

Arizona Casa Grande Ruin

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GENERAL INFORMATION

REGARDING

CASA GRANDE RUIN, ARIZONA.¹

GENERAL STATEMENT.

The ruin known by the Spanish name Casa Grande, "Great House," is situated near the left bank of the Gila River about 12 miles from the site of the present town of Florence, Ariz. It can be conveniently reached by carriage either from the town of Florence or from Casa Grande station on the Southern Pacific Railroad. The route to the ruin via Florence is slightly shorter than that from Casa Grande station, enabling one to make the visit and return in a single day. There are a hotel and livery stables in both towns, but the visitor should provide for his own refreshment at the ruin, where there is a good well with abundant water.²

This reservation was set aside by Executive order dated June 22, 1892, under the act approved March 2, 1889 (25 Stat., 961). By presidential proclamation of December 10, 1909, the boundaries of the reservation were changed by the elimination of 120 acres on which there were no prehistoric ruins and the inclusion of a tract of 120 acres adjoining the reservation on the east, on which are located important mounds of historic and scientific interest.

HISTORY.

The first known white man to visit Casa Grande was the intrepid Jesuit Father Eusebio Francisco Kino, or Kuehne, the pioneer missionary among the Opata, Pima, Papago, and Sobaipuri Indians from 1687 until his death in 1711. In 1694 Lieut. Juan Mateo Mange, nephew of Don Domingo Jironza Petriz de Cruzate, the newly appointed governor of Sonora, was commissioned to escort

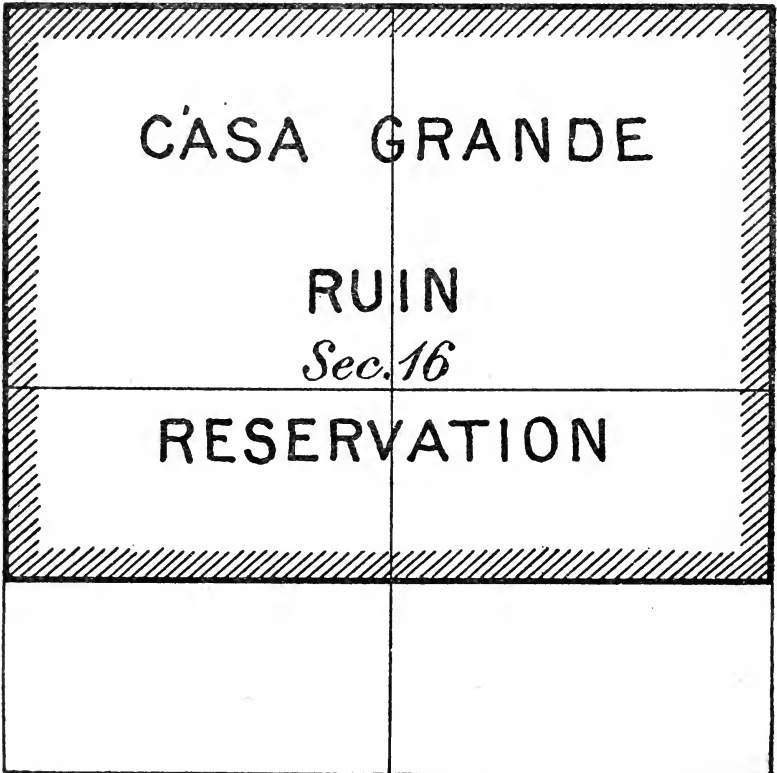
¹ This circular is an abstract of a detailed report by J. W. Fewkes, published in the Twenty-eighth Annual Report of the Bureau of American Ethnology. This report may be consulted at the principal libraries or may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., for \$1.25.

² The resident custodian, Mr. Frank Pinckley, has built his house in Compound A, and has likewise dug a well, no water having been available when he took up his residence at the ruin. On account of the extreme heat in midsummer, the autumn, winter, or spring months are best seasons of the year in which to visit the ruins at Casa Grande.

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the missionaries on their perilous journeys among the strange and sometimes hostile tribes of the region. In June of that year, while making a reconnoissance toward the northeast from Kino's mission of Dolores on the western branch of the Rio Sonora, Mange heard from the Indians of some *casas grandes*, massive and very high, on the margin of a river which flowed toward the west. The news was communicated to Kino and shortly afterwards was confirmed by some

/////// Reservation boundary



Casa Grande Ruin Reservation, Ariz., embracing the NW. $\frac{1}{4}$, the NE. $\frac{1}{4}$, the N. $\frac{1}{2}$ of the SW. $\frac{1}{4}$, and the N. $\frac{1}{2}$ of the SE. $\frac{1}{4}$ of sec. 16, T. 5 S., R. 8 E., Gila and Salt River meridian; set aside by executive order of June 22, 1892, under act of March 2, 1889.

Indians who visited Dolores from San Xavier del Bac, on the Rio Santa Cruz below the Indian village of Tucson. In November, 1694, Kino went from his mission on a tour of discovery, finding Casa Grande to be as reported, and saying mass within its walls.¹ The house was described as large and ancient and certainly four stories high. In the immediate vicinity were to be seen the ruins of other houses, and in the country toward the north, east, and west

¹ Mange in Doc. His. Mex., 4th ser., 1, 250, 259, Mexico, 1856.

were ruins of similar structures. Kino believed that Casa Grande was the ruin (Chichilticalli) spoken of in 1539 by Fray Marcos de Niza,¹ whose journey was followed in the next year by Coronado's famous expedition. Ortega, Kino's biographer, speaks of the ancient traditions of the Mexicans (Aztec), favorably received by all the historians of New Spain, that this Gila locality, as well as the Casas Grandes of Chihuahua, was one of the stopping places on their migration southward to the Valley of Mexico. This belief was prevalent during the period, and Casa Grande on the Gila is frequently marked on early maps as an Aztec sojourning place. For this reason it was also commonly designated Casa de Montezuma. There seems no foundation for the association of the people of Casa Grande with the Aztec, and considerable doubt exists whether the ruin was ever visited by Coronado or any of his companions.

Almost every writer on the Southwest who has dealt with the ruins of Arizona has introduced short references to Casa Grande, and many other writers have incidentally referred to it in discussing the antiquities of Mexico and Central America. Among the former are Browne,² Ruxton,³ and Hinton,⁴ while among the latter may be mentioned Prescott,⁵ Brantz Mayer,⁶ Brasseur de Bourbourg,⁷ Humboldt,⁸ Mühlenpfordt,⁹ and Squier.¹⁰

The Pima Indians, who dwell in the neighborhood, claim Casa Grande as the habitation of one of their ancient chiefs, and designate it by several names, among which are Váaki, Old House; Cívanaváaki, Old House of the Chief; and Sialim Cívanaváaki, Old House of Chief Morning Green.

Casa Grande was a ruin when discovered and has not been permanently inhabited since it was first seen by a white man. The identity of its builders has furnished a constant theme for speculation from the discovery of the ruin to the present time. Although it has been ascribed to the Aztec, there is no evidence that the ancient people who inhabited this building were closely related to any tribes of the Mexican plateau, whose culture, as indicated by archeologic remains, was different from that of the Pueblos, or sedentary tribes of New Mexico and Arizona. The age of Casa Grande and contiguous remains is unknown, but there is good reason to believe that settlements on their site were older than most of the present pueblos or cliff dwellings. The Pima claim, however, that it is not so old as ruins of the same general character situated near Phoenix, on Salt River, a short distance from its junction with the Gila.

¹ (Ortega) Apostolicos afanes de la Compania de Jesus, escrito por un Padre de la misma sagrada religion de su Provincia de Mexico, p. 253, Barcelona, 1754.

² Browne (J. Ross), *Adventures in the Apache Country*, pp. 114-124, New York, 1869.

³ Ruxton (George Frederic), *Sur la migration des Anciens Mexicains*; in *Nouvelles Annales des Voyages*, 5me sér., t. XXII, pp. 40, 46, 52, Paris, 1850.

⁴ Hinton (Richard J.), *The Great House of Montezuma*; in *Harper's Weekly*, XXXIII New York, May 18, 1889.

⁵ Prescott (Wm. H.), *History of the Conquest of Mexico*, III, p. 383, Philadelphia [c. 1873].

⁶ Mayer (Brantz), (1) *Mexico, Aztec, Spanish, and Republican*, II, p. 396, Hartford, 1853. (2) *Observations on Mexican History and Archaeology*; in *Smithsonian Contributions to Knowledge*, IX, p. 15, Washington, 1856.

⁷ Brasseur de Bourbourg (M. l'Abbé), *Histoire des nations civilisées du Mexique et de l'Amérique-Centrale*, t. 2, p. 197, Paris, 1858.

⁸ Humboldt (Friedrich H. Alex. de), *Essai politique sur le royaume de la Nouvelle-Espagne*, t. I, p. 297, Paris, 1811.

⁹ Mühlenpfordt (Eduard), *Versuch einer getreuen Schilderung der Republik Mejico*, Bd. II, p. 435, Hannover, 1844.

¹⁰ Squier (E. G.), *New Mexico and California*; in *American Review*, Nov., 1848.

MAIN BUILDING.**CONSTRUCTION.**

The walls of Casa Grande are of a fawn color slightly tinged with red. Externally they are rough and very much eroded, but the interior walls are plastered, still showing places that formerly, in the words of Father Kino, were as smooth as "Puebla pottery."

The walls are constructed of a natural cement, commonly called *caliche* by the Mexicans, composed of lime, earth, and pebbles; this was made into blocks, which were laid in courses. These blocks are supposed to have been made in position, the materials therefor being rammed into bottomless baskets or wooden frames that were raised as the work progressed until the wall reached the desired height. The blocks are not of uniform size, consequently the horizontal joints of the courses are not always the same distance apart. Although clearly shown in the outside walls, these joints are not visible in the interior walls on account of the plastering.

