

**RUINS IN THE WHITE MOUNTAINS, ARIZONA.**

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## WHITE MOUNTAIN POTTERY.

In an attempt to trace the past of the Zuni people, a considerable section of territory adjacent to their pueblo in New Mexico and a much larger section in Arizona have been surveyed. The three earlier papers in this volume report results obtained by Dr. Kroeber and myself in the drainage area of the Little Colorado, that is from the continental divide in New Mexico westward to Winslow and from the Santa Fé Railroad south to the Mogollon Rim. During the past summer, the White Mountains and the Verde Valley lying between the Mogollon Rim and Salt River were added to this area. This leaves the Tonto Basin as the only considerable unsurveyed portion of an otherwise continuous area. Since it was our intention to maintain this throughout as an empirical study, we have found it convenient to issue reports on the several sections of this area as they were visited. It is now possible to sketch its development in general terms and to particularize on Zuni participation.

In my second paper, "Notes on Some Little Colorado Ruins," I showed that ruins in the Little Colorado drainage area were distinguished by the presence of yellow or buff pottery: it occurs in such quantities that it might be called the buffware area. The surveys of the past summer suggest some minor modifications and additions to this area. Only two ruins in the White Mountains, No. 261 and Hough's No. 134, contained buff pottery and then only a small amount. I have been shown buff pottery said to have been obtained further west in the upper Tonto Basin close under the Mogollon Rim. Both of these additions extend the area a slight distance out of the Little Colorado drainage and into that of the Salt. On the other hand samples of buffware in the Mearns Collection from the Verde Region must have been obtained from the eastern section close to the edge of the Little Colorado Valley, since I found no such ware at any of the ruins I visited in the Verde Valley proper. None of these changes essentially affect the distribution of this ware.

In some of these ruins on the Little Colorado buffware is associated with red pottery decorated externally in a characteristic fashion. On bowls this commonly consists of a panel encircling the bowl near its edge, built up of two broad bordering bands in black between which geometric figures are drawn in fine lines with white paint. One well-defined figure of this type may be called "dentiform," for want of a

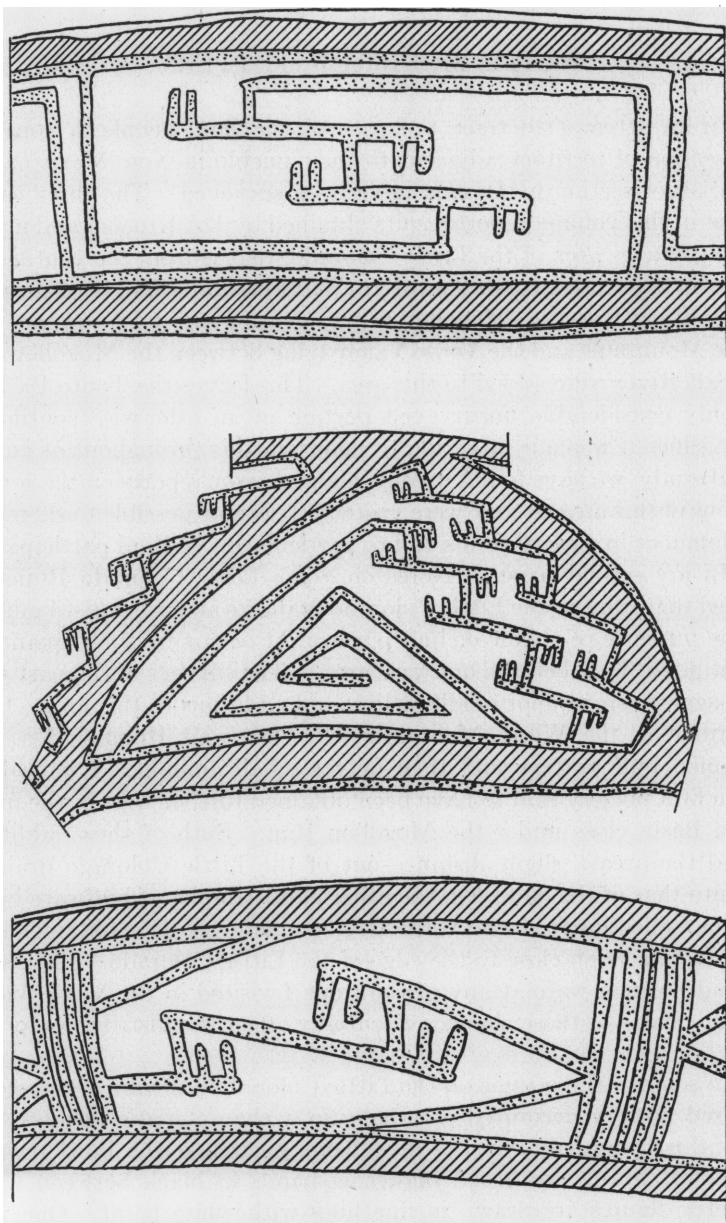


Fig. 1. "Dentiform" Figures from Wallace Tank Ruin (No. 203).

better name. This consists of a straight line bearing two or three short lines at right angles to it at its end and it occurs in a variety of combinations<sup>1</sup> (Fig. 1).

This figure is found on pottery from the following ruins: No. 203, the Wallace Tank Ruin, No. 213, Four-Mile Ruin, No. 214 at the junction of Showlow and Silver creeks, No. 217 at Showlow, and at the Homolobi, Cheylon, and Chaves Pass ruins, as well as appearing in Mearns's sherds from the Verde.

To judge from their pottery, pueblo ruins in the White Mountains undoubtedly belong with this Little Colorado group. More specifically, two ruins contain buffware and at four others I have seen the "dentiform" decoration, viz., Nos. 253, 255, 264, and 267, while it may also occur at two more, Nos. 228 and 274—I am not sure. This gives us a series of connecting elements: the White Mountain ruins share the "dentiform" figure with the Little Colorado ruins, and these latter have the buff, black, and black and red-on-white wares found on historic Zuni sites.

On the assumption that this is the actual historic sequence I have dealt with the White Mountain pueblos as with the Hecota'utilla group of ruins in the Zuni country.<sup>2</sup> The percentages of the various wares in these pueblos is given in Table I. It will be noted that blackware has been omitted. Even among the Little Colorado ruins blackware was extremely difficult to distinguish from corrugated, while here separation was not at all feasible. In Table II the ruins are ranked according to the percent of corrugated and the pottery is grouped by ground or body color. There we see that when corrugated disappears as the dominant type, redware takes its place while whiteware remains stationary. I have also indicated the pueblos at which three color painted ware and three color combination glazed and painted ware occur. From this it appears that the sequence of techniques was first the introduction of three color paint and then of combination glaze and paint.

