorway, so that when the slab was laid against it, cold drafts would be effectually shut off.

Perhaps one of the most interesting facts which came to light as a result of the excavation of this house-kiva was the intrusive part of a later kiva.

After house-kiva 1 had been burned and forgotten, another group of settlers came to this spot, built themselves houses (which the writer calls period 3 houses) and a kiva. This kiva had, as integral parts of its construction, a ventilator shaft and a deep southern recess or altar. Not (in all probability) knowing of and certainly not caring about an earlier structure, these later settlers dug into the already forgotten house-kiva 1, and constructed their altar and ventilator shaft on top of the charred logs and other debris and within its walls. A careful search in the altar of this intrusive kiva revealed the banquette of burned house-kiva 1, through which the intruders had dug in order to construct their ventilator tunnel (Fig. 2).

Mention should be made of the numerous holes or shallow depressions which dotted the floor in various places. There were in all ten of these. Fortunately it is easy to state what purpose they served, for in several of them were found cooking pots. These cooking pots were of the corrugated variety, still bearing soot, and were often made with rounded bottoms, so that they were unstable unless supported. These shallow depressions served that need, for a pot placed therein stood of its own accord. None of these holes was the *sipapu*, which, if it existed, was buried below the intrusive kiva.

Fifteen pieces of pottery were found in this room, most of them smashed. Nine were cooking vessels of the corrugated ware; two were food bowls, one of which was of black and white ware, the other of plain red ware; two were half-gourd-shaped ladles of red ware; and two unslipped jars (Plate II, e, f, g, h).

Underneath the stone slab, which had probably acted as a door for the ventilator tunnel, were found the charred fragments of a scalloped-toed yucca sandal. Near the fireplace and under a corrugated olla, or water jar, was a calcined bunch of long pine needles, tied together at one end with human hair in such a way as to resemble a whiskbroom or brush. Near the banquette on the east side were the burned remnants of what had been two baskets full of shelled corn. The most important find of all was a number of smooth stones, some of which looked like the reverse side of a man's foot (Plate VIII, a). One was probably a pestle. The others may have been "ceremonial" stones.

Two more house-kivas were carefully excavated and examined. House-kiva 2 was slightly smaller than number 1, but was more