The exterior faces of the walls are not perfectly plumb, the thickness of the walls at the top being much less than at the base. Impressions of human hands appear in places in the plaster of the north and the west rooms. Posts were used to support some of the narrow walls, and stones employed for the same purpose are found in their foundations.

Many conflicting statements regarding the former height of Casa Grande are on record, most authors favoring three or four stories. There were undoubtedly four stories counting from the level of the plain to the top of the highest wall, as could be seen from the outside as one approached the structure, but the lowest story was filled solid with earth, so that inside the building there were really only three tiers of rooms, one above the other in the central part of the ruin and two on each of the four sides. The entrance into the lowest room was on a level with the roofs of the surrounding buildings, forming a terrace that surrounded the base of Casa Grande. Entrance to the upper rooms was effected by means of ladders from the outside and by hatchways. The positions of the outside doorways indicate that there were entrances on all four sides, but the middle room had only one doorway, which was situated on the east side.

ROOMS.

The ground plan of the main building shows that its walls form five inclosures, which may be termed the north, west, south, east, and central rooms. When the walls had reached the height of about 7 feet, these inclosures were filled solid with earth, the upper surface forming the floors of the rooms of the first story. In the north, west, south, and east inclosures there were two rooms above each ground room; the central room had three stories, being one story higher than the rooms which surrounded it.

WALLS.

The interior walls of the north rooms in both stories are well preserved except in the southeast corner, where there was probably a connection with six rooms which extended to the north wall of the

inclosure. As indicated by a series of holes in the eastern and western walls, the floor beams extended north and south. The position of the floors is also indicated by ledges, or setbacks, one of the best of which appears on the level of the roof in the north wall of the first story; there is also a narrow ledge on the south wall. The east and west walls in both stories are true to the perpendicular from base to top. The tops of the north and west walls of the second story show setbacks, and the apertures where the beams were inserted are clearly marked. Small holes indicating that rushes were used in the construction of the roof are well marked in the east and west walls of the second story. The outer face of the north wall is much eroded near the top, exhibiting no evidences of continuation into a third story. There was a low parapet rising slightly above the roof on the north, as well as on the east and west walls of the north room. Both lower and upper stories of the west room have smooth walls, but the exterior surface of the walls of the central room, above the line of the second floor, is rough, indicating that the western inclosure never had more than two stories. The east wall of the west room is slightly curved, while the west wall of the same room is straight. Rows of holes in the east wall, which formerly received the floor beams, are arranged somewhat irregularly. The inner faces of the walls of the south room are finely finished, particularly on the south side, although the wall itself is in places more broken than the north or west walls. The holes for beams in the south wall are less regular in arrangement than those in the north wall.

A fragment of the east wall of the south room remained standing up to within a few years, when the repairs were made by contractors. At one time the south room was excavated far below its original floor, as indicated by the line of erosion on the surface of the north wall and a corresponding line on the opposite side walls. There were formerly two doors, one above the other, in the south wall, but the lintel between them has disappeared, the south wall remaining in the form of two very unsteady sections. The interior walls of the east room are finely finished, while the exterior surface of the east wall of the central room is very much eroded. The exterior surface of the east wall of the central section shows the effects of exposure to the weather, suggesting that there were but two stories to the eastern part. The north wall of the central rooms runs through the east wall without bonding, suggesting later construction of the latter. A wide crack left in the east wall where the north wall joins is smoothly plastered over for part of its length, a condition which implies earlier construction. The inner walls of the central rooms are smooth; the marks of reeds, grasses, and rafters indicate the former existence of floors in this part of the building. The roughness of the plaster above the line of the floor of the second story indicates that there was once a low *bauquette* about the room. The row of holes that accommodated the beams of the roof of the third story is not flush with the top of the wall but somewhat below it, indicating that the walls there were formerly continued into a low parapet.

FLOORS.

The floors of the second and third stories served as ceilings of the first and second stories, respectively, and resemble those of the ordinary adobe houses of the Southwest. The beams were small cedar

logs, most of which were laid across the width of the room, their extremities being inserted for support in the walls, or in some instances laid on a ledge or in a recess. The rows of holes that accommodated the ends of the beams are to be seen in most of the rooms; some of these holes are not strictly in line. Each roof was covered with mud firmly packed down and hardened by exposure to the air and to the constant pressure of human feet; in places appear the prints of reeds and grasses which were formerly laid on the rafters.

DOORWAYS AND WINDOWS.

The external entrances into most of the rooms of each story of Casa Grande were lateral, and there is reason to suppose that the rooms in which no openings appear in the side walls were entered by hatchways. As the floors have all disappeared, it is impossible, of course, to know what or where the entrances to rooms from the roof were. In the lowest story was a doorway about midway in each side. Openings appear in about the corresponding positions in the stories above, except the third, where the only entrance to be seen is on the east side. As its threshold was on a level with the roof of the second story, this doorway probably opened on the roof of the east rooms in that story. In addition to these external openings there were passageways between the north, south, east, and west rooms, in the first and second stories.

All the doorways were constructed on the same pattern. They averaged about 2 feet in width, and some were slightly narrower at the top than below. This decrease in width may be a survival of the times when the conical, or beehive, form of architecture prevailed.

The masonry over the doorways is now, as a rule, more or less broken, but it still shows holes for the insertion of logs that formed the lintels, which were arranged in series one above another. While most of the lintels which supported the adobe have been wrenched out, some remain, holding in place the heavy material of which this part of the wall was built.

There are several round apertures in the walls that may have served for lookouts. In the east wall of the central room to the left of the upper doorway are two such openings, each about 4 inches in diameter, and near the south end of this room in the east wall is another. Two similar apertures are found in the west wall of the inner room, one in the upper story of the north wall, and another in the south wall.

Cosmos Mindeleff makes the following statement:¹

The frequency of openings in the upper or third story and their absence on lower levels, except the specially arranged openings described later, supports the hypothesis that none of the rooms except the middle one were ever more than two stories high and that the wall remains above the second roof level represent a low parapet.

CASA GRANDE MOUNDS.

GENERAL DESCRIPTION.

It is evident to anyone who visits Casa Grande that the historic structure called by this name is only one of many blocks of buildings which formerly existed in the immediate vicinity. While it is now difficult to determine whether all these structures were contempora-

¹ Thirteenth Ann. Rept., Bu. Ethnol., p. 314.

neously occupied, it is evident that the Casa Grande Group, in its prime, was no mean settlement. Evidences of former habitations cover much of the surface of the reservation and extend on all sides far beyond its boundaries. The limits of this prehistoric settlement are difficult to determine. The whole plain was dotted at intervals with houses similar to those of Casa Grande, from the point where the Gila leaves the mountains to its junction with its largest tributary, the Salt, the valley of which is also marked by the remains of many similar prehistoric buildings. Not all the mounds on the Casa Grande Reservation, however, contains ruins of great buildings; many walled structures, formerly homes of the inhabitants, have fallen, leaving but slight traces of their existence—no vestiges of walls above the surface of the ground, merely broken metates or fragments of pottery scattered over a limited area. This destruction was inevitable, owing to the fragile character of the wattled walls. Even the foundations of heavier walls of many of the buildings are buried in the débris from the upper courses.

Two types of mounds occur in the Casa Grande Group: (1) Those containing walls of houses and (2) those consisting entirely of earth and débris not including buried walls. The former are composed of earth or clay, which has fallen from the walls, burying the foundations, augmented by sand blown by the winds. Mounds of the second class are composed solely of débris; when opened, some of these show stratification, as if formed of mud or soil deposited artificially on them from time to time in clearing out reservoirs or making other excavations, while others contain ashes and fragments of pottery scattered through the soil from the surface to a considerable depth. Certain of these mounds are devoid of features suggesting artificial origin.

Mounds of the first class admit of still further classification into two kinds: (a) Those arranged in clusters, each resting on a platform, bounded by a surrounding wall—these are remains of compounds; (b) compact blocks of rooms, each without a surrounding wall, known as 'clan houses. While the name Casa Grande is here applied to the main building of one compound (A), the designation Casa Grande Group of mounds includes all the clusters of adjacent mounds situated on the reservation. For many years the main building and a few outlying walls were the only structures projecting above the surface, but now it is known that the historic Casa Grande is but one of many aboriginal buildings in this neighborhood. Excavations have established the fact that many mounds of the Casa Grande Group are remains of former houses, and that there are as many others composed of the débris of former habitations.

For convenience of study and reference the large walled inclosures constituting the first class of mounds, called compounds, are designated A, B, C, D, and E. These will be considered in order.

COMPOUND A.

Compound A is not only the largest of the Casa Grande compounds, but is also the most important, containing as it does the historic ruin and a few other walls of rooms standing above ground when excavations began.

The dimensions of Compound A are as follows: The length of the west wall is 419 feet; of the east wall, 420 feet; of the north wall, 223.3 feet; and of the south wall, 215 feet. The west wall bears north $3^{\circ} 00'$ east; the south wall, south $81^{\circ} 35'$ east. The west wall of the main building bears north $4^{\circ} 30'$ east, or south $4^{\circ} 30'$ west, i. e., $1^{\circ} 30'$ out of parallel with the compound.

The following buildings, plazas, and courts have been excavated in Compound A:

(1) Southwest building; (2) northeast building; (3) rooms on west wall; (4) six ceremonial rooms; (5) central building; (6) Font's room; (7) rooms between Casa Grande and Font's room; (8) rooms adjoining ceremonial rooms on north wall; (9) northwest room; (10) room near east wall; (11) northeast plaza; (12) central plaza; (13) east plaza; (14) southwest plaza; (15) south court.

