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ARCHAEOLOGICAL SURVEY OF ARIZONA

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Archaeological Survey of Arizona

by

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A C K N O W L E D G M E N T

I wish to herein acknowledge the
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C.L.F.

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INTRODUCTION

In this paper an attempt has been made to complete a survey of all available material pertaining to the location of prehistoric habitations of the state of Arizona. Maps accompanying this thesis locate the ruins as definitely as possible from given diagrammatic or written descriptions of site locations. Each cultural type is herein described. The main regional divisions of the state are given, compared and contrasted with each other, and with other Southwestern cultures.

Sources of material by which sites were located and from which the contents of this paper were obtained are completely listed in the bibliography. Field trips taken by the author netted further information as to site locations and cultural evidences of the same. The accompanying maps have separate keys on each sheet. The varying symbols of the small maps are due to the fact that the individual scheme of each authority was retained. The large map bears symbols which are general, but this is unavoidable as many authorities were indefinite in their classification of ruins. For example, the term "pueblo" applies to all sites so-called by the authority in question, whether it stood for an early or late pueblo, a small two room structure, or a large one hundred room cliff house.

CULTURAL TYPES

I CAVE PEOPLES

Although a few Cave Dwellers' sites have been located within the state of Arizona, those few cited reveal a definite occupation prior to the circular pit houses. No house structures have been found in connection with the remains of these earliest known inhabitants of the Southwest, other than pole frameworks remaining in caves. These were set up in lean-to fashion and covered with brush or cedar bark. (1) From all indications it appears that the forerunners of some of the later pueblo arts were beginning their development among a people who knew practically nothing of house structures. Perhaps temporary perishable brush huts were thrown up in the open during the summer as sun and wind breaks, but of this we cannot be definitely sure. Natural caves supplied sufficient shelter for the nomads of the dim past. Slab-walled cists, or if the earth was sufficiently hard, jar-shaped excavations, served for storage purposes.

Physically the Cave people were of slightly greater stature than later people, the men averaging six feet, the women five feet five or six inches. (2) They were dolicoce-

(1) Cummings

(2) Ibid

phalic, or long headed, and no cave crania have ever indicated the use of the baby board to induce artificial flattening of the back of the skull.

The Cave Dweller was an agriculturist only to a limited extent. Corn, their staple, was a yellow flint variety, with very small kernels. From Cave du Pont, Kidder and Guernsey report the finding of other vegetable products, among them the stems and pieces of the rind of a large squash. "The rind is light grayish-green streaked with irregular markings of dark brownish-green." (3) Acorns were found in the debris, but it was not definitely determined whether or not they were eaten. The seeds identified were: a perennial sunflower, grass, and seeds of a species of Ephedra. One yucca pod was found. From Kinboko also come remains of squash, seeds and fragments of rind, (4) also acorns and pinon nuts. (5) Thus we can see that, aside from corn, the native population turned to nature for sustenance. Grass seeds of several varieties, nuts, berries, perhaps roots, and small game comprised the chief diet. Game included rabbits, mountain sheep, deer, beaver, birds, and prairie dogs. (6) Whole ears of corn have been found in a good state of preservation. Likewise have seeds been found stored away in holes made in shale formation, in clay or slate-lined pits, or in cedar bark bags.

Implements and utensils were made by the

(3) Nusbaum, p. 70

(4) Kidder and Guernsey, p.155

(5) Kidder and Guernsey, p.156

(6) Kidder, p. 118

Cave Dweller in sufficiency to supply their meagre demands. A few planting sticks to work small plots of corn, hammer-stones, and rubbing stones made up a list of tools. Hough reports hammer-stones of crude workmanship from Tularosa Cave, New Mexico. (7) Planting sticks were about three feet long, with the bark removed and knots rubbed off. The tips of the sticks were worked into thin blades or points. (8) Quite similar to these are the digging tools with long, slightly bent handles. Other types are implements with crooked handles by which the planter held the stick, or tools with unworked blades. Wooden scoops were made of parts of logs, with the outer surfaces unworked and retaining the natural convex form of the log. The inner surface was charred and scraped to form a concave scoop. These articles vary as to detail in size and shape. (9)

According to Nusbaum, burials of the Cave people were made in well constructed cists, or holes in the ground lined with stones or clay; or in simple scooped-out, unlined, holes in the ground. (10) Perhaps the cists were used as graves only secondarily; nevertheless they were fairly common. The grave was small and the body was placed in a cramped position. To illustrate the cist burial, an example from Cave du Pont, southern Utah, will be described. (11)

(7) Hough, 1907, p.21

(8) Kidder and Guernsey

(9) Ibid.

(10) Cummings

(11) Nusbaum

A large stone cist, eight feet by six feet eight inches, and two feet nine inches deep, was divided into partitions. One partition, two feet, nine inches by one foot, one and one-half inches, was occupied by an adult. The head was bent forward, the knees drawn up, and the arms bent along the sides. The body was on the floor of the cist, and the only covering was a fine coiled basket.

The cists in which burials of the Cave people, as so-called by Nusbaum, were made were constructed in the following manner: A hole was scooped out of the ground and lined with stone slabs which tilted outward at the top. The cist was sectioned off for the burial proper, the latter being in a small stone-lined enclosure. The slabs of the main cist formed part of the burial bin, while inserted slabs within the main structure formed the complete affair.

Beneath the floors of the Cliff Dwellings in the northern San Juan country, Richard Wetherill and his brothers found graves in the floors of shallow caves. "They are egg-shaped holes, in the earth or sand, either stoned at the side or lined with clay plastered directly upon the sand." (12) They contained mummies of men, women, or children, sometimes two or three to a burial. Their mode of burial was a peculiar one: A tightly flexed body with yucca fibre sandals on their feet, a breech cloth of woven cedar

(12) Patrick, p. 61

bark, strings of rough beads about the neck, a crudely made blanket of rabbit fur about the body, and a small flat basket over the head. Over all was a finely woven basket. With the burials unearthed by the Wetherills were bone implements, stone spearhead and arrow-heads, twisted cords of human hair, cylindrical stone pipes, and baskets filled with seeds and ornaments. (13) Although pottery was lacking, the use of clay was not unknown, as seen in the clay-lined cists.

The most perfected art among the Cave people was textile manufacture. According to a tradition prevalent among the Apaches and Navajos, the first art developed among their ancestors was weaving; so it is perhaps among the Cave Dwellers that this tradition can be sustained.

Scanty was the attire of the Cave inhabitant. With the exception of many sandals, few articles of wearing apparel have been found. A breech cloth of woven bark, a few pieces of fur cloth robes, and a few rags of dressed leather which might have served as a part of a garment comprise the general run of finds of clothing materials. Several robes of mountain sheep hides, tanned with the hair on, were found around child mummies. (14)

Kidder and Guernsey report a string skirt from a Cave burial which consists of a waist cord of two-strand hair rope to which is attached a pendant fringe like

(13) Kidder, p. 18

(14) Kidder and Guernsey, p. 156

a small apron. A tasseled sash was made of thirty-six yucca strings held together by two twined woven strings. A gee string was made of a soft loose cord made by twisting together thirty thin strings of fine gray animal wool. It is about one-half inch in diameter, and little less than seven feet long. (15)

The common sandal type was square-toed and square-heeled, some with toe fringes, some without. The warp of the sandals was a heavy yucca cord, the weft a much lighter material, also yucca, and the weave is usually a close twining. Loops were often added to the sandal and were made of yucca bark or human hair. These loops served to bind the shoe around the wearer's ankle and over the instep or toes. Toe fringes of buckskin were sometimes added.

Baskets of high qualities were not lacking among these peoples' products. Two main types of baskets existed: those of coiled weave, and other crude affairs of yucca and cedar bark. The following method of construction was used in the cedar bark-yucca baskets: Strips of yucca were fastened with cedar bark, the basket was lined with bark, and then sewed up. A slit was left in the side as the only opening.

Characteristic ornaments of the Cave people included bone and seed beads, crude stone pendants, and stone discs. The sides of seeds were worked down to

a cylindrical shape, sometimes to a fine degree, sometimes only roughly so. Rarely a shell bead is found. Stone beads, reported by Kidder and Guernsey to have been found in conjunction with seed beads, are unevenly and crudely shaped.

Two twenty-six inch strings of brown beads, identified as Ephedra seeds, were described by Kidder and Guernsey from Cave du Pont. (16) The two strings were knotted to each other at the two ends. Six large discoidal beads of green stone were placed at intervals with the two hundred forty-three seed beads. Beads of land snail shell, and one of large olivella shell were reported from the same cave. (17)

Bright hued feathers were fastened together in small bunches to form ornaments probably of a ceremonial nature. Eight bright colored tail feathers of a red-shafted flicker were bound together with a strip of yucca leaf. Another bunch of six white tail feathers of some small bird were bound to the end of a thin stick by yucca. (18) Strange that this simple combination of feathers and a stick should live through the ages to be as vividly expressed to-day in the bright colored "pahos" of the modern Indians!

(16) Nusbaum
(17) Ibid. p. 80

(18) Nusbaum

II PIT HOUSE PEOPLE

The first noticeable difference between the foregoing people and those of the pit houses is that the latter built permanent structures in which to reside. Secondly, they started the art of pottery making. Otherwise a gradual development of the earlier culture took place in a perfectly normal fashion. Two phases of Pit House culture have been distinguished, represented by circular and rectangular subterranean or semisubterranean structures. Circular pit houses are earlier, and present in a general way, a cruder culture than that represented by the rectangular homes. This has been proven by stratigraphic evidence. The latter period was marked towards its close by the influx of a people of the broad headed type who brought with them skull deformation and cotton raising.

The round pit houses were built partially underground, one-third to two-thirds of the structure being subterranean. The excavated walls were clay plastered or lined with stones, sometimes a combination of the two types of wall finish being used in a single room. As a rule the clay lined pits are peculiar to pit houses in caves, while slab walled structures are more often found in unsheltered villages as a prevention against element action in loosening the soil. Generally the floors were clay plastered. Several

types of wall structures above ground were made. In a circular pit house in Hagoë Valley there apparently was no definite perpendicular wall above ground, but charred remains of poles inserted at a certain angle to the ground indicated a conical roof. (19) A rectangular pit house with round corners, on the other hand, had a lower wall of slabs set on end in the earth, and above ground it was made of adobe "turtlebacks" or masses of clay averaging fifteen inches long, five inches wide, and three and one-half inches thick. These were put on wet and patted down to fit in with the others. Here and there they were chinked with stones, and the cracks were filled in with clay and smoothed over. (20) The pit houses of southern Arizona differ considerably from those of the northern part of the state, mainly in that they were rectangular almost without exception. Walls were either slab or clay lined. Rocks mark the foundations of the superstructures, which were of wattle work, i.e., poles and twigs covered with dirt. Holes for roof support poles were situated a foot or several feet from the wall. Entrance into the pit houses was made by way of steps leading from the ground level, or by means of a ladder leading from a hatchway in the roof into the room. Both types of entrance ways were found over the whole state; and thus the step entrance appeared both in the south and north as well as the ladder.

Roofs of the pit structures are a matter

(19) Kidder and Guernsey, p. 44

(20) Ibid, p. 42

of conjecture. As suggested above, it is thought that the roofs of some of the round pit structures were of branches curved over, caught in the center, and the whole covered with brush, dirt or clay.

The later round pit houses had four roof supporting poles upholding a flat roof. A banquette surrounded the wall, and it supported leaning posts connecting the sides of the dwelling with the flat roof. Brush and dirt covered both the flat and slanting roofs. The square houses of southern Arizona had upright poles which apparently supported a flat roof. Beams crossed from pole to pole, and were criss-crossed by smaller sticks. The whole was covered with brush and plaster.(21)

As the houses of northern and southern Arizona differed, so did their cultures, the latter perhaps even more than the houses. From all evidences the pit house people of the north were an older people.