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<sup>1</sup> Fewkes figures an excellent example from Four-Mile Ruin in Plate LXIII, c, of his "Two Summers Work in Pueblo Ruins" (*Twenty-second Annual Report, Bureau of American Ethnology*, part 1, Washington, 1904).

<sup>2</sup> I do not know that anyone has suggested that the Apache, who now occupy the White Mountains, built these structures. In fact Hodge has shown that the region was uninhabited in the sixteenth century (*American Anthropologist*, VIII, 1895, 230). None of these ruins then can date to historic times.

TABLE I.  
PERCENTAGES OF POTTERY AT PUEBLOS.

| Site      | Corru-<br>gated | Two Color<br>Painted Ware |     |      | Three Color<br>Painted Ware |     |      | Two Color<br>Glazed Ware |     |      | Three Color<br>Glazed & Painted Ware |     |      | Tularosa        |       |     | Size of<br>Sample |
|-----------|-----------------|---------------------------|-----|------|-----------------------------|-----|------|--------------------------|-----|------|--------------------------------------|-----|------|-----------------|-------|-----|-------------------|
|           |                 | White                     | Red | Buff | White                       | Red | Buff | White                    | Red | Buff | White                                | Red | Buff | Corru-<br>gated | White | Red |                   |
| 225       | 73              | 15                        | 7   |      |                             | 5   |      |                          |     |      |                                      | 26  |      |                 |       | ×   | 73                |
| 228       | 28              | 1                         | 19  |      |                             | 19  |      |                          | 7   |      |                                      | ×   |      |                 |       | ×   | 120               |
| 228-upper | ×               |                           | ×   |      |                             | ×   |      |                          | ×   |      |                                      |     |      |                 |       | ×   |                   |
| 228-lower | ×               |                           | ×   |      |                             |     |      |                          |     |      |                                      |     |      |                 |       |     |                   |
| 229       | 37              | 15                        | 17  |      | 3                           | 20  |      |                          |     |      |                                      | 8   |      | ×               | ?     | ×   | 90                |
| 237       | 64              | 20                        | 8   |      |                             | 8   |      |                          |     |      |                                      |     |      |                 |       |     | 105               |
| 238       | 85              | 9                         | 6   |      |                             |     |      |                          |     |      |                                      |     |      |                 |       |     | 34                |
| Hough 134 | 18              | 5                         | 19  | ×    | 1                           | 53  |      |                          |     |      |                                      | 4   |      |                 |       |     | 160               |
| 246       | 25              | 2                         | 73  |      |                             |     |      |                          |     |      |                                      |     |      |                 |       |     | 68                |
| 247       | 45              | 16                        | 27  |      |                             | 12  |      |                          |     |      |                                      |     |      |                 |       |     | 113               |
| 249       | 18              | 5                         | 39  |      |                             | 38  |      |                          |     |      |                                      |     |      |                 |       |     | 61                |
| 250       | 13              | 3                         | 26  |      |                             | 40  |      |                          |     |      |                                      |     |      |                 |       |     | 100               |
| 251       | 19              | 13                        | 22  |      |                             | 36  |      |                          |     |      |                                      | 18  |      |                 |       |     | 133               |
| 253       | 20              | 15                        | 11  |      |                             | 33  |      |                          | 3   |      |                                      | 18  |      | ×               |       |     | 102               |
| 254       | 68              | 15                        | 9   |      |                             | 4   |      |                          |     |      |                                      | 4   |      | ×               |       |     | 75                |
| 255       | ×               | ×                         |     |      |                             | ×   |      |                          |     |      |                                      | ×   |      | ×               |       |     |                   |
| 258       | 68              | 24                        | 4   |      |                             | 4   |      |                          |     |      |                                      | ×   |      | ×               |       |     | 57                |
| 259       | 81              | 14                        | 5   |      |                             |     |      |                          |     |      |                                      |     |      | ×               |       |     | 59                |
| 261       | 45              | 6                         | 27  | 1    |                             | 16  |      |                          |     |      |                                      | 5   |      | ×               | ×     |     | 210               |
| 263       | 39              | 19                        | 9   |      |                             | 27  |      |                          |     |      |                                      | 6   |      |                 | ×     |     | 103               |
| 264-upper | 54              | 6                         | 13  |      |                             | 9   |      |                          |     |      |                                      | 13  |      |                 |       |     | 90                |
| 264-lower | 20              | 22                        | 40  |      |                             | 18  |      | ×                        | 5   |      |                                      |     |      |                 |       |     | 67                |
| 267       | 37              | 15                        | 12  |      |                             | 23  |      | 1                        |     |      |                                      | 12  |      |                 |       |     | 137               |
| 274       | 58              | 7                         | 14  |      |                             | 19  |      |                          |     |      |                                      | 2   |      |                 |       |     | 156               |
| 275       | ×               |                           | ×   |      |                             | ×   |      |                          |     |      |                                      | ×   |      | ×               | ×     |     |                   |



TABLE II.  
PERCENTAGES OF POTTERY AT PUEBLOS BY GROUND COLORS.

