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# Archeological Investigations in New Mexico, Colorado, and Utah

(WITH 14 PLATES)

BY

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# ARCHEOLOGICAL INVESTIGATIONS IN NEW MEXICO, COLORADO, AND UTAH

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## INTRODUCTION

During the year 1916 the author spent five months in archeological investigations in New Mexico, Colorado, and Utah, three of these months being given to intensive work on the Mesa Verde National Park in Colorado. An account of the result of the Mesa Verde work will appear in the Smithsonian Annual Report for 1916, under the title "A Prehistoric Mesa Verde Pueblo and Its People." What was accomplished in June and October, 1916, before and after the work at the Mesa Verde, is here recorded.

As archeological work in the Southwest progresses, it becomes more and more evident that we can not solve the many problems it presents until we know more about the general distribution of ruins, and the characteristic forms peculiar to different geographical localities. Most of the results thus far accomplished are admirable, though limited to a few regions, while many extensive areas have as yet not been explored by the archeologist and the types of architecture peculiar to these unexplored areas remain unknown. Here we need a reconnoissance followed by intensive work to supplement what has already been done. The following pages contain an account of what might be called archeological scouting in New Mexico and Utah. While the matter here presented may not shed much light on general archeology, it is, nevertheless, a contribution to our knowledge of the prehistoric human inhabitants of our country. Primarily it treats of aboriginal architecture.

The author spent two months in searching for undescribed buildings concerning some of which comparatively nothing was known. During June, 1916, headquarters were made at Gallup, New Mexico: the Utah ruins, new to science, were visited from the Indian agency at Ouray, Utah.

The plan of operations in these two fields was somewhat different. The work in New Mexico was an attempt to verify existing legends

of the migrations of a Hopi (Walpi) clan that once lived in a ruined pueblo called Sikyatki, where the cemeteries, exhumed in 1895, yielded one of the most beautiful and instructive collections of prehistoric pottery<sup>1</sup> ever brought to the U. S. National Museum from the Southwest.

Legends mention by name several habitations of the Sikyatki people during their migration from the Jemez region, before they built their Hopi pueblo, but lack of time prevented the author from tracing their trail throughout the entire distance back to their original home. The object of the present investigation was to examine one of their halting places, a ruined pueblo called Tebungki, or Fire House,<sup>2</sup> on the prehistoric trail about 25 miles east of Walpi. Between this ruined village and the ancestral home there are large and as yet undescribed ruins, such as those of the Chaco Canyon, which may once have been inhabited by some of these people.

Our knowledge of the former shifting of ancient clans, derived from legends, is fragmentary, and one way to gain further information and revivify forgotten or unrecorded history, is to study the remains of their material culture. Architecture is a most important survival, and pottery, which has transmitted ancient symbolism unchanged, is also valuable. It happens that both these aids characterize the southwestern culture areas. Other objects, as stone implements, woven and plaited fabrics, and basketry, are not greatly unlike those made by unrelated Indians and consequently add little to our knowledge in studies of cultures, but architecture and ceramics are distinctive and afford data from which we can gather much information on the history of vanished races.

#### TEBUNGKI (FIRE HOUSE)

Hopi legends of clans whose ancestors once peopled the Sikyatki ruin, but are now absorbed in the Walpi population, recount that in their western migration they built, near a deep canyon, a village which they named Fire House. These legends were first obtained from the Hopi by A. M. Stephen and recorded by Victor Mindeleff<sup>3</sup> who located Fire House ruin over 20 years ago. His valuable description and ground plan, the only account heretofore printed, is graphic and substantially correct. He calls attention to the charac-

<sup>1</sup> 17th Ann. Rep. Bur. Amer. Ethnology, Part 2.

<sup>2</sup> Called by the Navaho, Beshbito, Piped Water; from a metallic pipe at the spring.

<sup>3</sup> 8th Ann. Rep. Bur. Amer. Ethnology, 1886-'87 (1901).

teristic or salient points which distinguish Fire House from ruined buildings in the Hopi reservation, especially its circular or oval form and the massive, well-constructed masonry of its walls.

The exact dimensions of Fire House (pl. 1) can be obtained only by excavation, but it is approximately 94 by 79 feet in greater and lesser diameter. Some parts of the outside wall are now 10 feet high, and its thickness averages 3 feet, but if the stones accumulated about



FIG. 1.—Fire House.

its base were removed the height would be 4 or 5 feet greater. There are evidences of an external passage-way through the outer wall indicating a central court. Within the enclosure there are many indications of rooms some of which appear to be circular, but the interior is so filled with fallen walls that an accurate ground plan could not be drawn without extensive excavation. The stones forming the wall are, as a rule, cubical blocks, well dressed and accurately fitted, showing good masonry.

Two of the largest of the wall stones are 5 feet long and 3 feet wide, with an estimated thickness of 2 feet. As it would take

several men to carry one of these stones from the quarry to its place in the wall, they might be called megaliths.

The fine spring at the base of the cliff below Fire House was evidently used by the inhabitants for drinking water, and the trail from here to a gateway in the outer wall is still well marked. As one climbs from the spring to the top of the plateau the way passes between the cliff and a flat stone set on edge and pierced with a hole about 5 feet above the pathway. This stone was evidently a means of defense; behind it the warriors may have stood peering down upon their enemies through this orifice. Near it are pictographs of unknown meaning.

The circular form of Fire House (fig. 1) and its well-constructed surrounding wall are more characteristic of eastern than of western pueblo masonry. This round type<sup>1</sup> is found from southern Colorado on the north to the neighborhood of the Zuñi settlements on the south; it has not been reported from the region on both banks of the Rio Grande. Roughly speaking, circular ruins correspond, in their distribution, with a line extending north-south midway between the eastern and western sections of the pueblo area—a limitation that can hardly be regarded as fortuitous. Its meaning we may not be able to correctly interpret, but the fact calls for an explanation. The type is old, the modern pueblos having abandoned this form. The area where circular ruins occur corresponds, in a way, to that inhabited in part by the modern Keres, none of whom, however, now dwell in circular towns. Provisionally we shall consider the Keresan pueblos as the nearest of all descendants of those who once inhabited villages of circular or oval form, a generalization substantiated by the existence of words of Keres language in many old ceremonies among all the pueblos.

There is a sharp line of demarcation between the zone of circular ruins and that inhabited by the pueblos along the Rio Grande, but on the western border these circular buildings extend as far west as the Hopi country.

In attempting to connect the oval form of Fire House with the rectangular form of Sikyatki we are met with the difficulty of architectural dissimilarity. Fire House is circular, Sikyatki is rectangular. If the descendants of the inhabitants of Fire House later

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<sup>1</sup> An able discussion of the pueblo problems is found in the excellent compilation of Fritz Krause, *Die Pueblo-Indianer, Eine historisch-ethnographische Studie*. Nova Acta Kaiserl. Leop. Carol. Deutschen Akademie der Naturforschern. Vol. 87, No. 1, 1907.



constructed Sikyatki, why did they make this radical change in the form of their dwellings? They may have constructed a habitation en route before they reached Sikyatki, and this village may have had a form like Fire House. On the Hopi plateau above Sikyatki there are two conical mounds visible for a long distance as one approaches East Mesa from the mouth of Keam's Canyon, which should be considered in this connection. These mounds, called Kükütcomo, are connected in Hopi legends with those of Sikyatki at the foot of the mesa on which they stand, and the buildings they cover are said once to have been inhabited by the Coyote (Fire ?) clan of eastern kinship. They have not been excavated completely but several rooms have been opened up enough to show that they are round towers or kivas with rooms annexed to their bases. They resemble, in fact, circular ruins and may well have been the home of some of the people who abandoned Fire House. They must be considered in discussing the reliability of the legend, for they are the only circular houses yet reported from the Hopi country. The reason why this form of house was abandoned can not be determined with any certainty, even though some of the clans from Fire House may have built the round towers above Sikyatki. The only other round room known to me in the Hopi country, besides Kükütcomo, is one in a ruin in the Oraibi Valley mentioned by Victor Mindeleff (*op. cit.*). The reference is very meager and on account of its exceptional character should be verified. Assuming the observation as correct it may be said that this so-called circular room lies embedded in a mass of rectangular rooms and not as kivas in the inhabited Hopi pueblos in the plazas free from houses.

The legends of the Snake people of Walpi who came from the San Juan near Navaho Mountain, probably Betatakin or Kitsiel, distinctly state that their ancestors built both round and square or "five-cornered" houses. The rooms referred to are believed to be kivas, since another legend declares the earliest snake ceremonies were performed in circular rooms. After visiting Fire House the author desired greatly to find other oval ruins between it and the zone of circular ruins, but his efforts were not successful.

#### SEARCH FOR HOPI RUINS EAST OF TEBUNGKI

After having visited Fire House and verified to his satisfaction that it was a former home of a Hopi clan, as recounted in legends of that clan, the author sought still further evidence of an archeological character in the region east of Fire House, as recorded in migration stories. The area between Fire House and Jemez is exten-

sive and rich in ruins of all kinds, open air pueblos predominating. It is too great a task to visit all of these ruins during one summer, and the work accomplished in a single month seems small, but a beginning was made in the hope that the cumulative work of many summers will make it important.

The farther we recede from the Hopi country the more obscure become their clan trails, and the more difficult it is to identify the localities mentioned in legends. The inhabitants of some of the pueblos now in ruins between Jemez and Hopi, may have died out without leaving any representatives; others, when they left their village, may have gone to Zuñi or elsewhere. In the country east of Fire House, as far as Fort Defiance, several ruins were observed, but none of them seemed to show close archeological likeness to the oval Fire House, or to corroborate the traditions of the descendants of the clans now absorbed into the population of Walpi. A large ruin near Ganado was visited, and an imperfect sketch made of its ground plan. Its walls are so much worn down by the encroachment of the stream on one side, and the road on the other, that little could be learned from superficial examination. Although it is not a circular ruin like Fire House, yet an extended excavation might reveal some interesting details of ceramic symbolism<sup>1</sup> which would be important.