The most important block of rooms is of course (16) Casa Grande.

SOUTHWEST BUILDING.

Father Font wrote of Casa Grande as follows:

The house Casa Grande forms an oblong square facing to the four cardinal points, east, west, north, and south, and round about it there are ruins indicating a fence or wall, which surrounded the house and other buildings, particularly in the corners, where it appears there has been some edifice like an interior castle or watchtower, for in the angle which faces toward the southwest there stands a ruin with its divisions and an upper story.

This southwest building is undoubtedly one of the "other buildings" referred to.

In Font's plan of Compound A, a single chambered room is represented in the southwest corner. Bartlett gave a plan of the cluster of rooms in this angle, but neither Bartlett's nor Font's plans are complete, for there are in reality six rooms in this corner of the compound, not counting an adjacent rectangular room separated from this cluster by a court. Several later authors have mentioned and figured these two fragments of walls standing above a mound southwest of the main building, and one or two have suggested that they were formerly connected with Casa Grande by walls.

NORTHEAST BUILDING.

The first historic building, Casa Grande, was not the largest in Compound A. The combined length of the six ceremonial rooms is double that of the main building, although their width is much less. A building standing northeast of Font's room is the largest yet excavated and contains many more rooms, some of which are larger than any in the historic building.

The arrangement of the rooms in the northeast building is different from that of Casa Grande, but is typical of others, especially the extra-mural clan houses. This similarity would lead one to suspect that this building was not, like the main building, a ceremonial, but rather a residential house. The typical form, to which reference is made, is that of a carpenter's try-square, or that of two sides of a rectangle—a form that reappears in the most southerly situated of the two clan houses on the east and the cluster of rooms in the southwest corner of Compound B. The six ceremonial rooms, together with

those extending eastward from the most northerly of these along the inner surface of the north wall, make also a group of the same try-square shape. Since one arm of the northeast cluster is formed by the east wall of the compound, it follows that this arm extends approximately east and west, and necessarily the other arm of the try-square lies at right angles, or north and south.

ROOMS ON THE WEST WALL.

Between the cluster of rooms occupying the southwest angle of the compound and the single "bastion" or "castle" at the northwest corner, there are several rooms, the walls of which appeared when the soil was removed from the inner or east side of the west wall.

The most characteristic of these dependent rooms, G, is separated by a narrow court from the northern wall of the southwest cluster. Unfortunately, one corner of this room was cut down before its existence was detected, but wherever its four walls were revealed they indicated a room of large size. In one corner there stood a large vase, too fragile to remove, which was consequently left in the place where found. The Casa Grande-Florence stage route formerly crossed the compound over the corner of this room directly above this vase.

On the west side of Casa Grande, or directly between the main building and the west wall of the compound, there were excavated several rooms, H, I, and J, the walls of which are low and single-storied. One of these rooms, J, is situated on the northwest corner of the ruin, and has its west wall continuous with that which forms the retaining wall of the north terrace. There are also two rooms on the southwestern corner which bear the same relation to the terrace wall of the south side. These two are separated by a court and have low walls. There does not seem to have been a building directly west of the main ruin and no sign of a terrace now remains on that side. The exact connections of the rooms along the west wall, southwest of the main ruin, with those on the southwest corner can be made clear only by continuation of the work in the unexcavated part of the compound. As shown in the ground plan, there are walls standing in that part of the compound; there is also a level space called the southwest plaza, situated between the wall of the most southerly room at the southwest angle of the main ruin and the northern wall of the room on the west wall adjacent to the building in the southwest angle.

SIX CEREMONIAL ROOMS.

Linear arrangement of rooms is exceptional in this compound. This row extends from the northeast corner of the main building to the north wall of the compound, with which the most northern room is united. The line of these rooms is not parallel with either the east or west walls of the compound, and their longest measurements vary, although the widths of the rooms are about uniform. Although the connection which formerly bound these rooms to the main building has been destroyed, there is no doubt that such a union once existed and that they were probably united to a solid terrace, which we must suppose existed on the north, east, and south sides of the main building.

Before excavations were begun, the row of ceremonial rooms was indicated only by a ridge of earth extending from the northeast corner of the main building northward. It is evident that the roof of these rooms was on a level with the floor of the lowest rooms of Casa Grande, which communicated with the roofs of these ceremonial rooms on the north, east, and south by means of the basal terrace, of which mention has been made. In this way one could pass directly into these rooms through the doorways in the middle of the sides of the main building.

CENTER BUILDING.

When work was begun on Compound A the center building was a low, regular mound situated near the southeast angle of the main building, occupying a somewhat similar relation to that corner that the first of the six ceremonial rooms does to the northeast angle. This mound was opened to the base, revealing several intersecting walls and rooms. When one stands at the north wall of the compound and runs his eye along the east side of the six ceremonial rooms, it is found that the middle wall of the center building is in the line of the eye, which also follows the supposititious retaining wall of the east terrace of the main building and the east boundary wall of the southwest plaza. The southeast corner of the main building, Casa Grande, is broken in much the same way as the northeast angle near the six ceremonial rooms, possibly from the same cause.

FONT'S ROOM.

Mange states that Father Kino said mass in the Casas Grandes, and it is generally believed that this ceremony was performed in one of the rooms of Casa Grande. As there were at the time of Kino's visit several other rooms in the group, some of which were more commodious, it is interesting to speculate on the possibility of one of these being that referred to.

Just east of Casa Grande was a large building, formerly two stories high, which was apparently in a fair state of preservation when Father Font visited it in 1775. So accurately has this zealous priest described and mapped this room, that it is called after him and is referred to as "Font's room" in this article.

Mange states in his diary that—

a crossbow shot farther on 12 other houses are seen half tumbled down, also with thick walls and all with roofs burnt except one room beneath one house, with round beams, smooth and not thick, which appear to be cedar or savin, and over them rush reeds very similar to them and a layer of mortar and hard clay, making a ceiling or story of very peculiar character.

Font, 70 years after, wrote:

In front of the east door, separated from the casa, there is another building with dimensions from north to south 26 feet and from east to west 18, exclusive of the thickness of the walls.

Directly west of Font's room is a passageway communicating with the central plaza. The floor of this passageway is hard and very compact, and on one side there were excavated an eagle skeleton and bones of several rabbits.

ROOMS BETWEEN CASA GRANDE AND FONT'S ROOM.

East of Casa Grande there were several large rooms with low, massive walls, evidently of one story. It would appear that in ancient times these rooms joined the terrace at the base of Casa Grande, and we may suppose that their roofs were on the level with the floor of the lowest room of the historic building. Apparently these rooms were not all constructed at the same time, the two at the north showing evidences of being older than the southern pair.

One of these rooms, C, was found to contain much débris, consisting of pottery fragments, charred basketry, cloth, maize, mesquite beans, marine shells, and other objects. It appears to have been a dumping place, and as it has every appearance of having once been a room, we may suppose that it was deserted while some of the other rooms of Compound A were still inhabited.

ROOMS ADJOINING THE MOST NORTHERLY OF THE SIX CEREMONIAL ROOMS.

Adjoining the most northerly of the six ceremonial rooms on its east side there lies a room or court, G, surrounded by walls, which appears to have been without a roof. Its floor is hard, as if made so by the tramp of many feet; its walls are massive, with smooth surfaces. A walled-up doorway, recalling a similar feature in the west room of the main building, occurs in the wall separating this room from the most northerly of the six ceremonial rooms.

NORTHWEST ROOM.

This room is single-storied, with free walls on two sides, the other sides being the walls of the compound. An entrance into the compound on the north side is situated near this corner room.

The excavations revealed many ceremonial objects on the floor, which would appear to indicate that the room was used for other than secular purposes. Household utensils, as grinding stones, which would be expected in a living chamber, were absent. No soot or other evidences of a fire were observed on the walls, and there were no charred logs or rafters.

ROOMS NEAR EAST WALL.

South of the plaza which lies to the east of the two-storied building known as Font's room are situated the remains of some massive walls which formed a large square inclosure separated from the east wall only by a narrow passage.

This building was evidently formerly one story high. Its size is so great that it is doubtful whether or not it was roofed, but if it had a roof it would be one of the largest rooms of Compound A.

NORTHEAST PLAZA.

The situation of this plaza and the fact that no doorways opened into it or terraced roofs looked down upon it imply that it was not a favorite one for ceremonial dances or spectacular performances. As the walls about it are, as a rule, massive, the plaza may have served

as a safe place to which to flee for protection, and it is probable that cabins, not unlike the Pima huts of the last generation, were temporarily erected in this and other plazas.

CENTRAL PLAZA.

The centrally placed, and on that account probably the most sacred, plaza of Compound A is surrounded by buildings, the roofs of which no doubt served as elevations from which spectators could witness the sacred dances and games. The floor of this plaza was solid, apparently hardened by constant tramping of feet. The labor involved in cutting down the earth in this plaza to the former floor was considerable, it being necessary to remove many cubic yards of grout that had fallen from the thick walls of the northeast building and the six ceremonial rooms. The southwest corner of the plaza was not excavated, because of a large stake to which is attached the iron rod that serves as a guy for the northeast corner of the roof built over the ruin.

The plaza appears to have been used as a burial place, for a human skeleton was dug out of the floor near its southeast corner, but the body might have been buried after the compound had been deserted.

There were excavated from this plaza, near the passageway west of the tall wall of Font's room, the skeleton of an eagle and several rabbit bones. It was probably customary at Casa Grande to domesticate eagles for their feathers and to keep them in confinement.