In the north cremation was apparently unknown among the pit house people. In the Kayenta country, northeastern Arizona, were found the burned bones of a single adult. These bones, which were broken up, were found at the top of a cist burial in a cave. Skeletal remains, many well preserved, are numerous. These show the people to have been of the same physical type as the Cave Dwellers, rather tall, with dolicocephalic and undeformed skulls.

(21) Excavations by University of Arizona.

The culture of the circular pit houses can be illustrated by the remains of a structure of this type in Vandal Cave, twenty-five miles northwest of Lukachukai, northeastern Arizona. Other pit house cultural remains, from either circular or rectangular structures, will also be considered due to lack of material on either one or the other types. (22) Some few shards of sun baked pottery were found at Vandal Cave. The pieces were tempered with cedar bark, and they bear impressions of baskets, suggesting that they were made in a basket. In comparison to this ware is a crude black sample, and a strange black and white type from an oval house in Hagoë, Fluteplayer house, northern Arizona. (23) The black pieces were originally a dull gray, darkened by use over a fire. They were heavily tempered with sand. They seem to have been tall ollas with distinct necks and slightly flaring rims, the necks generally being coiled.

The black and white ware was granular, with considerable tempering material. On the yellowish white slip were painted designs in dull slatey black. Ollas with squat bodies and high graceful necks were decorated with horizontal bands about the neck and body. The shapes of the bowls were not determinable from the small shards found, but they had straight rims, slightly convex on top. They displayed interior decoration. These last two types perhaps overstep the circular structure culture, and extend into the

(22) Excavations of University of Arizona

(23) Kidder and Guernsey

rectangular or semi-rectangular period.

The baskets from Vandal Cave well illustrate the textile art of the pit house peoples. Very fine workmanship is demonstrated in this ware, and although there is a slight variation in materials, several well developed types were made. One tray-like specimen was woven with a variation in the stitching, the result being a series of designs running from the center of the basket to the outer rim. This coil basket was stitched one to three times, then wrapped three to eight times, the number of stitchings or wrappings increasing as the basket approached completion. A second variation in design is made possible by the use of color. Here the natural material is combined with black and red colored splints, these forming a jagged design. The red and black jagged lines take off from a black circle several inches from the center of the basket, and spiral out to a second black line very close to the edge of the basket. This article, also, was tray-like. Gently curving black lines formed the design element for a third basket of this period, similar in shape to the other two. A characteristic feature of these baskets is to be seen in the last inch or inch and a half of the rim which is done in herring bone stitch. The rest of the rim is in plain wrapping stitch.

Further baskets (24) from the pit house period include some of less perfect workmanship. Several

types of carrying baskets, and a third cylinder-shaped affair will illustrate some variations. One of the carrying baskets is small at the bottom, and is abruptly enlarged above the center. A second one is conical, and is gradually enlarged to form a wide-mouthed article. A long cylinder is the peculiar shape of a reed basket, which might possibly have been a quiver. Rushes dried to hold their shape were laid together and interlaced with yucca; the lacings were then tied on the sides. The bottom of the basket was made in a similar manner and tied to the body. The same materials and the method last described were used for carrying baskets, with supporting sticks inserted in the two sides. A bifurcated basket, whose use is unknown, was also made by these pit people. They were made by the coil process, and of the four known specimens, only one was decorated in color, black.

Vandal Cave offered a variety of ornaments which were worn by the inhabitants of the round pit houses. Around the waist of a babe, forming a girdle, was a single strand of large olivella shell. An abalone pendant and some seed beads were also found. The seeds are not Ephedra (the genus usually associated with Cave remains), but what they are has not been definitely determined. An unusual ornament which might have been worn in the hair was made of wood with a short solid end, with four prongs extending from it.

The sandals of the slab house peoples

were practically all scallop-toed. No twilled sandals appeared in this period. The woven footgear was made of yucca fibre, the finer examples having from eighteen to twenty-six warp strands. These were filled with weft of finer yucca fibre. Ornamentation was often added by putting raised decorations on the soles of the sandals. This was accomplished by inserting extra strands in the warp before weaving in the weft. Color designs were also applied at times, either by means of colored weaving strands or by painting a design on the finished article.

Only one known circular pit house has so far been found in the southern part of the state, at Casa Grande, and this is classed by some as sub-circular. No definite cultural remains can be assigned to this site. The subterranean house had a cemented floor, walls, and fireplace. (25)

The rectangular pit house peoples showed development over the round house peoples, first and more particularly in house structure. The houses have become rectangular with corners of the rooms forming right angles. Slab or clay plastered walls are still in use, and the superstructures are practically the same as the better ones of the circular rooms.

From detailed work in the field, Mr. E.W. Haury (26) of the University of Arizona has worked out a sequence of house types in southern Arizona which passes from the earliest semi-rectangular structure to the typical valley compounds. As stated before, only one round pit

(25) Fewkes, 1906-'07

(26) Excavations of University of Arizona .

structure has been found in southern Arizona, at Casa Grande, and that was not truly circular. Therefore the semi-rectangular house will be considered as the first developed type. The walls are simply patted down with the aid of water, but there is evidence of the use of clay in their construction. The corners were rounded off, the walls were not parallel; hence the result was a poor attempt at a rectangular room.

Above this poorest type of structure was superimposed a rectangular room, with parallel walls, and square corners, which was plastered with clay. The floor of a second room was also plastered with clay, and, typical of these chambers, showed that fresh coats of plaster were added from time to time. Above these rectangular rooms appeared the first attempt at a true wall, unsupported from exterior or interior. The wall was made of adobe and averaged about one foot in width. An area was excavated in which to make the room, suggesting that the people of this time were intermediate in time between the true rectangular pit house and the later pueblo peoples.

The beginning of the compound, a pueblo surrounded by a complete outer wall, is illustrated in a room and wall structure appearing above all the foregoing types. The foundation of each is a row of stones, either single or double, and above was built the superstructure. A true compound was the last stage of pueblo architecture represented in southern Arizona, and this will be fully

described as Casa Grande.

Superstructures were made of poles, twigs and plaster. Pole holes were often found in rooms a few inches to several feet from the wall. Firepits appear in some rooms, generally off center. Adobe plastered stairways sometimes served as entrance ways to the lodgings, and if these were not present, entrance was made by means of a trap door in the roof with a ladder leading into the room.

Leaving the house structures of the pit people we now turn to the material culture. Because of the open location of the sites, little was preserved save bone and stone work and pottery. Little can be said of textiles. One piece of pottery with textile impressions, found at Tanque Verde, suggests that they were not lacking. A small piece of yucca string was found in a cave which served as a shrine for pit house peoples.

At Tanque Verde a burial plot was located in which there were seventeen cremation urns. (27) Cremation was a common practice among these people. Farther north other cremation evidences were also located.

The pottery at Tanque Verde is of one main type, red or buff. This, of course, has variations, as, for example, red on blue black interiors, with red on buff exteriors. Corrugated ware is present in smaller

(27) Museum, University of Arizona

quantities. Cloud and interlocked water symbols and cross-hatching supply the most common decorative motifs. Animal designs are infrequent, and are very crude when present.

Before leaving this phase of early pueblo culture, mention will be made of the shrines and ceremonial spots frequented by these ancient people. Caves were the common sites for ceremonial occasions, and offerings in such spots can be found from the northern to the southern part of the state. Offerings were sometimes placed in cavities in rock, or small piles of rocks were built up of peculiarly shaped and colored stones. The variety of materials found in caves is much greater. Groups encamped temporarily in caves during the performing of rites, as suggested by the smoked interior of the cave near by the aforementioned Tanque Verde pit house site. Here were found many corncobs, arrow shafts, small model arrows, awls, plume sticks, and pottery, and a piece of yucca string. A very interesting cache of ceremonial paraphernalia was uncovered in the northern part of the state. (28) All the material was in a piece of corrugated ware, and included a wooden bird, twenty-one yellow and five white wooden sunflowers, two leather sunflowers and twenty-five wooden cones.

(28) Kidder and Guernsey, p. 118.

CLIFF, MESA, AND VALLEY PUEBLOS

It would seem that toward the close of the rectangular pit house period a new broad-headed people came into the southwest. They brought with them cotton and the use of the baby board. They gave impetus to the slowly advancing aborigines, and amalgamation with northern Arizona population brought forth a decidedly new and different culture - the true Pueblo. Some of the arts of the earlier people declined, some with which they were just becoming acquainted were developed and perfected. In the main house types became decidedly different; the textile art continued, and pottery rose and reached great heights.

This period, which is the true pueblo period, is marked by many different house types. Cliff, valley, and mesa pueblos include structures having from one, two or three rooms up to a hundred or more. In several regions, as around Flagstaff, Arizona, and in the Tortilita Mountains of the southern part of the state, there are so-called "small-house" types. In the Verde valley of the central part of the state, are cavate lodges which undoubtedly belong to this late pueblo period. Each of these types will be discussed separately to illustrate their place in the later phase of pueblo culture.

Colton (29) reports a large number of small-house structures in the vicinity of Flagstaff, and classifies them in the following manner:

"(a) Hunter sites; (b) shelters of wood, adobe, or cornstalk; (c) small stone houses of one to ten rooms; (d) pueblos or clusters of many-roomed houses; (e) forts."

The most numerous of the small-house groups are the one to ten roomed stone houses. These rectangular rooms range in sizes from six by four feet to thirty-six by sixty feet, the average being about nine by twelve feet. The larger structures showed no traces of division on the ground, and was therefore taken for a single room. Pottery was the main cultural evidence taken from the small-house ruins. Types included black on red, black on white, and plain red ware. Some metates and manos were found.

According to Mindeleff (30) the cavate lodges seem to have replaced the cliff dwelling in the Verde valley. These dwellings were artificially hollowed-out rooms in the soft formation of this river valley. Front walls were the exception rather than the rule.(31) Roughly circular doorways were cut out, and beyond them the rooms were excavated. Smaller rooms were made connected to the main one by means of narrow passageways. These cavate lodges and the

(29) Colton
(30) Mindeleff, p. 187

(31) Mindeleff, p. 194

small-house types are contemporaries of the cliff, mesa, and valley homes. The cavate dwellings were products of their peculiar environment; the small house structures were most likely the sites occupied by individuals or small groups who left the main pueblos to farm a small plot, or because they preferred to be to themselves.

Turning to the more important phase of late pueblo development, the cliff house culture will now be discussed. Houses were constructed of stone, stone and adobe, or adobe. In size, the homes ranged from five to fifteen feet in width, the average rooms being six by nine or nine by twelve feet. The materials employed were determined by the site location, river boulders, sandstone slabs, adobe bricks, or adobe piled in heaps, being common materials used from the north to the south. Stone was more common to the north; adobe was the rule in the lower reaches of the middle Gila region. Intermediate forms combining the two will be described later, as also will other house structures.

In a cave at the head of a box canyon in northern Arizona, on a narrow ledge seventy feet above the canyon floor is situated a cliff-house ruin of ten rooms. (32) The rooms were built along the front wall flush with the edge of the cliff. At one end were four chambers of adobe-laid masonry. Each room had one or more doorways and the rooms were probably originally roofed. Beyond these, the rooms were larg-

(32) Kidder and Guernsey

er and had walls eighteen to twenty-eight inches thick, made of sandstone slabs, laid without mortar. No doors were left in the rough walled room; likewise, no roofs were made. In the three most southern rooms were two doorways, those in the first and third rooms being built up with masonry, but the second room had two doors still open. It seems that each of the rooms was at one time divided into two small chambers. This supposition is based upon the fact that the middle room has the dim traces of an adobe wall running down its center. The partitions of the other rooms were taken out and the doors sealed. The doorways were typical of cliff-house structure. They averaged twenty-three inches high and seventeen inches wide. Sills were made of sandstone slabs, jambs were rounded off with adobe and the lintels were made double.