#### RUINS IN NASHLINI CANYON

Two cliff houses of small size were visited in Nashlini Canyon which appear to be those casually mentioned by Dr. Prudden,<sup>2</sup> but, so far as known, they have not been described. This canyon is one of the southern branches of the Chelly Canyon, and although not very extensive shares with it many characteristics. A trip can be made into it by automobile as far as the first cliff house.

The ruin most easily visited (fig. 2) in this canyon is on a comparatively low shelf in a shallow cave, 40 feet high, a few feet above the top of the talus. Like many other cliff houses it is divided into two parts, called the upper and the lower, according to the level they occupy. The lower is practically buried under rocks fallen from the walls of the upper house. The front wall of the upper part

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<sup>1</sup> The specialized symbolism so elaborately shown on Sikyatki pottery is regarded as a local development and for that reason can not be expected elsewhere even in the ancestral homes of the clans whose later members lived at Hopi.

<sup>2</sup> The Prehistoric Ruins of the San Juan Watershed in Utah, Arizona, Colorado and New Mexico. Amer. Anthropologist, N. S. Vol. 5, p. 280.



is well preserved and closely follows the contour of the low ridge on which it stands. The masonry is fairly good, but the floors of the rooms are buried under a thick deposit of sheep droppings, solidly packed, showing that the enclosures have been used secondarily as corrals for these domesticated animals. The partition walls of the rooms end on the vertical wall of the precipice, the face of the precipice serving as their rear wall. It thus happens that there is no recess between the back of the rooms and the rear of the cave, as commonly found in cliff dwellings. Circular rooms are absent in the upper part of this ruin, and kivas, if any, must be sought buried

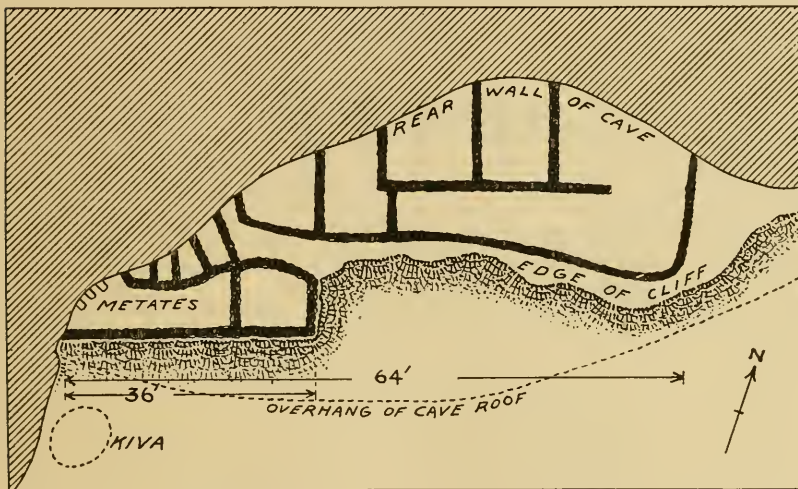


FIG. 2.—Ground plan of cliff ruin in Nashlini Canyon.

under the accumulated débris of the lower part. The front wall of the upper house measures 64 feet, and can be traced throughout its whole extent. At one end of the ruin there are four narrow rooms separated by partitions, each containing a grinding bin, where maize (corn) was reduced to meal. The remaining rooms are roofless, plastered, and evidently used as dwellings. In the lower series of rooms, buried beneath a mass of fallen rocks, are circular depressions, which may be ceremonial rooms; but no excavations were made in these depressions and their significance is unknown.

Another cliff house, a few miles farther up in the canyon, is almost hidden in an inaccessible recess of the cliff, but so high that it was not visited.

On the dizzy top of a cliff overlooking the canyon, near the second ruin, artificial walls were observed but not visited. An Indian guide claimed that they were towers; they are certainly so situated as to permit a wide view up and down the canyon. These walls are mentioned by Dr. Prudden.

On the walls of the canyon not far from the first ruin there is an instructive group of pictographs (fig. 3) representing human beings, some painted red, others white, standing in three lines. The majority have triangular bodies with shoulders prolonged into arms at right angles to the body; the forearms hanging from their extremities, as is common in this region. On each side of the head are lateral exten-



FIG. 3.—Pictographs near mouth of Nashlini Canyon.

sions recalling the whorls in which Hopi maidens still dress their hair, a custom that has passed out of use among the other pueblos, but is still preserved in personifying supernatural beings called Katsina maids. It appears to have been a universal custom of the unmarried women among the cliff dwellers to dress their hair in this fashion. These figures are arranged in three rows; three individuals are depicted in the upper row, four in the middle, and two in the lower row painted white, unlike the others. Below the figures are rows of dots and several parallel bars accompanied by a number of zigzag figures like lightning symbols. On the supposition that the red figures represent Indian men or women, the white figures may be white men and the dots and bars an aboriginal count, the whole representing participants in some past event.

## CHIN LEE CLIFF HOUSES

Along southern tributaries of Chin Lee Valley there are instructive cliff houses that have escaped the attention of archeologists. Judging from his map, some of these may have been visited by Dr. Prudden for he gives a figure of one of the two cliff ruins (pl. 2, fig. *a*), in the Chin Lee, about 40 miles from Chin Lee postoffice. Their state of preservation and the character of their sites may be judged from the accompanying illustrations. These ruins were not visited, the photographs (pl. 2, figs. *a-c*) having been presented by a Navaho Indian, George H. Hoater, who made the pictures but did not know the name of the ruin or of the canyon. There are other ruins in the Chin Lee canyons, of which information is quite meager.

## RUINS NEAR GALLUP, NEW MEXICO

The geographical position of the country about Gallup renders it a very important area in the study of the migration of aboriginal peoples in the Southwest. It lies midway between the Rio Grande on the east and the Little Colorado on the west, and between the San Juan on the north and the Zuñi on the south. In their intercommunication, the trails of migration in prehistoric times must have crossed this region, and as this migration was marked by successive stages where buildings were constructed we should expect here to find remains of former migratory peoples. Ruins in the vicinity of Gallup have been so much neglected by students that our knowledge of this region is very fragmentary. To remedy this condition the author made a few trips in this vicinity with Mr. Sanderson and Mr. Bruce Draper, local students, who furnished important aid. A number of pueblo sites and small cliff houses within a few miles of the city were visited and superficially examined, but no intensive work was done upon them. The ruins mentioned below are only a few of those in this region that could be brought to light by systematic scientific exploration. From his examination of them, it is the author's impression that the majority were inhabited by ancestors of clans now domiciled in Zuñi.

## ZUÑI HILL RUINS

This extensive ruin (pl. 3, *a, c*), 6 miles south from Zuñi station on the Santa Fe railroad, and about 11 miles from Gallup, lies almost directly opposite a conspicuous pinnacle of Wingate sandstone called the Navaho Church. Its site is a low ridge extending north and south for several hundred yards. None of the walls rise above the mounds

which are highest on the west side. There are numerous depressions scattered among the mounds which suggest subterranean rooms of circular form. A round depression 40 feet in diameter shows the remnant of a wall on one side. On a "flat" north of the ruin several piles of stone can be seen, which are interpreted as isolated houses; near one of them is a small fireplace made of slabs of rock set on edge surrounding an enclosure filled with ashes. This is without exception the largest cluster of mounds in the immediate neighborhood of Gallup, and would well repay excavation and further study.

#### KIT CARSON GROUP

This group of mounds has received its name from Kit Carson Spring which lies in their neighborhood. It is situated north of Navaho Church on an elevation overlooking the road from Gallup to Crown Point. The members of the group are numerous, but each mound is comparatively small. In no case were walls found rising above the mounds, but as nearly as could be judged from their shape, the buildings covered had rectangular outlines and were accompanied by circular depressions. Fifty feet south of the largest mound of this group there is a semicircular pile of rocks which measures 42 feet on the south side, and with a radius of 30 feet from this side to the curved wall. The main ruin has lateral extensions on the north and south ends, and measures 70 feet by 41 feet. The lateral extensions give the mounds the shape of the letter **E** and enclose a square room of rectangular form measuring 20 by 15 feet.

#### RUINS IN HEMLOCK CANYON

Hemlock Canyon, north of the road from Gallup to Crown Point, has the general features of other canyons in this neighborhood. At its mouth there are fertile fields, and a good spring which a Navaho has appropriated by building a hogan and fencing off the entrance. About a half mile from this spring following the right bank of the arroya, which rarely contains water, there is a house (pl. II, *a*) built in a recess of the cliff about 10 feet above small scrub trees which here grow in abundance. Its foundation is about 6 feet long, and the wall is slightly curved and well constructed, showing a doorway shaped like the letter **T**. This house is not regarded as a dwelling, for it is too small for a family, and no household implements have been found within the enclosure. It belongs rather to a type of cave-house called "ledge rooms," many examples of which occur



near larger dwellings. It was probably a storeroom, although possibly a retreat where priests retired to pray for rain, as was once the custom among the Hopi. The people to whom this house belonged probably dwelt near their farms a short distance from the base of the cliff. There is a similar room known to have been constructed by Navahos a few feet off the road from Gallup to Crown Point, which is still used for a granary, indicating the probable use of the small building here described.

#### RUINS NEAR BLACK DIAMOND RANCH

Black Diamond Ranch is 13 miles north of Hosta Butte. Mr. Bruce Draper, who owns the ranch, pointed out near the mouth of a neigh-

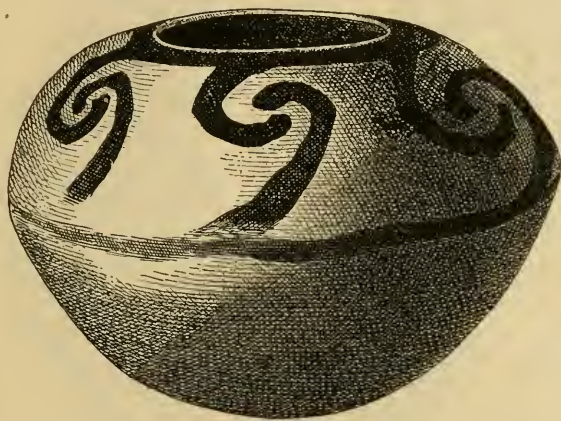


FIG. 4.—Spherical bowl, Black Diamond Ranch.  $7\frac{3}{8}$  by 5 inches.

boring canyon several comparatively large ruins. In one of the largest of these (pl. 3, *b*) near the ranch house, no walls are visible above ground, but the surface presents abundant evidence of a buried ruin. In one corner of this ruin (pl. 3, *b*) Mr. Bruce dug out a small room which has good plastered walls, several feet high, and found decorative bowls, some of which are here figured (figs. 4, 5). About 50 feet south of this ruin, a low mound suggests a cemetery, and about the same distance still farther south, a depression on the surface indicates a circular subterranean room or reservoir.