| Site      | Corru-<br>gated | White | Red | Buff | Three Color<br>Paint | Combination<br>Paint-Glaze | Pueblo Type (Shape<br>and dimensions<br>in feet) | Tularosa        |       |     | Size of<br>Sample |
|-----------|-----------------|-------|-----|------|----------------------|----------------------------|--|-----------------|-------|-----|-------------------|
|           |                 |       |     |      |                      |                            |  | Corru-<br>gated | White | Red |                   |
| 238       | 85              | 9     | 6   |      | ×                    |                            | □, 60×165  |                 |       |     | 34                |
| 259       | 81              | 14    | 5   |      |                      |                            | {□, 100×90                                       | ×               |       |     | 59                |
| 225       | 73              | 15    | 12  |      |                      |                            | {□, 50×50  |                 |       |     | 73                |
| 258       | 68              | 24    | 8   |      |                      |                            | T, 100×60  |                 |       |     | 57                |
| 254       | 68              | 15    | 17  |      | ×                    |                            | □, 75×39   | ×               |       |     | 75                |
| 237       | 64              | 20    | 16  |      |                      |                            | □, 65×40   | ×               |       |     | 105               |
| 274       | 58              | 7     | 35  |      | ×                    | ×                          | □, 120×70  |                 |       |     | 156               |
| 264       | 54              | 6     | 40  |      | ×                    | ×                          | □, 150×100                                       |                 |       |     | 90                |
| 247       | 45              | 16    | 39  |      | ×                    |                            | □, 130×85  |                 |       |     | 113               |
| 261       | 45              | 6     | 48  | 1    | ×                    | ×                          | □, 120×55  |                 |       |     | 210               |
| 263       | 39              | 19    | 42  |      | ×                    | ×                          | {O, 160?   |                 |       |     | 103               |
| 229       | 37              | 18    | 45  |      | ×                    | ×                          | □, 150×200                                       |                 | ×     |     | 90                |
| 267       | 37              | 16    | 47  |      | ×                    | ×                          | □, 115×90  | ×               | ?     | ×   | 137               |
| 228       | 28              | 1     | 71  |      | ×                    | ×                          | D, 140×145                                       |                 |       | ×   | 120               |
| 246       | 25              | 2     | 73  |      | ×                    | ×                          | □, 200×170                                       |                 |       |     | 68                |
| 253       | 20              | 15    | 65  |      | ×                    | ×                          | □, 75×85   |                 |       |     | 102               |
| 251       | 19              | 13    | 68  |      | ×                    | ×                          | □, 115×115                                       | ×               | ×     |     | 133               |
| 249       | 18              | 5     | 77  |      | ×                    |                            | □, 135×280                                       |                 |       |     | 61                |
| Hough 134 | 18              | 6     | 76  | ×    | ×                    | ×                          | □, 100×70  |                 |       |     | 160               |
| 250       | 13              | 3     | 84  |      | ×                    | ×                          | {□, 325×100                                      |                 |       |     | 100               |
|           |                 |       |     |      |                      |                            | {□, 250×100                                      |                 |       |     |                   |
|           |                 |       |     |      |                      |                            | O, 170   |                 |       |     |                   |

All of these results are a striking parallel of conditions in the Hecota'-utlla group near Ramah, where redware displaced corrugated ware with whiteware remaining a constant element, while at the same time the sequence of new techniques was first three color paint and then combination glaze and paint. Both series parallel the sequence of techniques found by Nelson and Kidder in the upper Rio Grande Valley.

Changes in the shape and size of the pueblo are not marked, but the tabulated data suggest that the later pueblos were somewhat the larger, as was the case in the Hecota'utlla group, and that the pueblo built as a hollow rectangle also became more common.

Percentages of pottery in the small ruins in the White Mountains are given in Table III. The data are too few for treatment similar to that for the pueblos.

A number of ruins in this area contain Tularosa-San Francisco pottery: one cave, Site 239, contains nothing else. This pottery is of three types: corrugated, with narrow coils, fillet edge and polished black interior; plain redware also with a fillet edge and polished black interior; and whiteware decorated with a black pigment which is either a very glossy paint or glaze. I have noted the presence of these types in the tables. Apparently there is no chronological distinction between the several types. If we consider these data together with that for Little Colorado ruins<sup>1</sup> however, it appears that Tularosa wares occur in the small ruins of both areas—presumably the earliest—and in pueblos of the middle period in the White Mountains, but not in the Little Colorado pueblos and not on historic Zuñi sites. This temporal relation suggests that the glossy black paint on the whiteware may be historically related to an early glaze.

At none of the ruins in the White Mountains were deep refuse heaps found, so that stratigraphic work was out of the question. Sherds obtained from the upper and lower parts of refuse heaps in Sites 228 and 264 show some differences, but these do not appear significant to me.<sup>2</sup>

<sup>1</sup> This volume, pp. 342-343.

<sup>2</sup> The question raised on p. 361 whether buffware appears only in the upper part of the ash heap at Homolobi No. 1 near Winslow is answered by the following data:—

|                   | Corrugated | Two Color Painted Ware |     |      | Three Color Painted Ware |     |      | Size of Sample |
|-------------------|------------|------------------------|-----|------|--------------------------|-----|------|----------------|
|                   |            | White                  | Red | Buff | White                    | Red | Buff |                |
| Surface (percent) | 41         | 6                      | 11  | 41   |                          | 1   |      | 145            |
| Upper Part        | ×          | ×                      | ×   | ×    |                          | ×   | ×    |                |
| Lower Part        | ×          |                        | ×   | ×    |                          |     |      |                |

A large proportion of the corrugated ware is buff in color.

TABLE III.  
PERCENTAGES OF POTTERY AT SMALL RUINS.

| Site | Corru-<br>gated | Two Color<br>Painted Ware |       |       | Three Color<br>Painted Ware |       |       | Two Color<br>Glazed Ware |       |       | Three Color<br>Glazed & Painted Ware |       |       | Tularosa Ware   |       |       | Size of<br>Sample |
|------|-----------------|---------------------------|-------|-------|-----------------------------|-------|-------|--------------------------|-------|-------|--------------------------------------|-------|-------|-----------------|-------|-------|-------------------|
|      |                 | Two Color<br>Painted Ware |       |       | Three Color<br>Painted Ware |       |       | Two Color<br>Glazed Ware |       |       | Three Color<br>Glazed & Painted Ware |       |       | Tularosa Ware   |       |       |                   |
|      |                 | White                     | Red   | Buff  | White                       | Red   | Buff  | White                    | Red   | Buff  | White                                | Red   | Buff  | Corru-<br>gated | White | Red   |                   |
| 223  | 38              | 56                        | 6     | ..... | .....                       | ..... | ..... | .....                    | ..... | ..... | .....                                | ..... | ..... | .....           | ..... | ..... | 55                |
| 224  | 82              | 18                        | ..... | ..... | .....                       | ..... | ..... | .....                    | ..... | ..... | .....                                | ..... | ..... | .....           | ..... | ..... | 111               |
| 255  | X               | X                         | ..... | ..... | .....                       | X     | ..... | .....                    | ..... | ..... | .....                                | X     | ..... | X               | ..... | ..... | .....             |
| 260  | 59              | 36                        | 5     | ..... | .....                       | ..... | ..... | .....                    | ..... | ..... | .....                                | ..... | ..... | .....           | ..... | ..... | 42                |
| 270  | 46              | 35                        | 13    | ..... | .....                       | 6     | ..... | .....                    | ..... | ..... | .....                                | ..... | ..... | X               | X     | ..... | 85                |
| 272  | 50              | 41                        | 4     | ..... | .....                       | 5     | ..... | .....                    | ..... | ..... | .....                                | ..... | ..... | X               | X     | ..... | 114               |