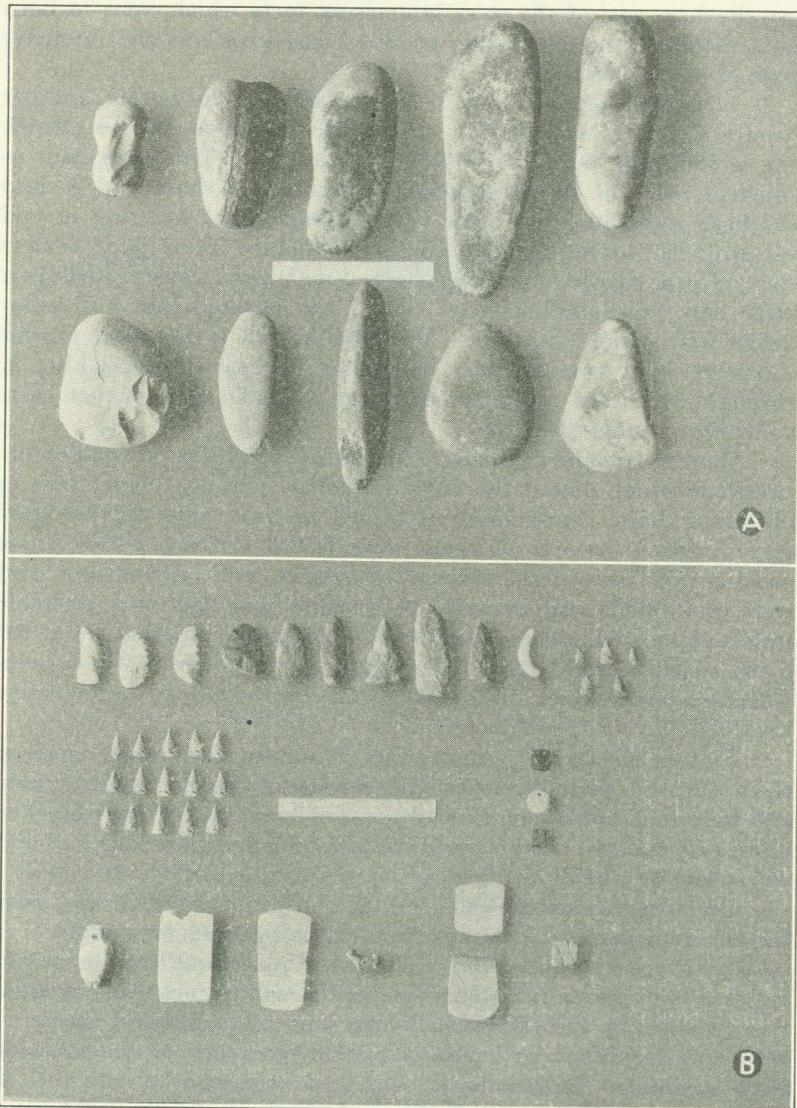


PLATE VIII.

- A. "Ceremonial" stones from house-kiva 1.
 B. Saws, knives, arrowheads, pendants and other stone artifacts from graves. Note pottery dog in center of lower row.

Photographs by P. S. Martin.

irregular in shape. A narrow, high banquette encircled only two sides of the room, the south and the west. The posts which had supported the roof, instead of being placed in the banquette, were set near it, but in the floor proper. They had likewise suffered from the effects of a hot fire, although there was some reason for believing that house-kiva 2 did not burn at the same time as number 1, for a portion of its east wall was built on burned timbers of the latter. It is probable that the roof was constructed in the same manner as just described above.

The firepit of number 2 was smaller than that of number 1. Resting on the ashes was a large, cracked slab, which was thought to be the remnant of a deflector, although it may have been a covering for a hatchway which might have existed in the roof. True to form, a ventilator passage entirely free from debris opened into the room, 5 feet south of the firepit. Again a stone slab was lying face down just in front of the ventilator doorway. When set in the wooden framework of the doorway, it fitted perfectly and obviously had been used for that purpose at least. The tunnel, the floor of which sloped upwards, was 7 feet long and proceeded south. The far end was not completely cleaned out.

Four pot holes were found, three of which still had ollas *in situ*. There were also two shallow stone-bottomed depressions, the exact use of which is unknown.

Near the wall of this burned room were found fifteen small but perfectly-shaped chert arrowheads and a lock of hair. Nearby were rejects, unworked pieces of stone, and a few hammerstones. Evidently an arrowmaker had been manufacturing projectiles just prior to the conflagration and, when the alarm was sounded, had been obliged to beat a hasty retreat, leaving behind the handiwork of several minutes or possibly an hour.

House-kiva number 3 was in no way strikingly different from the two already described, but it might be well to note a few items of importance.

This room was, in all likelihood, built before number 1, because the west wall of the former had been demolished to make place for the east wall of the latter, as will be seen by consulting Ground Plan B and a photograph of the same (Plate VII). As in the case of number 2, the roof posts were set out in the room proper, away from the wall. There was no banquette. Likewise, a cracked slab lay near the fireplace. It may have served as a deflector. Six feet south of the fireplace was the opening of the ventilator tunnel. If it had ever possessed a slab covering, none was in evidence. The ventilator tunnel ran almost parallel with that of number 1 and, like it, widened out into a tiny room.

Directly in line with the center of the firepit and the ventilator

opening and 3 feet north of the former was a small, round hole which resembled a *sipapu*. Along the east wall were several shallow depressions in the floor, two of which had served as pot holes, while the larger may have been used as a temporary container for grain or other foods. As in the case of its neighbor, house-kiva 3 had been molested by later, unsuspecting settlers, for the southwest corner of the deep southern recess of a later kiva had been built into it. However, in contrast to its companions, house-kiva number 3 had never burned.