Following up this canyon nearly to its head, there is a small ruin hardly worth mentioning save for a spiral incised pictograph 3 feet in diameter identical with the snake symbols widely distributed throughout the Southwest.

In all the region north of the high ridge of eroded Wingate sandstone there are several other groups of ruins with most of the walls very much broken down. It would probably be conservative to state that there were over 200 ruins, large and small, in this region, showing evidence of a considerable population, if they were inhabited simultaneously. Fragments of pottery occur on almost every ridge overlooking the trails, especially along the road from Gallup to Crown

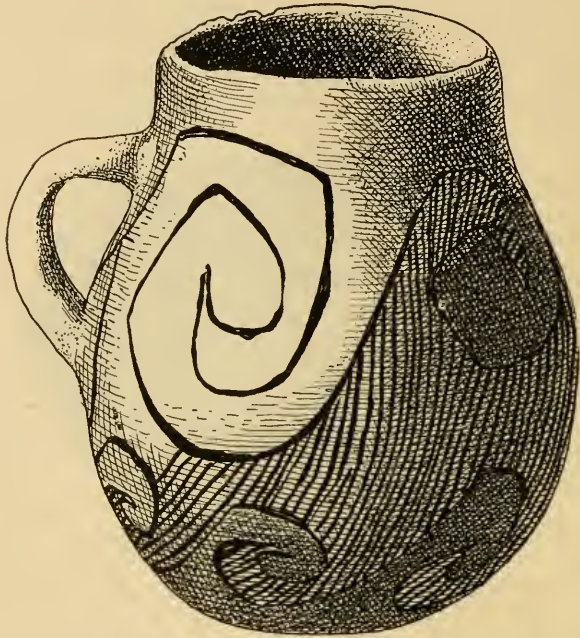


FIG. 5.—Mug with decoration half completed.  $5\frac{1}{2}$  by  $4\frac{1}{2}$  inches.

Point. The forms of these ruins vary and can be made out only by systematic excavation.

So far as limited exploration about Gallup has gone, the investigations by the author show that the ruins were inhabited by Zuñi clans, as indicated in the structure of the buildings and the symbols on the pottery. It would be important to determine the relative age of these ruins compared with those about Zuñi; as to whether they were peopled by colonies from Zuñi, or whether their inhabitants joined the Zuñi population after deserting these houses. Although there is not sufficient evidence to prove the latter proposition, the author is inclined to accept it.



## CROWN POINT RUINS

No more interesting question in southwestern archeology awaits an answer than the query: What became of the former inhabitants of the Chaco ruins, one of the largest clusters of deserted buildings in New Mexico? Like the cliff dwellers of the Mesa Verde, their former inhabitants have disappeared and left no clue as to where they went, the date of their occupation of the ruins, or their kinship with other peoples. Existing legends relating to them among supposed descendants who are thought to live in modern pueblos are fragmentary and knowledge of their archeology is defective. The Hyde Expedition made an extraordinary collection of artifacts from Pueblo Bonito, the largest and formerly the best preserved ruin of the group, but the excavations there have yielded little information on the kinship of its inhabitants. Until we know more about the Chaco Canyon ruins we are justified in the belief that there still remains a most important problem for the archeologist to solve.

In seeking the prehistoric migration trail of the Hopi before they came to Fire House, the author examined ruins near Crown Point identical with those of the Chaco Canyon. There are in fact two ruins within a few miles of the Crown Point Indian school, one of them known among the Navaho Indians as Kin-a-a (the name of the other unknown to the author), which are structurally members of the Chaco series.

The ground plan of the largest, Kin-a-a,<sup>1</sup> is rectangular and was apparently oriented north and south, the walls on the north side being the highest and best preserved and those on the south possibly terraced. On the south side remnants of a court or enclosure surrounded by a low wall can still be detected. The ruin is compact with embedded kivas and measures approximately 150 feet long by 100 feet wide, the north walls rising in places to 50 feet, showing good evidences of five stories, one above the other. The high walls reveal rooms of rectangular shape. Situated midway in the length of the north wall (pl. 4, *a, b, c*) is a circular chamber like a kiva on the ground floor, with high walls about it. The recesses between the wall of the circular room and the rectangular wall enclosing it are solidly filled in with masonry, a mode of construction adopted in the great ruins of the Chaco Canyon. The kiva of Kin-a-a (pl. 5, *a, b*),

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<sup>1</sup> This ruin has been added to the National Monument known as the Chaco group.

The name Kin-a-a seems to have been applied by the Navaho to at least two ruins. This particular Kin-a-a is possibly the ruin described by Chas. F. Lummis to which Bandelier refers.

like those of the great building of the same canyon, are built into the mass of rooms and not separated from them as in the modern pueblos, Walpi, those of the Rio Grande, and the ruin of Sun Temple on the Mesa Verde. This separation of the kiva from the house mesa is regarded by the author as a late evolution, being unknown among the cliff dwellers, and very rare in pueblo ruins possessing ancient characteristics. A union or huddling together of sacred and secular rooms is characteristic of the period when each kiva was limited to the performance of clan rites, the separation of the kiva from secular rooms marking the development of a fraternity of priests composed of different clans. The diameter of the kiva in Kin-a-a is about 15 feet, the average size of these rooms, no doubt determined by the length of logs available for roofs. When the diameter is greater than that it is customary to make the roof in a vaulted form by utilizing shorter roofing, but kivas as small as 10 feet in diameter were sometimes roofed by vaulting. Depressions, in mounds, measuring as much as 50 feet in diameter, in ruins in the Montezuma Valley have been identified as circular ceremonial rooms, but as these have not been excavated, there is always a doubt, for instead of being ceremonial and roofed they may have been uncovered reservoirs for storage of water, for not all circular depressions are kivas. In Far View Pueblo,<sup>1</sup> in the Mummy Lake Group, the author excavated a kiva 32 feet in diameter, which was found to have pilasters for a vaulted roof. No such pilasters occur in Kin-a-a, showing that the roof was flat with a central hatchway, as is customary in all these rooms with two or more stories.

It is difficult to explain the enclosed space above the kiva in this ruin. Was it occupied by rooms one above another, or was the lower open to the sky? The rows of holes interpreted as indicating floors is without significance, unless there were a number of superposed rooms. It must be remembered that the ceremonial room or kiva, in modern mythology, represents the underworld out of which, according to legends, the early races of men emerged through an opening in the roof or hatchway. Among the Hopi it is never covered by another room, and this is carried so far that it is forbidden to walk on a roof of a kiva, especially at a time when rites are being performed.<sup>2</sup> Such an act would be regarded as sacrilegious,

<sup>1</sup>A Prehistoric Mesa Verde Pueblo and its People, Smithsonian Report for 1916.

<sup>2</sup>At certain times in Hopi ceremonies a thin layer of sand is sprinkled over the kiva roof, and on this sand are drawn in meal four rain-cloud figures, around which are performed certain secret rites.

and the same taboo is now probably universal: consequently walls constructed 40 feet above the top of the kiva, showing evidence of rooms superposed in stories, are exceptional. The object of rooms above a kiva can only be surmised; possibly there may have been four kivas, one above another, to represent the underworlds in which the ancestors of the human race lived in succession before emerging into that in which we now dwell. The inner walls of this kiva are shown in plate 5, *a*. It was evident to the author when examining the inner wall of the superposed room, above that identified as the kiva, that it belonged to a room with a roof, as appears also from the view here given (pl. 5, *a*). Whatever explanation of this exceptional condition may be suggested, we cannot question the fact that here we have remains of a kiva below one or more other rooms.<sup>1</sup>

A well blazed trail passes the ruin and is lost in the distant hills. This trail was at first mistaken for an irrigation ditch, but an examination of its course shows that it runs up a steep hill, which precludes such a theory. It is a section of an old Indian trail, indications of which occur elsewhere in the State, a pathway over which the rocks used in the construction of the ruins were transported. A similar trail used for a like purpose is recorded near the great ruin at Aztec, New Mexico.

#### RUIN B NEAR CROWN POINT

Ruin B (pl. 6, *a, b*), largely made up of a kiva of circular form within a rectangular enclosure, lies near Crown Point on top of a low plateau, back from the edge. Its name is unknown to the author, but from its size and the character of its masonry it must formerly have been of considerable importance. It was not, like Kin-a-a, included in the President's proclamation making the Chaco Canyon ruins a National Monument. The appearance of the masonry and the structure of the circular room, identified as a kiva, leads the author to place it in the same class as the Chaco ruins, its nearest neighbor being Kin-a-a, east of Crown Point. The excavation of this ruin might shed instructive light on the extension or migration of the inhabitants of the Chaco, after they left their homes in that canyon.

A ground plan of this ruin (fig. 6) shows that the standing walls are rectangular and practically surround a circular room or kiva.

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<sup>1</sup>A two or three storied kiva like that of the Crown Point ruin is mentioned by Jackson in his description of Chetro Kettle ruin of the Chaco group, and is one of those features possibly existing in the tower kivas which are now extinct.

The walls are double, the interval between the inner wall and that of the circular chamber being filled in with solid masonry.<sup>1</sup> The outer of the two enclosing rectangular walls is separated from the inner by an interval of about 7 feet, and is connected with it by thin partitions, somewhat analogous to those described as connecting the two concentric walls<sup>2</sup> of circular towers on the McElmo.

