A SURVEY OF PREHISTORIC SOUTHWESTERN ARCHITECTURE

by

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Introduction

The heart of the Southwest is the region drained by the Colorado River and its southern tributaries. These rivers are the San Juan and the four or five streams that flow into it. Of particular interest as the scene of an important phase of southwestern culture is one of these streams, the Chaco, flowing northwest, in northwestern New Mexico; then the Little Colorado that rises near the source of the south-flowing White River, the Snowstake Glacier on Ord Peak; then the Gila River with its branches, one of which is the Salt River, with the Verde River, and the White and Black River, rising in the White Mountains in east central Arizona, flowing into it.

But there are physiographic features of the land that overawe these river systems, however, and that afford, in their large dimensions, the stage, as it were, of the erosion activity. These features are first, the great plateau of Arizona, across which, quite to the north of it, the San Juan River cuts west by south to join with the Colorado River, flowing southward through this highland. At the southern edge of the plateau of Arizona, the San Francisco
Mountain plateau lies across the region from the upper left to the lower right like a dexter band across a shield. At the edge of the plateau, the forest lands break into ranges and long escarpments toward the southwest, and give rise to the many streams that meet the Gila. The hills continue in series of nearly parallel folds that have greater and greater distances between them until long stretches of desert finally separate the ranges.

Thus one goes from the arid plateau region of long rarified distances down through the forest-covered ranges, over tumults of mesas and small systems of hills to the comparatively desert land that opens away toward Mexico like a brown sea, in which one is never out of sight of dim blue islands of the peaks.

It is on these plateaux, mountain ranges, and deserts, and along these river valleys that prehistoric peoples gathered, after primordial ages, into a communal life that we can study, to some extent, by the examination of their architecture.

To offer a short description of that architecture is the endeavor of this paper.

When a contact with this architecture is first established it is passing through a long dependence on the cave. It reaches an Early Pueblo Period about the be-
ginning of this Era that continues through about its Second Century. In this period there takes place a transition through the forms of the pithouse and an approach to the cliff, mesa, valley, and compound communal dwelling of the great period, through the small surface house, the unit type, and the rambling pueblo.

It is not possible to take up an account of early prehistoric architecture. It is known, because there are stone implements left of the time, that men fashioned work-aids in the form of tools in the Old Stone Age. It is reasonable to suppose that then, too, he lived in some kind of shelter, for an Old Stone Age camp site has been found in Gypsum Cave in Nevada with vestiges of the once prevalent ground-sloth. And we know that as the New Stone Age advanced, adaptability to working with tools in shaping materials with them became more marked. Somehow in the New Stone Age the pattern of concept, action, tools and product become clear to us. This frontier runs far down into our own measurable conception of time. Fairly safe speculation of early culture is made by some on the basis of Gila Valley ceramics. But our first definite point of time in architecture is ascertained in the by-that-time immemorial town of Pueblo Bonito. The year is 919. Dating from this time on, ceramics become more and more common in southwestern architecture, and we observe by them how rapidly the building arts made advance.
Long before this dating of one part of Pueblo Bonito the tradition-form of southwestern architecture had become set. That is what architecture is: form arrived at through the tradition of need, materials, and method. Architecture is never merely shelter.

But it begins with shelter, and in the Southwest the early shelters were in caves.
II
STAGES OF DEVELOPMENT

Since the glacial ages early man has had two resources for shelter: the bush and the cave. Shelter in the bush, whether a brush tent or a windbreak, or only a tree, perishes. In either place, the bush or the cave, he had the same device for comfort in inclement weather, that of digging in. In the cave some of these very early shelters have survived, and along with this form of shelter certain evidences of sentiment life, vestiges of crafts and products, that is, of dependable tools and food, that create the sedentary life out of which condition alone may an architecture emerge.

This is the Cave Period. Indian corn, the foundation of all the southwestern cultural economies comes into evidence. In this early stage appear the hammer-stone, the flint knife, the sandal, the basket, the blanket, in a word, of the last three items, an initial point of departure for the entire life of technologies,--textiles.

These have come to us not confined to any one locality, for recourse to the cave was once widespread. Many caves are found in the San Juan area, in the Kayenta Wash, in the Sagie Canyons, in Monument Valley.

The cave in Monument Valley has four concave de-
pressions in its rear wall. Around these room-like cavities poles were laid, and a covering of brush was put upon them. These shelters were found to be six to eight feet across. They are hardly structures but rather nests, lined with cedar-bark, and grass that was found under the first stratum of debris left there by subsequent time.

Beyond Monument Valley to the west there are found cave sites in Paiute Canyon, Cottonwood Canyon, and in Grand Gulch, to the north of the San Juan River. To the east, in the Lukachukai Hills, a very early cave dwelling of some interest has been examined. In the floor of this cave were found depressions some five feet across that had originally been twenty-six inches in depth. The superstructure was said to have been covered with brush and it had a framework of poles that is of some interest for this early site. The poles had been planted at intervals around the circumference, and it seems probable that they were bent inwardly and joined at the end. Two pieces were found in the debris of the excavation that seemed to conform to an artificial curvature. Moreover, clay that had been strengthened with cedar bark was found in the same place bearing impressions of the brush placed over the outside of the framework. In addition, along with two gourd ves-

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sels, a fur robe, breech clothes, and basket materials. Some unfired pottery was found that showed impressions of basket ware. Thus in the remains of this early site were found two experiments under way that some time were to have important results for southwestern life: one led to fired clay; one to plaster surfaces. The house, if this description is factual, employed our earliest example of architectural mechanics in the structure above the ground, and it might have withstood exposure on an open terrain.
Formless as the building of the cave dwelling seems to be, it gave way to a very definite kind of dwelling house, storage room and council chamber in the first of the three pithouse periods, that of the Circular Pithouse. This round house stood over an excavation that it was customary to sink to hardpan, usually about eighteen inches, and not more than four feet below the surface. If the soil in which the house was dug was loose, the exposed wall was covered with clay, or lined with flat stones. The fireplace was in a depression in the center of this living room. Superstructures varied in form. In one form, the poles were set in the ground around the circumference of the pit and slanted inwardly to meet at a central point. This form has been found in San Juan sites. Another usage set the poles around the circumference of the pit in a vertical position about six inches apart; then bent the tops over and tied them with bark or withes. Brush or cedar bark was then woven in and out over this framework, and earth or clay was then laid over the form. This type of superstructure was known in the San Juan area. The third type prevailed in the drainage of the Gila River, and it was the most general of all three of these usages. It employed four vertical posts rising not on the circumference of the excavation, but from within it. The height usually found was probably six feet or a little less. In the crotches that these posts very likely bore, poles were laid from one corner to the other. These stringers
carried rafters across this raised square, and on these rafters cedar bark, brush, or rushes were placed to hold up the top layer of earth. Poles held brush placed around the sides and the dirt piled on the whole structure in the first type made it an earth lodge. The third type had stones, boulders, or clay piled up from the edge of the pit to the eaves, making in one case practically vertical sides. Another usage was to lean poles against the edge of the roof, cover them with brush, and to insulate the entire building with earth. Entrance to these homes was from the side, by means of an incline, and as development went on, by steps. Of these circular pithouse towns there is one important example still to be found in northern Arizona at Juniper Cove, eight miles west of Kayenta. Nothing, of course, remains of any of the superstructures, but the excavations of one hundred and three houses remain, with storage pits and a council chamber thirty-six feet in diameter. Save in one minor case, all of the buildings are distinctly separate. The storage pits were 5 to 6 feet across; the living rooms 12 to 20 feet. Most of the storage pits and of the living rooms have a slab lining and their floors are from 1.5 to 3.5 feet in depth.