Another feature shared with ruins in the Zuñi and Little Colorado areas is the poor quality of the glaze.<sup>1</sup>

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<sup>1</sup> None of the ruins I visited in the Verde Valley—northward from Camp Verde—belongs with the groups described, except by reason of an architectural similarity. Here are cliff-houses and pueblos of the regular rectangular room type built of stone like others of the northern Pueblo area, but with crude pottery. These vessels contain a large amount of stone tempering, are soft and crumbling, walls thick, unpolished, and for the most part unslipped. About two-thirds are reddish, the remainder black; but these may not be separate varieties. With these is a very small quantity of black-on-white and corrugated ware. Neither Mindeff nor Mearns describe pottery from these ruins.

## NOTES ON THE RUINS.

## WHITE RIVER.

The White Mountains along the upper reaches of the North Fork of White River are too rugged to permit extensive occupations. In the general neighborhood of Cluff Cienega, however, ruins may be located.

*Site 223.* A small ruin lies on the west side of the road from Cluff Cienega a mile or so above Robert's Ranch Ranger Station. It is built of rough lava blocks; rectangular, 30 by 20 feet; and has been partly excavated. A sample of the few sherds seen on the surface was collected at random.

*Hough 129.* A small pueblo ruin near Interior Sawmill was excavated by Dr. Hough.<sup>1</sup>

*Site 224.* The road to Fort Apache runs along a ledge or plateau a considerable distance above the North Fork. A number of small-house ruins are scattered along the ledge. A small-house ruin, like Ruin 223 and measuring 20 feet square, is on the east side of the road about five miles south of Interior Sawmill. A random collection of sherds was made. Two more similar ruins are a short distance south.

*Site 225.* A small pueblo of the same rough construction lies a mile south of No. 224 on the east side of the road. It measures 100 by 60 feet, possibly two stories high at the center, with a 60 foot wing at one side. An excavated room is roughly 10 feet by 12. Two more small-house ruins are within a mile south and a third half a mile further on. There may be others in the vicinity.

*Hough 131.* Pueblo ruins noted by Hough<sup>2</sup> and described by Bandelier<sup>3</sup> are on the old Cooley ranch, eight miles above Fort Apache.

*Site 226.* Two small peaks on the east side of North Fork opposite the agency at Whiteriver are covered by an indefinite small ruin built of sandstone. Skeletons have been found to the southeast. Corrugated, black-on-white, and a little black-on-red pottery were seen.

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<sup>1</sup> Hough, Walter, "Antiquities of the Upper Gila and Salt River Valleys in Arizona and New Mexico" (*Bulletin 35, Bureau of American Ethnology*, Washington, 1907), 80: "Archæological Field Work in Northeastern Arizona. The Museum-Gates Expedition of 1901" (*Annual Report for 1901, Smithsonian Institution*, pp. 279-358, Washington, 1903), 297.

<sup>2</sup> Hough, "Antiquities of the Upper Gila and Salt," 80.

<sup>3</sup> Bandelier, A. F., "Final Report of Investigations among the Indians of the Southwestern United States, Carried on Mainly in the Years from 1880 to 1885" (*Papers, Archaeological Institute of America, American Series*, vol. 4, part 2, Cambridge, 1892), 394.

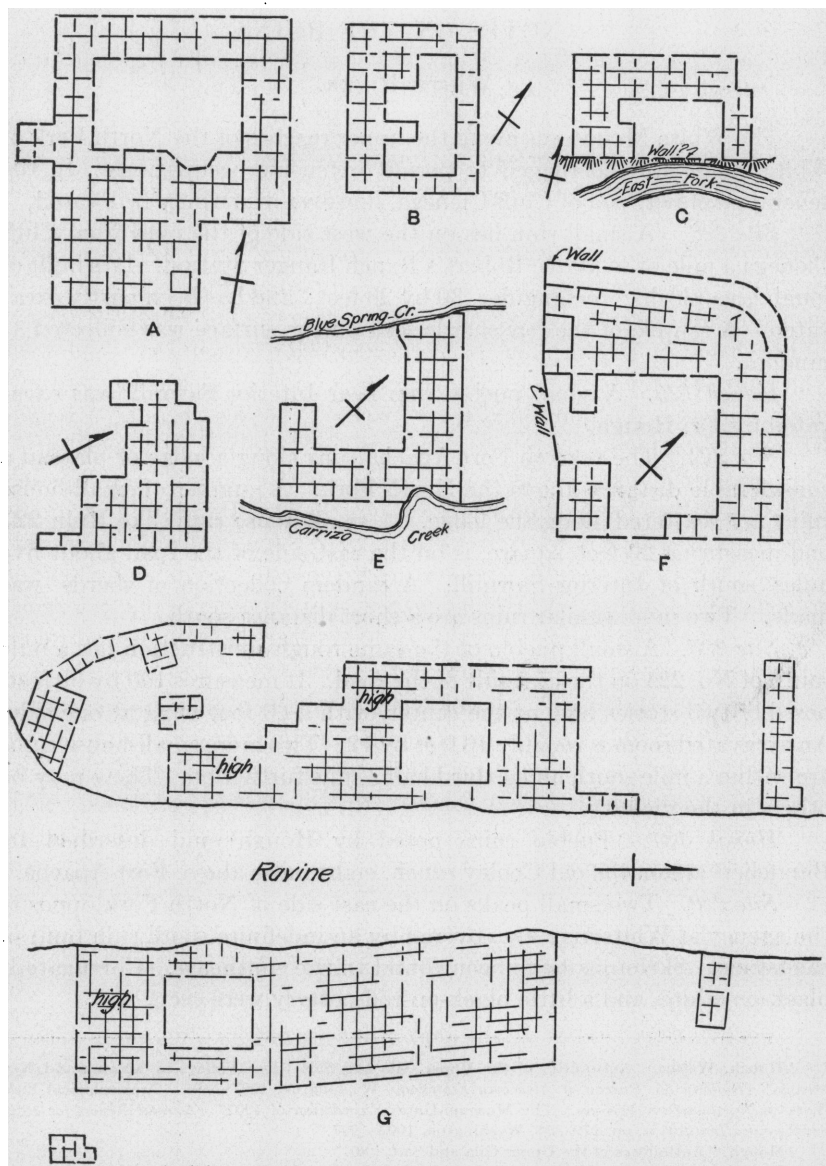


Fig. 2. Plans of Ruins. a, Ruin 228; b, Ruin 229; c, Ruin 237; d, Ruin 253; e, Ruin 264; f, Ruin 274; g, Hough's Ruin 134. :Scale: 1 in. =135 ft.