The question of the age and uses of these three rooms is, of course, interesting but puzzling. Judging from the banquette of number 1, built of chipped slabs, exactly like the walls of the houses of period 2, one would be tempted to believe that both house-kivas and rooms of period 2 had been used, if not constructed simultaneously. However, taking merely the pottery into consideration, one might be led to think that these house-kivas were contemporaneous with the pole and brush houses of period 1, or in other words much earlier than the houses of periods 2 or 3.

Looking at the problem from a different angle, the writer suspected that they belonged to none of the houses, but were separate establishments. The reasons for this hypothesis are many, but the main ones were suggested by the internal evidence of the rooms themselves.

First of all, the rooms look like kivas (that is, they have a bench in two instances, a firepit, deflector, and tunnel), but they were not constructed of masonry, and they did not have pilasters for roof supports, this function being performed by four upright posts. On the other hand, they bore more evidences of domiciles proper than any other kiva excavated. The numerous cooking and water jars, the ladles, the basket of corn, the metate and manos—all these seemed to point to the suggestion, at least, that these rooms were lived in by a family or families.

The ventilator tunnels and shaft, with their slab doorways and antechambers which may have been entryways, remind one forcibly of similar rooms excavated by Morris and Roberts.⁵ These latter rooms were semi-subterranean affairs resembling in a very general way the structures the writer described above, with short tunnels or passageways, proceeding more or less south from the room proper and opening into vestibules or antechambers. In the opinion of these workers, those structures were probably built in late Basket-Maker times and served not only as one-room domiciles but also possibly as places for rituals and ceremonies.

⁵Earl H. Morris. Unpublished notes and "Preliminary Account of the Antiquities of the Region Between the Mancos and La Plata Rivers in Southwestern Colorado." 33rd Annual Report, Bureau American Ethnology, Washington, 1919. F. H. H. Roberts. "Shabik'eshchee Village." Bulletin 92, Bureau American Ethnology, Washington, 1929.

With this in mind, then, one may conclude that the underground rooms excavated by the writer and herein termed house-kivas, were entered by means of a shaft, vestibule and tunnel, as well as by a hatchway in the roof,⁶ that they were probably used both for secular and ceremonial purposes, and that they probably belong to late Basket-Maker III or more probably Pueblo I. This hypothesis also fits in better with the early, crude black and white pottery, the unslipped ware, the half-gourd ladles, the plain red bowls and the scalloped-toed sandal.

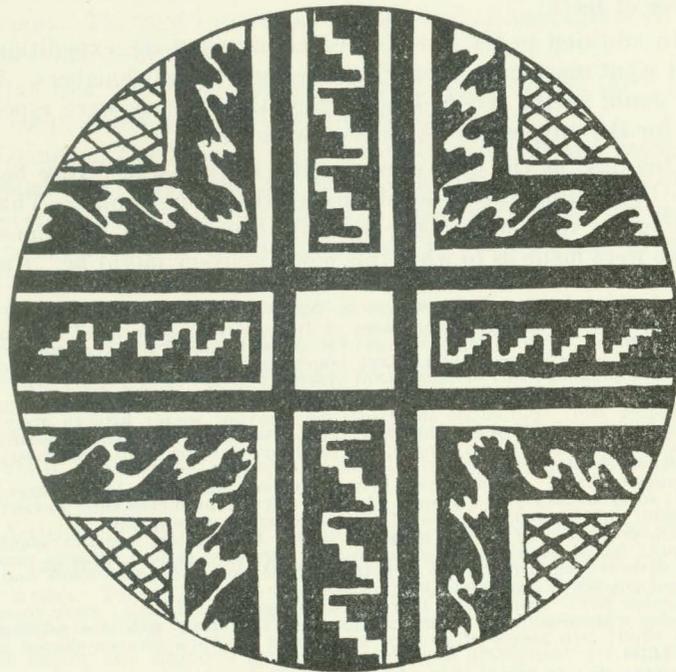


FIG. 3. DESIGN FROM INTERIOR OF UNUSUALLY FINE FOOD BOWL (Drawing by C. T. Lloyd).

Burials

It should be remarked at the outset that the number of burials found this season was far too few in proportion to the size of the village. Of course it is possible that not all the burial sites for a given pueblo were found, although all the terrain surrounding the ruins was carefully searched and trenched as well.