Although no beams were found, beam sockets appeared in the standing walls. Sockets for larger beams sometimes appeared on opposite walls, with smaller beam holes on the other two sides. This suggests a flat roof of wood and adobe wattle work construction.

The rooms of the Cliff Dwellers were probably seldom occupied, for the people lived in the open spaces between their rooms and the back of the cave, or between the front of the cave and the house structures. In inclement weather the rooms were used for living quarters, but otherwise they served only as sleeping chambers.

These people, as did their predecessors,

the pit house people, lived mainly on corn, although several new products have been added to their diet. Red, and red and white beans were also used extensively. Squash seeds, stems, and rinds are numerous in much Cliff Dweller's debris; gourds and grass seed were likewise used to a goodly extent. For the first time we now meet with the domesticated turkey, whose remains are found in nearly all Cliff Dweller ruins. Bones of numerous types of game were found in different ruins, and they probably represent the remains of animals that were used for food. (33) Among them are deer, mountain sheep, antelope, coyote, large dog or wolf, fox, rabbit, woodchuck, gopher, and Arizona bushy-tailed woodrat. (34)

Little was added to the prehistoric wardrobe in the development through the cliff-house and the pueblo period. Feather cloth as well as fur cloth blankets were used. These were made by twining the soft part of the feathers around yucca or cotton cord. This cord was then woven into a blanket - a warm article indeed. Cotton cloth, which becomes very popular in this period, is made into shirts and belts. Deerskin and mountain sheep hide were sometimes dressed with the hair on for clothing. Kidder and Guernsey report an interesting find, supposedly a skull cap of yucca cord.

Much time and effort was put into the sandals, yucca being the chief material used. Sometimes

(33) Cummings

(34) Kidder and Guernsey, p.99

the whole yucca leaf was employed, sometimes very fine cord was made from yucca fibre and was woven into foot-gear. The woven sandals of the pit period were still made, but now they had rounded toes and the sandal conformed to the shape of the foot. Twilled types were introduced and became popular. (35)

Odd specimens of art from the Cliff house culture reported by Kidder and Guernsey included cradles, screens, torches and brushes. The bodies of the cradles were made by cross lacing of yucca leaves and over this was a peeled stick bent into an open loop. A second cradle was made of smooth willow sticks.

The Cliff house people employed two main weaves in the manufacture of their baskets, namely, coiled and twilled. (36) Twilled baskets were very common, and they seem to have evolved from, or have been suggested by matting. Rush or yucca matting was very common among the Cliff Dwellers, and some baskets were made of the same weave. In the former, the edge splints were drawn more closely together to form a bowl-like or basket shape. The weave common to both and referred to as twilled was executed in the following manner. In the case of the mats, tule stalks or yucca leaves one-fourth to one-half inch wide were used, while in the baskets much narrower wooden splints were employed. A number of strips of yucca or stalks of tule were

(35) Specimens, University of Arizona.

(36) Ibid.

laid in rows close together. Secondary strips or splints of the same width were then interwoven, each carried over two (sometimes one or three) of the primary pieces then under two (one or three), and so on until the desired size was obtained. The mats were finished off in several ways, the most common being with a double edge. Every other strip of the mat was clipped off where this double edge began, and the remaining ones were carried up several inches, bent completely back, and interwoven to the point where the other strands were clipped off. The other side of the double edge was formed in a similar way. In the ring baskets the ends of the splints were carried over a heavy rod which had been made into the form of a circle. These splints were carried an inch or two down the outside and sewed. The only design used is the concentric diamond resulting from the weave.

A coiled basket from Vandal Cave will illustrate the second type of weave common to the Cliff Dweller. It is a shallow tray-like specimen, nine and three-fourths inches in diameter. No design was employed, a fine stitch in the natural willow lending beauty to the article. The complete rim is plain, which contrasts decidedly with the typical one inch or one and one-half inch herring-bone stitch finishing the pit house specimens. The splints are fine, averaging one-sixteenth inch which makes for eleven stitches and seven coils to the inch.

Cotton was raised by the Cliff Dwellers,

for among their ruins have been found balls, bunches of fibre, and unspun and uncombed cotton. Spinning apparatus has been found extensively from the north to the south end of the state. These consist of wooden spinning sticks and wooden or stone whorls. The cloth was plain or decorated, sometimes most elaborate patterns were woven into the goods, or lace work gave the appearance of knitting or crocheting. Color was applied in several ways to produce designs, either to the cotton cord before weaving, or after the cloth was made, when the design was painted on. The texture of the cloth ranged from the finest piece of lace, apparently knitted, to pieces of heavy canvas-like material. Cotton string was used in sewing up garments. Ties for sandals were made of cotton. Plaited or braided cord was used for tassels, fringes, and other ornamental additions to belts and clothing.

Pottery of the Cliff Dwellers had a wide range of texture, color and design. Its qualities depended on the region in which it was found, and as the range of this culture was widespread so too is the variety in pottery great. It will be possible to only briefly outline the pottery of the pueblo period.

Hough, in his excavations on the upper Gila and its tributaries, records the following types of pottery:

"Coiled, corrugated, mammillated, and scored exterior; smooth, with filleted rim, and with geometric tracing of white on the exterior (open vessels of the foregoing classes have black, highly polished

interiors); gray (black and white), and red ware, the latter decorated with black and the exterior of the rims having geometric ornamentation in white. Cream color ware with red-brown decoration forms another characteristic class of pottery..... which is represented by only a few specimens..... " (37)

Coiling was much used in this area as a decorative element.

In the Kayenta region between Agathla Needle and the Monuments of the northeastern part of this state Kidder and Guernsey (38) state that they found two substyles of a single main type. The black and white ware has a very clear white paste, with exceptionally fine tempering. Generally a fine slip was applied, although in some pieces the paste was so very fine that this was unnecessary. The black used is dull, with a slight bluish or slaty cast. The shapes of this black and white ware include ollas of a flat upper body with a straight neck, or globular body with a high neck, or globular body with a low neck; seed jars, collanders, jugs, canteens, ladles and bowls. The decorative element is applied in straight, complete, and broken lines, triangles, interlocked water symbols, bird wings, and in some minor designs.

The clay of the remaining types was originally gray, but firing turned them to a yellowish flesh color. The red ware with shining pink has an even coat of fine red slip covering the surface, which was worked down, probably with rubbing stones, to a smooth uniform finish.

(37) Hough, 1907, pp. 25, 26.

(38) Ibid. pp. 129 to 143.

The pigment used had a distinct sheen or gloss. This ware is represented by bowls, small mouthed pieces with pitcher-like handles, and seed jars.

The red ware with dull paint is made of a coarse paste. The slip is thin and the exterior bottoms of jars and bowls are generally left unslipped. "The pigment is a thick, dull black entirely without luster, contrasting with its background much more sharply than does the slaty, bluish paint of class I." The characteristic types of this ware are small, fat jugs, three to six inches high, with single verticle handles and large orifices. Bowls, ladles, and canteens also appear among this ware.

In the polychrome ware yellow paste is used as a background upon which is applied red, black, and white decorations. The red is rich and bright but rubs away quickly; the black is dull and unstable; the white is chalky and even less permanent than the black and red. Bowls are the most common vessels of this ware, and a few ladles and colanders were found.

Less important industries are represented by work in bone, stone, wood and shell. Occasionally one finds a remnant of skin which was worked to a slight degree. Deerskin, mountain sheep hide, and rabbitskin were used somewhat. (39) Perhaps it is the poor preservative qualities of this material which makes for its scarcity,

(39) Kidder and Guernsey, pp. 118, 119.

although it is more probable that it was actually less worked

Much stone work is found in the Cliff Dweller and true pueblo period. Pecked, chipped, ground and drilled objects in varying degrees of perfection and non-perfection are to be found among the remains of this people. Pecking is evidenced in metates, manos, and other handstones; axes, hammers, and rubbing stones. (40). In some regions the metates are lacking, and in their place are metate bins or thin stone slabs, hollowed by use on the upper sides. (41) Chipping is seen in the working of arrow-heads, knives, drills, and saws. Arrow-heads range from very small "bird shot" to long points for big game. Grinding was done on the edges of axes and on hoes. Well grooved axes seemed lacking throughout the northeast, the majority of the specimens being of irregular shapes and careless finish. The most beautiful specimens of axes come from more southern regions, particularly from the Middle Gila in Arizona. Drills of obsidian, chert, and other stone were used in some of the most delicate stone work done. Beads were made of slates and other fine grained stones, some of them so small and finely drilled that it seems almost impossible that they could have been made only with the crude implements available. Other less important stone objects were made by these people. Turquoise and less often other bright hued stones were made into pendants, beads, and

(40) Hough, 1907, p. 22 (41) Kidder and Guernsey, p. 124

other ornaments.

The most common shell objects were bracelets, generally made from pectunculus shell. Other ornaments from this same shell include necklace pendants, finger rings, armlets, and ear pendants. Beads were made from olivella and conus shell. The shell of which the ornaments of the ancients were made were indigenous to the Pacific Coast and Gulf of California.

A great diversity of animals large and small is evidenced by the numerous bones found among the ruins. Many of these bones were worked for ornaments or implements. Awls and scrapers were most common, and in connection with these two implements should be mentioned the same made of horn. Smaller bones are perforated for use as needles, or beads. Bone was worked by means of stone saws, grinders, and drills.

Many objects were made of wood. They were made by sawing, chopping, scraping, and rubbing. The largest prepared objects of wood were used in the construction of dwellings. Where the house timbers survive, they show the marks of the stone ax with which they were worked. Other architectural wood included, besides the roof beams, logs incorporated in masonry, door lentils, and door staples. In the northern part of the state pine, cedar, and pinon were extensively used for this purpose. Many smaller objects of wood were made and include agricultural implements,

ceremonial sticks, arrow shafts, awls and needles, fire drills, spindles and whorls. Agricultural implements consisted of wooden shovels and spades, and planting sticks of iron wood. Reed was a common material for arrow shafts. A few examples of cups and dishes of wood have been reported from various sites over the state.

CASA GRANDE, A COMPOUND

Casa Grande (or Great House) is located on the south bank of the Gila River about twelve miles from the present town of Florence. The ruin is of the compound type, i.e., a group of ruins are surrounded by a complete adobe wall. There are four compounds at Casa Grande, and several small groups of clan houses outside of these enclosures. Compound A, the main compound, will be discussed as a typical example. Besides the three other main compounds and the clan houses, there were debris mounds, apparently one for each compound.

The compound wall measures about two hundred thirty feet east and west, and four hundred twenty feet north and south. A single entrance way was left in the east side, several feet wide. Inside the wall were buildings, plazas, and ceremonial chambers. The results of Fewkes' excavations displayed six main buildings, five plazas, and six ceremonial chambers. The buildings range in size from one large single room to ten roomed structures (ground rooms). In the northwest corner is a large single room structure; the north building has five rooms; the northeast structure is made up of eleven rooms, varied in size; the east group has five rooms; the southwest building eight rooms; and the last main group, the Casa Grande proper, which is slightly northwest of the center, has five rooms on the ground floor,

and above, the central room was carried up four stories in height. This served as a watch tower. The other rooms were carried up three stories.

The walls of Casa Grande are of adobe, laid up in courses. The interiors of the rooms were plastered with clay to give a smooth finish. No plaster appears on the exterior surface. Poor workmanship is shown in the narrowing of the walls toward the top. Posts were used to support some of the walls, as also were beams used as roof and floor supports, that is, if for the roof of the first floor, then for the floor of the second. The floors of the rooms were of hard clay.