*Site 227.* A short distance south is a small ruin just above the White-river bridge. It was built of small sandstone blocks, but is nearly leveled; measures 20 by 35 feet (nine rooms) with an additional room alongside. There may be a circular kiva, 20 feet diameter, to the south. Corrugated, black-on-white, black-on-red, and a little black and white-on-red pottery was seen.

*Site 228.*<sup>1</sup> A large rectangular pueblo is situated a mile and a half east of Fort Apache on the south side of East Fork just above the junction with Seven Mile Creek.<sup>2</sup> The structure measures about 200 feet by 170, with a rectangular court 100 feet across (Fig. 2a). It was built of sandstone blocks with regular courses of chinking. Several rooms have been dug into by Dr. Hough and others. Sherds are relatively scarce on the surface and the ash heaps at the southeast corner and to the west (the cemetery) are only 12 to 18 inches deep. Sherds were collected from the surface and the upper and lower parts of the ash heaps. Excavations in the cemetery have now cleared it completely. Two burial urns, ollas covered by inverted bowls, containing partly burned human bones were found: one also contained part of a bowl. Two adult skeletons were found: extended, head to north, face up, symmetrically placed side by side, left arms akimbo, right arms extended, that of one skeleton underneath the other. A bowl lay on the right shoulder of one. A skeleton of a child had a square turquoise pendant near the right ear, a broken arrow point, and small shell beads at the wrist.

*Site 229.* Half a mile east of No. 228 on the higher ground on the opposite side of East Fork is a rectangular pueblo. It is not so well constructed as No. 228. It measures 115 by 90 feet with a rectangular court (Fig. 2b). Fifteen yards away is a structure of one or two rooms. Near this were found two burial urns containing burned bones. The ash heaps close to the east side of the pueblo have been dug up. Sherds are not plentiful.

A small-house ruin lies on the opposite side of East Fork. Turquoise has been taken from a spring, where there may be a small-house ruin, on a mesa in the southeast angle of Seven Mile Creek and East Fork.

*Sites 230-233.* Four small-house ruins are on the bluff north of East Fork about one quarter mile west of East Fork Day School. Three

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<sup>1</sup> Sites 228 and 229 are evidently Hough's 133 and 132 ("Antiquities of the Upper Gila and Salt," 80-81), since there are no ruins on the North Fork as he describes but in corresponding positions on the East Fork.

<sup>2</sup> Bandelier, *ibid.*, 395.

houses had only one or two rooms; the fourth three rooms and measured 30 by 20 feet. Pottery is corrugated and black-on-white.

*Sites 234-236.* Across East Fork from the Day School are three similar small-house ruins; two with two rooms, one with one. Pottery is similar.

*Site 237.* A pueblo ruin lies on the brink of the bluff which rises on the north side of East Fork one mile east of the Day School. It is bracket-shaped, with the open side at the bluff edge possibly closed by a wall; is built of rough sandstone and lava boulders, and measures roughly 120 by 70 feet (Fig. 2c). The cemetery to the west has been dug into. A random collection was made from among the few sherds seen.

A small cliff ruin, possibly only a storehouse, may be seen high up on the cliff face about a mile upstream.

*Site 238.* A pueblo ruin stands in the bottom land on the north side of East Fork about two miles or more above Site 237. It was built of sandstone; is now low and indefinite, but appears to be bracket-shaped, the open side facing south. The court is about 60 feet square, the arms roughly 60 feet long by 20 and 40 feet wide, and the rear section 165 feet long extending beyond the side building to the east. Sherds were collected at random here.

*Site 239.* Eight or nine miles above Fort Apache or about a mile above Site 238 is a cave in the cliff north of East Fork. Walled storage chambers are located near the entrance and a burial site 200 (?) feet within. The cave has been ransacked, but I found unburned and calcined bones, sticks, charcoal, corncobs, squash seeds, and piñon nuts, as well as yucca cords, strung and loose shell beads, and a bone pendant. The pottery is the corrugated and plain red with polished black interior of Tularosa type.<sup>1</sup>

*Sites 240-242.* There is said to be a little ruin a mile or so above this cave, a pueblo ruin on Ryan's ranch about three miles north of Sharp's ranch, and also at Bill Ryan's ranch on Little Bonito Creek.

*Site 243.* A small-house ruin, 60 by 20 feet, is on the ledge on the west side of North Fork opposite Fort Apache hospital. Pottery is corrugated, black-on-red, and black and white-on-red: sherds are scarce.

*Site 244.* A small ruin of a few rooms, 40 feet long, stands on a rise a quarter mile east of Canyon Day School on the north side of White River. Sherds are corrugated and black-on-white.

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<sup>1</sup> Specimens in the Field Museum referred to by Hough, *ibid.*, 81, may be from this cave.



*Site 245.* A little lava peak rises just west of the Day School; on it is a small ruin, indefinite but conforming to the top, 100 feet long by two or three rooms wide.<sup>1</sup> Part of the ruin is also on the shoulder of the peak. Pottery is corrugated, black-on-white, black-on-red, and black and white-on-red.

There are pictographs on the opposite (west) face of the gorge and two small-house ruins on the ledge above.

*Site 246.* A small ruin is on a hilltop on the south side of White River a half mile west of the Day School. Built of sandstone and fairly well defined, it is roughly a rectangular block 75 feet by 85, with a two-roomed structure nearby.

There are said to be small-house ruins about Chiricahua Beef Spring, which is near the top of the mesa about a mile south of Site 245.

*Site 247.* A small pueblo lies on a hill at the eastern foot of Kelley's Butte, about two and a half miles west of Canyon Day School. It is roughly rectangular, measures 120 feet by 55, with two outlying buildings of one and three rooms. Sherds were collected from the surface at random.