EAST PLAZA.

This plaza was almost wholly surrounded by rooms, and from its position was evidently one of the most popular of all the inclosures of this kind. From the roof of the main building one could probably look over Font's room into this plaza. Although the plaza is a small one, its eastern position would give it considerable ceremonial importance. The accumulated earth was cut down to the original level and removed outside the compound. There does not seem to be sufficient evidence that there was an eastern entrance way to this plaza, although it was looked for when excavations were made.

SOUTHWEST PLAZA.

This plaza adjoins the west wall of the compound, extending from the rooms southwest of the main ruin to the first of the cluster of rooms in the southwest angle. Although large quantities of earth were removed from this inclosure, it has not been wholly leveled to the floor, especially on the east side, near a wall which is a continuation of the rooms at the southwest corner of the main ruin. This wall was exposed along its whole length, but showed no rooms on the west side, although probably there are several on the east, or unexcavated, side.

SOUTH COURT.

A long court extends across the whole south end of the compound from the southwest cluster of rooms to the east wall. Its form suggests a ball court or course for foot races. In connection with the

former suggestion it is interesting to note that several stone balls, such as were used, according to Pima legends, in a game of kicking ball, were found in this court; this game is still practiced by the Pimas. Near one end there was excavated a square perforated stone, recalling that through which balls were thrown in the Nahuatl game of pelote.

As will be seen from the accompanying plan of Compound A, the whole inclosure has not been completely excavated, but enough débris has been removed to show its general character. There are no large unexcavated mounds remaining in this compound, and the level space in the southeastern part was either a plaza or, more probably, the site of many habitations, whose fragile walls have fallen, raising the surface to a uniform height. On this supposition we should look here for the remains of houses in which the majority of the people lived.

From the study of Compound A we can get an idea of the structural character of one of these Gila Valley prehistoric settlements. The people lived in clusters of houses surrounded by a common wall, which inclosed also massive houses that served as temples or as citadels for protection. Regarding the sociologic condition, whether each compound housed and protected many families unrelated by blood, or clans related to one another, can not be determined from the information available. That the compounds may have been built at different times appears probable, but it can hardly be supposed that one compound was completely deserted at one time and that the inhabitants might have moved to another site a few hundred feet away. If these compounds were inhabited at the same time, it may be readily supposed that there was considerable intermarriage of clans and therefore intermingling of blood. As no known legends speak of more than one chief of Casa Grande, the supposition is that the inhabitants recognized only one head. There is ground for the belief that the age of Compound A is not so great as that of Compound B, although it is of considerable antiquity. Casa Grande itself seems to have been constructed at different times, as it shows evidences of growth by a series of additions. There are no known data by which its age can be computed and none to determine which compound was the last to be deserted. It is known that Compound A was a ruin in 1694, but from the earliest accounts nothing can be ascertained which would show how long before that date the ancients occupied the buildings. The indications afforded by the rate of wear of the walls since the beginning of the eighteenth century lead to the belief that a few generations before that time Casa Grande was a populous settlement.

The orientation of the surrounding walls of the compounds and of the buildings within them is well marked, this feature appearing very significantly in Compound A. The greatest length of all the compounds is north and south. The doorways of the buildings, when practicable, open toward the east.

In certain walls is found evidence contradicting the theory that they were built by stamping caliche into bottomless baskets or boxes, as generally taught, and as indicated by the joints on the west side of the main ruin. At various places in the walls may still be seen masses of clay patted into shape by human hands, the imprints of

which are clear. Some of these masses, which are just large enough to have been handled by one workman, were evidently dumped on the wall and subsequently were not so stamped that they lost their original shape.

COMPOUND B.

When work on it began Compound B consisted of two mounds resting on a platform, the bases around both mounds being so filled in with earth that the surrounding wall formed the edge of a platform or terrace. The most extensive of these inclosed mounds (Pyramid B) occupied the southwest corner of the platform. The largest and most massive (Pyramid A) has a flat top, from which the visitor can see, in clear weather, the cupola of the courthouse in Florence, 12 miles away.

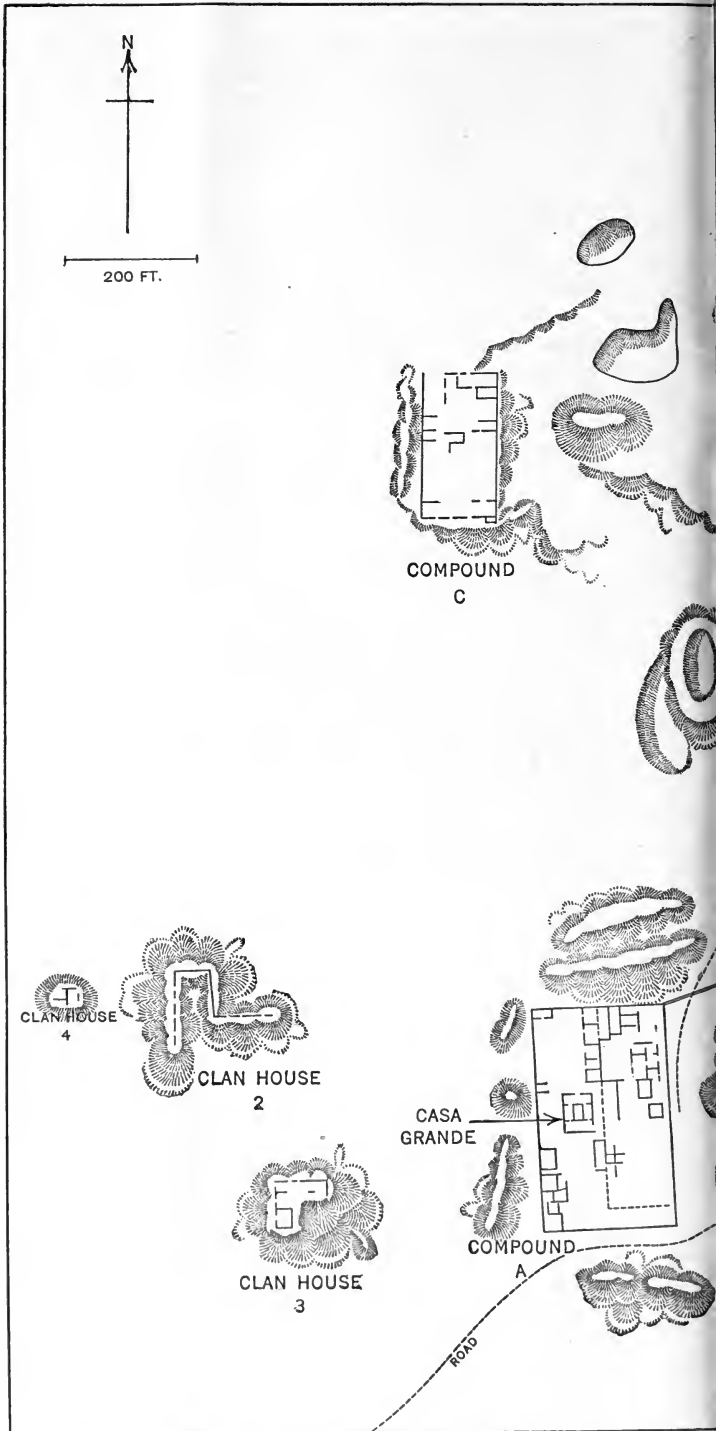
Compound B is 840 feet northeast of Compound A. Its excavated surrounding wall on the east and north sides, respectively, measures 299 feet and 180 feet; the west side is 297 feet long and the south side 167 feet. The compound is oriented approximately north and south.

