

Of the results recorded by Doctor Fewkes in his two papers concerning the archaeology of this district, some of the more interesting, together with our comments on certain of them, are the following:

a. — A first-hand knowledge—partial at least—of the type of village to which the Spley and Buena Vista ruins belong.

From his descriptions it appears that these ruins are like those of the Rio Nimbres in New Mexico in consisting of scattered houses without court-wall connections or circumsvallation, and unlike them in having a large citadel-like building as the central or leading village feature; and that in the latter respect—although not in form of the

Footnote "The Gila Valley ruins are characterized by a large centrally placed house, or fortress, and clustered about it many dwelling houses, unconnected with each other, apparently habitations of clans." (Fewkes, Smithsonian Report for 1897, p. 617.)

large building, as found at Buena Vista—they are like the Casa Grande and other large ruins on the lower Gila and Salado rivers. The large building at Buena Vista is likened by Doctor Fewkes to ruins north of the White Mountains, and in the two accounts of his 1887 field work he specifically mentions in this connection the ruin "at Chaves Pass" and "the rectangular ruin at Pinedale."

Footnote "XRep. cit., p. 615; and Bu. Am. Eth. Ann. XXII, p. 173. ~~As our writer it seems that, in form and plan, it should be compared especially with the round built pueblos of Tundastuga, Pinedale,~~

Footnote ~~"The ruins at these two places include both round and rectangular built pueblos, circular, elder, coneado, and other prehistoric round-built and polygonal built pueblos of the Rio Gila or Gila region, comprised chiefly within the southeastern portion of the Gila Mountains."~~

b. — The confirmation of the statements of Emory and Johnston, that upright timbers had been used in the construction of the walls of the houses of the Pueblo Viejo Valley; and the discovery that such timbers were also a part of the earth-wall structure of at least one ancient pueblo on ~~eastern~~ sources of the Little Colorado.

This feature is seen also in the houses of the lower Gila and Salado, ~~and in more~~ or less recent ones. ~~of Piman tribes in Sonora. (For the latter named, see Baudelien's Final Report.)~~

c. — The finding that the pottery of these ruins is "identical with that from lower down the Gila River at Phoenix and Tempe," in texture, color, and decorative design; this design being chiefly of simple geometrical patterns.

d. -- The discovery that the inhabitants of the Pueblo Viejo Valley commonly cremated their dead, burying the ashes in cinerary urns; while they also practiced--apparently for certain classes--~~interment~~ *interment within houses.*

e. -- Evidence that, besides practicing lowland agriculture by irrigation with water taken from the Gila River by canals, as ^{discovered} ~~discovered~~ by Captain Box before the Pueblo Viejo Valley ~~was settled~~ was settled.*

The courses of these old canals, according to information had by Doctor Fewkes in 1897 from an old settler of Solomonsville, are followed in part by the modern Montezuma and San José canals.

The remains of great canals and lateral ditches on the lower Salt and Gila rivers indicates, as Hough has remarked, that in no other part of America was irrigation anciently practiced on so large a scale as in the Gila-Salado Basin. Says Cushing, in his Preliminary Report (page 168), "These canals in the Salado and Gila valleys were found to vary in length from ten to eighty miles, and in width from ten to eighty ~~feet~~ feet, with a depth from three to twelve feet. Each canal, whether large or small, was found on excavation to have been terraced, i.e. the banks of dirt thrown out in its excavation had formed, as it were, a greater canal containing a lesser, which in turn contained yet another." Bandelier (Final Report, II, 436-7) describes one which he investigated a few miles west of Tempe, as having a channel-width of 15 feet, "its length, as far as I could ascertain, about twenty miles. The borders where I saw it are slightly raised, and the whole shows nothing marvelous."

~~See also Hodge, "Prehistoric Irrigation in Arizona", Volume VI, July, 1893.~~

On page 437, he says, "There is said to be a long and wide ditch near Tempe, part of which is reported to be cut through solid rock, but I have not seen it, and I have so often been told of similar marvels, which upon inspection dwindled down to quite modest proportions, that until it is proved by careful investigation that the cut is really ~~not~~ artificial, and not merely a natural one artificially widened in places, I must take such statements with a great deal of reserve."