The council chamber was lined with large sandstone slabs, and there is a circular, slab-lined firepit. This building reveals clearly that an able and direct use of stone had been arrived at. The stone is well trimmed or
selected. A part of the bench along the circumference remains but not much else. Side doorways gave entrance to these buildings.

Neil Judd has described one of the pithouses at Chaco Canyon. He says that there are great numbers of unexplored structures in this region of the early period. One that he examined in 1920 was seventeen feet in diameter and three feet deep. No trace of applied plaster was present, but the sides of this living room had been roughly finished by dampening the plaster, beating it; then smoothing it down. In the Kayenta region, Dr. Byron Cummings has made pioneer studies of cave sites containing circular pit dwellings and storage rooms. There are numerous caves with these remnants in Sagiotsosie, a branch of Moonlight Canyon, and in Water-lily, a branch of the main Sagie. Around some of the excavations, flat stones stood on edge braced with occasional posts and poles, and having the intervening apertures stuffed with clay and grass. Plate 3 illustrates a cave partition wall that was developed from these materials. These dwellings were also roofed over with poles, brush, cedar bark, and clay. Some of these houses, he has suggested,

1. Smithsonian Report for 1922, 2740, 399, Judd, N.M.; Two Chaco Canyon Pithouses.
served as ceremonial chambers. This circular pithouse is the origin of the kiva form of the ceremonial chamber, and it carries the memory of the circular pit home throughout the history of southwestern architecture. Thus, these little earth-covered dwellings are the more interesting to us, not only because they are a universal form of neolithic building, but because they become in time the temple form that has so much of interest to us to-day.

The Transitional Pithouse remained partly below the surface of the ground but a change came in the contour of the excavation. This contour began to conform to the shape suggested by the four corner posts. So that the salient characteristic of the transitional pithouse is that its straight sides meet in rounded corners. The entrance remained at the center of the side, and at one end a kind of slab-covered storage chamber conjoined. The diagram of Plate 2 is a map of a townsite of a transitional pithouse village on the south bank of the Salt River, thirty-one miles north of Globe, Arizona. It lies, as these towns so often do, close to the ruins of a later community. A stone surface pueblo lies one hundred feet to the east of it. The transitional village consists of fifteen houses, some outside firepits, twenty-nine burials, a brush kitchen, and two middens. It is one of the many widespread settlements common in the early times of these southern people. This diffusion is a characteristic of the early desert
culture. The houses of the town are without any set directional relation to each other. The entrances, then, also face in various directions. In length, the houses varied from twenty-six feet to seven feet, and in floor area from 364 square feet to 49 square feet. This large floor space was in House XI. Each house had, as its primary characteristic, a floor about eighteen inches below the surface of the ground. This sunken floor level extended to include the vestibule floor. Steps seem not to have appeared in any of these houses. In the case of House XII, the one step to the surface was protected on the riser by two vertical slabs of stone. Some facts about House IV will serve for the entire group. House IV was 20 feet long and 12 feet wide. The posts for the central ridge beam were about five feet from the ends of the excavation in holes 3 feet in depth and 8 inches in width. This house which is freely illustrated in Plate 4 had round corners. This applies to all the houses save for House XV. Around the inside of the pit, and set in no particular manner except that they were all laid two feet out from the wall, were the twelve posts that supported the stringers. From the ridge beam in the crotches of the two central poles, rafters were laid out to the stringers. The skeletal part of these houses was elaborated by the addition of buttress posts driven a foot in the ground, and leaning, or rather wedged, against the stringers. On the rafters and on the sides, brush was laid, and over the en-
tire work, clay. In House XI, these willow and juniper braces were planted inside the pit at the base of its wall, and slanted up to the stringers. One thing more characterized House IV—around the perimeter of the floor there was a small trench two inches deep and two inches wide in which the ends of water reeds that grew a few rods off were placed. They were close together, and bound probably against crosspieces, and formed a kind of wainscoting around the entire room, continuing along the vestibule to the two posts of its door.

In all the houses the firepit is directly in front of the door, about twenty-four inches in toward the center. This might allow for the supposition that there was no smoke hole.

For Houses II, III, VI, XI, XII, and XIII, seepage problems forced the raising of a secondard floor in the excavation. This was accomplished by setting blocks of stone under poles that were then covered with slender sticks to hold in turn a matting of reeds over which clay was spread. A place was left open in this raised floor for the use of the firepit in the ground below. Plate 5 is an unmeasured drawing of House XI.

Four things distinguish the rectangular pithouse from the transitional house. The excavation is altered in shape so that the corners become rounded. The four corner posts
are the normal supports for the roof, as in the rectangular pithouses at Tanque Verde. The ridge beam type seems to have been more characteristic of transitional sites like the Salt River village just described. Plastering seems to have become more prevalent, and the rooms in the rectangular site are sometimes contiguous in small groups. Tanque Verde is a transitional and rectangular pithouse site twenty-three miles east of Tucson, Arizona that has been described somewhat fully in "The Succession of House Types in the Pueblo Area," and with this site the story of the Pithouse Period is carried through some characteristic phases from the northern to the southern part of the pueblo culture area.
Within the development of the Rectangular Pithouse the sides of the structure become straight as the introduction of adobe around strengthening post of wood leads to the development of masonry. Right angles take the place of the curved corners. The proportions of the rectangular house take on the long shape. The width is about half the length. Communities contract, and as they do, houses become separated by a common wall. Experimental strengthening of this wall may have led to the final building of walls on the undisturbed surface of the ground. A section of a northern rectangular pithouse is shown on Plate 1. At Tanque Verde, the rectangular pithouses had straight sides, some plastering, steps, and contiguity. In the contiguous room, the wall freeing itself from concealed reinforcements, in the right angle corners, in the accelerated use of stone, the rectangular pithouse achieves some of the important features of the structure unit of southwestern architecture,—the single room home.
The surface pueblo structure introduces the last creative phase of southwestern architecture. In the surface pueblo period one thing that liberates architectural techniques for the development of variety in form is the characteristic material: building stone. Wood, brush, and earth have limitations for structure that are soon arrived at. The use of the wall of mud has little structural value; adobe or clay over interwoven sticks such as in Plate 4 has no structural value at all. Building stone, however, can be used to considerable height if it is even casually tied. Examination of many kinds of early pueblo building lead to the suggestion that in many communities the increase in the use of building stone grew, perhaps, out of the use of stone to strengthen adobe, or mud, or clay. As the craft became a secure tradition less and less of earth was made use of where stone was very plentiful; and where stone was none too plentiful, but still available, the use of earth as a binding agent began to be understood. Thus, the pueblo building of any period or geographic location takes its character from materials found available for it. Stone and clay were used commonly. River boulders, lava, the layers in which sandstone is often found were also used. Then there develops a progression in quality of stone work. Crude cyclopean masonry is characterized by large blocks that are laid up in an attempt at courses. Often cyclopean
masonry is made of water boulders as in the Gila and Little Colorado Basin where pebbles, clay, and irregular boulders were used. In improved cyclopean masonry blocks are better selected for shape and conformity in size, and they are faced. In true ashlar, the blocks have greater unity of size and shape, are nearly alike in height, at least, so that courses continue as much as possible on the same horizontal plane. True ashlar and ashlar have careful use of clay mortar. Ashlar has even courses though the blocks are varied in shape at the facing side. At Kinishba, a mesa pueblo, and at Chaco Canyon, ashlar is used in decorative variation. At the one place, the courses vary in thickness and in the use of spalls in linear patterns; at the other, a texture of stone surface is achieved by variation courses over large surfaces.