No other walls were observed above ground in this ruin, although small piles of stone were noticed which may have been walls of other

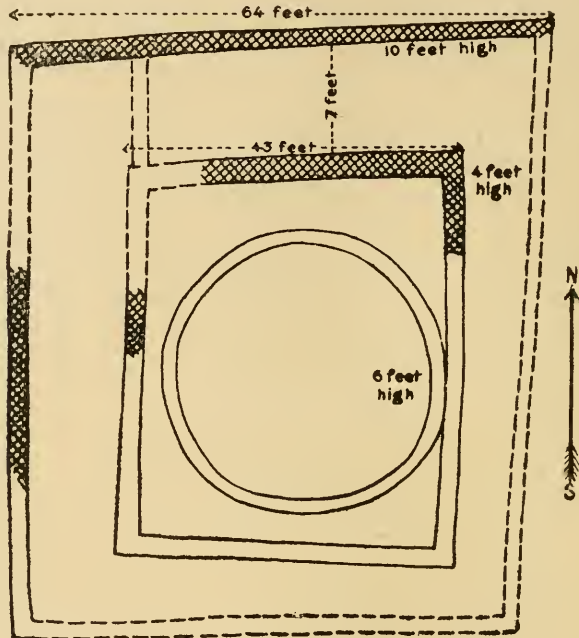


FIG. 6.—Ground plan of ruined kiva near Crown Point.

buildings. The reason why the walls about the kiva have been preserved so much longer than those of neighboring secular cham-

<sup>1</sup> Although the author has observed several towers with fallen rock about their bases, he has not been able to trace three concentric walls with connecting partitions.

<sup>2</sup> The circular kivas of the two ruins near Crown Point are enclosed by four standing walls forming sides of a rectangle, a feature they share with some of these chambers in the Chaco and San Juan region. The intention of the builders was to secure the prescribed subterranean feature by construction of a rectangular building about the circular room rather than by depression below the level of the site. This type is now extinct, but belongs to the most advanced stage of pueblo architecture before its decline.



bers, is probably because of the universal care exercised by man in the construction of the walls of religious buildings.

#### POTTERY

Brief mention of ceramic objects found in the area considered in this review is here introduced because they substantiate the evidences of the buildings concerning the relationship of prehistoric people in



FIG. 7.—Decorated handled cup, Black Diamond Ranch.  $5\frac{1}{2}$  by 4 inches.

this neighborhood. Moreover, they add to our limited knowledge of the arts in a little-known area. Very little has been recorded concerning pottery from the ruins near Gallup, but the few known specimens do not bear a sufficiently specialized symbolism to separate them from others found in different geographical areas. Evidently no distinctive ceramic area was developed in this region. Attention, however, may be called to the fact that the symbols on pottery (fig. 7) represent the oldest types, and that geometrical designs rather than conventional animal figures predominate. The pottery

suggests Zuñi ware, but is radically different from modern Zuñi and has different symbols, showing, as far as it goes, that settlements in which it occurs were made prior to the development of modern Zuñi ceramic decorations which were influenced by them. It has a likeness to old Zuñi ware, but has a closer resemblance to fragments from the Crown Point Ruin, and the Chaco settlements, which is significant.

Perhaps the most exceptional specimens obtained during the author's trip are two large, black jars (fig. 8), their color recalling

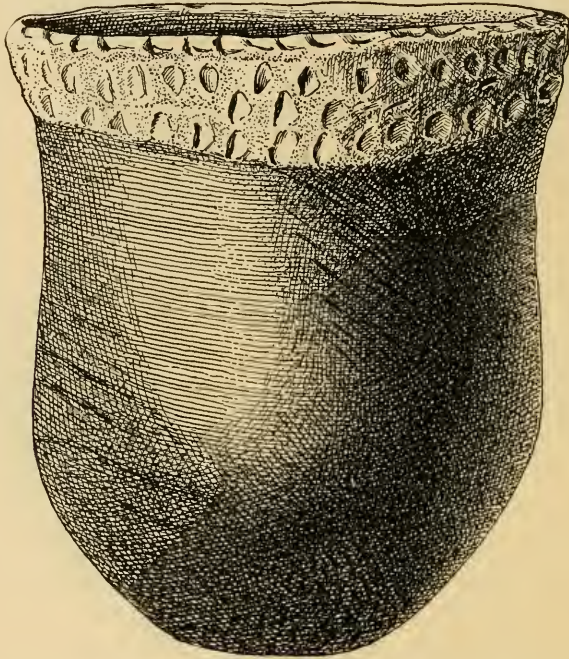


FIG. 8.—Cooking pot, Black Diamond Ranch.  $7\frac{1}{2}$  by 6 inches.

Santa Clara ware. The decoration on these jars takes the form of designs on a raised zigzag band meandering about their necks, similar to pottery used by the Navaho Indians. The informant, a reliable white man, claims they are not Navaho work, and showed the locality near a ruined ancient wall where he excavated them. He also reports a portion of a human skeleton found in the same neighborhood which affords good indication that they were mortuary, while the position of the grave would show that they were deposited by the same people who inhabited the room near by. The question is pertinent, however,



whether they were not a modern secondary burial; but if we accept this theory it indicates an unusual condition, for the Navaho seldom bury their pottery as mortuary offerings.<sup>1</sup>

The author noticed, especially in his examination of the mounds near Kit Carson Spring, certain foundation walls indicating small, circular, buildings strung along in a row on the tops of ridges. One or two of these suggest a round ruin near Zuñi, and seem to afford the missing link in the prehistoric chain of settlements connecting the great Chaco ruins<sup>2</sup> with some of those in Zuñi valley. These important similarities are supported by the traditions of the Zuñi that some of their ancestors once inhabited the buildings on the Chaco; and the fact that certain ruins, among them Kintiel, north of Navaho

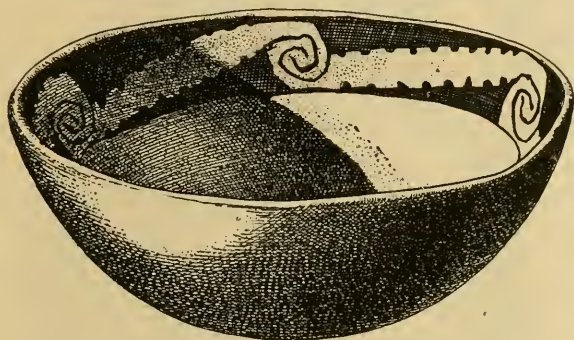


FIG. 9.—Decorative food bowl, Black Diamond Ranch. 7 by 3 inches.

Springs, are definitely claimed by the Zuñi to have been inhabited by their Corn clan.

The black and white pottery, found about Gallup, is identical with that of the latter ruin, and very similar to that generally found in the earliest epoch of pueblo occupancy. As pointed out in an article on Zuñi pottery, in the "Putnam Anniversary Volume," modern Zuñi pottery is so different from the ancient that we can hardly regard it as evolved from it. The same is true among the Hopi; the modern pottery decoration is not like the old, but is Tewa. Hopi-Tewa pottery is largely the work of Nampeo, who once decorated her pottery solely with Tewa symbols instead of old Hopi. In 1895

<sup>1</sup> The Navaho are not a pottery making people, but often use bowls and vases they find in prehistoric ruins.

<sup>2</sup> Although prehistoric, the author regards all the Chaco Canyon group of ruins as later in construction than those of the Mesa Verde and San Juan, with which they are morphologically connected.

she abandoned the Tewa symbols of her people to meet a demand for old pottery and substituted for Tewa designs copies of ancient Hopi pottery from Sikyatki. Thus there have been two radical changes in the style of Hopi pottery since 1710; one the substitution of Tewa designs for old Hopi, the other a return to Sikyatki motifs within the last 20 years. This modern innovation, however, has not been derived from the ancient by any evolution, but by acculturation. Possibly a similar change has taken place at Zuñi, calling for caution

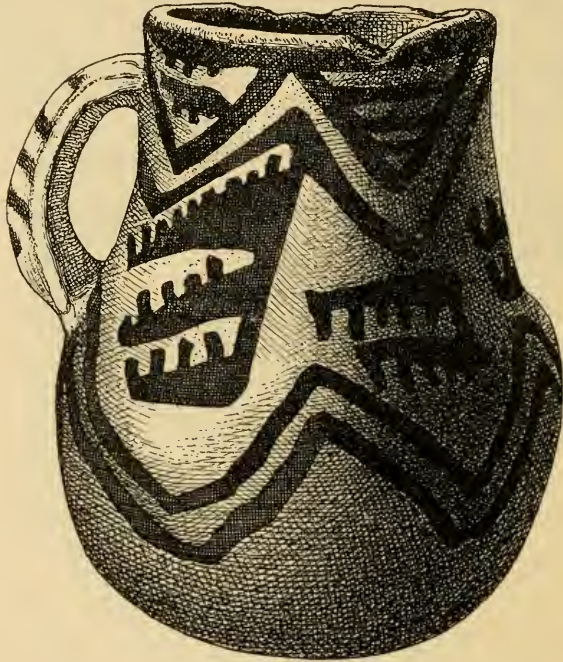


FIG. 10.—Decorated handled cup, Black Diamond Ranch.  $6\frac{3}{8}$  by  $5\frac{1}{4}$  inches.

in supposing that pottery found in the refuse heaps is necessarily evolved from that preexisting or found in strata below it.