In an article on "Prehistoric Irrigation in Arizona" (in the American Anthropologist of July, 1893), Mr. F.W.Hodge, who was a member of the Hemenway Archeological Expedition, 1887-'88, under Cushing, has given some interesting data concerning the ancient irrigating canals of the Gila-Salado Valley. "Along the course of one of the principal supply canals of the ancient Pueblo de Los Muertos, near one of the thirty-six large communal structures which formed this now ruined city," and which was excavated "for a distance of about thirty feet," the "depth of the bed beneath the original banks was found to be about seven feet.....The bed of the canal was about four feet wide, but the sides broadened in their ascent to within about four feet of the bank, where a 'bench' three feet ~~wide~~ in width on each side of the canal had been made. From these benches the banks continued broadening until they reached the brinks, which were about thirty feet wide. Thus a main ditch consisted, so to speak, of one water-course within another; so that if at any time a small current of water only could be supplied at the headgate, owing, perhaps, to drouth, the lower and narrower ditch was doubtless always filled sufficiently to supply the towns beyond, while during the rainy season the upper

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and much broader portion of the great canal would readily accommodate all surplus waters.

"The bottom and sides of" this ditch, "as well as those of a branch of it excavated to the southwest of the ruined-house cluster alluded to, were found to be exceedingly hard, evidently having been tamped while moist, and then, perhaps, roughly plastered with adobe clay." (L.C., pages 324-325.) Mr. Hodge believes that the extreme hardness of the ditch lining was produced by burning upon its newly plastered surface the dense underbrush cut in clearing the way. Very little silt was found in the beds of these ditches.

"A few rods south of the canal excavation referred to, the canal was observed, from the course of the chipping stones and concretions or 'water-tamers' along its banks, to decrease in width and branch off into two canals, each at an angle of about 45° from the trunk acequia. Excavation at this point showed a number of post-holes on the outer banks of the two branches, as well as at the angle formed by their juncture, attesting the former existence of a headgate for cutting off or supplying at pleasure the farm lands and house groups to the southward." (Ibid., page 325.)

Both the ruined pueblos and the irrigating ditches of the Gila, were found to be larger than those of the Salado.

"In tracing the routes once pursued by many of the canals, great depressions—the sites of ancient reservoirs—are observable. The remains of one of these reservoirs, nearly a mile long by about half a mile wide, occur on the open plain at the terminus of one of the main canals that formed the source of water-supply of Los Muertos, and about three miles southwest therefrom." This "storage basin of surplus waters from the Los Muertos irrigating system," it was thought, may have been in part a natural depression, which was artificially deepened.

"Every cluster of communal structures in Los Muertos was supplied with a reservoir on a smaller scale than the one just mentioned, a single canal forming both its inlet and outlet. Sometimes a lesser communal dwelling shared with a neighboring structure in the water supply from a single storage basin." By trenching, the largest reservoir within the limits of Los Muertos was found to have had a depth of 15 feet. "This artificial basin was elliptical, measured about 200 feet in length by fully 100 feet in width, and, like the canals, had apparently been tamped and burned. The bed and sides...were covered by a thick stratum of silt." (Ibid., page 329.)

In tracing the old canals, it was found that in open country the original line of depression had been ~~marked~~ by drifting sands, but could be better seen in places protected by the dense mesquite forests. Where effaced, they could often be traced by lines of stones. "These stones were the implements once used, broken and cast aside upon the banks, as well as concretions grotesquely eroded by the river stream and deposited by the natives along the banks as 'tamers of the waters.' Similar concretions, or huacas, according to the description by Mr. Cushing in his article on 'Zufi Breadstuffs,' are placed by the Zufis along the courses of hill-streams near their main pueblo and along the ditches of Pescado and Ojo Caliente, in order, presumably, to direct the waters of the rainy season from the hillsides to the thirsty fields, and to prevent the overflow of their acequias. It is interesting to note that in no instance were these concretions found to have been used as implements, although many of them are admirably adapted to such purposes; a fact further attesting their sacred character." (Ibid., page 324.)