As one leaves the consideration of pithouse building the search for form is still in progress. When one comes upon early but well-defined "small house" surface pueblo, the form has been found. For the "small house" of surface pueblo building, while early, is not primitive. In the San Juan region these early buildings are frequently met with. "It is generally supposed that a type of room called "small house" was the predecessor of the multiple community dwelling throughout the Southwest. This type defined as a simple, four-walled, one-story building with a flat roof, is widely spread in New Mexico and Arizona."1

1. Smithsonian Institute, Bureau of American Ethnology,
These structures are seen often in the canyons west of the Mesa Verde country in McElmo Canyon and other canyons toward the Colorado River. Very soon the "small house" developed into the "unit-type". This "unit-type" is very widely distributed in the northern and eastern part of the San Juan drainage.

The essentials of the "unit-type" of pueblo architecture are a small house, elongated, and a subterranean ceremonial chamber that are connected. Far more common than this arrangement is the conjunction of the subterranean ceremonial chamber with a nucleus of rooms that are contiguous. The unit-type may appear in a cave. In Sand Canyon, a small cave is filled with a ceremonial room and one small house. They are found, not only in caves, but on ledges on the rim of canyons. One favourite site seems to be at the head of canyons. A classic example of the unit-type is furnished by Prudden. There are two rows of contiguous rooms, the largest room being about six feet in length. In the floor of the center room of one row there is a manhole that descends about four feet to a horizontal passage that leads to the ceremonial chamber. (This may have been an instance at privilege or perogative). Nearly universally, kivas were entered from the center of the roof by means of a ladder.)

The floor diameter of this chamber is seven feet. With a vertical rise of about two feet there is a bench following the circumference of this room. The bench enlarges on the north to receive the passageway from the house, and at the south side of the room to a depth of three feet and at the greatest width of a little over four feet. The south wall of this secondary room is curved, it being concentric with the bench of the ceremonial chamber. On the kiva floor at the opening center of this south enlargement, there is a passageway about twelve inches in diameter, leading about five feet south from which point it ascends vertically to the surface of the ground. In the south chamber, described as an enlargement of the bench, there is a filling of earth above this passage to the level of the bench. On the bench around against the ceremonial chamber walls are pilasters about three feet high. These mark the angles of a hexagon described by logs laid from pilaster to pilaster. Above these logs, others are laid in the manner of a cribbing with a decreasing diameter. On the inside contour of the kiva, then, this inwardly progressing corbelling forms a kind of dome in which, at the top, there is a smoke hole. The pilasters are a little over twelve inches wide, and being about eighteen inches deep, extend farther into the earth surrounding than does the twelve inch bench. There is a firepit in the center of the room on the line of the horizontal passage on the floor and of the horizontal pas-
The recesses between the pilasters are walled to the height of the pilasters. Logs, at the height of the recess wall, cover the shallow south chamber. The entire building, except for the smoke hole and the orifice of the vertical passage, is covered with earth. Save then for these two apertures, the building is invisible and tacitly secret since the earth covering is at the same level as the terrain where this is possible (in a cave it is sometimes not), save where a slight slope drains water away from the smoke hole. Both the orifices have a slightly projecting crown of stone.

As for the house itself, there is, first, stone walls, without separate foundation, rising directly from the ground at right angles to each other. The masonry is ashlar with much mortar judging a typical house from Prudden's drawing. At the ceiling level, a central beam crosses the room parallel to two walls; resting on it and extending through the walls are beams that carry the brush and earth roof. Above the roof, the wall extends in a low parapet. Doors are about two feet off the floor, which is earthen. In the nearly square door there is a single stone for a sill, and stone lintel. This may be one large stone, or two long stones side by side, or sticks with the ends extending over the wall into the jambs. In this region, though
possibly not at an early period, the door-sill descends to the floor.

Plaster was, to some extent, employed in finishing these ceremonial chambers of the San Juan region. While it was not put on as a complete covering it was used in ceremonial chambers on the face of the banquette. Plaster appears sometimes in pilasters. Successive coatings of it are found. Sparingly, color was used—a red band three or four inches wide on the banquette extended clear around it. Red and white has been found. Sometimes on house walls the ceramics' geometric patterns can be found, and very rarely, color.

This is the bare formula of the unit-type house. It expands at once in the number of rooms about the ceremonial chamber. The primary significance of this room is religious. The more men that resorted to it, the more efficacious its functioning should be. As the clan increases, the residence-units expand around the ceremonial chamber, keeping as close to it as the situation allowed. In the San Juan area, excepting for the fact that the ceremonial chamber is south of the house unit, and the burials south of the ceremonial chamber, at first anyway, there is no prescribed orientation. What seemingly determines the manner of expansion in the San Juan country is topography. At Aster Springs, the two principal ceremonial chambers are in a bloc of thirty-six rooms around the head of the spring's wash. At one ruin on the
North Fork (site 10) in Hovenweep, the ceremonial chamber is embedded in a group of eight rooms. At every site in the San Juan country the situation determines the form of the development. And henceforth, in the entire picture of southwestern building, the number of needed ceremonial chambers and the population belonging to them determine the size of the development indicated by the site and, in some cases as in the compact pueblo of a somewhat later period, the plan.

The ceremonial chamber functions as a council house, and as a meeting and working place for men. In order to be the locus for the religious life, however, the ceremonial chamber must have certain additional symbolic features. It has the central fireplace. It has, in the floor, the entrance from the nether world; this is called the sipapu. It has the sacred passage described in the unit-type house of the San Juan. In line with the fireplace or pit there is a vertical slab of stone before the entrance to the sacred passageway. This stone varies in size. It is called an altar stone.

The sipapu may be a hole about four inches across. In general it was near the fireplace although there are cases where it is near the wall. It is lined with clay; it has a hole in the bottom and has no set depth. If, as happens in

1. Fewkes. Above, p. 50.
some localities in the north, an olla is used, buried to the rim, as a sipapu, it is lined with clay, and a hole is made in the bottom of it. From the sacred passage that has been described there are variations in Mesa Verde, the Kayenta at Chaco, and in the Hopi world, but the symbolic elements obtain in all kivas except certain ones in the Kayenta.

In a manner that is in no sense complete, the symbolic ideology can briefly be indicated. The kiva is a passageway for the spirit that is to be born. Being such, it is, at the same time, a recapitulation of the entire drama of nativity, not as a physical, but as a psychic history. The earth is the universal mother. Through the sipapu the spirit passes from the maternal earth into the kiva. It is attracted there into this symbolic womb by the presence of the fire, the symbolic sun-father. In order to achieve the light-world, the fourth phase of life, it passes into the sacred passage and rises to the light world. To enter the sacred passage it must pass around the altar stone. As a symbolic act, at least, this is an acknowledgment of the Gods. This meagre outline does not indicate anything of the symbolic wealth, and nothing of the speculative wealth, of aboriginal theology in the American Southwest.
The town of two score kivas at Alkali Ridge is thought to indicate a general movement that took place in the early part of the Late Pueblo Period. It was a contraction of population evident throughout the San Juan region. The primary reason for the contraction is defense. The movement seems to have led at once to the exploitation of cave sites and to a full elaboration of the unit-type in a complex social organization. This movement concentrated itself in mostly southwestern Colorado. Just west of the La Plata Range is the region now called the Mesa Verde. Here among the more defendable canyons are those in the Rio Marcos Drainage. The thousand feet of depth of the Rio Marcos drains many lateral canyons. Several hundred feet from the floor of one of them, Cliff Canyon, in a cave one hundred feet high and three hundred feet long, is Cliff Palace. This city is one of the great works of prehistoric man.