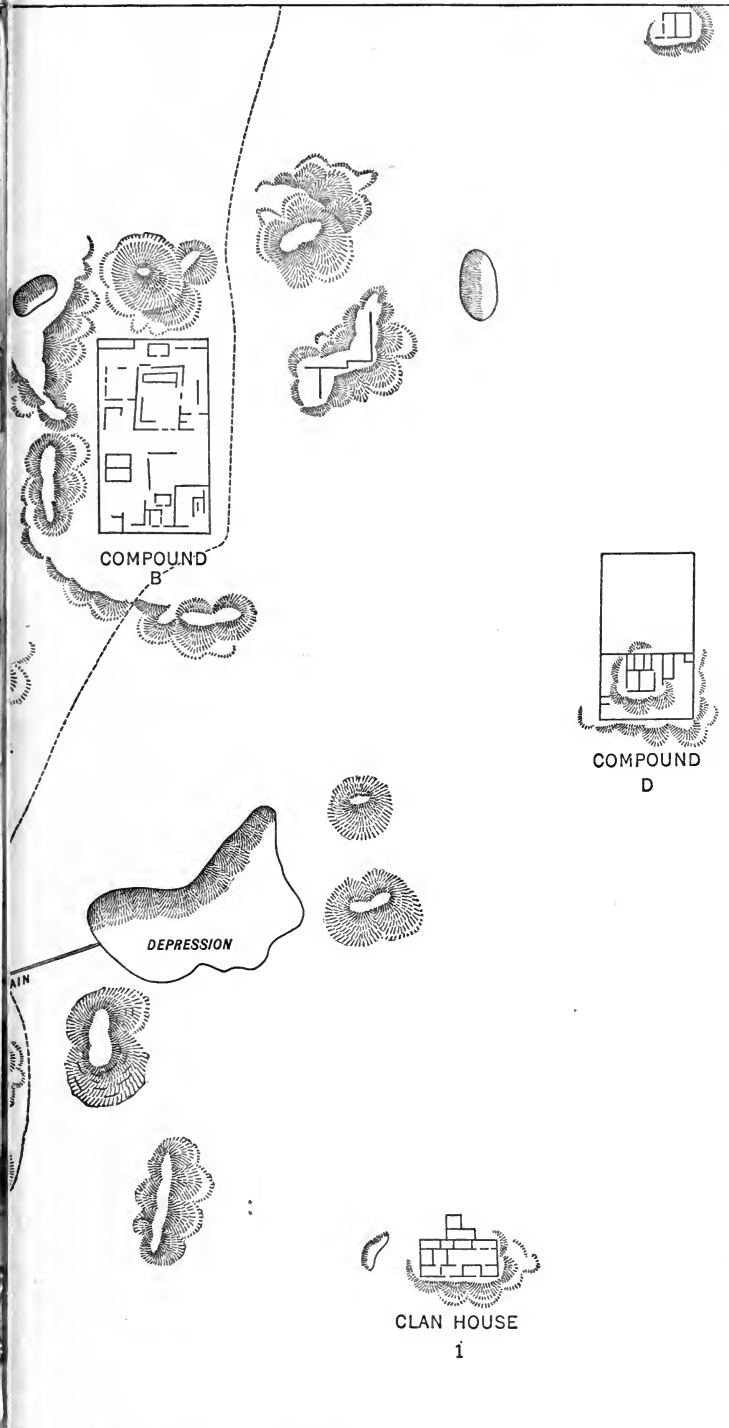
When the excavation of Compound B began no part of the surrounding wall was visible, its existence being indicated only by a slight rise above the level of the surrounding plain. The first work attempted was the determination of the angles or corners of this compound. This work brought to light a massive wall surrounding the whole inclosure. It is evident from the amount of débris that had accumulated on the outside of this wall that it must have been formerly at least 7 feet high. The accumulated earth was removed to a depth of 4 feet, the present average height of the wall. This wall was found to be much higher on the west side than on the east, south, or north, and in order to obtain a level for the drain constructed around the compound to carry away the surplus water, it was necessary to remove débris on the west wall to a depth of at least 9 feet. Below that depth many circular depressions, similar to those used by Pima in mixing mortar for the walls, were found, and it is believed that the former level of the foundation of the compound was reached on that side.

None of the outside walls of Compound B laid bare by excavation were found to be straight and none were exactly perpendicular. The thickness of the surrounding wall varies; in some places it is as much as 5 feet and is, on the average, about $3\frac{1}{2}$ feet. Outside the wall, about 7 feet from the former foundation, was dug a shallow ditch surrounding the whole compound. This ditch was continued into deeper ones extending from the northwest and southwest corners in order to carry all superfluous water from the foundations of the walls into a natural depression some 50 feet from the compound.

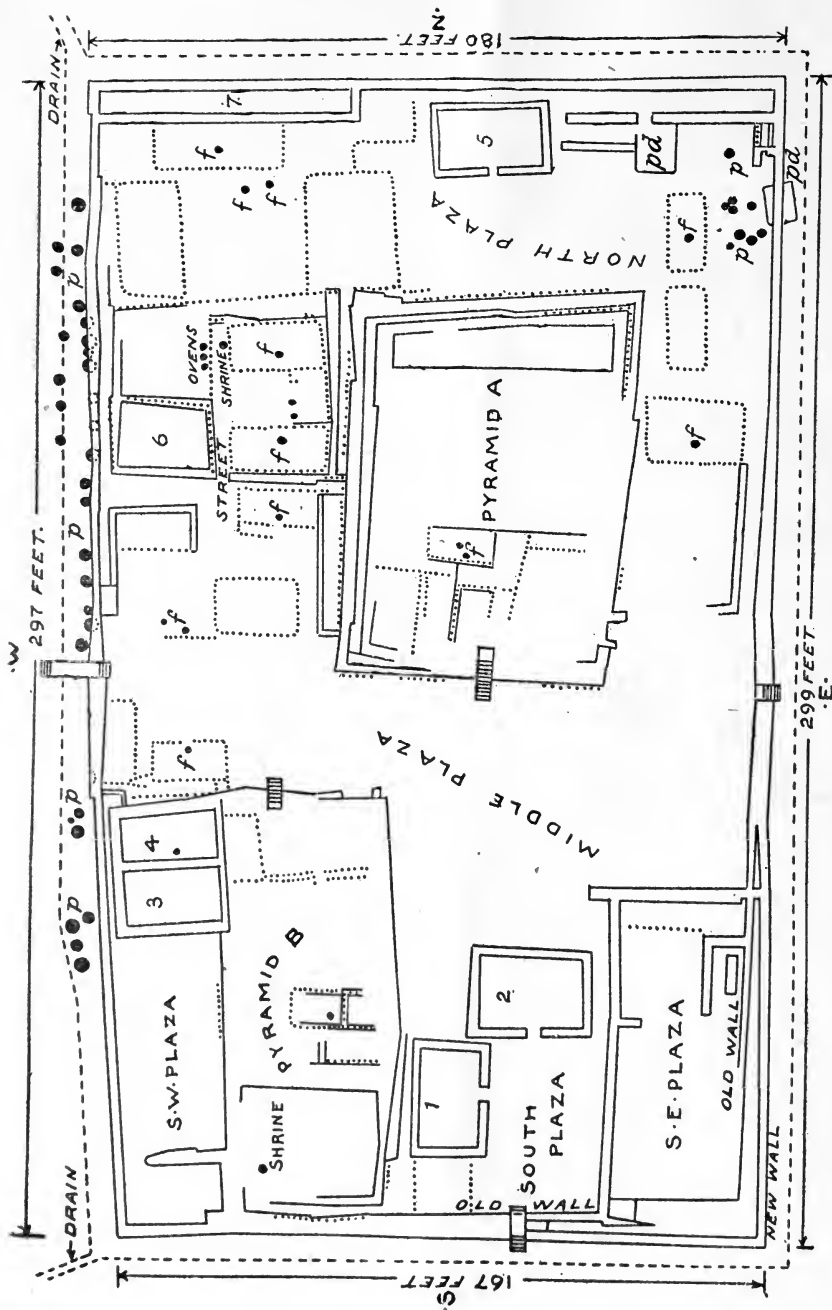
A subterranean room provided with a cemented floor, walls, and fireplace was discovered near the northeast corner, under the foundation of the exterior wall.¹ This was evidently a pit-house inhabited before the massive wall had been constructed and antedating the structures built above it. Traces of similar subterranean rooms are found within the compound near the same corner.

¹The diagonals of none of the rooms at Casa Grande are exactly equal in length.





GRANDE GROUP OF RUINS.



COMPOUND B.

1. Room with plastered wall.
 2. Massive-walled room.
 3. Ceremonial room (entered from roof).
 4. Ceremonial rooms (entered from roof).
 5. Ceremonial room.
 6. Room with massive walls supported by posts.
 7. Race course (?).
- f. Fireplaces.
p. Pits in which mortar was mixed.
pd. Subterranean rooms.

The outside wall of Compound B was constructed, like that of Casa Grande proper, of huge blocks of natural cement, which were made where they now rest, the marks of successive blocks being visible at several points where the union is not perfect. Evidences that this wall had been repaired by ancient builders are seen in many places, and it appears that the form and direction of the original wall have been modified by its enlargement at the southeast corner. Within the inclosure surrounded by the massive exterior wall were found evidences of two kinds of buildings: First, those made of cement blocks, characteristically massive; second, those having fragile walls supported by upright posts. Some of the walls of buildings of the former class still remain upright, but those of the latter have fallen, their positions being indicated only by decayed stumps. To the first type belong also well-plastered floors, in which are present circular depressions that served as fireplaces. If we interpret buildings of the first type as temples used for ceremonial purposes, the fragile-walled buildings may be regarded as habitations of the people comparable with those in which the Pima have lived since known to history.

PYRAMID A.

The two large pyramidal elevations occupying much of the inclosure of Compound B were found on excavation to be remarkable structures, suggesting a style of architecture common in Mexico. It appears that the larger and most northerly of these structures, designated on the map as A, was a pyramid, formerly marked by the presence of two or three terraces, the massive walls of which still rise at one point to a height of more than 10 feet. The top of this pyramid is square and level. A deep excavation made in its north end revealed a long chamber, suggesting the north room of Casa Grande. On the southwest side of this pyramid shallow excavations revealed several cemented floors one below another, and vertical walls indicated by decayed posts which formerly supported them; each of these floors contains a well-made fire pit. The shape of the rooms, as shown by the positions of the stumps, was rectangular; the length was double the width. A doorway, indicated by the absence of upright logs from one side, was just in front of the fireplace, which itself was situated, not in the center of the room, but slightly nearer one side. The existence of these floors or evidences of rooms situated one above the other would seem to indicate that a considerable portion of this pyramid was formed by accumulations of earth resulting from the decay of habitations. The supposition is that this accumulation continued through a long period and that new habitations were built on the débris of those below. Excavations extended in the southwest angle of the pyramid to a level with the outside plazas showed that there were in this mound seven layers of floors, indicating by the above theory seven successive constructions or times of habitation.

PYRAMID B.

Pyramid B, which is situated in the southwest section of Compound B, is separated in part from the west wall of the compound by a plaza 100 feet long by 50 feet wide. The pyramidal form so

well seen in Pyramid A does not appear in Pyramid B, the shape of which is try-square, a mound extending north and south with a western extension. On the top of this mound, as on Pyramid A, were found floors of houses whose upright walls were indicated by decayed posts; below were other floors, resembling those found on top of Pyramid A. There were remains of a shrine at the southwest corner of the top of Pyramid B; in it were found fragments of copper and many strangely formed stones. The north end of Pyramid B, extending toward the west wall of the compound and forming the north wall of the southwest plaza, was occupied by two rooms, the massive walls of which are 8 feet high and average 4 feet thick. The ground plan of these rooms resembles in shape a try-square. Their common west wall is separated from the west wall of the compound by a passageway, through which one formerly could enter the southwest plaza from the central plaza.¹ The walls show no indication of a side entrance, and no proof was obtained that the rooms were roofed. The most logical supposition is that they were entered from the top of the adjacent mound by means of ladders or notched logs. Each of these rooms had a fireplace near the middle of the room, well-plastered floors, and vertical walls; they have no lateral openings for communication with each other.