*Hough 134.* Opposite Fort Apache is a plain which extends to the west to Saw Tooth Mountain. Near the eastern foot of the peak, a mile and a half from it by air line and three miles west of the Day School, is a large pueblo ruin lying on both sides of a ravine, forty or fifty feet deep.<sup>2</sup> It was somewhat rambling, built of sandstone, and two stories high in the highest parts. East of the ravine the main block covers an area 325 by 100 feet, on the west side the main block is roughly 250 by 100 feet (Fig. 2g). Sherds are plentiful around the eastern block and undoubtedly were dumped into the ravine, whence they were carried by storm flow. Nowhere could stratigraphic work be done. Rock walls of the ravine just above the ruin would have served for an excellent tank: there is no water within several miles today. Sandstone and lava manos and metates were seen.

Two ruins of one room each lie in the plain a quarter mile east of this pueblo.

*Site 248.* There is said to be a pueblo ruin built of lava blocks together with small-house ruins at Navajo Bill Spring (at the head of Priebe Creek?) about eight miles west of Canyon Day School.

There are said to be a few small ruins and caves south of Black River below Turkey Creek and above White River.

<sup>1</sup> This or the next site may be No. 135 of Hough, *ibid.*, 81.

<sup>2</sup> Hough, *ibid.*, 81; Bandelier, *ibid.*, 396.

## CEDAR CREEK.

*Site 249.* The Cibicue road skirts the north end of a high and very narrow mesa about three and a half miles east of Cedar Creek or two miles west of Saw Tooth. The southern end of this mesa is capped by a small pueblo ruin which conforms to the outline of the mesa. It is roughly a right-angled triangle; one side 100 feet long, the base 70 feet, and tapering to one room 10 feet wide. There is no water nearby and the mesa walls are sheer.

*Site 250.* Two miles west in the flat there is a circular pueblo built of sandstone and still standing high. In plan it is nearly a perfect circular ring 170 feet outside diameter; three rooms wide on the southern sector, elsewhere two wide; rooms placed radially. It was probably two stories high. Lower structures fill the greater part of the interior court. Three or four smaller structures are on a hillside a few yards west. The largest is L-shaped; the long arm 180 by 50 feet, the shorter 75 feet long and one room wide for the most part. So far as an inspection during a storm would permit, I judge that the sherds at these structures are the same as those at the circular pueblo. Sherds are not abundant.

*Site 251.* A dry wash joins Cedar Creek just south of Silver Butte. On the point of a mesa in the fork is a pueblo ruin consisting of a rectangular block 135 by 100 feet, two or three stories high, and with a small court in the center; this forms one end of a court the two adjoining sides of which are 180 feet long by 33 and 42 feet wide, and the fourth side formed by wings of the side buildings which nearly meet. These buildings were one story high.

There is said to be a small ruin and terraced slopes on a small peak near which the road passes three miles west of the Cedar Creek crossing.

*Site 252.* A ruin of about five rooms is on the bottom land of Cedar Creek opposite Silver Butte. Pottery is corrugated, black-on-white, black-on-red, and black and red-on-white.

A small ruin of a few rooms is said to be on Silver Butte.

*Site 253.* A small pueblo ruin is on a mesa south of the junction of West Cedar Creek. It is somewhat L-shaped (Fig. 2d), since the main portion was two or three stories high, with a wing of one story. Its overall dimensions are 115 by 115 feet.

There are said to be no ruins on West Cedar Creek, although the Apache have farms there.

*Site 254.* A small ruin is on a hill on the east side of Cedar Creek near the junction of Middle Cedar (Arrow) Creek. Although it has been

rebuilt by Apache like many others, the original walls are fairly distinct. It is rectangular, 65 feet by 40.

*Site 255.* A small cliff ruin is located on the east side of Cedar Creek about a mile and a half above the Arrow Creek junction. A single line of rooms is built in a shallow cave, which range in width from 10 feet at one end to 4 feet at the other, and have lengths of 10 and 6 feet. The sandstone walls still stand and rafters are present 5 feet above the floor. Walls show alternate courses of chinking and are plastered inside. Interior doorways measure 36 by 18 inches, are 6 inches off the floor, and have stone and stick lintels. Sherds are very scarce.

*Site 256.* On the west side of Cedar Creek about a mile and a half above Site 255 is a small semi-cliff-house against the base of a cliff. Both end walls of a single room, 12 feet long, stand, but no front wall. No sherds were seen; it may have been a field shelter.

*Site 257.* A series of oval storage chambers were seen a mile (?) above the junction with Cedar Creek on the west side of Arrow Creek. Sherds here are corrugated, black-on-white, and redware.

Two small ruins are reported to be in the bottom land a mile or so above this.

*Site 258.* A small ruin lies on a hill on the east side of Arrow Creek about three miles above its junction with Cedar Creek. It measures 75 by 30 feet, but is low and indefinite.

*Site 259.* A small pueblo ruin stands on a high hill on the east side of Arrow Creek more than half a mile north of Site 258. It is low and indefinite, but apparently consists of two blocks, the main portion 90 by 100 feet, the other L-shaped with 50 foot arms, 25 feet wide.

*Site 260.* A trail leads from Arrow Creek over Big Mountain and down Corduroy Creek to the settlements on Forestdale Creek. On a slight rise near the northwest base of Big Mountain is a small indefinite ruin, roughly built of lava blocks. Its total length is 60 feet. Nearby is a lava boulder with a cup-like milling hole.

#### CARRIZO CREEK.

*Site 261.* A pueblo ruin is located on the north side of Forestdale Creek where it is reached by the old road from Adair. Hough has given an extended description<sup>1</sup> and notes three more ruins in the vicinity.

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<sup>1</sup> "Archæological Field Work in Arizona," 289-297, also "Antiquities of Upper Gila and Salt," 80, No. 127.

*Site 262.* A small ruin lies south of the Cibicue road about two miles west of Carrizo Creek. There are two buildings, 40 by 25 feet and 20 feet square. Pottery is corrugated and black-on-white.

*Site 263.* On a knoll on the east side of Carrizo Creek perhaps two miles below Limestone Creek is a small D-shaped pueblo ruin, consisting of a rectangular portion 120 by 75 feet with a semicircular building in the rear leaving a court 75 feet across. The rectangular block is a high pyramid, but probably nowhere more than one story high as Bandelier shows.<sup>1</sup> The semicircular part is level, one room wide and also one story high.