It has left two hundred rooms of which twenty-three are ceremonial chambers. Of the two hundred rooms, twenty-nine are second story. Houses and the tapering towers are built on rocks too large for prehistoric engineers to move. They were used as foundations, or rooms and kivas were built between them. These rocks determined plaza levels. Debris was terraced down, and retaining walls were built. There were three distinct terraces. Three levels were
indicated by rows of kivas which skirt the middle section of the ancient village. At the southern end the terrace and subterranean room in on the floor level. At the western end of the crescent there is a rise of the whole city level on the fallen rocks from the roof. The lowest level is along the middle section of the cave. From Walter Fewkes' report on the restoration of Cliff Palace, from which all of this description is taken, we learn that there are circular kivas of two kinds, round towers, square towers, circular and rectangular secular rooms of all kinds, terraces, and retaining walls. The unknown main entrance was found, and its passage by kiva 0 through a narrow court between high walls, was opened. Entrance from this main court to the level of the cave floor was by a moveable ladder. This highway led to the spring below, now dry, in the canyon.

The general plan is that of the crescent shape of the cave. There is something of regularity, but this is apparent only from the ground plan, shown on Plate 6. The one highway was bordered by high walls over which one could not see. The kivas are for the most part on terraces in front of their respective houses. Walter Fewkes divides the town into four quarters.

The northern quarter has four ceremonial rooms; one of them was set apart from any rooms. The lower level of the Northern Quarter adjoins the Old Quarter. The upper terrace of the Northern Quarter has a large kiva, U, behind
fallen rocks; it has also the unique kiva, V. This kiva is without the south chamber that was described as being a prime characteristic of the unit-type ceremonial house. In fact, this feature is absent from some fifteen kivas in the Cliff Palace. But for other reasons kiva V is unique. It has the firepit, the sipapu, the altar stone, the sacred passage. Under the sacred passage there is another passage. It runs from the firepit to the outer wall of the kiva, then beyond the ventilator wall it turns to the vertical. In the floor at the west end of the altar stone there is a manhole that gives into this unnamed and unaccounted-for passageway. Kiva V like Kiva W, and like Kiva E and Kiva D in the Tower Quarter are built back against the virgin rock. The Old Quarter, entered through the main entrance, has an open court on the fourth terrace, and a small street in front of rooms 63, 62, 61, 60; this is really a blind court. Rooms around kiva P are low stones in height. Secular rooms 78, 77, 76, 75, 68, 66, are round. The quarter has a high retaining wall in front of kiva Q and P. In this quarter occurs the Speaker Chief's house. Walls are hewn stone carefully laid, smoothly plastered. The castellated tower is three stories high. The entire city is in full view from the bench on the south side of Speaker Chief's house. The Plaza Quarter continues the Old Quarter fourth terrace court into the Main Plaza of Cliff Palace. It passes in a sinuous curve between kiva M and kiva N; then between kiva L
and kiva K. The fourth terrace continues on into Tower Quarter around kiva J; then ceases. On terraces 2 and 3 are a group of ceremonial chambers. Kiva I is D-shaped. So was kiva T, end terrace, Northern Quarter. Though large and circular, O is a secular chamber faced by a straight retaining wall. Kivas I and H, L, M, and K, have auxiliary walls. In this quarter, high in the back of the cave, rooms 47, 48, 40, 39, 38, 37, are two stories high. Behind the whole quarter is refuse space under the cave roof where burials were found, and a group of right small rooms. Tower Quarter is well divided between the second, third, and fourth terraces. It has eleven two-story rooms, and two three-story rooms. Kivas A and B are connected by a passage. E and G are ceremonial rooms. F and G are at a lower level, G on terrace 2, F on terrace 3. From terrace 3 a ladder leads to terrace 4 in front of a tower foundation. The walls of kiva D are among the first known of all these ruins. They are painted yellow, and have the superficial plastering well preserved. The square tower, four stories high, between kiva O and kiva E has five mural decorations in red and white on the inner walls of the third story. Photographs of the site usually include too much and are misleading. A house nearby, Balcony House, Plate 7, under a similar cave, shows two houses, the ruins of several others, and twokivas without roofs. The retaining wall shown to hold the kivas is a very important feature of
Cliff Palace, as at all cave pueblos. Walter Fewkes thinks that the Cliff Palace kivas that are without benches and pilasters were roofless, and had high surrounding walls. This category would apply to round chambers M, I, R, V, and W. Some of these Cliff Palace kivas are nearly square with round corners. One kiva, D, is painted yellow; the lower part of another is red. As to the orthodox kiva, there is the sacred passage, the firebox, the altar stone, in all cases. Some of these rooms are in solid rock, in part. Kiva K is a complete rock excavation. The number of pilasters varies. Some of the "deflectors" are arcs of stone wall around the aperture of the sacred passage. This applies to ceremonial rooms V and H. Rarely is a sipapu absent, but its position in the floor, often solid rock, does vary a great deal. Of the dimensions given kiva J has the greatest diameter—14 feet.

The secular rooms are living rooms, storage rooms, granaries, mill rooms, dark rooms of unknown purpose, towers, round and square, round rooms and towers. The Round Tower is called the finest masonry north of Mexico. For the whole of Cliff Palace quality of masonry varies. It was clearly a practice to smooth masonry by rubbing it after it was laid. Corners are not banded. If building was exclusively a clan affair, some clans had extraordinary masons, others wretched ones, by comparison. The foundation of many walls was weak; the high walls standing on
them were not the original intention. Walls vary in thickness. Adobe, in some cases, is harder than the sandstone. Some walls were plastered inside, some on the outside. Few of the rooms would conform exactly to our description as they are circular, square, or rectangular. Thresholds, lintels, and jambs were hewn and rubbed into shape.

Tau doors abounded, and some doors were very wide. Few were at floor level, and many had a projecting stone for a step. Slab-lined fireplaces abounded. They were frequently in the plazas, and appeared at different places in the rooms, generally near a corner.
The pueblo that has just been briefly described is a compact pueblo in a cave. A compact pueblo in a valley is Pueblo Bonito in Chaco Canyon, northwestern New Mexico.

The Rio Chaco, a tributary of the San Juan system, rises at Seven Lakes close to the Continental Divide, flows through Chaco Canyon before taking to the open country that leads to the San Juan at Shiprock. A commercial map records the sites, Kin-kla-tzin, kim-me-ni-oli, kin-yai, Casa Moreno, Pintado, within a range of forty miles of Pueblo Bonito. In less of a range there are numberless sites and some nineteen towns; some of the more important ones are—Pueblo del Arroyo, Chetko Ketl, Yellow House, Rinconada, Hungo Pavi.

Pueblo Bonito has been made a household word by photographs, popular articles, and not least, by Jackson's lithograph of a restoration projection. This projection retains its interest, but so much has been done in the nearby area that it now has more historical than scientific value. Judd's ground plan, reproduced on Plate 8, describes its size and intricate organization in the final manner, for without it the pattern of change that accrued in additions in the growth of the town could never be apprehended. No cross-section, no elevation, could show it.