All doorways were practically the same, averaging about two feet in width. Some were narrower at the top than below. Although lintels are now present in small numbers, there are still holes for the insertion of logs over the doorways. Most of the sills are broken, but the jambs remain entire and smoothly plastered. In the lowest story doors appear about midway on each side. Openings appear in the stories, except the three above, in about the same position. In the third story there is an opening only on the east.

Many interesting articles which ably represent the culture of these people have been taken from Casa Grande. Three crudely made stone idols possibly served a ceremonial purpose. They represent a man, a lizard, and a

bird. Several other stone images are : an imitation of a mountain sheep, made of lava and roughly fashioned; an idol representing two serpents twisted together which suggests Mexico; and an image of lava which represents some unknown animal.

The majority of stone implements from Casa Grande were found near one of the clan houses. The specimens consist of axes, hammers, mauls, perforated stones, paint grinders, mortars, corn grinders, sinkers, discs, and polishers. Cult objects, beads, and ceremonial stones were also found at this spot. In hardness of material there is a range from diorite to friable sandstone. Most of the implements are smoothly polished; many are rough and unfinished.

Most of the axes were grooved on two faces and one edge, only one or two examples showing a grooving on both edges. One end of the ax is sharp, the other is blunt; some few examples show sharpening on both ends. One specimen, with ridges on the sides of the grooves, resembles axes from northern Arizona. Many of the hammers at Casa Grande were originally axes whose blades had become broken or worn, so the article was adapted for use in pounding. The hammers are of different shapes, some circular in cross section, elongate, grooved on three sides, and convex at the ends.

Several arrow shaft polishers were unearthed, one with a double groove. Both are made of malapi, and

have a highly polished surface. One is rectangular and one oval in shape.

Grinding stones were fairly common at Casa Grande. There are several types, including circular or rectangular shapes, with or without marginal grooves. They are made of volcanic scoria, igneous or some other rock. These stones are smaller than the corn grinding metates and manos. Metates are ordinary, being either flat or concave on one side, and generally rough on the other. Differing from the metates of the Cliff Dwellers these were not set in boxes. Manos vary in size, shape and material, the majority of them being flat on one side, rounded on the other.

Several types of paint grinders were found. One of the most interesting is made of a hard volcanic stone, is ten inches long and rectangular in shape. Paint still adheres to the grinder. The rim is decorated. This with a second stone, a pestle of hard material with flaring end, were exhumed from a burial cist of a clan home. Mortars were also circular and rectangular; some being deeply concave, some almost flat.

Mention should be made of so-called "medicine stones", and in connection with them, pigments. Medicine stones include any bright colored stone, rock crystals, especially quartz, fossils, concretions, etc. Among the pigments, which resemble those of northern Arizona, are oxides of iron,

carbonates of copper, black shale and gypsum.

The arrowheads of Casa Grande resemble those of the rest of the southwest. Many of them were picked up from the surface of the ground. The remaining objects of stone were of many types and were scanty in numbers. Several hoes and shovels were found. Quite numerous were the worked stones forming perfectly round balls, and whose purpose was not known. Beads, pendants, and other ornaments were made from stone.

Pottery from Casa Grande resembles that of other ruins of the region, the shapes being cups, spoons, ladles, ollas, vases and bowls. In decorative schemes, rectilinear patterns predominate, while life forms are conspicuous by their absence. The crudest ware is rough, unpolished; coiled ware is less common than in cliff dwellings. Color decoration is in polychrome, black and white trade pieces, red ware, red ware with black interior, and red on buff. The latter is very common to the south of Casa Grande, in the Santa Cruz valley. Decoration was mainly in terraced and zigzag figures. Another characteristic decoration was a triangle having two or more parallel lines extending from one angle, which generally forms a continuation of one side.

An extensive system of canals was developed in the Salt River valley which extended from a point ten miles northeast of Mesa into, and beyond the Casa Grande ruins region. The system of canals form a tree-like af-

fair , with the Salt River as the main trunk and the canals as branches. Sub-branches take off from the latter. The whole system extends westward or southwestward.

Such an extensive system of canal building required a great expenditure of time and labor, particularly as only crude implements were to be had for the completion of such a stupendous undertaking. To-day many of the canals used for watering large well planned projects follow the course of the ancient ditches; hence it seems that considerable effort was expended in the planning of the earlier canals. Scientific principles and skillfully handled mechanical devices have been employed in the mathematically accurate irrigation systems of the modern farmers; common sense and the simple laws of nature were the devices employed by the aborigines.

In places the present bed of the river is from eight to fifteen feet below the beds of the ancient canals, indicating the age of the canals, for it would take considerable time for this lowering process to have taken place. "The longest canal is about twelve miles in length, but one of the old systems has about twenty-eight miles of mains, while in the aggregate there are one hundred and thirty-five miles of mains in the ancient system. The total mileage of the systems is but ten miles more." "The largest canal is seventy-five feet wide between the water ways. The borders were six feet high. (42)

The digging of the canals was a task, indeed, for the tools were only wooden or stone. The dirt must have been carried out by means of baskets or blankets after it was hand excavated. Small stones which sometimes line the channels indicate that there was an attempt to make the walls more substantial. In places the linings of the canals appear to have been plastered, or if not clay plastered, they were tamped, or a third possibility is that they were lined with plaster and then quantities of brush ^(burned) buried in the ditches to harden this lining. (43) Reservoirs in several instances were connected with the ditches. These perhaps afforded a sure supply of water.

(43) Fewkes

REVIEW OF THE GILA RIVER AND ITS TRIBUTARIES

Little has been written on the Gila River and its tributaries as a unit. Reports have been made of the region from the upper reaches of the river to the known southern limit, many of them detailed reports, but none connecting the whole has been attempted.

The region in question will be divided into the Upper, the Middle, and the Lower Gila. The Upper Gila includes all the land drained by the Gila and its tributaries, from the head of the Gila proper and the San Francisco River to San Carlos. The Middle Gila is that section drained by the Gila and its tributaries from San Carlos to Gila Bend, south central Arizona. All below this is Lower Gila. The most outstanding work of the Upper Gila was done by Hough. The Tularosa, a small tributary of the San Francisco River has an individual culture which will be treated as such. The influence of this region extended over a greater area than the immediate range of the Upper Gila River tributaries.

The Upper Gila has been explored in particular in the following areas: The Tularosa, the Blue, and the San Francisco. East and south of these is the continuation of the Rio Gila, where slight work has been done. Here have been found remains which resemble those of the east.

For example, the ruins and pottery from Sapillo Creek, a small branch, resemble those to the east, the Mimbres in particular. (44) According to Bandelier, the ruins of the Diamond River are properly but one story high, with stone walls laid up in adobe and mud, and plastered on the outside. Roofs were constructed of beams and adobe. The doorways were low and nearly square. (45) A second type of ruin in Diamond Canyon differs somewhat. The front wall is from fifteen to eighteen feet long, is built of volcanic debris laid in mud, and has timbers cemented into the inner face.

Turning now to the more northern and western headwaters of the Gila River, we will consider the culture of the Tularosa, San Francisco, and Blue Rivers. The ruins of this region include large and small pueblo ruins, cavate dwellings, and caves. The latter are either ceremonial or contain simple house structures with some other remains and great quantities of debris.

Numerous pueblos were built on the terraces above the Tularosa River overlooking the fields in the valley below. In Apache Creek, a branch of the Tularosa, are many compact stone pueblos. (46) One group of ruins was entirely surrounded by a stone wall; a second aggregation of ten rooms had a large kiva. (47) On the Tularosa proper is a group consisting of "four rectangular stone pueblos of the compact type and a rectangular kiva."

(44) Hough, 1907, p. 30
 (45) Ibid. pp. 30 and 31

(46) Hough, 1907, p. 70
 (47) Ibid. p. 71

The San Francisco was apparently less densely populated, and is marked by fewer large pueblos than the Tularosa. Even smaller pueblos were scattered and scarce. Similar to the Tularosa district, the ruins border immediately on the San Francisco or its small branches. One pueblo will indicate the rest. "It was a polygonal stone pueblo, made up of several house masses irregularly disposed along the back of the level terrace, leaving a plaza one hundred feet deep in front of the house. On the plaza are several circular stone-walled 'wells' three feet in diameter. The shards thickly strewn on the site are brown, red, and gray varieties of pottery of the better class." (48)

The remaining branch of the upper reaches of the Gila, the Blue, was somewhat more densely populated than the two above mentioned regions. Large pueblos were outstanding, small pueblos secondary, and the cave ruins not infrequent. Again river terraces serve as choice locations. Again stone-walled rooms with a plaza continue. The first kiva found above the mouth of the Blue is a most interesting and unusual specimen. It was sixty feet square, sunk in a level terrace. "The sides were laid up with stone built on a slight slant, and a graded way, ten feet wide, paved with slabs, leads down into the kiva. The entrance is located on the east side ..." (49)

A ceremonial cave which Hough thought

(48) Hough, p. 45, 1907

(49) Hough, 1907

the greatest in all the southwest is located on the Blue.

"High up in the wall of the canyon, at one and one-half miles distance from the Blue, is a great cave whose portal is a low uniform arch sixty feet wide, opening on a ledge fifteen feet wide. The cave has a floor area of about 10,000 square feet.... The ceiling is in the form of a dome about twelve feet high....In the debris there were found numerous pits about three feet square, each a shrine in which were placed ceremonial offerings....The offerings were bows and arrows of natural size and in miniature, painted rods, carved staffs, baskets, tablets, flutes, beaded flutes, cane cigarettes, pahos of many kinds, torches, models of clothing, cloth, colored cord, sandals, beads, game dice, votive pottery, and many other objects."(50)

Burials were as a rule in close proximity to ruins, and Hales reports burials beneath the floors of a ruin near the junction of the San Francisco and the Gila. "Below these floors and close to or under the foundations, were skeletons of adults, but so far decomposed that only the large bones and skulls were generally traceable."(51) In one room two skeletons in a flexed position were found, partially under the foundation. Pots were about the heads of some of the adults. All burials were not accompanied by pottery; some had other things. (52)

Three main types of wares existed in the San Francisco-Tularosa region, namely, corrugated, black on white, and red. Corrugated ware is characterized by ollas and flat-bottomed bowls; the latter had deep black highly polished interiors, (53) and brown or reddish-brown exteriors. The coils in this ware are very fine, running as much as twelve to the inch.

(50) Hough, 1907, p. 51
(51) Hales, p. 537

(52) Hales, p. 537
(53) Kidder, p. 97

"Black-on-white pottery is well-made, the slip is bright, and the paint a sharp clear black. The only forms that appear in collections are pitchers, bowls, ladles and eccentrically shaped pots.... Black-on-white are relatively rare.... The decorations of the black-on-white ware is elaborate and in most cases well painted. The most typical design is an involved interlocking device in contrasted black and hatching." (54)

Hales reports a "red, smooth, glossy ware without ornamentation, all of a bottle or vase form." (55)

The red ware of the region as a whole is scarce; it appears in bowls and pitchers, and is usually decorated with a dull black paint.

Kidder sums up the reaches of this culture as follows:

"To the south Tularosa ware appears not to have penetrated the valley of the Mimbres; nor to the southwest is it found, as far as I know, on the Gila below Solomonville. In the northwest and north, however, the conditions are different. The White Mountain country, the Zuni district, and the Little Colorado contain, according to Spier, ruins which show an admixture of Tularosa wares. This admixture is strong in the black-on-white ruins, may last into the early glaze period, but disappears in later times. Tularosa polished black bowls have been found by Morris at Aztec, and Nelson has recorded fragments of the same sort of vessels from the Pueblo Bonito refuse heap." (56)

(54) Kidder, p. 98
 (55) Hales, p. 537

(56) Kidder, p. 99

Dropping south on the Gila to the next important region we enter the Pueblo Viejo valley. This includes the ruins from San Jose, a short distance from the mouth of the Gila Bonita Creek, to Pima, a region approximately some thirty miles in extent. Large pueblos characterize this area.