In one of these rooms was found a mass of caliche about the size of a small keg, which had a cavity in one end, while the opposite extremity was rounded. This object resembled a rude stove or oven,² the cavity being used formerly for storage of fuel. A somewhat similar object was found buried under or near the west wall of Compound C. The other objects found in these rooms are evidently ceremonial and perhaps served somewhat the same purpose as those found in the large rooms of Casa Grande.

In the floor of what appears to have been either a room or a small plaza, on top of Pyramid B at its southwest corner, was found a shallow pit or depression about a foot in diameter, which had a hemispherical cover made of caliche; this cover, which was perforated by two holes, fitted accurately into the depression. The purpose of this pit and cover was not ascertained, nothing being found that afforded any clue to their use.

ROOMS EAST OF PYRAMID B.

The inclosure east of Pyramid B and south of Pyramid A forms a large plaza, in the southern part of which are several buildings of massive proportions. These have been excavated to their floors, which are well preserved. Two of these rooms are especially noteworthy. These were formerly a single story in height and show no evidence of ever having been higher. Although separated by a narrow court or passageway, both rooms open into the same court through well-made doorways, the jambs and thresholds of which are smooth and well preserved. When these rooms were uncovered, it was found that their floors were made of hardened adobe upon which, when first brought to light, could be seen impressions of matting laid upon them when the room was inhabited. This would seem to show

¹ These narrow passageways exist also in Compound A, as between Font's room and the massive-walled structures east of the main building.

² Like the pits the Hopi use in baking their ceremonial pudding (pigume).

that the ancient people of Casa Grande used a kind of sleeping mat similar to that employed by the Pima Indians. The preservation of these impressions for so long a time is certainly remarkable.

The walls of these rooms are covered with several layers of smooth plaster, each very carefully applied. The size and shape of the rooms lead to the belief that they were connected with ceremonial rather than with domestic life. In the open places adjoining these chambers the former existence of rectangular rooms is indicated by rows of holes in which were found decayed fragments of wooden posts that had formerly supported the fragile walls, long since fallen. Where possible, these were carefully replaced by new logs. The number of these habitations could not be determined. Their floors may be traced by the remaining cement, hardened by the tramping of many feet, but no fireplaces were found in these floors or in the walled buildings east of Pyramid B.

SOUTHEAST PLAZA.

In the southeast plaza of Compound B evidences of several rooms were brought to light, although for the greater part their once massive walls were very much broken down. Here were found indications of fragile-walled rooms, their floors situated one above another, separated by a few inches of soil. There had evidently been a change of plan in this quarter which had led to secondary construction, thus modifying more or less the original architecture. The exterior walls of the compound at this point and for about 50 feet north along the east wall are double. Within the inclosure near the southeast angle¹ appeared rows of decayed posts, remains of walls, arranged in quadrangular form, indicating the former existence of several fragile-walled dwellings.

East of Pyramid A, between it and the east wall of the compound, were traced portions of the massive walls of a large building, very much mutilated. To the north of this building are remains of three fine rectangular buildings having well-formed floors, fireplaces, and walls.

NORTH PLAZA.

Due north of Pyramid A, between it and the north wall, from which it is separated by a narrow passage, was found a large building fully 40 feet long; the floor is partially subterranean and the doorway opens to the south. Between this building and the northeast corner of the compound were other massive rooms, the walls of which are destroyed to so great an extent that their ground plan can not satisfactorily be traced. In this region reoccurs evidence of successive strata of floors, suggesting repeated occupancy of the same site by the rebuilding of new houses on the débris formed by the destruction of older ones. Almost all the north side of this compound is occupied by a room 15 feet wide and extending in length about 80 feet eastward from the northwest angle. The use of a room of this shape and size is conjectural. There is no evidence of the former existence in this area of rooms of fragile construction.

¹ It was not possible to trace the rooms by means of the remaining walls in the southeast angle of this inclosure, owing in part to the dilapidated condition of these walls.

WEST AREA.

The west area of the inclosure, or the section north of Pyramid B, was wholly covered with fragile-walled buildings, the remnants of which show that they were built along streets and around courts, which can still readily be traced. Here occur also remnants of thick walls, indicating dwellings of moderate height but without large rooms. It would seem from the arrangement of the rows of holes in which the upright supports of the former walls stood that a street, extending north and south, bisected this section of the compound and that rooms were arranged along both sides. These rooms were rectangular, with a firepot or fireplace in the floor of each at or near the center; the doorways are in the longer side, about midway.

Attention should be called to a room of this row, on the north side of the street about west of the middle pyramid. West of the great Pyramid A was an inclosure in the walls of a house, containing three small stone idols and a number of oddly formed stones, all suggestive of shrine deposits.

When the workmen who had excavated this shrine and removed its contents ceased work, one of the Pima made a symbol called *tcuhuki* ("house of Tcuhu,") on the pile of excavated sand. Although disclaiming any knowledge of connection between this figure and the contents of the shrine, he gave reason to believe there was some meaning not yet discovered. The same symbol was found by Mindeleff on a wall of Casa Grande.

The collection of stones from this shrine is a remarkable one, being equaled only by the contents of certain shrines of the Hopi. Most of these stones had been brought from a distance; they consist of boulders and pebbles from the Gila, twisted and contorted fragments of lava, petrified wood, and objects of sandstone and other rocks, botryoidal in form. There are also pigments of various colors—green copper ore, white kaolin, and black shale, with fragments of red iron oxide.

The general appearance of Compound B after excavation leads to the belief that it contained fewer massive-walled buildings than Compound A, and that the number of more perishable habitations was much larger.

The character of the mounds of Compound B and the evidence of great erosion (greater than in Compound A) they exhibit suggest considerable age, an idea confirmed by the superposed strata of floors and the subterranean walls and "pit rooms" under the boundary walls. Compound B is believed to be much older than Compound A, but whether it was abandoned before the latter was erected is a question which can not be answered. The age of Compound B as compared with that of the other compounds is also hypothetical; few data remain that can be used in such comparisons.

SUBTERRANEAN ROOMS.

Subterranean rooms were found near the northeast corner of Compound B, apparently filling the whole of that section. The best-preserved of these lies directly under the east wall, which passes over it at an angle. It seemed important to protect this room by erecting

a roof over it. The position of the wall, of the floor beneath, and of the fireplace several feet below it and the level of the plain, indicates that these subterranean structures were made before the wall of the compound was constructed.

The presence of subterranean rooms under the walls of Compound B proves that the people of this region lived in pit-dwellings on that site before they constructed the wall. This fact points to a belief that the pit dwelling is the oldest form, and if so search for the kin of the original inhabitants of the Gila-Salt Valleys may be made among those dwelling in similar habitations. Taken in connection with the existence of cremation, this clue serves to direct attention to California tribes, thus adding weight to a legend that the prehistoric peopling of southern Arizona was by migration by way of the mouth of the Gila.

COMPOUND C.

Compound C, situated due west of B, is, on account of its moderate height, the least conspicuous of all the compounds. As there are no mounds within the inclosure it seems never to have had extensive buildings, but to have been merely a rectangular area surrounded by a wall, in which was clustered a large number of fragile-walled rooms that once served for dwellings but are now destroyed. The outside dimensions of the compound are not far from 300 feet long by 40 feet wide, and the surrounding wall in places was 4 feet in thickness and probably breast high. There appears to have been a gateway about midway in the west side, and at the northwest corner was once an opening of considerable size. The shape of the compound is not perfectly rectangular, the whole northern portion having been much more eroded by the elements than the southern end. In the southern section still remain fragments of walls, some of which were a part of buildings of considerable size, possibly of communal nature. Most of the walls of buildings in Compound C were supported by upright posts, the stumps of some of which still remain, notwithstanding the walls themselves have fallen. In the southeast corner rose a small square tower, or lookout, the foundations of which are well preserved, although the portion of the walls above ground is entirely destroyed.

The greater part of Compound C was covered with rows of houses, the floors and fragments of the walls of which, although present in several places, are now very much dilapidated. All the evidence indicates that this compound was of much later construction than Compounds A and B and that it was not inhabited long enough to have temples or specialized rooms for ceremonial purposes.

Not far from the west side of this compound can be traced for a considerable distance the remains of an irrigating ditch, which extends from the Gila to a point west of the Casa Grande Group of ruins. This ditch entered the Gila at a point higher up, about 3 miles from the ruin.

Near this compound, averaging about 20 feet distance from the surrounding walls, is a succession of low mounds resembling the refuse-heaps found in the vicinity of the other compounds. From the numerous fragments of pottery that are found on them, it may be inferred that some of these mounds were perhaps places where pottery was fired; others of circular shape show on their surface

charcoal and wood ashes. These elevations may possibly have been used in some instances for the cremation of human bodies. Excavations in mounds of this kind revealed alternate layers of charcoal and ashes, with drifted sand deposited upon each. From the relatively large number of pottery fragments and stone implements in this mound it appears that the place was formerly inhabited by a large number of persons. The inclosing wall served as a protection for the buildings within it that have long since fallen.

COMPOUND D.