The most salient feature is the D-shaped perimeter that marks the ground plan of the communal house of Tyuoni in New Mexico, at Mesa Verde, and in other parts of the San Juan. The bowed side of this perimeter is 550 feet in length. A line along a curved wall at the greatest part of the curve is about 340 feet long. The straight side of this building is the low side. It may represent a frontage on a former channel of the Rio Chaco. Between the 11th and 12th room from the left end is the one entrance to the entire town; the continued elevation contained 13 more rooms to the right. Rooms 12, 13, 14, 15, and 16, covered the south side of a minor, or at least, a smaller kiva. Around it, possibly to keep within the traditional demands of subterranean locus of this religious structure, houses are piled up. The kiva contour, then, is invisible from the outside. It is reasonable to conjecture that this inclusion had recognition all through the northern pueblo culture. For over in the Kaibito canyons there were small cliff-sheltered kivas that are round, inclosed in a cartouche of walls that approach tangency to it, and are built up to very near its height. At the corners left open, waste materials were put in. In Chaco Canyon a very fine example of this type of kiva was being excavated near Chetro Ketl in the summer of 1935, at Talus, Unit No. 1. Walls around larger kivas, however, leave space for

not to be neglected; four small rooms are in the group around this outer ceremonial chamber, adjacent to the minor kiva. Ten rooms are built up against it. Between the group of buildings on the chord of rooms across the center of Pueblo Bonito and the left part of the crescent as one faces north, there is a court of about twenty-thousand square feet. The open area on the right side of the chord of rooms is larger, and of even greater irregularity. Moreover, it is divided by a chord containing two kivas smaller than the one just mentioned in the first chord. It has become clear that after the original D-shaped plan was expanded as far as it would stand pressure of population, additions were to grow, tumor-like around new kivas established in the protected space. Before the pressure exacted this device, kivas were integrated into the circular wall-sections themselves, in the upper stories. These walls that swing around a radius of 350 feet rose up to a height of five stories on the outer row. On the west end, the rows run in some places to six concentric lines of rooms, although at no place are any of the alignments of rooms continuous throughout the semicircumference. Toward the center the rows were lower, so that theoretically the étages stepped up one additional height as they approached the back wall. But to think that this seeming regularity of form can only bring surprise when the structure itself is seen, forgetting plan. Then its accretive organic character becomes apparent from the
height of the mesa behind it. The manner in which sections conjoin, with what seems at first, disregard for function and space economy, can hardly be otherwise appreciated. The view from above shows how well some of the previous organization has been built over. For some forty rooms in an arrangement like the "chords" that have been mentioned lies almost indiscernable under the kivas and the plan-stage of subsequent building. Adding a few possibilities for certain supposed rooms, the ground plan shows nearly two hundred and seventy-five rooms. Probably there are more. In the entire structure there are 800 rooms.

Pueblo Bonito has one great kiva. The ground floor shows nineteen small ones; those seen in the aerial view do not coincide with those indicated in the plan. The great kiva measures about fifty-six feet on the inside diameter. It shows a double ring of masonry around the lower part of the circumference like a banquette, and a step before it. This is called a double banquette. Above the banquette are the niches. There are no pilasters. The antechamber, so prominent in most great kivas, is not so apparent in the great kiva at Pueblo Bonito. On the south part of the plan axis is the square fireplace or altar. Parallel to the same axis, equi-distant on either side is the problematical "fire vault" that contains also sockets for the four roof pieces.
The smaller kivas vary, as they did in the Kayenta, in
diameter. They have the banquette, the horizontal wall post-
socketed in masonry on the banquette, the central firepit,
and the sacred passage under the south wall that opens through
the floor near the firepit, the feature that connects these
structures in the eyes of Noel Morss to later Kayenta kivas.
In four cases, there is, in the smaller Chaco Canyon kivas,
a small vault of masonry to the west of the firepit.

That the function of the great kiva is that of a com-
munal gathering place at least in part for religious ob-
servance, and that of the small kiva is that of a gathering
place for a small, and probably exclusive group, are points
of general agreement. For these kivas that accommodated
small groups are built, frequently enlarged, and altered.
Often they are rebuilt on the same site or within the same
form. Such a case is that of the small kiva on Plate 9.
Here, what must have been the first banquette determined
the level of the floor of the rebuilding. In their adjust-
ments, different styles of stone work appear, and they can
be traced at Pueblo Bonito and at Chetko Ketl, a town about
900 yards away that may prove to be very much closer to
Pueblo Bonito than it now appears, when excavations get be-
low the present level. The earliest of these styles reveals
well-selected small pieces of stone stuck into, rather than
laid up in, what seems to be a wall of adobe. These spalls
are in thin and diffuse courses and are probably solely
ornamental. Style II seems, on the other hand, to be devoid of all mortar. Large stones are laid up in block courses, not always horizontal, but nearly enough so to give strength to a fine pattern in texture. Between these larger blocks that must be six or eight inches long there are courses of spalls. These vary in number of grouped courses; the range is two courses to eight courses between the large blocks. That relation of small and large blocks occur in a much coarser ratio also in the ruin. Type III is laid up with thin courses and mortar with a preponderance of large stone courses in one case. In another case, it has larger spalls finely cut and matched between courses of well-cut larger blocks. Here, there seems to be no mortar at all. Style IV employs the larger small blocks in lessened proportion. Type V is composed entirely of small blocks.

The walls made of small spalls have lesser rigidity than those made of blocks, and they had to be buttressed in places. Doors in the section near the Museum at Pueblo Bonito were, in some cases, flush with the floor. Tau doors were seen. Fireplaces were not so common, and probably were out-of-doors on roof tops.

In Pueblo Bonito, certain rooms seem in the curved wall facade to have had ceilings. Willow, aspen, cedar, and pine were used. Usually the pine furnished the beams, and split cedar or aspen was laid on the pine, with bark
and clay over the wood. Sometimes, the willows were tied. Sometimes, beam ends banded into the walls were wrapped in bark. Shelf-scaffolding was frequently employed, slender poles across the narrow end of a room. Loops of withes were found. These rooms were very dark. Many inner rooms had no light, no ventilation. There were a few windows, and some rooms had several entrances.
The pictorial cross-section of the Sanctuary at Chetro Ketl, Plate 10, shows two stages for this kiva. In the first stage it is said to have functioned as an amphitheatre or general meeting place. The excavation depicted at the left of the cross-section shows the first level as it now appears. On this floor, one sees the square altar, a part of the fire-vault with one of the hypothetical posts (or piers?) in it built up to the second level. The right side shows the level employed, and one pier at the second stage of the Sanctuary's history, that of the great kiva. The drum has a diameter of 64 feet. The north sanctuary with its steps at the right could belong only to the second period. The date-range for Chetro Ketl at present reads 900-1125; for Pueblo Bonito it reads five years later.
Within a short distance of the source of the Little Colorado, the White River rises to flow southwest into the Salt River. About halfway down its course, in a sheltered plain, lies the pueblo of Kinishba. Kinishba, because it has six clan houses and several pithouses around it, and because it is cut in half by an arroyo, is called a semi-compact pueblo. It belongs to the Mesa Type. It is not defendable as Casa Grande was by its walls, or some of the Chaco pueblos may have been, if we can judge from the walled-up "loggia" that once, in the early period, filled part of the Chetro Ketl on the low or south side. But Kinishba looks far more toward the Gila than it does to the north. There are two courts that are excavated and at least one that is not, at Kinishba, and no defense of entry way seems very likely save one on the south side of group 1, where the entrance is a passage-way that gives onto a small vestibule, the east side of which is illustrated in Plates 11 and 12. The plan seems to be that of the addition of courts and their surrounding buildings along the arroyo. Possibly a mutual extension would have grown up between the two large groups and the clan houses. It seems that this ruin would average a court about every one hundred feet at its present plan. The second large block is 149 feet wide at the greatest point. It was 435 feet in length, and the neighboring arc across the work was 348 feet.
The rooms lie in various depth of tiers around the courts. To the first court one passes six tiers on the south side of Group 1. Part of these are shown restored on Plate 15. There were three tiers to the west of this court to the right, none to the north. In room 71 and room 59, there are remnant walls of superior masonry that indicate debris ramps at a lower level. Along with these early walls, it is to be noted that there is a pithouse very near Group 2. As these previous, covered walls are several feet high, at least in the case of room 71, this indicates that the level of the first occupation must have been considerably lower. Across room 72 there was a post and earth wall. Posts were found used occasionally with crude ashlar masonry. One was in the corner of room 62; but post holes for various purposes were found in most of the rooms.