"The ruins of the valley, which are mainly situated on the level alluvial lands of the river, consist as a rule, of a central edifice, surrounded by smaller structures. They are built usually of mud, the lower walls having a core of water-worn boulders with upright wooden stakes at intervals, showing that a lighter structure supporting the roof was continued above the basal story. As in many other sections of the southwest, the ruins are frequently oriented to the northeast. "(57)

Because of extensive farming projects, the Pueblo Viejo valley has been but slightly touched. Sites have been located and the general characteristics of the structures noted, but the majority of theories in regard to the region must be based on the smaller cultural finds.

The dwellings of the Pueblo Viejo region are more like rancherias or farm dwellings. Each of the houses was small, apparently inhabited by a single clan, and they were generally grouped in clusters, which may for convenience be styled villages. In this region we first meet with the presence of a large edifice among the smaller buildings which probably served the purpose of a ceremonial room. This feature characterizes the Middle Gila region in the

(57) Hough, 1907, p. 32

absence of kivas. The use of boulders and adobe in the Pueblo Viejo area suggests a combination of the two outstanding materials on each side, to the east rocks, and to the west, adobe. Strength was given this combination by the placing of upright logs at intervals, and filling the spaces between with stones and adobe. (58)

Two burial methods were used by these people, house burials and cremation. These customs as practiced in this area form a connecting link between the areas described above, and the Middle Gila region. The only evidence northeast of Pueblo Viejo of cremation was a reported find on the Rio San Francisco about five miles above Clifton. From the Pueblo Viejo region on down the Gila cremation was practiced.

Strange it seems that the majority of burials of the Pueblo Viejo region were of infants, and they were "accompanied with mortuary food vessels and bowls, generally rude ware". (59) Calcined bones were found in mortuary ollas which were buried on low mounds adjoining the houses. Jars and other mortuary objects were placed in the vicinity of the cremation ollas.

No extensive irrigation canal systems were necessary above the Pueblo Viejo region, as the farm plots were directly on the edge of the river or stream banks.

(58) Hodge, 1923, p. 197
 (59) Ibid. p. 175

But in the Pueblo Viejo area a new condition is encountered; hence the first traces of an irrigation system are met. The Gila Valley has widened, therefore it was necessary to provide means of transporting the water to the garden-plot. Ditches and reservoirs, which become larger and more perfected in the Middle Gila and Salt valleys, supply this need.

A marked change appears in the pottery of the Pueblo Viejo region. The outstanding black-on-white of the regions above has almost disappeared, and in its place is the red on buff ware which characterizes the Middle Gila region, especially toward its southern limits and on its southern tributaries. Other types include rough undecorated coiled or indented ware, mainly ollas; rough food vessels with a black slipped interior; and bright red, narrow mouthed vases, of coarse paste.

Around San Carlos, which is the division between the Upper and the Middle Gila, are numerous sites (60) including both pit and pueblo structures. The true compound is not encountered this far up the Gila, but loose aggregations of houses are common. Both stone and adobe walls were constructed. Cremation and burials, often in refuse heaps were found. Pottery types are dominated by a definitely red on buff ware. More trade pieces were encountered in this region, as opportunity for trade was made possible through connection of the region with the northern area by the branching San Carlos Creek and its proximity to Pinal Creek.

(60) Excavated by Cummings

The compounds are found practically only on the borders of the Gila, Salt, and Santa Cruz rivers. Casa Grande well illustrates the compound structure.

Dotting the banks of the Gila at intervals from San Carlos to Gila Bend are scattered ruins, some belonging to the typical compound, some small-houses. They are situated on the plains bordering the Gila from Mesa to the junction of the Salt and Gila, and are on the southern tributaries of the Gila from Tubac to Picacho Peak. Accompanying each of the compounds is a debris heap which usually is of goodly proportions, indicating a large number of people, or a lengthy occupation. Less conspicuous dwellings of the same period in this region are the structures scattered about singly or in small groups. "These dwellings were rectangular in form. Their walls were supported by upright logs, between which were woven matting or possibly branches of the "ocotilla", the whole frame being covered with adobe. The floors of such houses were made of mud firmly trodden down, while the fireplace was a single depression near the middle of the floor, generally in front of a doorway opening in the longest side. We may suppose that the roof was also constructed of mud laid on boughs or split logs, the interstices being filled with mud."

In summing up the Gila Drainage, the following conclusions are suggested as of some import. In architecture, a certain unity is maintained in that the

pueblo is predominant. The Upper Gila is characterized by stone walled exteriorally plastered or unplastered rooms in combination with a plaza. Rarely is a separate wall surrounding the whole pueblo encountered. Timber and clay roofs were the rule. As progress is made into the middle Gila region, adobe becomes the characteristic building material, and the compound is the unit of structure. The only pit houses reported in the Upper Gila were circular; the typical pit house of the Middle Gila is rectangular. In each case these pit dwellings have been definitely proven to be of an earlier period.

In the Upper Gila both round and rectangular kivas were reported. Ceremonial caves were much more common. The Middle Gila boasted of temples, or a large structure, centrally located within the plaza which served for all ceremonial purposes. Ceremonial cages in the middle Gila region are rare, though by no means absent.

Disposal of the dead offered a third standard of comparison. In the northern part of the Upper Gila, burial in a cemetery plot near the houses was the common method of interment. In the southern extremity of the Upper Gila house burials and cremation took the place of the cemetery plot. This latter method extended into the Middle Gila area, although cremation seemed to have been the more popular form. The pit houses of the Tanque Verde Mountains

in the Santa Cruz valley yielded cremations only. The type compound, Casa Grande, employed both customs of burial of the dead.

Pottery serves as an excellent basis of comparison because of its abundance. In the Upper Gila wares are corrugated, black on white, and red. The Middle Gila produced red on buff, plain red ware, and black and white on red polychrome.

Nothing is known of the Lower Gila other than the location of a few sites.

LITTLE COLORADO RIVER DRAINAGE

Extensive rather than intensive work typifies the reports from the Little Colorado area. The region may be divided into three main parts: first, the eastern or Zuni, which includes the head stream and upper tributaries of the Little Colorado to the Arizona-New Mexico line; second, the western or Hopi area, from the above boundary line, over the valley of the Little Colorado to its junction with the main Colorado; and third, the southern area, including the southern branches of the Little Colorado. The work of Hodge is noteworthy in the eastern area; Fewkes is outstanding in the Hopi region, and Fewkes and Colton have done a considerable amount of work on the southern tributaries of the Colorado.

The work at Hawikuh, New Mexico, has revealed little. Here are two distinct cultural periods, the pre-Hawikuh and the Hawikuh proper. (61). The houses were small buildings, the walls of irregular stones or slabs poorly put together. Burials belonging to this period were either in the rooms, under the walls or outside the houses and were rarely accompanied by pottery or other artifacts. (62)

"The skeletons in most of these older graves were usually incomplete, as if purposely dismembered at the time of burial; and in one instance the bones almost without exception had been deliberately broken." (63)

(61) Hodge, 1916, p. 64
 (62) Ibid

(63) Hodge, 1916, p. 64

The pottery of this pre-Hawikuh period was black or gray, black on red, and fine corrugated ware. The black on (64) white ware showed both Chaco Canyon and Upper Gila influence.

Definitely related to this pre-Hawikuh culture were two circular kivas excavated by Hodge. The ceremonial rooms were enclosed in a partially complete compound wall, this wall extending across the north frontage of the site and part the way down the east and west sides. Both kivas exhibit better workmanship than did any of the later Hawikuh structures. (65) Superior in character was the masonry of the largest kiva, which was seventeen feet in diameter. The inner or buttress wall corresponded to the benches of the kivas of the San Juan drainage, and was two feet and 8 inches above the floor, ten inches wide, and was capped with smooth slabs of sandstone. (66) Several applications of thin plaster had been applied to the entire surface of the inner wall. (67) The rectangular fireplace was slightly to the south of the center, and on its southern side was the altar. A well made shaft extended from the sacred passage which was beyond the altar, to a distance of five feet and seven inches beyond the kiva wall. (68) The sipapu was near the wall to the east. In general the second kiva at this site corresponded to this first one, only it was smaller in size. Neither had roof-support pilasters.

(64) Hodge, 1918, p. 29
 (65) Ibid. p. 10

(66) Hodge 1918
 (67) Ibid. p. 29
 (68) Ibid. p. 65

"These two kivas show strong Chaco Canyon influence, but they appear to represent a sort of cross between the great kivas in possessing an unpilastered encircling bench, and a rectangular firepit; the small kivas in having a sub-floor ventilating shaft, a deflector, and a single rectangular vault west of the firepit." (69)

Larger houses were rectangular kivas of better stone construction characterizing the Hawikuh period. The dead were either buried with many funerary objects, or they were cremated. Incinerated bones were placed in jars and were buried with vessels of food and water. Beads were often found with the remains of burnt bones. The later burials showed great care in preparation.

"The body was fully clothed, and accompanied with such personal belongings as in the case of women, metates and manos, floor and hair brushes, head-rings used in carrying water jars, mats, baskets, raw material for various manufactures, together with pottery vessels and quantities of food (corn, squash, pinon nuts, etc.), also articles of adornment such as hair combs and ear pendants of wood beautifully incrustated with turquoise and jet mosaic, shell and turquoise ear ornaments and necklaces, finger rings, etc.; and in the case of men, bows and arrows, arrow points, fetishes, prayer sticks, ceremonial paraphernalia of various kinds, pipes, and of course earthenware vessels and baskets that had contained food and drink." (70)

In one of the burial grounds at Hawikuh was found a small red jar of the Middle Gila polychrome type. The outside was painted in black and white, having become almost a smoky blue. In a kiva was found a red corrugated bowl of Upper Gila type. This indicated a relative age between

these kivas with the Upper Gila culture.

The pottery of the prehistoric Hawikuh period was varied. Red or green glaze on red or orange, and cruder corrugated ware typified the earliest period. This was followed by black, green, or purplish glaze on white or creamy slips, later black or green glaze on white or cream was made along with the introduction of non-glaze colors. The last prehistoric period was characterized by the disappearance of glaze ware, and the introduction of true polychrome. Life forms became common. (71)

As for the Zuni region as a whole, the following will sum up its outstanding characteristics:

"The earliest sites were little buildings with pottery identical with that of the pre-pueblo ruins in the San Juan. Then came somewhat larger homes whose pottery is preponderantly corrugated and black on white; then began a decline in black on white ware accompanied by a rise of red ware with decoration first in black paint, later in both black and white paint. ... After the introduction of three-color (i.e., black and white on red) painted decoration there came into use the true pueblo form of architecture. Painted decoration soon gave way to decoration in black glaze, the three-color scheme still obtaining. After a considerable time glaze painting and red background declined more or less together, and were replaced by light background (buff or white)" (72)

The Hopi country cultural development was somewhat different. Several indications of earlier phases of culture were present in this area which have not as yet been found in the Zuni country, for example, on the eastern-

(71) Hodge

(72) Kidder p. 90

most of the three Hopi mesas were found sites marked by scattered stones and shards of rough, gray unornamented vessels.(73) In the same vicinity and also in Jeditto valley were located small slab-walled structures with characteristic black on white and neck coiled black ware.(74) More numerous are the typical stone pueblos, with large rooms whose walls were nicely plastered, and which were sometimes two stories high. Wooden beams were used in the roofs. One instance of adobe blocks is found in this area.(75) Rectangular pueblos were the common form, sometimes in rows of rooms enclosing a central plaza.