The author has seen no evidence that would lead him to abandon the theory, that the Zuñi valley was once peopled by clans related to those on Little Colorado derived from the Gila, and that other clans drifted into the valley from the north at a later date. These later additions were from the circular ruin belt. Later came Tewa clans as the Asa of the Hopi, and others. The author finds more evidences of acculturation than autochthonous evolution in modern Zuñi, as in modern Hopi ceramic symbols. Pottery (figs. 9, 10) found in ruins

about Gallup belongs to the same type as that from Kintiel which Cushing, from legendary evidences, found to have been settled by Zuni clans.<sup>1</sup>

#### RUINS IN HILL CANYON

The country directly south of Ouray, Utah, is an unknown land to the archeologist. Geologically speaking it is a very rugged region, composed of eroded cliffs and deep canyons which up to within a few years has been so difficult of access that white men have rarely ventured into it. At present the country is beginning to be settled and there are a few farms where the canyon broadens enough to afford sufficient arable land for the needs of agriculture. The canyon is very picturesque, the cliffs on either side rising from its narrow bed by succession of natural steps (pl. 7, *a*) formed of sandstone outcrops alternating with soft, easily eroded cretaceous rock. Its many lateral contributing canyons are of small size, but extend deep into the mountain in the recesses of which are said to be hidden many isolated cave shelters, and other prehistoric remains. The cliffs and canyons of this region are not unlike those farther south along the Green and the Grand Rivers, a description of which, quoted from Prof. Newberry,<sup>2</sup> pictures vividly the appearance of the weird scenery in these canyons. He says :

From this point the view swept westward over a wide extent of country in its general aspect a plane, but everywhere deeply cut by a tangled maze of canyons and thickly set with towers, castles, and spires of varied and striking forms; the most wonderful monuments of erosion which our eyes already experienced in objects of this kind had beheld. Near the mesa we are leaving stand detached portions of it of every possible form from broad, flat tables, to slender cones, crowned with pinnacles of the massive sandstone which forms the perpendicular faces of the walls of the Colorado. These castellated groups are from 1,000 to 5,000 feet in height, and no language is adequate to convey a just idea of the strange and impressive scenery formed by their grand and varied outlines. Their appearance was so strange and beautiful as to call out exclamations of delight from our party.

In this wild country up to his time rarely visited by white men, Prof. Newberry also graphically described ruins not greatly unlike some of those in Hill Canyon as follows :

Some two miles below the head of Labyrinth Canyon we came upon the ruins of a large number of houses of stone. Evidently built by the Pueblo

<sup>1</sup> 4th Ann. Rep. of the Director of the Bur. Amer. Ethnol.; also 22d Ann. Rep. Bur. Amer. Ethnol., pp. 124, 125.

<sup>2</sup> This account is taken from a report of an Exploring Expedition from Santa Fé, New Mexico, in 1859, under command of Capt. Macomb; published in 1876 by the Engineers Department, U. S. A.

Indians as they are similar to those on the Dolores, and the pottery scattered about is identical with that before found in so many places. It is very old but of excellent quality made of red clay coated with white and handsomely figured. Here the houses are built in sides of the cliffs. A mile or two below we saw others crowning the inaccessible summits, inaccessible except by ladders, of picturesque detached buttes of red sandstone, which rise to the height of 150 feet above the bottom of the canyon. Similar buildings were found lower down and broken pottery was picked up upon the summits of the cliffs overhanging Grand River. Evidence that these dreadful canyons were once the homes of families belonging to that great people who formerly spread over all this region now so utterly sterile, solitary and desolate.

Prof. Montgomery,<sup>1</sup> in an article on the ruins in Nine Mile Canyon, gives a description of similar prehistoric remains which he had found in that region. From this description the author of the present paper supposes that these ruins belong to the same type or one very similar to those found in Hill Canyon. The antiquities Montgomery mentions are well preserved, for he speaks of one of the towers in this region as about 50 feet high, standing in an almost inaccessible spot commanding a magnificent view of several canyons and mountains. He says :

On the top of a mesa in an extremely dizzy situation, were the remains of three small stone circular structures, two of which were provided with roofs of heavy cedar logs and heavy, flat stones. The logs and poles of these two structures would make about a cord of wood, and they possessed distinct marks of the rude stone axes with which they had been cut into suitable lengths. \* \* \* On the south side of the canyon, and about a mile from Brock's Postoffice, I explored a strong and well-built stone structure, which stood upon a high and precipitous cliff. It formed about the two-thirds of a circle, being 14 feet long, 12 feet wide, and 5½ feet high, and was completed by a cliff in its rear. \* \* \* In a short time we came to the rock column, which, although hard and solid was much disintegrated and had been vertically cleft and separated, leaving a dangerous gap between its two inclined and overhanging portions. By the aid of cedar poles we succeeded in clambering to its summit, and there, in a situation that commanded a magnificent view of many canyons and hills, we found the ruin of four circular stone structures which, in my opinion had once been a look-out, and signal military station. They were arranged upon the flat top of the rock in such a manner that three smaller ones, each capable of holding but one man, occupied the front and most exposed places, one of them being in advance of the other two, which were nearer the sides of the rock. The fourth and largest stone structure held a place several yards in the rear of the three small ones, but from it a clear view of a wide and extended tract of country could also be obtained. They were all destitute of openings except at the top, and their walls sloped inward from below, so that the opening in each of the three small structures was small and only sufficient to allow the entrance or exit of one person.

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<sup>1</sup> Prehistoric Man in Utah. The *Archæologist*, Nov., 1894, pp. 335-342.



The author's attention was called to ruins in Hill Canyon like those above mentioned, by Mr. A. H. Kneale, agent of the Utes at Fort Duchesne, Utah, and at the close of work at Mesa Verde a trip was made into the region where they are found. The route was from Grand Junction, Colorado, to Mack, Utah, by rail, thence by rail to the end of the road at Watson. The trip from Watson to Ouray was by automobile. At Ouray the author outfitted with wagon, forded the Duchesne River, and crossed the Green River by ferry. Later he proceeded south to Squaw Crossing on Willow Creek, and thence to Taylor's ranch, in the midst of the ruins of Hill Canyon.

The ruins mentioned below were visited, but many others were reported by cowboys which were not seen on account of limitation in time, the object of the visit being primarily a reconnoissance.

The following ruins were seen by the author and his companions during their short visit to this region:

1. Ruins *A* and *B*, on the canyon rim within sight of Taylor's lower ranch.
2. Two ruins on pinnacles of rocks  $1\frac{1}{2}$  miles from Taylor's lower ranch following the canyon southward.
3. Tower ruin crowning a leaning pinnacle.
4. Ruin on top of a plateau with precipitous sides, in middle of a canyon 3 miles south of Taylor's lower ranch.
5. Walls on top of an inverted cone, 6 miles up the canyon from Taylor's lower ranch.
6. Several towers in a cluster on a point of the plateau 8 miles below Taylor's lower ranch.<sup>1</sup>

The above ruins may be classified into two types distinguished by the character of their site: (a) True "mushroom rock ruins," as their name implies, are perched on tops of isolated rock pinnacles resembling the so-called Snake rock at Walpi, and (b) the second type, crown spurs of the mesa overlooking the canyon. The pinnacle foundations of the former are the last stage in erosion of a spur from the side of the canyon. It is doubtful whether these pinnacles were cut off by erosion before or after the buildings thereon were constructed. On the whole both types of ruins in Hill Canyon present no architectural differences from those found in some of the tributary canyons of the Colorado River.

The author's visit to the Hill Canyon region was mainly a reconnoissance to verify reports of the existence of prehistoric remains in this little-known region. He was accompanied by Mr. T. G. Lemmon of Dallas, Texas, a volunteer, who furnished the Hill

Canyon pictures here reproduced. Mr. Owen, the official farmer of the Ute reservation, and an Indian boy accompanied us, the former as guide, the latter as driver. In penetrating this secluded country we were obliged to camp along the way, but were hospitably received by the few ranchmen along the route and made our home for a few days at Taylor's lower ranch while making our excursions to the ruins. It is a great pleasure to acknowledge this aid and especially that of Mr. Kneale, who aided us in outfitting at Ouray.

The best preserved examples of characteristic Hill Canyon Ruins belong to the second type, or those not isolated from the neighboring plateau, the most striking of which belong to the mushroom type. Both have a general similarity in circular form and massive walls, recalling, except in poor quality of masonry the so-called "towers" of the McElmo Canyon. They resemble the "Tower ruin," found by Prof. Montgomery, in Nine Mile Canyon, on the western slope of the range. Their masonry is composed of natural slabs of rock, rudely fashioned by fracture, but rarely dressed in cubical blocks, as in the towers on the McElmo Canyon. Their exposure to the elements has led to considerable destruction, the adobe in which the walls were laid having been washed out of the joints. The lower courses of stone, as seen in the view of the large ruin perched high above the ranch house, were of larger stones than the upper, and showed more evidences of having been dressed than the flat stones piled one on the other, which form the upper courses.

#### RUINS NEAR TAYLOR'S LOWER RANCH

##### RUIN A

The two large buildings near Taylor's lower ranch, ruins A and B, are typical of the first group, the most conspicuous of which, ruin A, is shown in the accompanying figures (pl. 7, *b*, pl. 8, *a*). This ruin stands on the point of a high cliff, inaccessible except on the west side. Although the special features of the masonry are somewhat obscured by fallen sections, and the form (fig. 5) is hidden, it is a circular enclosure about 25 feet in diameter, its wall being about 13 feet high, at the highest point. Between this high outer wall (fig. 11) and that of the inner circle, there are remains of a banquette or bench, surrounding the chamber very much broken down. The lower stones are much larger than the upper, similar in this respect to the walls of certain cliff dwellings. The circular room and



bench once covered the point of the mesa, and is separated from the plateau by a deep fissure worn in the rock outside the wall on that side. The height of the highest wall is 20 feet, and the bench around the circular portion averages 3 feet high. In thickness the walls vary from 1 to 3 feet. On the second ledge, or outcrop of hard rock

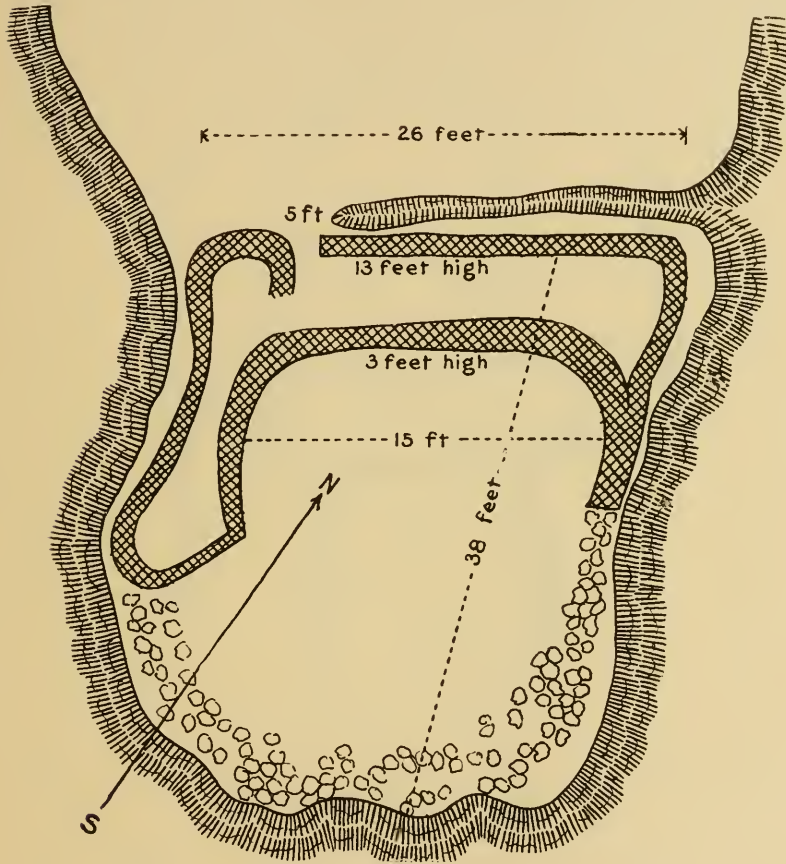


FIG. 11.—Ground plan of ruin A, Hill Canyon, Utah.