Nearby is a small-house ruin, now nearly obliterated.

Another ruin lies a mile upstream on the same side.

*Site 264.* A pueblo ruin is situated in the junction of Blue Spring Creek with Carrizo Creek. It is L-shaped, the main block 130 by 40 feet, the arm 85 by 35 feet (Fig. 2e), but portions have been carried away by both streams. Considerable refuse appears on both banks but this is back-fill in the rooms, all outside refuse heaps having been carried away. Sherds were collected at random from the uppermost and lowest parts of this back-fill. A skeleton lay four feet under the outer wall on the original surface; on top of the head was a red bowl containing a small bowl, dipper, and jar. Another skeleton was found on the floor of a refuse-filled room with turquoise at neck and a corrugated bowl at feet.

A small ruin is said to lie on the ledge west of Carrizo Creek opposite Site 263, but I could not find it.

*Site 265.* On the point of the mesa in the forks behind Site 263 is a small ruin of half a dozen rooms. Pottery is corrugated, black-on-white, and redware.

*Site 266.* South of Blue Spring Creek opposite Site 263 is a small ruin of four partly excavated large rooms. Sherds are much like those of the pueblo ruin.

Two small ruins are said to lie on the bottom land of Carrizo Creek, one near the junction of Deer Spring, the other a mile above. Similar small ruins are said to be on the points of mesas in the vicinity of Phoenix Park and Buckskin Creek further up Carrizo Creek.

#### CIBICUE CREEK.

*Site 267.* A pueblo ruin stands in the bottom land near Cibicue Creek opposite the Mission. The pueblo is D-shaped, with a base 140

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<sup>1</sup> Bandelier, *ibid.*, 399-401.

feet long and measures 145 feet transversely. It seems to have originally enclosed a large court but this is now entirely filled by lower buildings. All interior walls are indefinite. Some ash and sherds show in the plowed field southwest.

*Site 268.* A small ruin, 40 feet by 30, is on the east side of Cibicue Creek about 200 yards above the Day School. Pottery is corrugated and black-on-white.

A still smaller ruin is said to lie on the point of a low mesa on the west side of Cibicue opposite this one.

*Site 269.* A small ruin consisting of two buildings of two rooms each is on the west side of Salt Creek, nearly three miles above the Day School. Pottery is corrugated and black-on-white.

*Site 270.* An eighth of a mile above the last is a larger ruin. This is three rooms (25 feet) wide, one row extending 95 feet, the others 50 feet.

*Site 271.* Half a mile above the junction of Salt Creek on the west bank of Cibicue Creek is a curious small ruin. It seems to be only partly finished, yet some sherds are scattered about. A single line or row of stones marks the walls, like the boulder-marked sites of the Rio Verde. One room, 13 by 33 feet, has no fourth wall; another building has a room 16 feet by 13, with the side walls extending 8 feet more and without a fourth wall. These might be passed over as unfinished buildings, but for the association with somewhat unusual corrugated and black-on-white pottery.

*Site 272.* Half a mile west of Site 270 and near the north bank of Salt Creek is a small ruin of the same sort. One building is an L with arms 35 and 40 feet long; nearby is a second consisting of a three-sided room 15 feet by 40. Sherds are also similar.

*Site 273.* On a ridge 100 yards north is a small ruin, 45 feet by 20, with outlying rooms. The pottery is corrugated, glossy black-on-white, and black-on-red.

There are said to be no ruins further up Salt or Cibicue creeks, although Apache farms are on the latter. Ruins were also spoken of as "way down" Cibicue Creek, probably near Salt River.

*Site 274.* A pueblo ruin stands on Blue House Mountain about a mile east from the summit. It covers a hilltop with a low encircling wall which forms a terrace. The main building is L-shaped with arms roughly 150 feet by 50 and 100 feet by 45 (Fig. 2f).

A ruin was said to be located southwest of Blue House Mountain and south of Brush Mountain.

*Site 275.* There is a pueblo ruin at Grasshopper Spring west of Cibicue Creek, consisting of one large building divided by a flowing spring with numerous small buildings scattered around.

Ruins reported on the Canyon Creek drainage, including a large cliff-house on Oak Creek, were not visited.

## HISTORICAL RECONSTRUCTION.

Taking the data for the whole surveyed area, I suggest the following scheme of historic interrelations.

In the first place, there are in this area a fairly large number of small ruins. The earliest type (p. 293) was presumably the oval, semi-subterranean "slab-house" which was found in the Zuñi Valley. Pottery here was simply corrugated and black-on-white. The small rectangular house which followed it is found in all parts of the area. The pottery associated with this is corrugated, black-on-white, and black-on-red. The differences between the small ruins lie largely in the decorative style: a difference too slight to permit of advantageous study at present. Some Tularosa pottery is also found in these ruins.

However, when we consider the pueblo ruins, some fairly definite historic relations may be seen. We first find two groups of ruins; one in the White Mountains, the other the Hecota'utilla group centering around Ramah in the upper Zuñi Valley. Although these two regions are some distance apart, there are no intervening barriers. These groups have had a parallel development. At the outset corrugated was the prevailing ware but was displaced by redware, while whiteware remained throughout a relatively constant minor ware. Corrugated may have been slightly more prominent in the White Mountains, whiteware at Ramah. Three-color painted decoration—in this case the addition of decoration in white paint to the black paint figures on redware—appears in both groups under the same conditions, and presumably at about the same time. Next glaze technique appears in both groups, black glaze being substituted for black paint without any marked change in decorative style. The glaze is applied to white and red pottery giving us the two color glaze technique, but at the same time it is used in three color decoration. Hence the development here did not parallel that in Nelson's Tanoan area, where two-color glaze appeared as a definite type before three-color combination glaze and paint. Here glaze was clearly introduced from outside, presumably from the upper Rio Grande. In this connection it is significant that the glazes of all periods in this area are distinctly inferior to those of the Rio Grande. At about the same time the pueblo was introduced as a definite architectural type. It does not seem to have grown out of the small ruin in this area—at least this is distinctly so in the Ramah region. Pueblos in this region are somewhat larger than those in the White Mountains.

These two ceramic groups present similarities in decorative treatment; at least this is noticeable in redware. But one difference may be pointed out in the white paint figures; at Ramah broader lines and more diagonal step and volute patterns were used than in the White Mountains. Tularosa pottery is also found in both groups of pueblos as in the earlier small ruins.