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they had, upon the slopes and summits of the gravel benches, ~~besides the cobbles bounded~~ terraced gardens, like those (partly still in use) of the Hopis and Zuffis.*

*Ancient examples of terraced gardens are found in many parts of the Southwest; from Sonora, Mexico ^{Mesa Verde (Wooden Field) and the region of} ~~to~~ ^{to} ~~the~~ ^{the} ~~face~~ ^{face}, on the northern border of the pueblo area. ^{Contour lines marked by} ~~foundations~~ ^{foundations} ~~stones of~~ ^{stones of} ~~former~~ ^{former} inclosing walls, usually ~~remain~~ ^{remain} ~~to indicate their size and shape.~~ ^{to indicate their size and shape.}

The terraced gardens of two of the Hopi pueblos are described as follows by Lieutenant J. C. Ives, as seen by him in the spring of 1858: "As the sun went down, and the confused glare and mirage disappeared, I discovered with a spy-glass two of the Moquistowns, eight or ten miles distant, upon the summit of a high bluff overhanging the opposite side of the valley. They were built close to the edge of the precipice, The outlines of the closely packed structures looked in the distance like the towers and battlements of a castle, and their commanding position enhanced the picturesque effect. The face of the bluff, upon the summit of which the town was perched, was cut up and irregular. We were led through a passage that wound among some low hillocks of sand and rock that extended half-way to the top. It did not seem possible, while ascending through the sand-hills, that a spring could be found in such a dry looking place, but presently a crowd was seen collected upon a mound before a small plateau, in the centre of which was a circular reservoir, ~~with~~ ^{with} fifty feet in diameter, lined with masonry, and filled with pure cold water. The basin was fed from a pipe connecting with some source of supply upon the summit of the mesa. Continuing to ascend we came to another reservoir, smaller but of more elaborate construction and finish. From this, the guide said, they got their drinking water, the other reservoir being intended for animals. Between the two, the face of the bluff had been ingeniously converted into terraces. These were faced with neat masonry, and contained gardens, each surrounded with a raised edge so as to retain water upon the surface. Pipes from the reservoirs permitted them at any time to be irrigated. Peach trees were growing upon the terraces and in the hollows below. Oraybe came in sight; it was larger than the other pueblos. an Indian. led the way to the east of the bluff on which Oraybe stands. to an angle formed by two faces of the precipice. At the foot was a reservoir, and a broad road winding up the steep ascent. On either side the bluffs were cut into terraces, and laid out into gardens similar to those seen at Mooshahneh, and, like them, irrigated from an upper reservoir. The whole reflected great credit upon Moqui ingenuity and skill in the department of engineering. The walls of the terraces and reservoirs were of partially dressed stone, well and strongly built, and the irrigating pipes conveniently arranged. The little gardens were neatly laid out. Two or three men and as many women were working in them as we passed. The top of the mesa on which we had been encamped proved to be very narrow, and before we had travelled a mile we came to its northern edge, where there were the usual precipice and foot-hills forming the descent to a broad valley. Here, also, the bluffs had been formed into terraced gardens and reservoirs." (Report upon the Colorado River of the West, pp. 119-125.)

In the Eighth Annual Report of the Bureau of Ethnology, Mr. Victor

Footnote (beginning of)

[Mooshahneh, i.e. Mishongvovi]

(Continued on 72.)

come in adobe

and coarsely plastered with mud

Mindelleff has described small terraced gardens which he observed, apparently in 1881, on the southwestern and southeastern borders of Zuñi. They were near the river bank, and averaged about 10 feet square. They were inclosed by low, rude walls "of very light construction, . . . built of small, irregularly rounded lumps of adobe formed by hand." These walls were "2 1/2 or 3 feet high," their "average thickness not exceeding 6 or 8 inches," and they "required frequent repairs." These gardens were "used for the cultivation of red peppers, beans, etc., which, during the dry season, are watered by hand." Mr. Mindelleff farther observes: "These inclosures, situated close to the dwellings, suggest a probable explanation for similar inclosures found in many of the ruins in the southern and eastern portions of the ancient pueblo region. Mr. Bandelier was informed by the Pimas (Fifth Ann. Rept. Arch. Inst. Am., p. 92) that these inclosures were ancient gardens. He concluded that since acequias were frequent in the immediate vicinity, these gardens must have been used as reserves in case of war, when the larger fields were not available; but the manner of their occurrence in Zuñi suggests rather that they were intended for cultivation of special crops, such as pepper, beans, cotton, and perhaps also of a variety of tobacco — corn, walnuts, squashes, etc., being cultivated elsewhere in larger tracts. There is a large group of gardens on the bank of the stream at the southeastern corner of Zuñi, and here there are slight indications of terracing. A second group on the steeper slope at the southwestern corner is distinctly terraced. Small walled gardens of the same type as these Zuñi examples occur in the vicinity of some of the Tusayan villages on the middle mesa. They are located near the springs or water pockets, apparently to facilitate watering by hand." (L. c., pp. 146 and 216-217.)