⁶There is no certain evidence for stating positively that there was an opening in the roofs of these chambers, but a primitive room, secular or not, in which fires were kindled, without at least some kind of smoke-hole, is well nigh unthinkable.

Burials for the most part were found in refuse heaps or dumps. These presented all the appearances of low, irregular mounds situated about ten or fifteen feet south of the kiva and thirty to forty feet south of the houses.

Each burial was carefully cleaned, dusted and prepared for photography, before anything was touched. In addition to this, notes as to its position in reference to some fixed spot, its orientation, its pottery, were jotted down. After removal of the bones, which were generally in a very bad state of preservation, all points of interest were noted (i. e., evidences of disease, age, condition and number of teeth).⁷

In addition to the burials just enumerated the expedition also found what may quite properly be termed burial chambers. There is no doubt in the writer's mind that these rooms were especially built for the purpose to which they were put.

One day, as the men were digging in the large refuse heap at Little Dog Ruins, their shovels disclosed a stone tunnel. This was startling, as they were some distance from a kiva. Innumerable guesses were made as to what this new discovery might be. Further

⁷Herewith is given a list of the more important and interesting burials.

Number one: found on the farm of Roy Herren; associated with a unit-type site; male; 25 to 35 years of age; faced south; about five feet eleven inches tall; flexed; arms crossed with finger bones on back of neck; head deformed; pronounced prognathism; sloping nasal ridges; two pieces of pottery with bones, a food bowl and a mug (Plate I, b and f, and Fig. 3).

Number two: buried on talus of Cow Canyon; male; fifty to sixty years of age; about five feet ten inches tall; placed on right side; faced north; head deformed; backbone entirely gone; toe and nasal bones well preserved; teeth decayed; no pottery.

Number three: from farm of Roy Herren; slab burial, four feet deep; female; forty to fifty years of age; about five feet four inches tall; flexed; faced east; skull undeformed; one olla of black and white ware at feet.

Number four: in refuse heaps at Little Dog Ruins; female; about fifty years old; flexed position; faced southeast; deformed skull; arthritis marks on bones; carious teeth; five pieces of pottery, three corrugated, one black and white bowl and one black and white jug.

Number five: from Little Dog Ruins refuse heap; female; sixty to seventy years old; extended with lower legs crossed; vertebrae and ribs missing; deformed skull; two pieces of pottery, a jug and a Chaco Canyon-shaped pitcher (Plate II, i).

Number six: in refuse heap of Little Dog Ruins; infant; sex indeterminate; three or four years old; on left side; faced south; three pieces of pottery, a large black and white food bowl and a small corrugated jar.

Number seven: found one foot south of number six; male; thirty to forty years old; flexed on right side and faced south; deformed skull; about five feet eight inches tall; no pottery.

Number nine: from Little Dog refuse heap; female; about thirty years old; buried in extended fashion with face upward, right leg crossed over left in "crusader" fashion; five feet four inches tall; hole two millimeters in diameter in frontal bone over eye; two pieces of pottery at left side of head, a corrugated, undecorated mug and the bottom of a corrugated water jug.

Number ten: from same refuse heap as number nine; female; forty-five to fifty years of age; buried in extended position, with right leg crossed over left, and face upwards; skull deformed; vertebrae, radii and ulnae missing; three pieces of pottery on left shoulder, a black and white food bowl, a duck-shaped piece (Plate II, d) and a Chaco Canyon-shaped pitcher (Plate II, j).

Number eleven: from same refuse heap as number ten; female; flexed on right side; thirty to forty years of age; about five feet five inches tall; skull flattened in posterior portion; six pieces of pottery, four black and white food bowls, one black and white olla and one corrugated mug (Plate V, a and Plate I, j and l).

digging soon put an end to any guessing, for the "tunnel" turned out to be a stone-lined entrance to a tomb.

The room measured 4 feet square, the floor of which was 8 feet below the present ground level. The stone facing extended 3½ feet upward from a slab floor. On the south side of the room, with its base on the uppermost slabs of the wall, was a tunnel-shaft doorway, 1 foot 6 inches wide, 2 feet 6 inches deep, and 1 foot 8 inches high. The manhole entrance to the shaft was topped with a large, thick stone slab. The entrance may have been built in order to permit friends or relatives to bring food offerings to the dead after interment. The roof had probably consisted of logs, although there was no evidence of them.