below the summit of the cliff, on which ruin A stands, there is a fine example of the dug-out type of habitation, several of which occur in the sides of this canyon. The roof of this type of dug-out is formed by a flat slab of rock projecting horizontally from the cliff and forming the protection for a chamber excavated in the soft rock below. In some instances these dugouts have rudely constructed lateral and front walls but none of them has more than one room. They appear

to have been inhabited rooms but may at times have served for shelter.<sup>1</sup>

### RUIN B

Ruin B (pls. 7, 8, *b*) is a better preserved example of the tower type and is on a ridge considerably lower than that on which ruin A stands extending at right angles. It occupies a narrow space from the rim of Hill Canyon on one side to a rim of a tributary canyon, blocking the passageway along the surface of the ridge to its point. This structure (fig. 12) would appear to be structurally not unlike ruin A, but with the wall smaller. There is a raised bench on the south side,

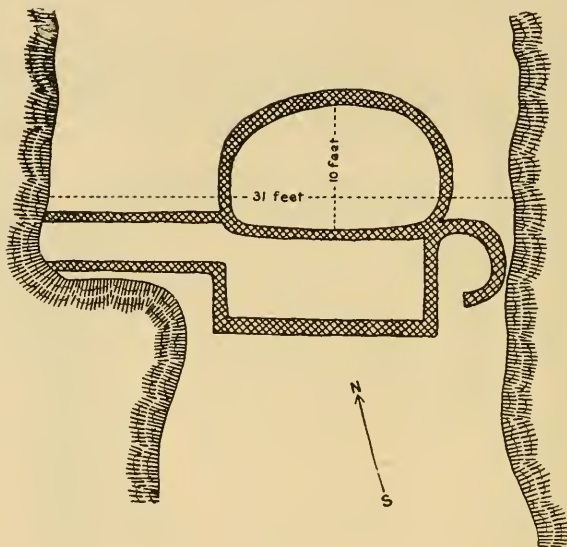


FIG. 12.—Ground plan of ruin B.

the tower itself being a semi-circular chamber annexed to the north side, which extends from one canyon rim to another. The breadth of this semi-circular room is 10 feet. The longest dimension is 31 feet and the average height of its wall is 4 feet. The top of the wall, throughout, is unevenly broken down, the part adjoining the bench being the best preserved. The structure suggests a fort, for it would not be possible to pass between this obstructing ruin without entering it through a circular doorway, the walls of which still stand on the east side. There is no passage between the wall and the mesa edge.

<sup>1</sup>We have in Hill Canyon ruins a good illustration of an all but universal custom, among prehistoric people, of dual types of rooms, one ceremonial, the other domiciliary, each constructed on different architectural lines.

## LONG MESA RUIN

On the flat top of a long and narrow mesa (pl. 9, *a, b*) rising about 200 feet from the middle of Hill Creek Canyon a few miles above Taylor's ranch, there is a cluster of three circular ruins, whose walls are composed of well constructed masonry, now much dilapidated. The surface of this plateau, near the end looking down the

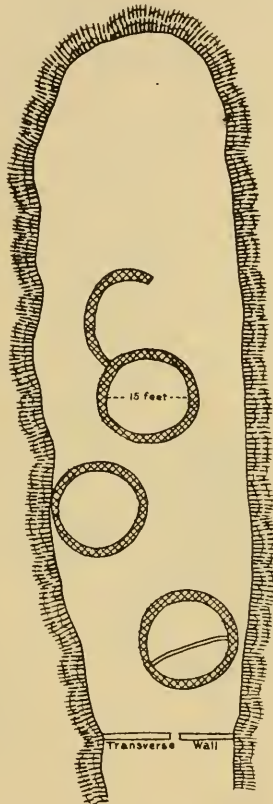


FIG. 13.—Ground plan of towers on Long Mesa.

canyon, is partitioned off from the remainder by a low transverse wall, extending from one side to the other. This wall was built advantageously for defense and apparently designed to prevent passage of foes from the upper end of the plateau into the area where the circular rooms are situated. About midway in its length it has a passageway, the jambs of which are still visible. Three circular ruins (fig. 13) make up the cluster on the lower end of the mesa, each averaging about 15 feet in diameter, all constructed of low walls

of stones dressed into proper shape. These buildings are not connected but separated by intervals. The tops of the walls for several feet have fallen, exposing interiors which are almost completely filled with stones and rubble.

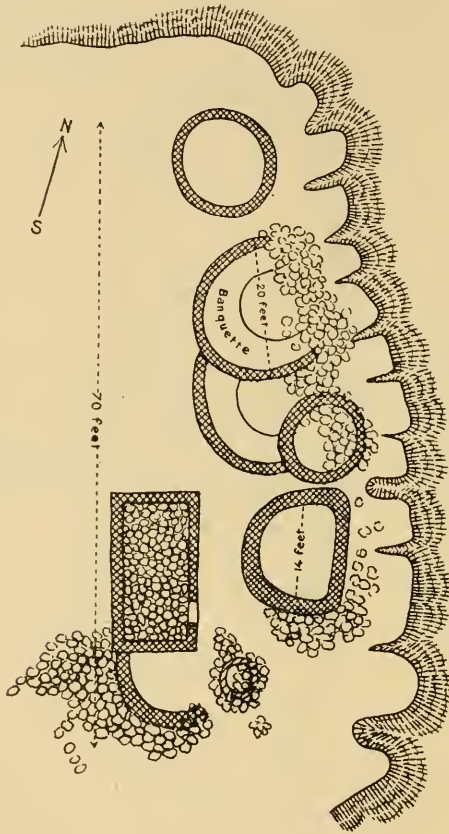


FIG. 14.—Ground plan of Eight Mile Ruin.

#### EIGHT MILE RUIN

Eight Mile Ruin (pl. 10) is the largest and most conspicuous of the Hill Creek remains. It consists of a cluster of towers on a cliff overlooking the right side of the canyon below Taylor's ranch and from the bottom of the canyon resembles a single large building. It is made up of several circular towers, with passageways between which preserve all the typical features of this style of ruins. When this cluster is examined individually it is found to be composed of

round rooms, a semi-circular building, and a rectangular room (fig. 14). The basal courses of the masonry are constructed of massive, almost megalithic, rocks. The walls of the rectangular building are particularly well made, and enclose a room filled to the top with clay mixed with fallen rubble. The longest side of this room extends north and south. The whole cluster is approximately 70 feet in length. The diameter of the circular rooms varies, the outside measurement of the larger ones being about 20 feet, while the smallest is barely large enough for a man to stand in with comfort. The semi-circular room is 14 feet in diameter. The axis of these rooms extends approximately in a north-south direction. So far as could be traced each of the larger circular ruins has on the inside an elevated banquette surrounding it, and enclosed in a wall, reaching a height of 10 feet. There is much fallen rock within these enclosures concealing their floors and rendering it impossible to trace properly the course of the banquette or interpret its relation. Another ruin of the same general plan, but smaller, is a little farther down on the same side of the canyon. Its walls have tumbled almost to their foundations, and are inconspicuous, resembling piles of stone.

The essential architectural feature of the Hill Canyon towers is their circular form, modified in many instances by the addition of a straight wall or rectangular annex. In certain cases the enclosing walls of two towers have fused, while in the Eight Mile Ruin the towers are accompanied by a rectangular room separated a short distance from them.

None of these towers show any evidences of past habitation and, what is remarkable, no fragments of pottery occur on the surface of the plateau in their neighborhood. Not far from the tower (pl. 10, *a*), there was picked up a mealing stone similar to those used by pueblo Indians in grinding corn, but no accompanying metate was found. No excavations were attempted.

#### MUSHROOM ROCK RUINS

The structure of the ruins of the mushroom rock type is not radically different from that of the towers above described, they being exceptional only in their unusual sites. They occur on top of eroded pillars of rock, often enlarged on top, reminding one of mushrooms, like the so-called Snake rock at Walpi. They were once extensions or spurs of the mesa but are now rock pillars cut off by erosion so that they stand out isolated from the rim of the canyon.



On account of the difficulty in reaching their tops, the ground plan of many could not be observed, but with a glass it was seen that as a rule they conform to the shape of the rim of the rock on which they stand. Considering the unusual sites of these inaccessible buildings, the question naturally arises, How could the ancient dwellers enter these rooms? Had they ladders or ropes, or were footholes cut in the side of the cliff to aid them? If the theory of footholes be correct we may suppose that these have been worn away, for no trace of them could be found.

A geological question might likewise suggest itself to anyone seeing the evidences of erosion between the cliffs and pinnacles. Has the gap between the latter and the edge of the plateaux been ploughed out by the water since the building on the former were constructed? Although the cliffs show that the amount of the erosion has been enormous, it must be borne in mind that the prevailing rock is soft sandstone, the wearing away of which would not necessarily require a great period of time. It is not probable that these pinnacles have been separated by erosion from the cliff since man constructed the walls upon them, but this question involves the knowledge of a geological expert.