Compound D, which is situated about the same distance east of Compound B as is Compound C in the opposite direction, is rectangular and oriented about north and south, as are other Casa Grande compounds. It was of apparently the same general character as the others, containing a massive building centrally placed, the walls of which have been greatly eroded by the elements.

Within the surrounding wall were also numerous rooms whose fragile walls have fallen, burying their floors two or three feet below the surface. At the periphery of one of the floors a row of holes in which upright posts formerly stood could readily be traced, showing that the room was rectangular in form and had a doorway on one side. The fireplace, a round depression in the floor just in front of the doorway, still contained ashes. The conditions here are similar to those in Compound B. The massive-walled buildings doubtless served as granaries or possibly were devoted to religious purposes; the fragile-walled structures were the dwellings of the people. The eroded appearance of this compound suggests great age, stamping it as one of the oldest of the Casa Grande Group.

In the character of the masonry the massive-walled buildings of Compound D closely resemble those elsewhere described. They are not as high as the corresponding structures of Compounds A and B, having been greatly weathered. The surrounding wall was low, in no place above the surface of the ground, and its course could not be traced by excavation. The central building was apparently connected by a wall with one side of the wall of the compound.

On the plastering of one of these buildings are black impressions of human hands. The rooms were excavated to their floors, but no objects of importance were found.

COMPOUNDS E AND F.

Remnants of large walls identified as boundaries of several other compounds were traced at various places in the reservation, the most conspicuous being those of Compounds E and F, which could be followed for a considerable distance west of Compound A. These inclose low white mounds, sparsely covered with mesquite and other growth, which seem to contain the remains of massive buildings, the walls of which have fallen or have been worn down by rains to a level with the plain. In this vicinity there are numerous other low mounds without walls which bear outward resemblance to refuse piles.

No excavations were made in these mounds, although there is evidence that some of them would repay examination. The presence of

fragments of pottery and broken stone objects, apparently worked by hand, suggests sites of many former habitations.

CLAN-HOUSE 1.

In addition to the compounds, or structures inclosed by a common wall, there is a type of thick-walled buildings at Casa Grande from which this wall is absent or at least has not yet been discovered. The best example of this type is the so-called Clan-House 1.

Clan-house 1 is 740 feet due east of Compound A. The group of rooms brought to light by excavation possibly belonged to a large compound the boundary walls of which had been practically buried or totally destroyed. When work on Clan-house 1 began, two ash-colored, treeless mounds, rising a few feet above the level of the plain, were all that was visible, the space between the mounds being covered with scattered trees, bushes, and cacti.

Clan-house 1 has 11 rooms inclosing a plaza, its outside measurements, exclusive of the annex, being 113 feet long and 49 feet wide. The longer walls extend east and west, instead of north and south as in the compounds. In addition to the 11 rooms which form the main portion of the structures excavated, there are three low-walled rooms on the east side, which we may call the annex; one of the main purposes of this structure was to contain the grave of the former chief, possibly the owner of the whole building. From various circumstances it is believed that the walls of this annex were built later than the remainder. The walls of clan house 1 are massive, averaging 4 feet in thickness; the altitude of the highest is 10 feet. As shown in broken sections, these walls were supported in part by upright logs, but were constructed of huge cubes of rammed natural cement, in the same way as the walls of Casa Grande. The arrangement of the 11 rooms composing Clan-house 1 is as follows: On both the north and south sides there is a row of rooms the breadth of which is about uniform, while the length varies; the room at the east end of each series is the largest. There are five rooms in the series on the north and four in the series on the south. To the west of the plaza, between these rooms and connecting them on this end, are two rooms, which have the highest walls and were apparently the most important rooms in Clan-house 1. These rooms occupy about half of the space between the north and south series of rooms, the remaining area consisting of a plaza, or open space, having an entrance from the room on the west side. The several rooms in the series on the north side do not communicate, nor have they external passageways except in two instances; also, room in the southwest corner communicates with a large room at the west end of the plaza. In the middle of the centrally placed of the 11 rooms above mentioned was found a seat facing the south, made of a great block of natural cement.

It is suggested that Clan-house 1 was a structure similar to Casa Grande proper and pertained to the worship of the six primary points—north, west, south, east, above, and below. It is an interesting fact that the number of rooms in Clan-house 1, excepting the annex, is exactly the same as in Casa Grande. In the former, however, the 11 rooms are one story in height, whereas in Casa Grande there were five rooms in each of two lower stories and one room in a third.

Perhaps the most remarkable of the several rooms in Clan-house 1 are the two massive-walled inclosures on the north side, which have been designated "the annex." One of these seems to have been merely an open space surrounded by thick walls formerly higher than at present. In this inclosure were found the remains of a walled-up cyst of natural cement, one side of which was built continuous with the south wall; the other sides of this cyst, visible from the room, were decorated with figures of birds and other animals, painted red.

In the interior of this cyst, or rude sarcophagus was found a human skeleton extended at full length with the head directed to the east; near the head was a receptacle for mortuary offerings. From the nature of the objects associated with this skeleton and the special receptacle apparently made for them, it is supposed that the remains were those of an old priest, possibly of a chief, who once occupied these rooms. The mortuary objects appear to be priestly paraphernalia, similar to those now used in ceremonies by priests of the Pueblo Indians. All the facts gathered show that this burial chamber was built after the main building was constructed, but its age, as compared with that of the other compounds, is unknown. In the sand outside the walls were found one or two clay vessels containing burnt human bones, covered with clay disks, which are supposed to be the partially cremated remains of inhabitants of this building. The two methods of disposal of the dead—inhumation and cremation—were practised in all the compounds of Casa Grande.¹

It is sometimes stated that the priests of the Gila compounds were always buried in houses while the less-favored classes were cremated, their calcined bones being deposited in cinerary urns or vases that later were buried on the borders of the mounds where they had been committed to the flames. While not able to prove or disprove this theory, it is believed that the grave of the chief of Clan-house 1 has an important bearing on this question. Here, as stated, a man was found buried with care in a rude sarcophagus evidently constructed for the purpose. A human skeleton was also excavated from the plaza west of the northeast building of the same compound, at the point marked "skeleton" in the ground plan of that compound.

REFUSE HEAPS.

The large structures, especially compounds A, B, and C, are surrounded by refuse heaps, the surfaces of which are strewn in some cases sparingly, in others plentifully, with fragments of pottery and with ashes and other evidences of human occupancy. No remains of house walls were found in these mounds, and their structure shows that they may be regarded as dumping places for the habitations in the vicinity. Some of these heaps were thrown up from neighboring depressions, or reservoirs, and their stratification indicates that layers of earth were deposited on them at different times. A vertical section exhibits beds of ashes and other refuse alternating with sand and soil, showing how the mounds increased in size.²

¹At the present day the Pima bury their dead, and the graves of the shamans are different from those of other people. The custom of burning the dead does not now exist among these people.

²One of the largest of these refuse heaps lies between Compound A and Clan-house 1, nearer the former. This mound, which extends about parallel with the east wall of Compound A, contains many fragments of pottery.

Distinct from these are the small mounds or elevations, rising a foot or two above the plain, that likewise mark man's presence. These mounds indicate the former existence of dwellings in the open, and it is reasonable to suppose that outside the compounds, especially along the irrigation ditches, there were isolated dwellings somewhat resembling the modern Pima houses. While these may have been shelters used by farmers only while planting or watching their crops, they show that the country around the compounds had its quota of inhabitants. Within and near the compounds these houses may have been very numerous, so closely arranged as to give the appearance of a village, in the middle of which rose the great communal structure that served as a place of refuge in great emergencies or for ceremonies when desired.

A mound situated a short distance east of Compound B was excavated to the depth of 9 feet. Trenches were dug across it at right angles, bisecting the mound east and west, north and south. This mound was found to contain fragments of pottery, sticks, charcoal, and other refuse; also the remains of several skeletons, extended at length, the skulls of one or two being in fairly good condition. It thus appears that the inhabitants of Casa Grande buried some of their dead in mounds and others in the floors of houses and plazas.

RESERVOIRS.

It has been already mentioned that, scattered over the area occupied by the Casa Grande Group of ruins, there are several depressions into which drains from the compounds have been run. The largest and deepest of these is found northeast of Compound B. These depressions, which have no masonry walls, appear to be the places from which was obtained the caliche of which the buildings are made. One or two of the depressions are so situated with respect to the largest buildings that the adobe of which the houses were built may have been carried at times a considerable distance.

Similar areas inclosed by artificial circular ridges of earth are found in several of the clusters of mounds in the Gila and Salt River Valleys, among which may be mentioned the one in the group near Adamsville and the reservoir at Casa Blanca. The Escalaute Group, situated near the Phoenix-Florence Railroad, also contains a similar reservoir. In the country south of the Southern Pacific Railroad, inhabited by a group of Indians of Piman stock called the Quahatika (Kwahadt), similarly shaped depressions are recorded, some of which are still used as reservoirs at certain seasons. This is likewise true of so-called Indian tanks (Pima, *vashki*), to the east of Casa Grande, near the Santa Catalina Mountains, and elsewhere.

Certain areas marked by no mounds or depressions may have served as race courses or dance places, the existence of which is mentioned in legendary accounts of Casa Grande.

On the southwest side of the large reservoir is a depression from which were obtained the sand and earth out of which walls were made, and a similar depression on the east side may have been due to a similar cause. There are depressions in the surface near Clan-house 1 and Compound D, and those near the western clan-houses¹ served the same purpose.

¹ There are mounds west of Compound A, which are here referred to as "western clan-houses," but these were not excavated, although traces of caliche walls were found in them. Potsherds were abundant.