One foot under the doorway was an empty niche, three inches high, eight inches long, and five inches deep.

Lying on the floor in the northeast corner of the room were the bones of a male, who had died when about sixty years of age. The posture was so curious that it is hard to describe, but may be better understood by examining Plate V. Not a single vertebra was found. Only seven ribs were discovered. In the opinion of the writer this may represent what is called a bundle burial or a re-interment. This person, after death, may have been buried in the ground until all the soft parts decomposed; or in a tree, where the elements and the buzzards would act as cleaning agents; after one of these procedures the bones were gathered together and placed in this vault. Near the bones was found a food bowl turned upside down (Plate I, n).

Adjacent to this tomb was another. It, however, was cruder, for it was merely dug out of a gypsum stratum and was not faced with stone. The marks of the prehistoric diggers' tools were very clear in this white layer. This second room, the floor of which was 7 feet below the natural ground level, was irregular in shape, but measured about 5 feet square. In the northwest corner was the burial of a child, who had died when approximately ten years of age. Near its feet were the pieces of two incomplete food bowls. After the burial was made the room had been filled in with the same dirt that had been thrown out. No more such burial chambers were discovered this year. However, in 1928, a stone-lined tomb similar to the one just described above was partly excavated. It was found to underlie a later, round tower. Several burials with pottery were removed from its floor, but no satisfactory interpretation was given the find, because of its confusing position. But when linked up with the discoveries of 1929, it may be seen that it, too, was probably a specially built burial chamber.

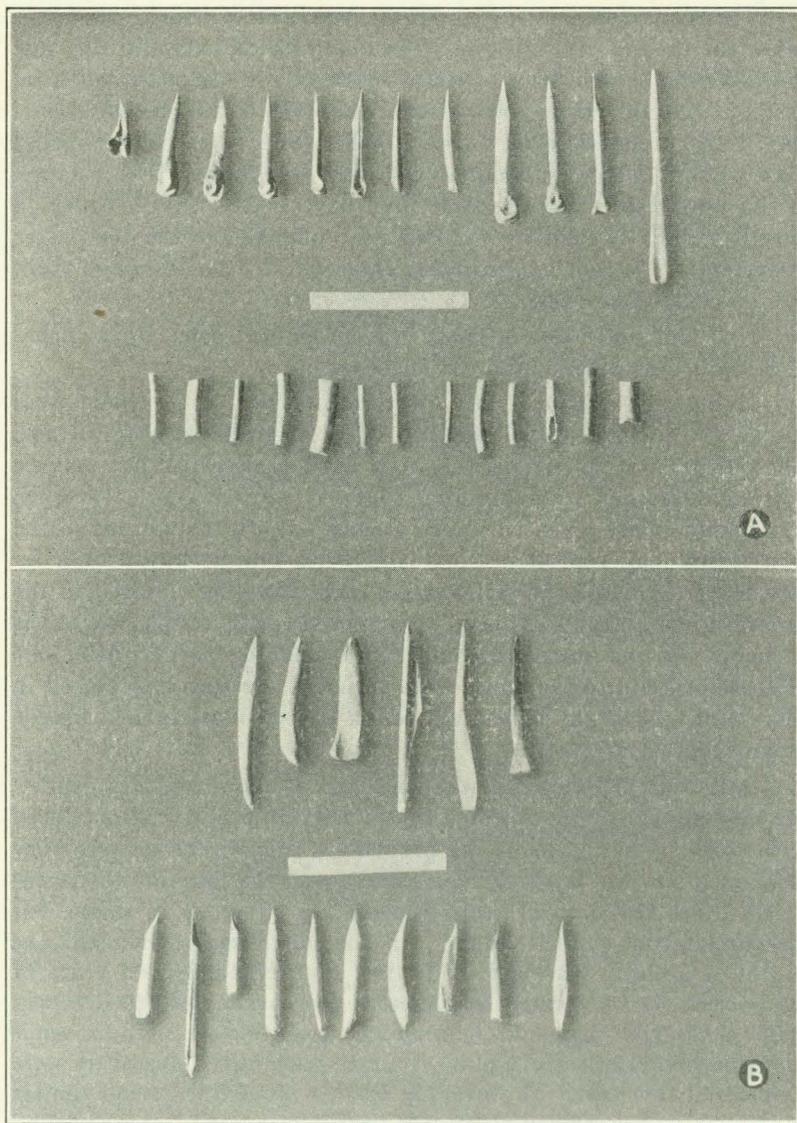


PLATE IX.