It is quite clear that two stories were over a good deal of the south part of Group 1, and it has been suggested that there may have been three around a part of the court in the second large group. For support of roof beams, posts are not infrequently used. Stone, left out of the sturdy ashlar, usually was about large enough for the beam end, and three beams usually were used. There was some use of slabs and cedar bark over cross beams, then willow foliage and mud. Usually willows were placed directly on the secondary cross-beams, and on them, heavy mud. Almost all rooms are living
rooms. There are a few storage rooms, and for ceremonial rooms it seems clear that the first court was employed. There is an altar-like construction of masonry at the south side of the court. A bench runs all the way around the court. Posts survive, and it might be that from them an awning covered a part of this open space. There were fourteen of them.

Little of the sturdy stone work of the Kayenta, nor of the brilliantly textured masonry of Chaco Canyon obtains at Kinishba. A great deal of mud, or adobe, was used and the use of rubble facing behind an ashlar facing is very common. It becomes a kind of an interior finish to many rooms, and it is not infrequently found under a coating of mortar. The ashlar was used with spalls running in vertical and in horizontal patternization.

To the north of the first court lies a second, smaller one running the whole width of the first. A subterranean chamber found here in the summer of 1935 had a central fireplace and a secondary chamber. A drawing of this chamber, when half reconstructed, is on Plate 13. The drawing of kiva R-4 at Kokopnyama, Plate 14, and Old Hopi site in Leroux Wash in the Hopi periphery to Kinishba, shows a probable proto-type from which this diminutive ceremonial chamber may have very indirectly been derived.
ARCHITECTURAL INFLUENCE ON THE CULTURE

The conditioning stimulus that sets the history of an architecture in motion is environment. Post-glacial man, at any rate, had recourse to the cave in the Southwest. In warmer climates the early shelter that is resorted to retains longer its sufficient character. But in the San Juan country, where great inclemencies are a factor in the exposed lives of early inhabitants, shelter of some kind was imperative. The evidence that the cave served this purpose is endless.

In its relative effectiveness as shelter, the cave did, in two ways, give architecture a pause that cost it, probably, the first place in the history of southwestern techniques.

The cave and the ledge afforded a satisfactory resting place for the population was was small and so recently nomadic. Even plants migrate on our earth, and the ancients of man found it not too difficult to seek a new living place. And doubtless, for those in their caves; shelter ceased to be the most pressing of all their problems, unsolved as it might be from any point of view that is subsequent. Living in a building is an orientation in the natural world; taking residence in a cave is an equivalent change. For a time it is
one that is sufficient. Accomplishment in improving this new living condition did not, then, go beyond a certain point of obvious and minimum effort. But though the endeavor to keep warm went on, it went on in a different direction. In resorting to the always insufficient supply of fur for warmth the desire for more of it led, among other agencies, to the development of the textile arts. These arts progressed rapidly, and it is these handicraft techniques, it has seemed to me, that have received early, though not exclusive attention in the Southwestern culture groups.

The cave functioned in the inner history of the culture again for architecture brought into being by an environment, creates a new environment. From within it, crafts, aside from religion, then become the full order of the life. They assume a predominant role in the summarized nature-knowledge, that is, the science of the culture.

Technologies of handicraft set the direction of culture-tendency, then, in the Southwest. This culture-tendency achieved its final phase in architecture. Architecture is not only a prime form of social surplus. It is the articulation for religion of the spiritual intention of the group. In the Southwest, it is the temporarily solidified clan-group, held together by the one all-absorbing activity of the group, the technique and the craft of raising corn. The works that are piled up, from the per-
fectly designed and beautifully adequate unit-type establishm-
ent to the great accretive compact houses, are the 
work of people for whom the handicrafts, and not engineer-
ing as a technique or great planning as style, is the 
horizon. There has often been much finer space-design in 
wall surface, but not often, anywhere, such effective 
texture. But long before expression-form has taken place 
the storage of food and possibly the care of the dead have 
contributed something to the growth of function-form. For 
as far as building techniques are concerned, Southwestern 
man seems to have had a container for his corn, and a mar-
velous winding sheet of fur or feather textiles for his 
death, almost before he had a house for his life. This 
seeming priority is perhaps verified by the evaluation 
that historic generations have placed on their own cul-
tural activities. It is weaving, bread-making, and pot-
tery, that is, fabric, corn, and clay. Hunting parapher-
nalia stand before all three, and the stone wall, last. 
Were exigencies to compel them to move for any reason 
that made the raising of corn more difficult, the bad 
floods, the late silting, it was always possible to build 
a new home.

Perfection of one form stimulate another stage of 
the form. In the south, an incline protected with brush, 
for how many generations, led to the house door. Then 
here, in the next village, houses appear with a step letting
down into a sheltered vestibule, that leads into a house. In the north, the corn is kept clean in a stone-lined cone-shaped excavation. It can be covered over with brush and debris. You would not know that it is there. Someone widened one out a few feet and put more stones around it. The poles leaning against the cliff were put over it and brush piled on them, and mud piled on the brush, and it looked not much different from the rocks around it after the mud dried, and it was seen from the spring below. Then, when someone in the next canyon wove mud, cedar bark, sticks, around these same poles set upright, and the overhanging rock close above was already the covering, the problem had already been stated, and in the statement of it, had become clearer. Development became rapid. In the old round house near the new one, that old, old house farther in the ground, the one where the matriarch died, the place where valuable things are put away quickly, and one slips out, where the old men go when the rain does not come, to ask her to send it...this is the third of the structures of southwestern building, the fane. The form of prehistoric architecture at once becomes of moment, and it almost visibly hurries onto perfection of the simple type. The house might follow in development, and the storage cist stay on, or even become a house itself, but the dynamic factor in this craft-rich society henceforth becomes the ceremonial chamber. Some place along the line its function and realization must have been relatively sudden,
very concrete, and great. For in the San Juan region, where the unit-type house, that is residence, is complete as a fabric and has no subsequent history beyond that of enlargement, its attendant ceremonial chamber, under the power of ritual and the clan, that is religion and politics, becomes the prime symbol that was implied in corn. More than one observer has felt that the ceremonial chamber for the unit-type structure appears in an appreciably swift development on the canyon rims that are its early sites. This might be true. But it is even more startling that the roof, the pilasters, the bench, the sacred passage appear in such final structural relation. In all architectures, intimations of effective form accelerate from this point on to fulfillment. In this kiva there is a very present fulfillment, for it has been observed how preponderant the building and its functions were at Cliff Palace. The kiva approaches the point of giving style, that is, inner realization, to the whole society.