From remains of ancient irrigating ditches in the neighborhood of the several compounds it is evident that water from the Gila River was conducted over the plain west of Casa Grande. Here and there, especially near the large mounds, occur numerous depressions in the earth's surface, some of which are possibly reservoirs, or places where the water was stored for irrigation, drinking, and other purposes. Most of these depressions are surrounded by a ridge of earth, by which their capacity was increased and the chance of overflow diminished. Their prevailing shape is oval. The indications are that they have been filled to a considerable extent with drifting sand since Casa Grande was deserted.¹ The largest is situated about midway of a line extending from the northwest corner of Compound A to the southeast corner of Compound C. It was supposed that this reservoir was lined with a cement wall, but a section exposed through the rim on the south side, which was solid sand throughout, revealed no such condition. It is interesting to note that the floor of this reservoir is now thickly overgrown with trees and bushes, although without water.

At one end of this reservoir may still be seen a trail along which the women toiled with water jars from their dwellings near by. The shapes of the water jars and certain headrests that have been found indicate that the vessels were carried on the head, as at Zuñi, rather than on the back as at the Hopi pueblos. There is strong evidence that the people of Casa Grande were well supplied with water by means of reservoirs and irrigation ditches. This need was not so pressing as in northern Arizona. It does not appear from symbolism on the pottery or from other evidences, which it must be confessed are scanty, that rain ceremonies occupied the prominent place in the worship of the inhabitants that they do among the present Pueblos. The people depended for water less on rain than on the Gila; the river was typified by the plumed serpent, which was worshipped.

There are indications of small mounds in the neighborhood of these reservoirs, a fact from which it would seem that every reservoir had a cluster of habitations around it and that houses were built along the courses of the irrigation ditches. Nothing now remains to mark these houses except the mounds upon which are found fragments of pottery and broken stone implements, including now and then a well-worn metate. Excavation of one of these mounds revealed a hardened floor surrounded by holes in which are found decayed stumps of the posts that formerly supported the walls. The resemblance of these houses to those now built by the Pima and Papago Indians is striking. They resemble also the remains of rooms of the ancient people in the various compounds of Casa Grande.

IRRIGATION DITCHES.

The evidences of prehistoric irrigation in the neighborhood of Casa Grande are many, but it is difficult to trace any ditch very far. The main canal which supplied the fields with water extended along the left bank of the river, from a point 3 miles higher up; this was probably provided with lateral ditches along its entire length. It

¹ Many of the casas grandes in the Gila-Salt region have similar reservoirs, or circular depressions with raised rims. Cushing's excavation of one of these depressions convinced him that it was not a reservoir, but a ceremonial chamber.

approached Casa Grande about midway between Compound B and the river, on the north side of the compound, and, extending westward, turned to the south, sending off smaller branches toward the east and west. Although the main ditch can not be traced throughout its entire course, traces of it appear at intervals; in some places it is clearly marked by walls of earth containing small stones similar to those found in stretches of its bed nearer the river. In places the canal is 20 feet wide, adequate for carrying a great amount of water.

The construction of the Casa Grande ditch was not difficult, as the earth is not hard to dig and no considerable elevation was encountered throughout its entire course. The canal divided probably shortly after it left the river, sending a branch that runs east of clan house 1 to supply the fields on the east side of the compounds. From the point of bifurcation the remains of a smaller canal can be traced for some distance.

As above stated, there is evidence that buildings once stood on the banks of these ditches, where their former presence is now indicated by low mounds on which are scattered fragments of pottery and a few broken stone implements (metates, or grinders). Irrigation ditches are more apparent elsewhere in the Gila and Salt River Valleys than at Casa Grande. The settlement near Poston Butte was supplied with water by one of the best-preserved of these ancient ditches in the Gila-Salt Valley. This follows the right bank of the Gila from a point several miles higher up the river and extends to the neighborhood of the Escalante ruin, where it is lost in laterals or minor branches. Near Poston Butte, the southern side of which it skirts, the banks of this prehistoric ditch are head high and can be traced for many hundred feet without difficulty. An old Mexican who lives in Florence stated that when a boy he saw stumps of old logs in this ditch at the point where the banks are highest; he believes these were remains of a prehistoric head gate.

In the following quotation H. C. Hodge refers to a prehistoric irrigation ditch on the north side of the Gila near Poston Butte:¹

About 2 miles west of Florence, on the north side of the river, between the homes of Mr. Stiles and Mr. Long, is a stretch of hard, stony land, through which another of the large irrigating canals was cut, and where, for several hundred yards, one can ride on horseback in the canal, which is yet so deep one can not look over its banks on either side when sitting on his horse.

Some of the best irrigating ditches in the Gila-Salt Valley were found near Phoenix and Mesa when the country was first entered by Americans. That near Mesa was utilized by the Mormon farmers who settled this region; others have been filled or destroyed by modern agriculture. The lines of many of the new ditches follow substantially the lines of the prehistoric canals, showing the skill of the primitive farmers. The irrigation ditches in the neighborhood of Phoenix have been traced and mapped by Mr. H. R. Patrick.² These can now be traced only at intervals, and in many instances nothing remains but ridges of earth or rows of stones.

It appears from Mr. F. H. Cushing's studies of the irrigation ditches³ near the ruins of Los Muertos, in the Salt River Valley, that

¹ Arizona As It Is; or, The Coming Country, p. 182, Boston, 1877.

² The Ancient Canal Systems and Pueblos of the Salt River Valley, Arizona, Phoenix, Ariz., 1903.

³ See F. W. Hodge, in American Anthropologist, VI, 323, Washington, 1893.

some parts of these were well preserved. The main ditches were large enough for irrigation when full of water and doubtless were used for that purpose. Not far from Blackwater is a hill, surrounded by a prehistoric ditch above the level of the plain, around which the ditch was dug to avoid a too rapid descent.

The testimony of the old men consulted supports the theory that the ancient irrigation ditches were dug by means of wooden shovels similar to those mentioned and figured later in this report, the earth probably being carried to a distance by the women and children. The present Pima say that they now organize to construct irrigation ditches in a way somewhat similar to that of the ancients. As all clans enjoy the advantage of the water thus obtained, every clan has its representatives in constructing the canals, and failure to work involves loss of water right, although a clan may be represented by members of other clans. The amount of labor necessary in the construction of new ditches is settled in council, in which all clans interested take part.

The construction by the ancients of the great irrigation ditches led to greater cooperation of labor in the Gila-Salt Valley than anywhere else in the prehistoric Southwest. This union of many men under a chief, with equal representation in council, led to an advanced social organization and culture, a degree of culture which would not have been realized so soon under less favorable conditions. This cooperation and resultant organization made possible also the building of the great compounds and the massive structures they inclosed.

Excavation of one of the banks of an irrigation ditch near Casa Grande shows successive layers of soil and small stones, indicating repeated clearing out of the canal. The layers of stone may have been necessary to prevent the earth washing into the channels. These were also continually filling up with mud and detritus from the river, the amount of which was considerable when the Gila was swollen. The head gates were probably made of posts and brush, not unlike the gates constructed at the present day by the Pima and the Maricopa.

Closely connected with the irrigation ditches are the reservoirs (*vashki*), of which there are one or more near every large group of compounds in the Gila-Salt Basin. These reservoirs are shallow depressions in which rain water collects, but were not always connected with the irrigation ditches. Drinking water was probably obtained from these and other receptacles.

METHODS OF DISPOSAL OF THE DEAD.

Considering the large population that must have lived at Casa Grande, it is strange that so few human skeletons have been found. There is evidence of two kinds of burial, inhumation in houses and mounds, and cremation, an instance of which was discovered not far from the north wall of Compound B.¹

Whether or not this difference in the manner of disposal of the dead was due to the rank of the deceased is not clearly evident, but

¹ It would appear that a people who burned their dead did not believe in a resurrection of the body, and the same may be true of those who buried their dead. The placing of offerings in the grave indicates faith in the continuation of life, but does not prove, of course, belief in immortality. The practice of burning the dead, which was widespread in the Southwest in prehistoric times, was abandoned when the teachings of the missionaries were followed.

the nature of the objects buried with a skeleton in Clan-house 1 would seem to indicate the grave of a priest. Skeletons unaccompanied by mortuary objects were found in the plazas of Compound A and in rooms of the southwest angle, but whether these are ancient or modern is not positively known.

The absence, so far as known, of evidences of cremation from the cemeteries of the Little Colorado region, including those of Zuñi, and of Sikyatki, Awatobi, and other Hopi ruins, has been used as an argument against associating the former inhabitants of these pueblos with the Hohokam of the Gila-Salt Basin. Moreover, the Pima do not burn their dead, nor have they done so in historic times. It may be said in reply to this objection that the Hohokam inhumated as well as cremated, thus furnishing a double precedent for their descendants. Moreover, there is good evidence that cremation was practiced in the eastern and northern Pueblo region, at Mesa Verde for instance. According to Castañeda, the Cibolans¹ burned their dead.

The human bodies buried in the earth of Casa Grande were laid at full length, no remains of an inhumated body in a flexed position having been found. It is usual to find in pueblos and cliff dwellings² skeletons buried in both ways. The manner of interment may have had in some cases an esoteric meaning, but in most instances it had no special significance.

Several theories have been suggested to account for burial in the contracted position. It has been asserted by some authorities that the corpse was so disposed to represent the embryonic position. According to a second theory the body was deposited in the squatting position as suggestive of a state of rest.

¹ Cibola is identified by the best authorities as ancient Zuñi, but no evidence of cremation has yet been found in Zuñi ruins.

² A cliff dwelling is practically a pueblo built in a cave, and what is true of one probably holds true for the other, with slight modification.