A and B. Bone awls, punches and beads.

Photographs by P. S. Martin.

HUMAN PALEOPATHOLOGY

Human paleopathology, or the study of human bones and mummies for the purpose of finding out the types of diseases suffered by people of ancient times, is a most interesting, yet greatly neglected subject. Of course it is known that the ancient Peruvians practiced trepanation, but an intensive study of the great quantity of skeletal remains reposing in museums has only recently been inaugurated. Dr. Williams has recently published a short, comprehensive paper, which deals with this subject and presents a comprehensive bibliography. The writer would refer anyone interested to this treatise for further detail.⁸

It is a common belief that prehistoric peoples led a "natural life" which somehow or other exempted them from the diseases and aches and pains to which modern peoples have fallen heir. Nothing could be further removed from the truth. Scientists have been able to demonstrate that prehistoric man probably suffered from as many ailments as we do, and probably was obliged, through ignorance, to endure more pain than is commonly supposed to be conducive to happiness and general health. Toothache, for example, was probably frequent, and, so far as is known, the simple expedient of extraction of the offending portion was rarely resorted to.

In the course of excavations made in 1929, the writer was fortunate enough to be able to examine about twenty-five skeletons, and from these observations wishes to mention several phenomena.

Carious or decayed teeth were common. Out of 600 teeth studied about 15% showed decay. Very often attrition or grinding down, due to coarse food mixed (unintentionally, perhaps) with grit, had exposed the pulp and had hastened decay. The presence of tartar was frequently noted.

Loose teeth in five skulls were observed. These teeth had suffered considerable loss of cementum, the covering which surrounds the root. The bone around these loose teeth had become thicker and denser. In other words, these specimens showed evidences of pyorrhea. Ante-mortem loss of teeth occurred, but no cause may safely be ascribed. There was no evidence that any of the observed cavities had ever been filled in any way.

A case of a broken femur of a sixteen year old boy should be mentioned. The fracture had healed, but malunion due to overriding of the bone occurred, causing this femur to look like a flattened out "S." Arthritis, by producing new bone formation at the joints, leaves its indelible mark on the skeleton, so that even after many centuries it may be recognized. Three of the skeletons ex-

⁸H. U. Williams. "Human Paleopathology," Archives of Pathology, May, 1929, Vol. 7. Chicago, Ill.

homed showed spicules or spiny growths on the vertebrae which may have made movement of the backbone very painful. Trepanation was not surely observed, although the right frontal bone of one skull had been pierced in such a way that it was impossible to state definitely whether it was a wound due to a blow or to an operation. Certain it is, however, that the woman died almost immediately, because the sides of the opening were very jagged and healing had not begun.

The most interesting skull was one that showed what Dr. Williams calls osteoporosis, or sponginess of the bones of the skull. This condition may be better explained by comparing the surface of the skull to a pumice stone, to a coral, to a fine sponge or to moss. The area affected in this particular specimen was confined to the upper and rear portions. The skull was so fragile that it was impossible to save it. However, a similar one now reposes in the State Museum at Denver.

MATERIAL CULTURE

Stone objects were occasionally encountered on the surface, in the rooms, and in refuse heaps. Many axes were found, all of which were made of metamorphic rock, granite being predominant. There were several types, which will be briefly described.