Like most historic architectural forms its subsequent course, when liberated from technical limitations such as the cave floors of cliff cities, is that of enlargement. Its mere radius soon, as building generations go, becomes more than twice the length of a good-sized residence. Possible its religious character breaks down, too. For it is a far cry indeed from the secure conservatism of
the locally modified, religious architecture at Betatakin, lasting on an additional century to the great sanctuary kivas at Chaco Canyon. For whether these great chambers indicate large, rich, dominating clans, or whether they indicate anti-clan or cross-clan influences, they are probably no asset to the traditional religious life. Their very existence seems to mean that the old cohesions are broken down. For a common meeting place means a council, and a council may mean discussion. And in a society that had so long ago ceased to be primitive, policy and religious conservatism each has a following.

Thus architecture as structure, as design, as technique is a confluence of many facets of social life, so its achievements, that are in themselves, a convergent expression of groups, have subsequently a place in moulding society. Architectural form is a vicarious nature-world for human beings, all human beings who are not shepherds, or who do not live at sea. And because it is a conceptual world it holds forth a constant and mighty invitation for recreation of itself. To the present writer the whole of the Chaco phase of San Juan culture is perhaps of some less importance than the Kayenta. But the efflorescence that took place at Pueblo Bonito in two hundred datable years is a culture-miracle without parallel. Any achievement of grand style is an occasion for marvel. At Santiago in the Isle-de-France, among the Cistercians, or in Athens
in the lifetime of one influential man, this sort of thing happened, as it were, overnight. But there, always, were millenia of contributory cultural influences working. But in Chaco Canyon what was there of this? Not far away some dogs, said to be from Mexico, and sacred, have been found, and parrots, also mummified, that Neil Judd says may have been brought alive from Oaxaca, have come to light. But these represent no influences that leavened the dense population on the meagrely irrigated lands of the eastern San Juan Drainage.
The pueblo architecture that has survived the threatened economic extinction of the pueblo nations retains its outward form. Some of the pueblos are rambling, like Sia, and Santa Clara; others are compact, like Taos. In the Little Colorado towns the kiva is shrinking as an influence, but it retains its significance by its underground position. In most other towns in the Rio Grande Valley the kiva is now on the surface. This is a major violation of inner form, and it is a fatal admission on the part of the priests. Some buildings remain, and do remain symbolic caverns. Any Byzantine church, built before those erected and lined with light Persian tiles by pro-Moslem architects, shows this. But a subterranean place for worship that emerges from the ground indicates that its society has other primary values. The forms that are being now elaborated by the prosperous pueblo at Taos simply follow the accretive patterns that one may see in the two large compact units at Kinishba. Taos achieves height rather confidently, however, and it may be that alien material can be found in it. Given very little economic stability, the conservatism of these pueblo groups may retain much of their outward similarity to ancient form-life. Architectural forms usually soon lose their essential meaning, but they seldom, with that, give up their flexibility. Because aboriginal architecture grew up in the Southwest, apparently free from all outside modification,
it is indigenous, appropriate, and, as it happens, endlessly variable and adaptable for the needs of those who supplanted aboriginal builders. In a very high culture, where building remains in the hands of craft-control, these rich possibilities for climatic adjustment, health, design, and beauty could be attacked, and developed for all architectural need. In a society stiffened by rigid economic rather than guild control, such a modulation of living is not possible. For this reason, prehistoric architecture, where it is a complete enough study, should be retained. As adaptations for us, Oraibi and particularly Walpi may have a future.---Pueblo Bonito has not.
Young societies, when they have achieved an architectural form that satisfies their intention, proceed swiftly to make over their entire world. Everything goes, and the first thing to go is the old building. But since the old buildings were themselves a form of the search, something of them survives. In primitive societies the separation of the quarters for women is often met with, even among the nomads. The separate work room and retiring place for men in the Southwest may possibly be a conformation to this pattern. In the continental Mediterranean house the practice was marked, and maintained itself in vestigial form for long after the symbolism of the use was forgotten. The women's quarter becomes the cella that disappears in time in the tribuna. Thus, again, the early home helped to shape the architecture of historic form. In the Mayan descendance the sequence is more difficult to follow. But I think that more vestigial wood form survivals might be found in late Mayan architectural decoration than have survived in the conventional picture of functional decoration. The wood that was used for the Mayan home is plentiful, varied, malleable and capable of extraordinary finishes. The wood carving of the locale, ancient and modern, shows that. The use of structural wood by the people of the present time might permit of the analogy. The decorative palisading and the decorative lattices that appear in Mayan stone work on late buildings can be seen in something that
strongly suggests them in southern San Luis Potosi in modern times. This is a universal result of the use of similar material.

The aim of this paper looked more to the development than to the sources of prehistoric southwestern architecture. The problem of its sources lie in the field of excavation, rather than in the field of analogy. But Roberts can still point out "unmistakable" relations of the early pithouse to pithouses that have been examined in Siberia. These asseverations will probably grow to be of less moment as the claims for distributive, or foreign origins for the prehistoric southwestern folk subside.
In this study we have very briefly seen something of the architectural realization of the prehistoric culture of the Southwest. There has been a glance at the adjustments following coming of a sedentary life that gradually encroached on the migrations around communal corn planting. This adjustment took place clearly in the caves of the San Juan River Drainage, although it can now be followed with increasing accuracy in the Gila Valley, and elsewhere. Gradual improvement in the mechanics of building took place long before characteristic form of the essential unit, the rectangular surface room was achieved. This adjustment passed through the stages of the circular, the transitional, and the rectangular pithouse, to the surface structure. The small house is always the primitive home, but in the Southwest the small house emerges from its development in the northeastern San Juan country in permanent association with a definitely formed ceremonial chamber that remains in most areas, but not in all areas, circular. It functions as an esoteric religious meeting place, as a council chamber, as a place of contemplative and recreational retreat, and for some crafts, as a workshop. As a religious building it has an elaborate symbolism that remains fairly constant, although there are clan variations in position, shape, purpose, and finish of the form, especially in the Kayenta. This symbolism and the liturgical function of
the building obtain throughout the entire history, and exist today in certain essential forms. When, after the house acquired form in the unit type house, it was taken up and adapted to conditions of greater population. For the secular building this led to no great modification, but for the kiva it led to a modification of the esoteric clan religious function in the small building. The kiva form was enlarged, in some places very greatly enlarged, to what appears to have been a public meeting place. At the same time the secular structures were massed, possible in some places for defense, to house populations of about two thousand the unit. The period of intense building seems to have arisen swiftly, developed rapidly, and ended suddenly. It was in all places on a decline by the Conquest. There were peripheral flotations, some in the Little Colorado, the Mimbres, the Rio Grande, the Gila drainage that were remarkable, and all are of great interest. But the central theatre of the whole tragic drama is the drainage of the San Juan River.
A Survey of Prehistoric Southwestern Architecture.

Bibliography

I Books.

II Museum and University Publications.

American Museum of Natural History, New York.
Carnegie Institute, Washington.
Field Columbian Museum, Chicago.
Gila Pueblo, Globe.
Museum of the American Indian, Heye Foundation.
The University of Arizona Bulletin.

III The Archaeological Institute of America.

The American Journal of Archaeology.
The School of American Research.

IV Journals.

V Magazines.

VI Consultations.

VII Field and Lecture Notes.

VIII Maps.
I Books


Hewett, Edgar Lee: Ancient Life in the American Southwest. Indianapolis, Bobbs, Merrill Company, 1930

II Books

A. The American Museum of Natural History, New York.
   1. Anthropological Papers.
      An Outline for the Chronology of the Zuni Ruins.
      Notes on Some Little Colorado Ruins.