Now come shifts of population: the Ramah group disappears from the area I have surveyed and Tularosa pottery never appears again. The White Mountain group moved northward to the Silver Creek section, where a new development began, shared with the group on the middle Little Colorado centering around Winslow. During this period corrugated ware continued to disappear but began to be replaced by plain blackware, which is clearly a derivative of it. Redware becomes the dominant type—possibly half of all pottery—and again declines. Here, as in the White Mountains, the “dentiform” figure appears on it. Small quantities of whiteware continue to be made. Buffware, which appeared in a few pueblos of the White Mountains is now found in larger quantities. It is a very minor constituent in the Silver Creek ruins, but a much larger one in the western group and also in historic Zuñi pueblos. The significance of these proportions is not clear, possibly because my survey did not extend north of the Little Colorado where there are ruins also containing buffware. The pottery of the Silver Creek region is more nearly like that of the earliest Zuñi site near Zuñi Pueblo. This would imply that the Zuñi have moved up the Little Colorado-Zuñi Valley to their present location. A possible explanation—I do not mean to suggest that it is necessarily the fact, since I have not investigated the buffware area north of the Little Colorado—is that buffware did not develop to any extent until the Zuñi reached their historic habitat. This would presuppose a second group of people remaining on the Little Colorado. Fewkes and Hough believe that these western ruins relate to the Hopi or some constituent group of that tribe.

Let us return to the problem with which we set out: what could be learned of the former communities of the Zuñi that bears on their present life. Formulating this question more specifically we were, first, to investigate the relations between the present pueblo and the several pueblos attributed to the Zuñi of the period of the conquest by early documents and native statements; and, second, to discover their prehistoric location and cultural leanings. Dr. Kroeber, who brought a new method to the attack, showed that the situation was even more complex than the documentary confusion implied. My excavations into the base of



modern Zúñi revealed its growth since the foundation just prior to the Spanish advent. Taking the earliest pottery types there as a point of departure, we concluded that the Zúñi inhabited the pueblos, Hawwikku, Kettcippawa, Kyakkima, and Mattsakya, together with the unidentified "Aquinsa," immediately before concentrating in their present town. All of our evidence indicates that neither Pinnawa nor Hallonawa were Zúñi ruins of the historic period as had been supposed by earlier investigators. The solution of the second part of our problem is given in the foregoing historical reconstruction. The Zúñi originally lived further to the westward and their pottery at least showed close resemblance to that of the Hopi.



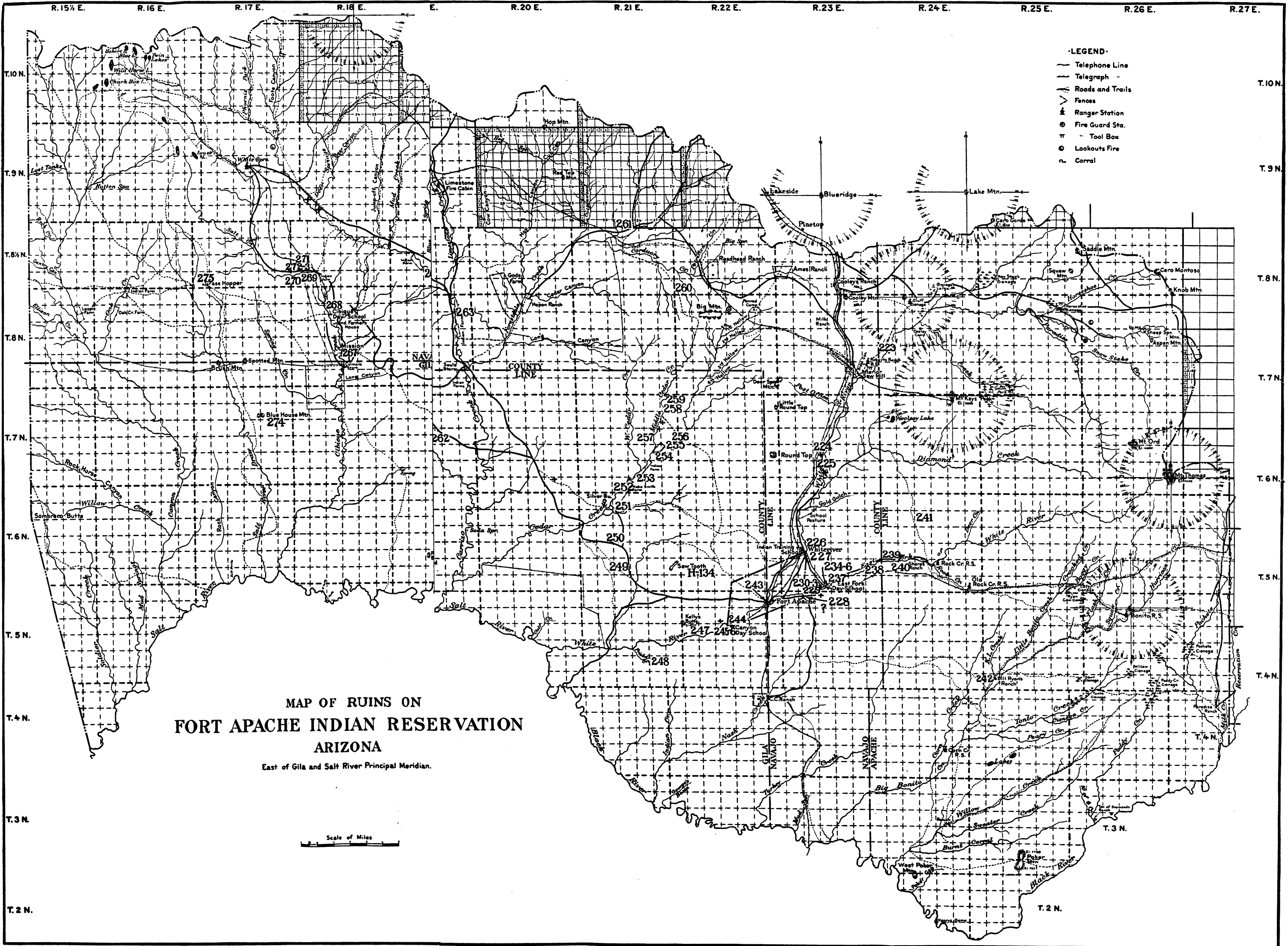


Fig. 3 Map of Ruins in the White Mountains.







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