Burials were commonly made just outside the walls of the houses, and were marked by upright or horizontal slabs of stone. Some of these stones were perforated. No evidences of cremation of the dead were found. At an ancient site at Linden, on a tributary of the Little Colorado, were graves which were different from any others in the region. No particular attention was paid to directions in the placement of the body, which was buried at full length. Stones and clay were packed around the body, and no stones resembling those just mentioned marked the graves.

"There was no uniformity in the orientation or positions of the dead, for some of the bodies were extended, others had knees drawn to the breast, and still others were lying on one side. Double and multiple burials were common." (76)

(73) Kidder, p. 94
 (74) Ibid.

(75) Fewkes, 1896, p. 527
 (76) Ibid.

Mortuary objects accompanied the burials.

Perhaps one of the best known sites of the Little Colorado area is Sikyatki. Before treating the pottery of the two above mentioned sites, Linden and Homalobi, the Sikyatki wares will be cited. The Sikyatki type ware has a surface color which ranges from creamy white through the yellows to shades of flushed orange, the designs are in brown-black and reds. Cross finds at Pecos indicates that this well executed ware was contemporaneous with the late prehistoric wares of the Rio Grande. Directly ancestral to this excellent ware is Jeddito yellow decorated with brown black. Below this occurred pottery of an orange-red shade, which apparently was allied to Kayenta polychrome. (77) Kidder believes that this sequence of types indicates that Sikyatki was a local growth from local prototypes, and was not an importation from the Rio Grande.

The pottery from Homalobi differs in color from true Sikyatki ware, but has many shapes which resemble the type site.

"Roughly speaking, about one-third of the specimens from Homalobi are similar in color with those from Sikyatki; another third red and black ware, which is glazed, another third white and black, like the Cliff house pottery." (78)

Design execution is less pleasing and less perfect at Homalobi, as also, was the pottery as a whole. Gray ware with black decoration is common at Linden. One excellent specimen (79) was finely

(77) Kidder, p. 93

(78) Fewkes, p. 524

(79) Hough, 1901

coiled on the exterior, and exhibited a fret pattern in black as a band on the interior. Some coarse red ware bowls, and small vessels of coiled ware also occur at Linden⁽⁸⁰⁾ Fragments of large flaring bowls with polished black interiors and coiled exteriors bearing designs in white were very common with burials. ⁽⁸¹⁾ Rugose vessels with kaolin decoration seem to have been limited in distribution and were centralized around Linden and Showlow, a site some eighteen miles to the south.

North of Linden are ruins in the Little Colorado valley proper. In a ruin in McDonald's Canyon, the wares are strikingly similar to those of the more southerly sites. Seventy-five percent of the ware is black and white or gray ware and the remainder is red and coiled. The gray ware, from this region is very fine, perhaps some of the finest produced; design execution is also excellent. Red ware here, too, is of small pieces, although better finished than at Linden, for the surface is polished and decorated with geometric designs.⁽⁸²⁾ Some of the red ware has unobliterated coils on the exterior, and the interior is painted black and is highly polished. Here again the coiled ware is evidenced in small rough cooking pots.⁽⁸³⁾ In other spots in the vicinity of McDonald's Canyon are variations of pottery types, but on the whole, all center around those described above.

In the petrified forest were a number of

(80) Hough, 1901
(81) Ibid.

(82) Hough, p. 304
(83) Ibid. p. 305

small villages inhabited by blood relatives forming clans. At the rim of the forest the dwellings faced the northeast, while to the southwest the villages present a blank wall of two or more stories. Debris heaps to the east guarded graves, which held burials at length, accompanied by the finest of pottery, beads, etc. Near the ruins are shrines at which men placed strange fetishes for strange gods - though no stranger than our own, to be sure. Graves of these people were rich in pottery, often with remains of food in them, awls, hammers of fossil wood, knives, and arrow-heads, fragments of coiled baskets, matting and fabric, stone and sea shell beads, and ornaments of lignite and white stone.

A site which serves as a happy connecting link between several areas might be mentioned here although it does not truly belong to the Little Colorado district. Forestdale really belongs to the upper Salt drainage. Its bright red ware with black on white decoration resembles that to the north; its gray vases belong to the Salt River valley. The inhabitants of Forestdale incinerated their dead, a practise linking them a second time with the more southern peoples.

SAN JUAN DRAINAGE

The San Juan River proper does not enter the state of Arizona at any point, but, rising in northeastern New Mexico, it extends across the corner of this state, crosses the corner of Colorado into southeastern Utah, and then goes westward to empty into the Colorado River. The river has many tributaries in these four corner states, its southwest branches coming from northeastern Arizona. In these branches are found the many ruins which belong to the San Juan drainage area.

The San Juan drainage is perhaps the best known region of the southwest. Within the area is represented the three main divisions of culture, Cave, Early Pueblo and Late Pueblo. Some of the best known and most important sub-cultures belong here, particularly of the late pueblo period. The region as a whole will be discussed, especially that portion included in Arizona. Three outstanding type examples of the pueblo period will be cited for comparison and contrast of Arizona culture with that of other cultures.

As far as is known the earliest or Cave culture had a small range. The cave in southern Utah excavated by Nusbaum, and its culture as described by Kidder and Guernsey, have already been referred to under Cave Period. The season of 1914 was spent by Kidder and Guernsey

in northeastern Arizona with the result that further evidences of Cave culture were located. The range of this culture now

"...includes all the north tributaries of the San Juan from Comb Wash (northeastern Arizona) to the Colorado; it covers the Chinlee valley, and the entire drainage of its largest affluent, Laguna Creek; recently it has been extended to the Kanab district north of the Colorado River". (84)

Little need be said further of the attributes of Cave culture as found in its several locations. The same general crude culture characterizes all sites: lack of house structures, no pottery, coiled basketry, simple stone, bone, and wood artifacts, undeformed skulls, and simple burials.

The second stage of development in the San Juan drainage, the Pit Houses, has also been described. Located Pit House sites cover a much greater area than did the Cave sites. The former extend from the Mancos and La Plata Rivers in southwestern Colorado (85) to southwestern Utah. (86)

"They are known to occur abundantly in the Kayenta region as well as in the Chinlee, Canyon de Chelley, Chaco Canyon, the Pagosa country, on the mesas between the Animas and the Mancos, in the McElmo, and on Recapture Creek." (87)

The glory of the San Juan drainage was to be found in these three regions: Chaco Canyon, Mesa

(84) Kidder, p. 79 (86) Harrington, p. 19
 (85) Morris, 1911, p. 12 (87) Ibid. pp. 49-58

Verde, and Kayenta. Here prehistoric culture reached its peak, and a discussion of the three areas will well illustrate the relation of Arizona's prehistoric development to that of other southwestern people. The outskirts of each will overlap into the others and exchange of ideas naturally result.

To begin at the easternmost extension, Chaco Canyon will first be considered. Here are to be found ten or twelve major valley ruins of one hundred or more ground floor rooms which were terraced from front to back to a height of from three to five stories. A central court containing the kivas is surrounded on three sides by the terraced rooms just mentioned, while the fourth side is closed by a row of one story structures. Massive architecture and excellent masonry characterize the Chaco Canyon structures. (88)

"The walls of the best period are generally made with adobe-laid stone work, or rubble, and finished on the two surfaces with what might be called a veneering of carefully selected tabular stones, evenly arranged in courses that often vary in thickness and thus give the work a very pleasing texture. The details of construction are notable for excellence of finish and accuracy of line." (89)

Two types of kivas are common to Chaco Canyon ruins, small and large. There are generally one large and several small kivas to a ruin. The former measures from forty to sixty feet in diameter, has a

(88) Kidder, pp. 49-58

(89) Kidder p. 50

central fireplace with rectangular vault-like structures on each side; the central part of the roof was supported by four large pillars; and generally the kiva was surrounded by small rooms. The smaller structures were never over twentyfive feet in diameter. Similar to the great kivas, a low bench encircled the base of the wall, but in the small rooms there were six to ten small blocks of masonry.

Strange to say, no burial grounds have been found of the people of Chaco Canyon ruins; likewise there is no hint of cremation. Hence it is thought that, averse to other pueblo peoples, they buried their dead some distance from the villages.

The arts of these people exhibit a high degree of attainment, particularly in inlay work. Sandals had pointed toes and an offset on the outer edge, exactly as did the Kayenta and Mesa Verde footgear. Pottery included corrugated, black on white, and a little red ware. The black on white ware is characterized by extreme white slip and fine line black decorations typically in the form of band decorations on the interior of bowls.

To the east Chaco culture stopped at Pueblo Pintadoan, which is situated in the divide between the San Juan and Rio Grande ruins. Gallup, New Mexico marks the southern extent of the culture, where characteristic

pottery appeared. In Leroux Wash, northeastern Arizona, Chaco influence is seen in architecture only. A short distance from this site was found pottery which was typically Chaco ware. Likewise, in Canyon de Chelley were found Chaco-like shards. In southeastern Utah were found vessels which "are seldom of the most pronounced Chaco types; they give one the impression of being either the product of a peripheral development affected by Chaco influence, or of an earlier and less specialized stage of Chaco culture." (90) Influence of Chaco in the northeast is seen in the low bench kivas of the Pagosa Springs region, Colorado. Exactly Chaco-an in ground plan is the ruin at Aztec, sixty-five miles north of Pueblo Bonita. From pottery evidences it seems that Aztec was built and inhabited by Chaco people for a time, abandoned, and later recolonized by Mesa Verde people. This fact and other similar evidences indicate that Mesa Verde culture was of longer duration in the San Juan than was Chaco civilization.

The culture preceding the great pueblos of Chaco Canyon was less specialized and its geographical limits have not been defined. Kidder believes they belong to an early black on white period, which Morris has demonstrated as existing in the San Juan area. Small houses and excellent coiled ware are characteristics.

In the very southwesternmost corner of

(90) Kidder, p. 56

Colorado lived the Mesa Verdans. Their culture area overlapped into the adjacent corners of Utah, Arizona, and New Mexico. Although the Mesa Verde influence extended even great distances beyond this, the Mesa Verde proper is located on a large plateau in the Mancos River drainage of southwestern Colorado. The characteristic structure is the cliff house, built in and conforming to the shelters of caves. There are also many ruins on the plateau. The rooms of the cliff house are clustered in the back of the caves in irregular forms, sometimes several stories in height. Toward the front are the kivas. The villages seem "always to have started in a modest way and grown by accretion."

The masonry of Mesa Verde ruins is typical in Cliff Palace. It is less massive than Chaco Canyon; large stones often hewn to shape are carefully coursed and brought to an even face by pecking. Rooms are more irregular in shape and smaller in size. The kivas are uniform in size and average about thirteen feet. They generally have the standard sacred passage and altar, fire pit and sipapu. Towers, round, oval, D-shaped, or rectangular are a decided Mesa Verde structure. They are built in the villages, or alone some distance away.

Some evidence of cremation was found by Fewkes in Mesa Verde, although here, too, no cemeteries have been found. Ceremonial burials shed slight light on the subject.

"Less richness of material and less perfection of workmanship than Chaco Canyon tells the tale of Mesa Verde minor arts. Pottery is decidedly different. Corrugated, black on white and little red ware are the types"

Mesa Verde black on white ware may be recognized by its clear pearly, grayish-white slip, which seems to have a certain softness and "depth" not found in other groups. The surface of the vessels is carefully polished, so highly in some cases as to produce a distinct gloss. There are four standard shapes: ollas, bowls, mugs, ladles. (91) Flat rims on bowls are a characteristic Mesa Verde feature. Large, striking elements supply decorative motifs.

Along the Mancos River and its eastern tributaries extended this Mesa Verde culture. We have noted its extension into Chaco Canyon to the south. It apparently went no farther north. To the west there are many ruins which may be classed Mesa Verde, the most distant one being in Montezuma Creek. The most outstanding feature which links the western sites to Mesa Verde is the presence of the strange towers and of blockstone masonry.