   1. Anthropological Series.
      Vol. VI, No. 1, Voth, H. R.
      The Stanley-McCormick Hopi Expedition.

D. Gila Pueblo, Globe, Arizona.
   The Medallion.
   1928 The Use of Potsherds in an Archaeological Survey,
      A Method for the Designation of Ruins in the Southwest.
   1929 The Red-on-buff Culture of the Gila Basin.
   1930 An Archaeological Survey of the Verde Valley.
      The Red-on-buff Culture of the Papagueria.
   1931 The Western Range of the Red-on-buff Culture.
      Some Southwestern Pottery Types, Series II.
      Kivas of the Tusayan Ruin, Grand Canyon.
   1934 The Canyon Creek Ruin and the Cliff Dwellings of the Sierra Ancha.
   1935 An Archaeological Survey of Texas.

E. Museum of the American Indian, Heye Foundation.
   1. Indian Notes.
      Vol. II, No. 2, 125, 1925. Harrington, M. R.
      Archaeological Researches in Nevada.
      Prehistoric Pueblo Ruins in Arizona.
      Another Ancient Salt Mine in Nevada.
      Vol. IV, No. 3, 232, 1927. Schellbach, Louis,
      Ancient Bundle of Snares from Nevada.

2. Bulletins

Exploration of a Pithouse Village at Luna, New Mexico.
Vol. 78, No. 2865, 1, 1930, Hough, Walter. The Exploration of Ruins in the White Mountain Apache Indian Reservation.
4. Annual Reports.


5. The Smithsonian Institution Miscellaneous Collections.
   1921, Vol. 70, No. 3, 2536, Judd, N. M. Archaeological Investigation at Paragonah, Utah, 1919.

   1921, Vol. 72, No 1, 2706, Judd, N. M. Archaeological Investigation in Utah and Arizona, 1922.
      No. 6, 2619, Judd, N. M. Archaeological Investigation in Utah, New Mexico, and Arizona, 1920.


   192 , Vol. 78, No. , 2865, 1927, Judd, N.M. Archaeological Investigation at Pueblo Bonito and Pueblo del Arroyo, New Mexico, 1926
      No. , 2912, Judd, N.M. Archaeological Investigation in Chaco Canyon, 1926.

   192 , Vol. 82, No. 11, 3069, 1931, Haury, Emil, and Hargraves, L. L., Recently Dated Pueblo Ruins in Arizona.
G. Harvard University.


   Vol. XII, No. 1, 122, 1931, Guernsey, Samuel, Explorations in Northeastern Arizona.


H. University of Arizona Bulletin.


2. Thesis
   Haury, Emil., House Types in the Pueblo Area, 1928.
III The Archaeological Institute of America.
   A. The American Journal of Archaeology.

B. Annual Reports.
   V. 1880- , Bandelier, A. F., Reports for
   1882-1883; 1883-1884.

C. The School of American Archaeology.
   1. Archaeological Papers.
      No. III, Reprint from the A. J. A., Vol. XIII,
      334-344, 1909.
      Hewett, Edgar.
      The Pajaritan Culture.
      No. IV, Reprinted from Out West, 1909.
      Hewett, Edgar.
      The Puye.
      No. V, Hewett, Edgar.
      The Excavation of Tyuoni, New Mexico, in 1908.
      No. X, Reprint from the A.A., Vol. II, No. 4,

2. El Palacio.
   Vol. XXXIX, Nos. 16, 17, 18, Fossnock, Arnette,
   Pictographs and Murals in the Southwest.
   Vol. XXXII, No. 9, Cummings, Byron,
   Three Types of Culture in One Pueblo.
IV Journals

A. The American Anthropologist.
   1. Memoirs.
      Vol. 1, 104, Colton, R. F. and H. S.
      The Little-known Small House Ruins in the Coconino Forest, 1906.
      Prudden, Mitchell,
      A Further Study in the Prehistoric Small House Ruins in the San Juan Watershed.

   2. New Series.
      Vol. v, 224, 1903, Prudden, Mitchell.
      The Prehistoric Ruins in the San Juan Watershed.
      The Circular House Kiva in the Small House Ruins in the San Juan Watershed.
      Vol. XVII, 272, 1917, Cummings, Byron,
      Kivas of the San Juan Drainage.
      Vol. XXXI, 213, Spier, Leslie,
      Problems Arising from the Cultural Position of the Havasupai.
      Vol. XXXII, 1930, Hawley, Florence,
      Prehistoric Pottery and Culture Areas in the Middle Gila.
      Vol. XXXVII, 1, 1934, Roberts, F. H. H. Jr.,
      A Survey of Southwestern Archaeology.
      547, 1935, Kroeber,
      History and Science in Anthropology.

B. American Antiquity.
   Vol. 1, No. 2,
   Archaeological Field Work in North America in 1934, II.
   Vol. 1, No. 3, 1936, Clements, Forrest,
   Notes on Archaeological Methods.
V. Magazines.

A. The National Geographic.
   Vol. XLIII, No. 2, 210, 1923, Bernheimer, Charles,
   Circling Navajo Mountain with a Pack Train.
   Vol. XLIV, No. 1, 99, 1923, Judd, N. M.
   Pueblo Bonito, the Ancient.
   Vol. XLV, No. 3, 275, 1924, Judd, N. M.
   Beyond the Clay Hills.
   Vol. XLVIII, No. 3, 263, 1924, Morris, Earl H.
   Exploring the Canyon of Death.
   Vol. LVI, No. 6, 737, 1929, Douglas, A. E.
   The Secret of the Southwest Told in Talkative Tree Rings.

B. Art and Archaeology.
   Vol. IX, No. 1, 27, 1929, Cummings, Byron.
   The National Monuments of Arizona.

VI Consultations.

VII Field Trips

VIII Maps
Basalt fragment of an old wall. Large blocks and small stones in a poorly constructed course.

Smithsonian Miscellaneous Collection Vol 82, 3069, No. 11 Haury-Hargraves Recently Dated Pueblo Ruins in Arizona
Taken from "Roosevelt 9:6".
The Medallion Publications,
Gila Pueblo.
A Wall of Wattle and Mud. Forbidding Canyon, Site XIX

Peabody Museum of American Archaeology and Anthropology, Vol XII.
Elevation Sketch of House IV A Salt River Drainage Site.
Elevation Sketch
House IX A Salt River Drainage Site.
CLIFF PALACE
MESA VERDE NATIONAL PARK
COLORADO
Balcony House Mesa Verde
After Excavation

Hewett, Edgar
Ancient Life in the American Southwest
A Small Kiva. Later floor level at second horizontal A fire-place, Ceremonial entrance, South bench recess
Formalized Sketch from Ground Plan of 1929-31 Excavations, and from U. of A. Summer Session Photographs, 1935.

Great Sanctuary at Chetro Ketl Showing Levels as Amphitheatre and as Great Kiva.
Kinishba: A Semi-Compact Pueblo in the Salt River Drainage.
Kinishba: A Semi-Compact Pueblo in the Salt River Drainage.

A Restoration Projection For Group I.
Kinishba: A Semi-Compact Pueblo in the Salt River Drainage.

Rebuilding the Transition-al Ceremonial Chamber.
Kiva R-4 at Kokopnyama
Platform restored-Fire-pit cover-Olla in floor

Smithsonian Miscellaneous Collections Vol XXIV n.11
Haury-Hargrave Recently
Dated Pueblo Ruins in Arizona
Kinishba: A Semi-Compact Pueblo in the Salt River Drainage.

Looking East over the partly rebuilt South End of Group I.
Proceedings of the United States National Museum
2856 Vol 78 art.13 March 1930.
Hough, Walter Exploration of Ruins in the White Mountain Indian Reservation

Unbonded walls of a subsequent and inferior construction
Unbonded walls of a subsequent and inferior construction