To the same group of ruins as the mushroom type belongs one from a wholly different locality, shown in plate 12, *a*, a photograph of which was given the author by Mr. Chubbock. In this case the ruin is not built on top of a rock pinnacle, in the shape of an inverted cone, but in the horizontal fissure or constriction worn out under the harder stratum above it. The building in this cleft is in fact a kind of cliff house in which the front wall extends from top to bottom of the crevice, the rooms occupying a recess back of this wall. A somewhat similar form of habitation found in the side of a cliff has been described by the author.<sup>1</sup> It was discovered in the Verde Valley, Arizona, near Jordan's ranch, about 6 miles from Jerome, Arizona. In his description it is classified as a "ledge house," a type where the opening into the cave is completely walled up. Unlike a true cliff dwelling the rooms occupy the whole of a natural cave the top of which is its roof. It is not possible to determine from the illustration here shown whether or not the recess has been enlarged by artificial means, and as the author has not visited the ruin he has no idea of the arrangement of rooms.

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<sup>1</sup> 28th Annual Report, Bureau of American Ethnology, pp. 198, 199.



## INVERTED CONE RUIN

The best example of the mushroom type of ruin, shown in the accompanying figure (fig. 15) is about 6 miles up the canyon from Taylor's ranch on the right hand side of Hill Canyon. It is clearly visible from the road which follows the stream and has a wide out-

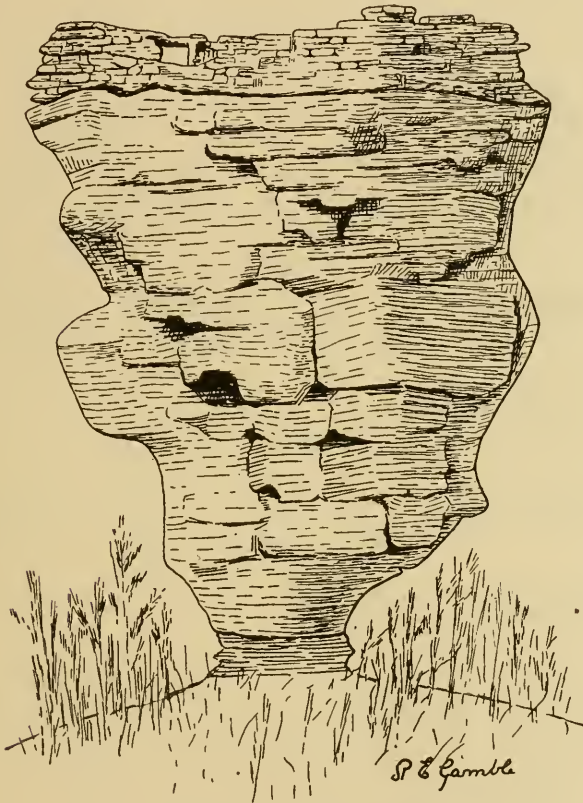


FIG. 15.—Inverted cone ruin.

look up and down the valley. Although the top of the rock on which this ruin stands would at first sight appear to be inaccessible, Mr. Owen, by means of a log, surmounted it and reported that its surface is flat and that the walls thereon are about 20 feet long and five feet wide, enclosing a roughly oval chamber, as their outline follows the rim of the top of the rock. These walls, when seen from the road with a good glass, appear as low ridges constructed of indifferent masonry.

## TWIN TOWERS

Twin pinnacles, shown in figure 16, were observed from the road about 3 miles up the canyon from Taylor's ranch. Fragments of

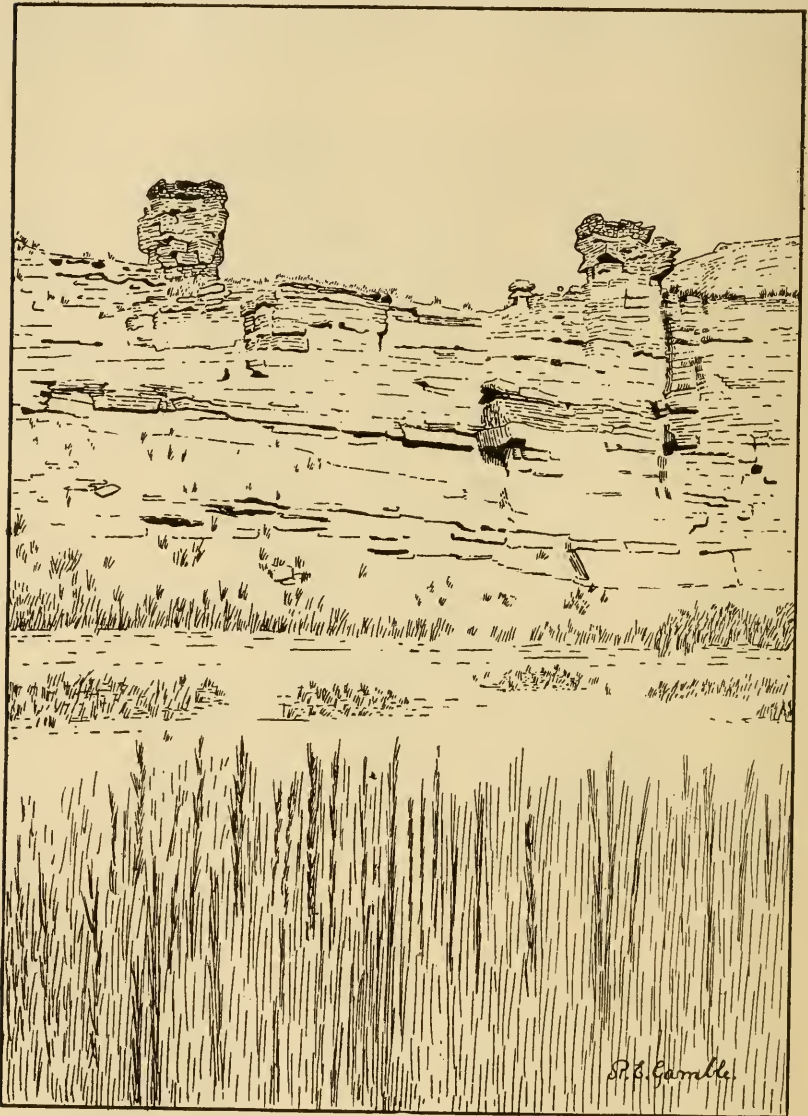


FIG. 16.—Mushroom rock ruins.

walls existed on top of both of these pinnacles, but as it was impossible to reach them on account of the erosion at their bases the form and condition of the walls were impossible to determine. Like the tower

last mentioned, the view from their tops stretches several miles in both directions up and down the canyon.

#### RUIN ON LEANING PINNACLE

The author's limited visit to this region made it impossible to record all the various shapes of eroded pinnacles bearing buildings found in Hill Canyon, but one of the most remarkable of these foundations was observed to lean very perceptibly to one side (pl. 13) so that one side of the ruin barely falls within the line of stable equilibrium. The top of this leaning pinnacle was inaccessible, the height being about 50 feet from the base, which rose from a narrow ridge over 200 feet above the plain. The author's idea of the ground plan and character of the masonry in this ruin is limited to what could be seen from the road, but its general appearance from that distance is the same as the preceding ruin.

In this account the author has mentioned a few of the more prominent mushroom rock ruins, confining himself to those which can be observed in a hurried visit to the canyon. It is undoubtedly true, as reported by several cowboys, that the side canyons, difficult of access, concealed many others which a longer visit would bring to light. The characteristics of the ruin crowned pinnacles, or leaning buttresses of rock in Hill Canyon are shown in plate 13.

#### CONCLUSIONS

As artifacts were not found in or near the buildings on the Hill Canyon cliffs, and as the ruins show no evidence of former habitation, it is evident that they were not dwellings. Their use and the kinship of the people who built them can be judged only by what is left of their walls and the character of their masonry. As has been pointed out, the most prominent of these ruins are circular rooms or towers, arranged in clusters, for an interpretation of which we may look to similar architectural forms found elsewhere in the Southwest.

Their commanding position suggests that these towers were constructed for lookouts and for defense, but the questions might very pertinently be asked, Why should either of these uses necessitate three or four almost identical buildings grouped together, when one would be sufficient? Why are some of them in places where there is no broad outlook?

The massive character of the walls suggests a fortification, but why if defense were the only explanation of their use would not one large

building be preferable to many, especially as it would be more easily constructed. It might be urged that they were granaries; but if so, why were they placed in such a conspicuous situation?

In searching for an explanation for the construction of these buildings, an examination was made of aboriginal towers in the valley of the San Juan and its tributaries, especially the Yellow Jacket Canyon and those tributaries entering it on the northern side. In the Mesa Verde National Park the author has also discovered several towers which are in a comparatively good state of preservation. Some of these are situated on high cliffs, others stand in valleys hidden by dense forests of cedar.

Towers are, roughly speaking, scattered sporadically in numbers over a wide extent of country, bounded on the east by Dolores River and on the south by the Mancos River and the San Juan. They extend as far west as Montezuma Creek, following it up north as far as exploration has gone and occurring as far south as Zuñi. Rarely, if ever, however, do we find towers in the dry, sandy, wastes south of the San Juan, and they are unrepresented in the great ruins of the Chaco Canyon. Although there seemed to be certain minor differences in the construction of towers found at different places in this area of distribution, all are identical in essential features.

The towers of Hill Canyon bear a close likeness to those in the region mentioned, except that their masonry is poorer and their walls are more dilapidated. This can be ascribed in part to the material out of which they are built, for whereas the stone in the southern part of the area is soft and easily worked, that in the Hill Canyon region is hard but can readily be split into slabs which did not require much manipulation to bring them into desired shapes for use. The tall and better built towers of the San Juan (pl. 14, *a*) and its tributaries are sometimes single rooms without connections with other buildings, but are more often surrounded at their bases by rooms not unlike those of pueblo ruins. Thus at Cannon Ball ruin the towers rise from the midst of secular rooms and the same is true of the tower in Cliff Palace and elsewhere. This leads to the supposition that these buildings were constructed for some purpose other than as lookouts: they bear all the outward appearance of sacred rooms called kivas of pueblos and cliff dwellers. If we accept this explanation<sup>1</sup> that the McElmo towers are round kivas, as suggested by Holmes, Mor-

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<sup>1</sup> A complete discussion of these prehistoric towers would lead to a morphological comparison with the Chulpas of Peru, the Nauregs of Sardinia, Irish and other similar religious structures.



gan, and others we can explain why several are united in a cluster, for it would seem that each room in such a cluster belonged to a family or clan. The use of these towers as here suggested can not, however, be proven until excavations of them are made and the signification of the banquettes constantly found annexed to their inner wall is determined.