In the same country are found smaller structures, unit, multiple-unit type houses, which exhibit inferior masonry, less specialized pottery, and the kivas are more uniform in construction. "It is difficult to escape the conclusion that the three classes: unit-type, multiple unit type, Mesa Verde type, are all parts of a single cultural sequence of which the Mesa Verde remains are the culmination. (92)

(91) Kidder, p. 61

(92) Kidder, p. 61

The Kayenta lies south of the San Juan and west of the Chinlee, and centers in Sagie Canyon, Arizona. Here, as in Mesa Verde, cliff houses are best known, though many other pueblos are present. A decidedly different culture existed here.

Architecturally, the masonry is sometimes inferior in its irregularly shaped stones, which are poorly coursed and laid up with much adobe mortar. Wattlework walls were rare in Mesa Verde and Colorado, but are common in Kayenta. Towers are absent. In Mesa Verde kivas and pilasters were the rule, in Kayenta they are the exception. Some Kayenta sites have no kivas; some have "kihus", rectangular above ground chambers with firepit and deflector. The pueblos in the Kayenta district are of better masonry, and have kivas more like the other regions, though they are not incorporated in the villages.

Similar to Colorado and Mesa Verde, no burials were unearthed with the cliff houses, though bodies were found buried in the rubbish heaps of the surface pueblos.

Pottery is the only consistent basis upon which definite traits can be placed as belonging peculiarly to the Kayenta district. Corrugated, polychrome, and black on white wares appear. Corrugated ware is inferior, the coils being less regular and indentation is careless; the shapes are bulky. Black on white is characterized by fine

hard paste, clear, white slip, and excellence of decoration. The common vessels are ollas, bowls, ladles, and colanders. (93) Close-set arrangement of elements marks the decoration; frets, keys, and spirals and cross-hatching supplying common motifs. Polychrome ware has a yellow or orange base, with black, red, and white decoration, and appears in small handled jar shapes. Polychrome decoration includes one or two carelessly drawn lines exteriorly below the rim; and all-over design on the interior.

Beyond Marsh Pass in Segie Canyon, the Kayenta culture apparently extended no farther eastward; to the south it appears in Canyon de Chelley, in the neighborhood of the Hopi towns and of the San Francisco Mountains and on the Little Colorado at Black Falls.

Similar to the Chaco Canyon and Mesa Verde regions there was an older culture contained within and extending beyond the limits of the Kayenta region. These were small pueblos and cliff houses which bear resemblances in mediocre masonry, variability of kivas and prevalence of colored pottery, and which differs in having no kivas and in less specialized pottery.

(93) Kidder, p. 71

S U M M A R Y

The prehistoric culture of Arizona extended over a large part of the state. Many sites have been worked; even more have been located; a still greater number remain unknown. From the maps accompanying this paper, one can readily see that much remains to be done in southern and southwestern Arizona before it can be said that work within the state has been even outlined. The discussion of the Gila culture illustrated the lack of knowledge pertaining to the Lower Gila, and the inadequate information regarding the Middle Gila. So it is in all portions of the state, meager materials, but sufficient to show that a great and important problem rests in the outcome of archaeological investigations in the state of Arizona.

From the foregoing maps, and written matter, it is apparent that there are three main cultural areas with subareas in each; the Gila, Little Colorado, and San Juan regions. The maps show that village sites were located on the rivers of these names, or on their tributaries. Seldom were ruins situated far from a constant supply of water. Agriculture was the mainstay of these people; hence such locations were necessary.

House structures in the northern part of the state included from the earliest known cave "lean-tos" to the latest pueblo sites. Included in these two extremes

were many circular pit houses, some rectangular pits, numerous small-houses, and many pueblo sites. In southern Arizona the outstanding cliff pueblos of the north are replaced by compounds. Earlier than these were the rectangular pit homes. Some small-house or unit-type structures existed in the south. Adobe was common to the south; stones and stone slabs were almost exclusively used in the pueblos of the north.

As the pueblos of the south were situated in open, unprotected spots, few works of art other than stone, bone, and shell have been preserved. Contrarily in the north, great quantities of baskets, sandals, mats and other textiles have been preserved. Cremation of the dead was peculiar to the south; burials were the rule in the northern and central parts of the state. Climatic conditions also account more remains in the north.

The wares of the Gila region included plain red, red on buff, and polychrome, the latter black and white on red. In the Colorado district appear black on white, black on red, and black and white on red. The San Juan area is well represented in Kayenta, which produced corrugated, black on white, black on red, and polychrome wares. The latter differed from other polychromes in being red, yellow and black, and rarely white. Sometimes the yellow formed the background for the red and black designs; less often the red served as the immediate background for the main design element.

An outstanding difference between the north and south is seen in two distinct agricultural methods: in the north small plots were cultivated; in the Salt and Gila river drainages, immense canals were constructed for agricultural purposes.

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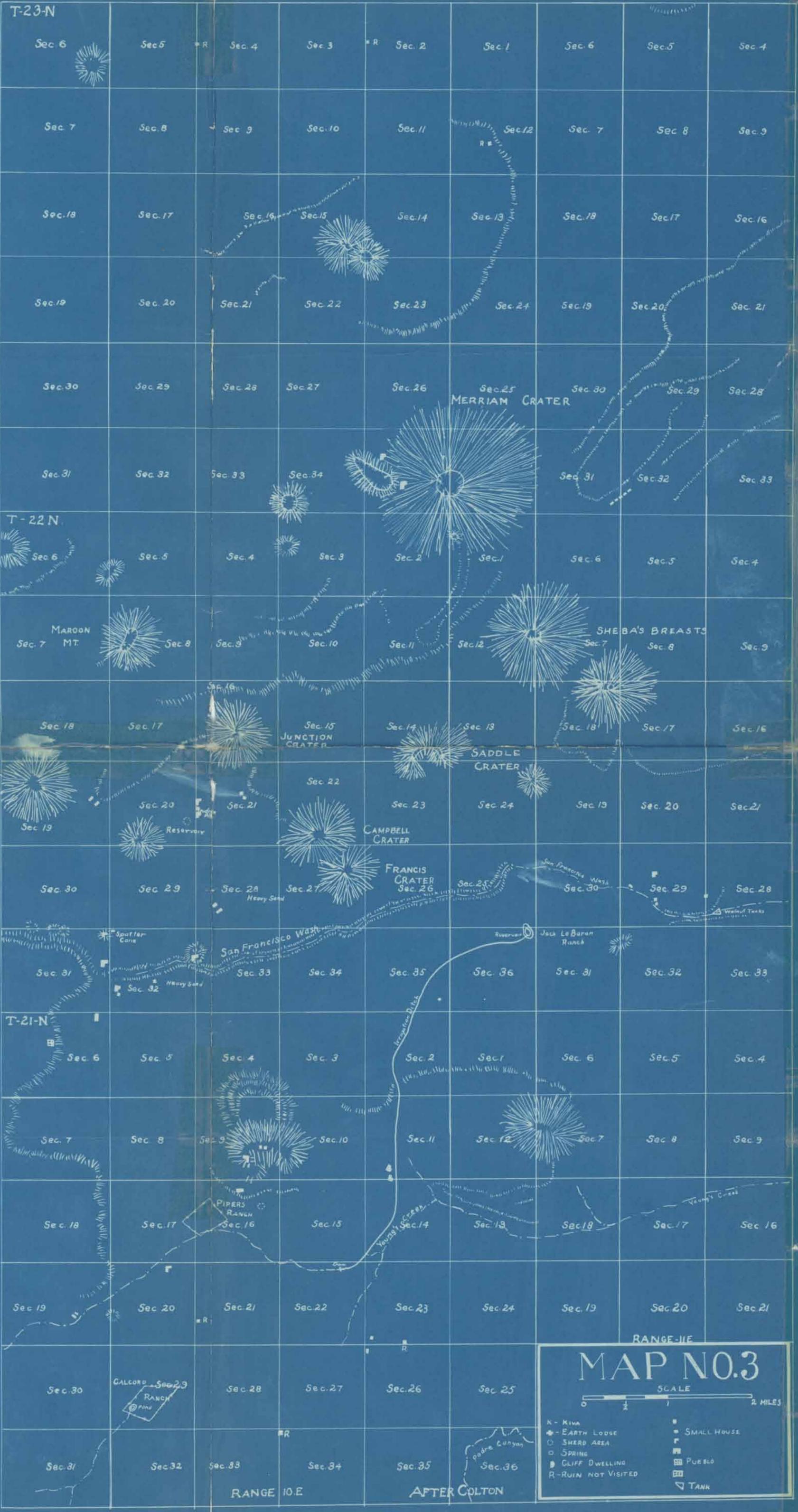
MAP NO 1

KEY

0 1 2 3
MILES

- K KIVA
- ◆ EARTH LODGE
- SHERD AREA
- SPRING
- 1-2 ROOMS
- SMALL HOUSE 2-4 ROOMS
- 3-8 ROOMS
- 9-16 ROOMS
- PUEBLO 17-24 ROOMS
- 25-50 ROOMS
- ▷ CLIFF DWELLING
- ◁ TANK
- WASH
- R RUIN NOT VISITED





T-23-N

T-22-N

T-21-N

RANGE 11.E

RANGE 10.E

AFTER COLTON

MAP NO.3

SCALE 0 1 2 MILES

- K - KIVA
- ⊕ - EARTH LODGE
- - SHEEP AREA
- - SPRING
- ⊙ - CLIFF DWELLING
- R - RUIN NOT VISITED
- - SMALL HOUSE
- ▣ - PUEBLO
- ▽ - TANK