Evidences of southern influence, ^{and at the same time of northern relationship, as} ~~imported from~~ ^{afforded} by "an effigy vase found near San José . . . , recalling a kind of pottery common in the northern Mexican states"; and by a human effigy vase, from a ^{sacrificial} ~~ceremonial~~ cave in the Nantacks north of the Pueblo Viejo, so closely like those from Casas Grandes, ^{The} ~~Mexico~~ ^{of Chihuahua,} and from Central America, "that the vase might readily be mistaken for an illustration of a type from northern Mexico or even Central America;"* an ^{especi-}

Footnote

*For ~~illustrations~~ figures of these vases, see pages 189 and 191 and 189 of the report cited; ^{for the Nantack vase, see} also American Anthropologist, Vol. XI, Pl. III.

ally interesting feature ^{also} of this vase ~~was~~ being that it has the same markings on the cheeks (to wit, a few short parallel lines painted with white pigment and extending downward from the lower eyelid) as may be seen on one of the Zuñi dolls in the "Pottery Court" of the

United States National Museum, labeled "Zuñi Heheh katcina."* This

Footnote

*In a footnote Doctor Fewkes explains that "Heheh katcina is a Hopi name, and the doll representing this person at Walpi has not the same markings on the face as the above. The Hopi variant has parallel zigzag lines above both eyes and on the cheeks. The name given above is that by which the Zuñi doll is known to the Hopis."

effigy vase therefore has a dual relation,—namely, to cultures both south and north of the Gila Basin.

In his "Preliminary Account of Archaeological Field Work in Arizona in 1897," published in the Smithsonian Report for that year, Doctor Fewkes says (page 619), "My attention was called soon after my arrival in Solomonville to a small head made of clay, which reminded me of certain similar objects from Old Mexico. As in all excavations on the Little Colorado I had never found more than the rudest imitation of a human head in clay, I was startled by the discovery of objects of this kind so well made and so Mexican in appearance. A report of a similar head on a dipper handle from the Beebe ruin, near Safford, was confirmatory of my suspicions, but later, in the excavations at Buena Vista, a well-made figure of a human face and head was taken from a small mound of ashes and other debris." In his "Two Summers' Work in Pueblo Ruins" (page 192), he says of the Buena Vista figure, "It was evidently a handle of a dipper or saucer, and was well made and well proportioned."

~~As the above, it may be seen that~~ In 1879, Professor F. W. Putnam described a quadruped effigy vase from the Rio Gila in New Mexico, which he regarded as probably belonging to about the same period as a color-decorated mug (described in the same chapter) ~~found by Mr. Francis Klett in 1873 at the ruins of Pueblo Viejo on the Rio Gila.~~ ^{found by Mr. Francis Klett in 1873 at the ruins of Pueblo Viejo on the Rio Gila.}**

Footnote

**See Report of the United States Geographical Surveys West of the 100th Meridian, in charge of First Lieut. Geo. M. Wheeler, Vol. VII, pp. 382 and 383.

In his discussion of the ruins of ^{the} Pueblo Viejo Valley, Doctor Fewkes says:

"In ancient times, when the valley was populated by a sedentary, agricultural race, aboriginal dwellings were thickly scattered over

Of the pottery from ~~the~~ a ruin explored a few years since at the junction of San Francisco and Blue rivers, Doctor Hough says, "Many of the specimens of the gray ware have the form of birds and animals." (Bu. Eth. ~~Arch.~~ Bull. 35, p. 45.)