Several structural remains in Ruin Canyon (pl. 14, *b*), a tributary of the Yellow Jacket, especially those at the head of the South Fork, give a good idea of the relation of the tower to surrounding rooms. Here we find towers constructed of fine, well preserved, masonry rising to almost their original height, but crowded into the midst of rectangular rooms imparting to the whole ruin a compact rectangular form. Several towers in this canyon are without surrounding rooms, others have rectangular, square or D-shaped ground plans, but the author studied none with two or three concentric surrounding walls.

The form of one of the largest ruins in Ruin Canyon situated near the fork of the canyon, closely resembles Far View House, in the Mesa Verde National Park. It has a central tower around which are rooms with straight walls, the intervals between which and the circular wall of the tower having a roughly triangular shape. While there is but one tower in this ruin, its similarity in form and position to the large central kiva of Far View House indicates that towers in the McElmo are practically ceremonial rooms, as has been long suspected.

This identity in form of tower and round kiva and the relative abundance of both in the San Juan drainage, leads the author to believe that one was derived from the other, in that district, and spread from it southward and westward until, very much modified, it reached the periphery of the pueblo area. It is believed that, in the earliest time, the isolated tower was constructed for ceremonial purposes and that rooms for habitations were dugouts or other structures architecturally different from it. Later, domiciles were constructed around the base of these towers until they encircled them in a compact mass of rooms. The tower then lost its apparent height, but morphologically retained its form. As this circular type of kiva spread into the pueblo area in course of time it was again constructed independently of the domiciles and the relative numbers diminished until, as in some of the pueblos of the Rio Grande, there survive only one or two kivas for each village, but these are no longer embedded in habitations as in the more advanced archaic conditions.

The tower kiva may be regarded as the nucleus of the clan, or the building erected for ceremonies of that clan, the earliest and best



constructed stone structures in the region where the pueblo originated. Where there were several clans there were several towers; when one clan, a single tower. In course of time rooms for habitation or possibly for other purposes, clustered about these towers; these units consolidated with rooms and kivas of another type forming a composite pueblo. In this form we find the towers rising above a mass of secular rooms. The archaic form of ceremonial room or tower survived in Cliff Palace and other Mesa Verde ruins.<sup>1</sup>

Several circular kivas and towers seen by the author have one or more incised stones, bearing a coiled figure resembling a serpent. One of the best of these has also peripheral lines like conventional symbols of feathers. An obscure legend of the Hopi recounts that the ancestral kivas of the Snake clan, when it lived at Tokonabi, or along the San Juan were circular in form. While at present only a suggestion, it is not improbable that towers and round kivas may have been associated with Snake ceremonials, especially as this cult is known to have survived among Keresan pueblos like Sia and Acoma. The Snake clan of the Hopi according to traditions came from the north or the region of circular kivas.

From their similarity in external shape and distribution, circular ruins and round towers have been regarded as in some way connected. It by no means follows that rooms inside their external walls were identical in use. For instance, the so-called Great Tower on the cliffs overlooking the San Juan, described and figured by Prof. Holmes, is said by him to measure 140 feet in diameter, and to have double walls connected by partitions, forming a series of encircling rooms. This ruin may be classified not as a tower but a circular ruin, and the same may be said of the so-called Triple-wall Tower, rising on the

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<sup>1</sup>A more extended discussion of towers is reserved for a monograph, now in preparation, on "Prehistoric Towers of the Southwest." The author has made several new observations on these structures some of which differ considerably from those of his predecessors.

Morgan, "Houses and House Life of the American Aborigines" (Contr. to Amer. Ethnol., Vol. IV), has pointed out, page 191, that the round tower at the base of Ute Mountain must have been entered through the roof, as no lateral doorways were visible, and Montgomery's observations on towers in Nine Mile Canyon point the same way. These facts tell in favor of the theory that towers and kivas are morphologically identical, as Morgan indicates. An absence of pilasters on the inner walls of towers indicates that the roof was not vaulted, as in most Mesa Verde cliff dwellings and in the pueblo, Far View House, of the Mummy Lake group. Towers belong to what I have designated the second type of kivas, or those with flat roofs, and are less abundant in the San Juan area.

border of rectangular rooms, situated at the mouth of the McElmo. The dimensions of this so-called tower are reported to be "almost" the same as the Great Tower. The author regards these as examples of an architectural type related to towers, from which it is distinguished not only by size, but also, especially, by the arrangement of rooms on their peripheries. The internal structure of the tower type is little known, but in none of these buildings has the author detected peripheral rooms separated by radial partitions, although one of these radial partitions is found in kiva A of Sun Temple. The original building of the last mentioned ruin, although D-shaped, has a morphological similarity in the arrangement of peripheral rooms to the "Great Tower" of the San Juan, or that on the alluvial flat in the Mancos, and the "Triple-wall Tower" room of the McElmo, save that the so-called innermost of the triple walls is replaced in Sun Temple by two circular walls, side by side, forming kivas B and C.

The tower, with annexed rectangular rooms, like its homologue, the circular kiva with similar adjacent chambers surrounding it, is practically the "unit type," a stage of pueblo development pointed out by Doctor Prudden,<sup>1</sup> who does not make as much as would the author of the intra-mural condition of the kiva, or its compact union with domiciliary rooms. Far View House on the Mesa Verde is a good example of this union of form, characteristic of the "unit type" or compact pueblo with embedded circular kivas, one of which is central, probably the first constructed, and of large size. Such compact pueblos are numerous on the Mesa Verde, judging from central depressions in mounds, and characteristic of the San Juan, at least of its northern tributaries. The previous stage in pueblo development is that in which the sanctuary or tower (kiva) and habitation are distinct. The extra-mural circular kiva,<sup>2</sup> or circular room separated from the house masses either in courts, as in Rectangular and Round villages, or situated outside the same as in "Line villages," like Walpi, or pyramidal forms, is like Zuñi or Taos and more modern pueblos. This modification is widely distributed in ruins south of the San Juan, still persisting in several modern pueblos.

The above observations have an important bearing on the author's differentiation of the village Indians of the Southwest, into two

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<sup>1</sup> *Op. cit.*, also, The Circular Kiva of Small Ruins in the San Juan Watershed. Amer. Anthr. Jan.-March, 1914.

<sup>2</sup> The intra-rectangular kivas of such pueblos as Zuñi are comparatively modern, but their position is explained in a very different way from that of the intra-mural circular kivas characteristic of the ruins of the San Juan.

groups, which are culturally distinct and widely distributed geographically. The western group originated in the Gila Valley, and extending across Arizona spread northward making its influence felt as far as the Hopi villages; the eastern culture was born in Colorado and Utah and extended to the south along a parallel zone. The former sprang into being in low, level, cactus plains; while the latter was born in lofty mountains and deep canyons filled with caves. Each reflects in its architecture the characteristic environment of the locality of its origin. As they spread from their homes and at last came together each modified the other by acculturation. The expansion of these two nuclei of culture, and the products of their contact is the prehistoric, unwritten, evolution of primitive people in the Southwest upon which documentary accounts throw no light, and the function of archeology is to read this history through the remains left by this prehistoric people, as interpreted by surviving folklore, ceremonials, legends, and artifacts. Both types of culture reached their highest development before the arrival of the white man; and the advent of the European found both on the decline. The localities where both types originated and reached their highest development were either no longer inhabited or occupied by descendants with modified architectural ideas. Some of the survivors lived in houses of much ruder construction than the cliff dwellings or pueblos of their ancestors. The habitations of others were scattered rude, mud huts. In short the cliff dwellers of the Mesa Verde and the prehistoric inhabitants of the Gila compounds left survivors possessed of inferior skill. Both architecture and ceramic art had declined before the advent of white men.



TEBUNGKI FIRE HOUSE, ARIZONA.





a



b



c

CLIFF DWELLINGS IN CHIN LEE CANYON, ARIZONA.

a, b, Ruin A.  
c, Ruin B.

(Photographs by G. H. Hoater)





a



b



c

SITES OF RUINS NEAR GALLUP, NEW MEXICO.

- a, Zuñi Hill Ruin.
- b, Black Diamond Ranch Ruin.
- c, Kiva of Zuñi Hill Ruin.



a



b



c

KIN-A-A, CROWN POINT, NEW MEXICO.

a, b, From west.

c, Showing mounds near Kiva.



a

KIN-A-A.  
a, Inner wall of second story of Kiva.  
b, Outer wall of Kiva.



b





a



b

CROWN POINT, RUIN B.

a, From east.

b, From north.



a



b

HILL CANYON UTAH.  
a, Ruins A and B.  
b, View up the canyon.  
(Photographs by T. G. Lemmon.)





a



b

RUINS NEAR TAYLOR'S LOWER RANCH, HILL CANYON, UTAH.

a, Ruin A.

b, Ruin B.

(Photographs by T. G. Lemmon.)



a



b

LONG MESA, HILL CANYON, UTAH.

a, From north.

b, From south.

(Photographs by T. G. Lemmon.)



a



b

EIGHT MILE RUIN, HILL CANYON, UTAH.

a, From south.

b, From west.

(Photographs by T. G. Lemmon.)





a

a, Storage room, Hemlock Canyon, New Mexico.  
b, Mushroom Rock without ruin on top, McElmo Canyon, Utah.



b



a

(Photograph by Chubbock.)



b

(Photograph by T. G. Lemmon.)

a, Ledge House in cleft of mushroom rock.  
b, Tower in cedars near Sprucetree House, Mesa Verde National Park.





RUIN ON ROCK PINNACLE, HILL CANYON.



a



b

RUINS IN SOUTHFORK, RUIN CANYON, UTAH.

a, Twin Towers.

b, Towers and buildings.