A long, narrow grooved type was rare, although three were found. These measured 9 inches long and 3 inches wide at the butt. They were unpolished, but were well shaped. The sides were nearly parallel, although they tended to slope inward slightly near the blade. A broad, flat axe, which showed the effects of usage, was 6 inches wide at the groove and 6 inches long. The blade was very dull. This implement looked as if it had been used more as a maul than an axe. The most common type was a tool 4 or 5 inches long, 2 or 3 inches wide at the groove. Each had a well ground surface and a sharp edge. The butts were rounded and had been used for chipping and pounding. No celts or adzes were found.

Metates were frequently found in and near houses. Most of these were of the flat, ungrooved type. One grinding stone, found in house-kiva number 1, was troughed from end to end.

Mention has been made of the "problematical" stones found in one of the house-kivas (Plate VIII, a). Several limestone pendants were recovered from the refuse heaps. A tiny dog-figurine pendant made of pottery and painted black and white was discovered with a burial (Plate VIII, b). It was this dog-figurine which suggested the name of Little Dog Ruins.

Stone arrowheads, knives, scrapers, and "saws" were less fre-

quently found. The last named objects may not have been saws, but they were chipped on one edge in such a manner as to produce teeth. When tried on bone, they served admirably as cutting tools (Plate VIII, b). No grooved arrowheads of the Folsom type were found.

Bone implements abounded and were turned up with almost every shovelful of dirt. These tools were fashioned from the bones of turkeys, elk, and deer. Antlers were occasionally used also. Sharp-pointed awls of turkey bone were commonest, although the long bones of deer were likewise used (Plate IX, a). Punches, spatulate awls, scrapers and beads may be seen illustrated in Plate IX, a and b.

POTTERY

More than eighty excellent specimens of pottery were excavated, sixty-eight of which were whole, unbroken pieces. Plates I and II illustrate a few of the most interesting types.

The ceramics from Little Dog Ruins may, for the most part, be classed as Proto-Mesa Verde or Pueblo II. The painted designs are generally well executed. The cooking vessels or the corrugated pots were, with four exceptions, coiled from neck to base. The paste for the non-culinary types was grayish black in appearance and was tempered with minute particles of stone. All, with the exception of several pieces found in the house-kivas, were covered with a grayish-white slip or a thin coating of liquid, pasty clay. In some cases this wash, or slip, was very thin.

The designs varied from piece to piece, each one having individuality of its own. The reader may gain a better idea of them by studying Plates I and II. Many attempts have been made to interpret some of these as having esoteric meaning. It is quite without the scope of this brief paper to add in any way to such guesswork.

One hundred potsherds were picked up at random from ten different sites and subjected to a statistical study. Assuming that unslipped and neck-corrugated ware were the earliest types (in the San Juan region) and that the "classic" ware of Mesa Verde represents Pueblo III, this potsherd analysis indicates that the earliest culture in the area studied (western part of Montezuma County, Colorado) was the simple, unit-type sites with kivas; the second culture the rim-rock houses; and the third or last the multiple unit-type sites with kivas. These conclusions may or may not be valid, but are merely presented for what they are worth. However, if the results are valid, the last named culture would seem to represent the drawing together of various units, groups, or clans.

SUMMARY AND CONCLUSIONS

During the season of 1929 excavations were carried on in two kinds of ruins, namely, rim-rock houses and unit-type sites. The former was an endeavor to enter a new, little explored field, while the latter was an extension of the excavations of 1928. While engaged in working on a unit-type site, an unexpected, earlier culture was discovered.

Three round towers were carefully cleaned out. In every one of them was found an underground passage which proceeded to an adjacent kiva. This corroborated last year's digging.

The relative chronology of these cultures is fairly clear, for the house-kivas seem to belong to very late Basket-Maker III, or more probably to Pueblo I; the unit-type sites to early Pueblo II; while the rim-rock houses may represent the last stage of Pueblo II or very early Pueblo III. It is not yet possible to state with certainty just how old these cultures and ruins are, for the roof beams found were of cedar, a type of wood which Dr. Douglass cannot yet confidently date.⁹ However, in view of his recent discoveries, it would seem probable that the earliest cultures described above developed and flourished some time shortly after the beginning of the Christian era.

⁹A. E. Douglass. "The Secret of the Southwest Solved by Talkative Tree Rings." *National Geographic Magazine*, December, 1929, Volume LVI, number 6.