MAP NO 6 WALNUT CANYON

Scale: one half mile



GILA AND SALT RIVER MERIDIAN TOWNSHIP 21N-R8E

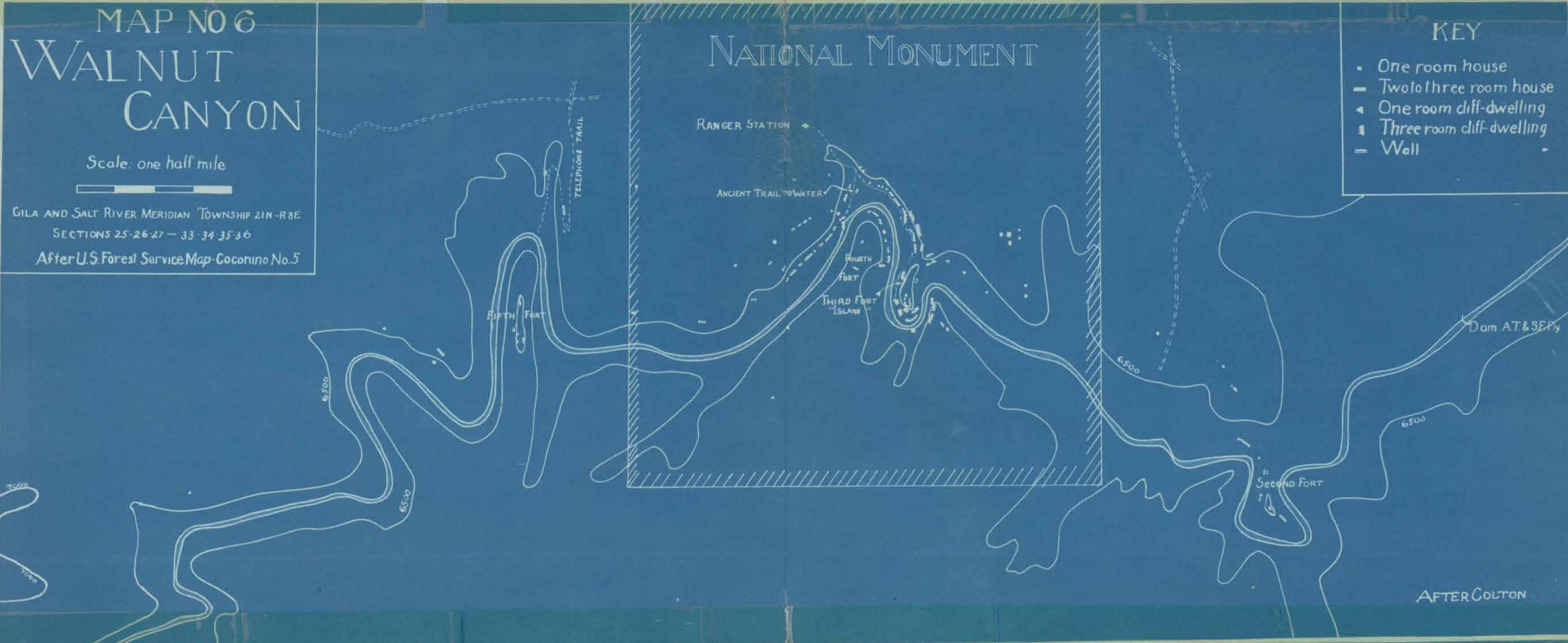
SECTIONS 25-26-27 - 33-34-35-36

After U.S. Forest Service Map-Coconino No. 5

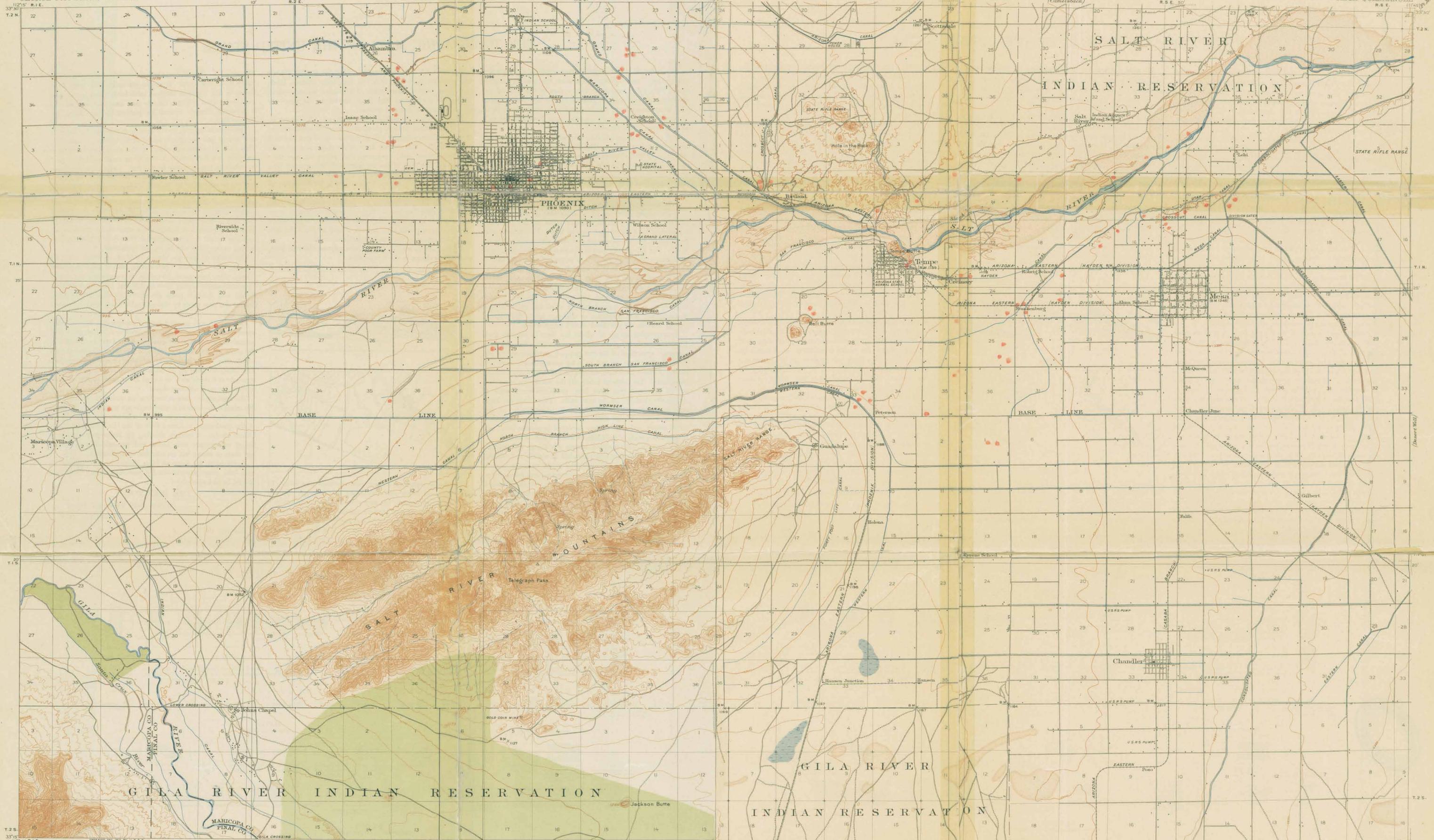
NATIONAL MONUMENT

KEY

- One room house
- Two to three room house
- ◀ One room cliff-dwelling
- ≡ Three room cliff-dwelling
- Wall



AFTER COLTON



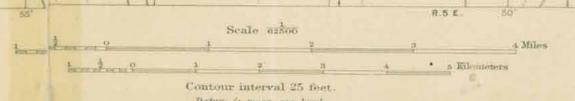
R. B. Marshall, Chief Geographer.
T. G. Gardine, Geographer in charge.
Topography by T. P. Pendleton and Reclamation Service.
Control by A. H. Thompson, J. T. Stewart, and Reclamation Service.
Surveyed in 1903-1904 and 1912.



Edition of June, 1914.

PHOENIX

R. B. Marshall, Chief Geographer.
Geo. R. Davis, Geographer in charge.
Topography by U. S. Reclamation Service.
Culture revision by T. P. Pendleton and D. H. Watson.
Control by U. S. Reclamation Service, A. H. Thompson,
C. M. Bannan, Thomas Windsor, and J. T. Stewart.
Surveyed in 1903-1904 and 1913.

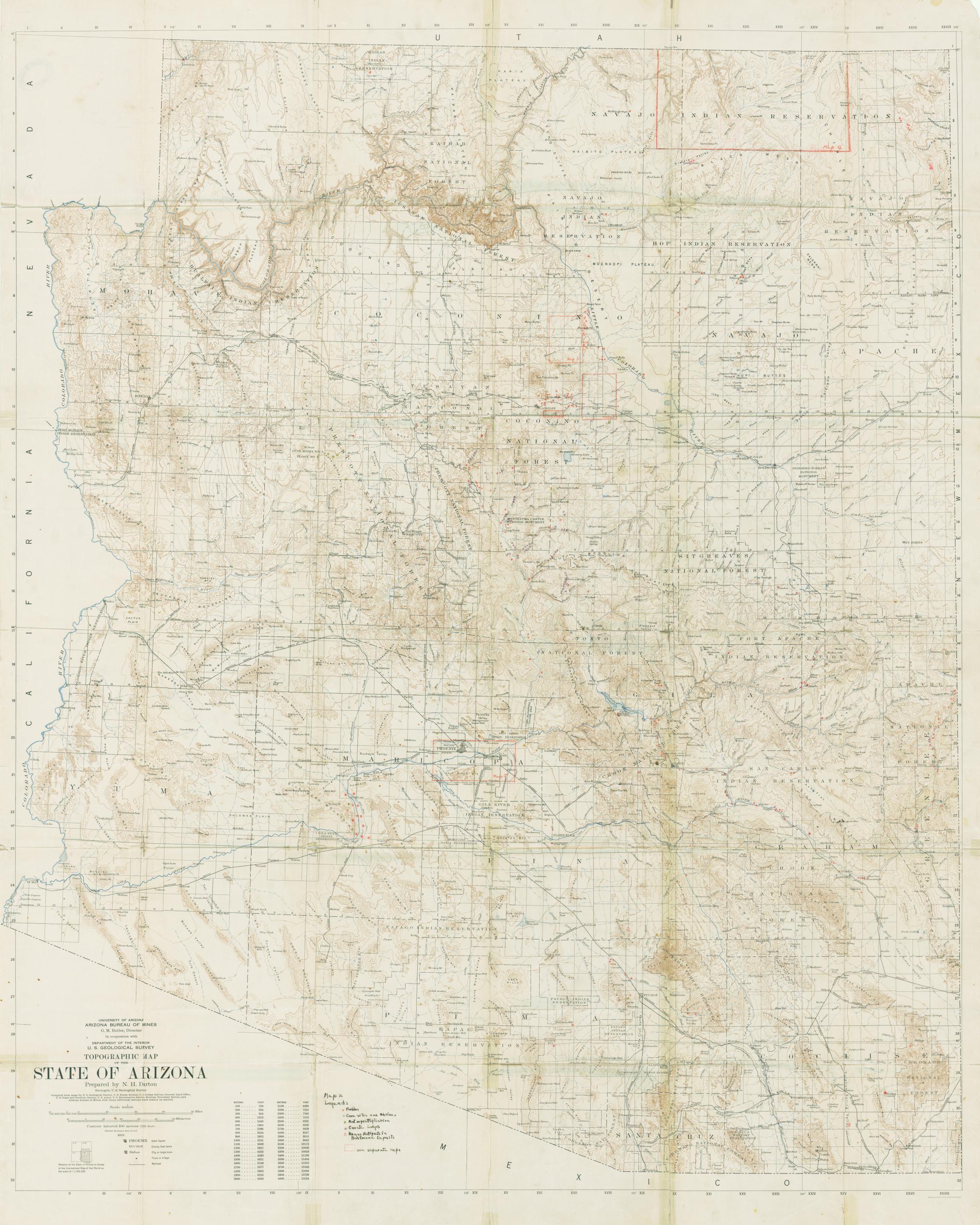


Edition of April, 1915.

MESA

Map No. 5
Pueblos

MESA, ARIZ.



UNIVERSITY OF ARIZONA
 ARIZONA BUREAU OF MINES
 G. M. Butler, Director
 In cooperation with
 DEPARTMENT OF THE INTERIOR
 U. S. GEOLOGICAL SURVEY
 TOPOGRAPHIC MAP
 OF THE
STATE OF ARIZONA
 Prepared by N. H. Dutton
 Geologist, U. S. Geological Survey

Compiled from maps by U. S. Geological Survey, U. S. Forest Service, U. S. Fish and Wildlife Service, General Land Office,
 U. S. Coast and Geodetic Survey, U. S. Army, U. S. Navy, U. S. Department of Agriculture, Bureau of Reclamation, and
 Arizona Bureau of Mines, with State administration surveys based mainly on section



Symbol	Feature
☐	PHOENIX State Capital
☐	TUCSON County Seat
☐	City or large town
☐	Town or village
—	Railroad

FEET	METERS	FEET	METERS
100	30.5	2100	640
200	61.0	2200	670
300	91.5	2300	700
400	122.0	2400	730
500	152.5	2500	760
600	183.0	2600	790
700	213.5	2700	820
800	244.0	2800	850
900	274.5	2900	880
1000	305.0	3000	910
1100	335.5	3100	940
1200	366.0	3200	970
1300	396.5	3300	1000
1400	427.0	3400	1030
1500	457.5	3500	1060
1600	488.0	3600	1090
1700	518.5	3700	1120
1800	549.0	3800	1150
1900	579.5	3900	1180
2000	610.0	4000	1210

Map Legend:
 Pushes
 Cave sites and barrens
 Red speckle
 Cave ledges
 Heavy beds in
 Holocene deposits
 See separate maps