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The Prehistoric Population and Architecture of the Cebolleta Mesa Region, Central Western New Mexico

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THE PREHISTORIC POPULATION AND ARCHITECTURE OF THE CEBOLLETA
MESA REGION, CENTRAL WESTERN NEW MEXICO · DITTERT

THE UNIVERSITY OF NEW MEXICO
ALBUQUERQUE, NEW MEXICO 87131

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THE PREHISTORIC POPULATION AND ARCHITECTURE OF THE CEBOLLETA MESA REGION, CENTRAL WESTERN NEW MEXICO

A Thesis
Presented to
the Faculty of the Department of Anthropology
University of New Mexico

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Alfred E. Dittert, Jr.
June 1949

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ABSTRACT

During the summers of 1947 and 1948, investigations were conducted in the Cebolleta Mesa area, the center of which is located twenty miles south of Grants, New Mexico. A site survey and a series of excavations were conducted around Los Betios Canyon which lies near the southern boundary of the area.

As a result of the investigations, it was determined that the area was occupied by an Anasazi population during recent archaeological times. The sites and pottery reported appear to occupy a time span, in approximate figures, from 800 A. D. to 1400 A. D.

The area is essentially a peripheral one, with centers of higher Pueblo culture on several sides. Perhaps with increments of population, the Cebolleta region received, at different times, cultural impulses or impetus from different surrounding areas of greater population. These influences are evidenced chiefly by the more important archaeological traits such as masonry, house types and pottery.

The occupation of the region studied includes three temporal subdivisions: early, middle and late. All three subdivisions fall within the approximate date span given above. During the early period, outside influences from the northwest (Chaco) appear to have been strongest. This is

demonstrated by the jacal unit and by pottery types. During the middle period the northwestern contacts were supplemented by strong influences from the western (Cibola) area. Also during the middle period, the pottery demonstrates contacts with the area to the southwest.

The third and final period of Anasazi occupation of the area saw few if any contacts with the northwestern (Chaco) peoples, a weakened continuation of western (Cibola) contacts and loss of many of the southwestern relationships. On the other hand, influences from the east (Rio Grande), the beginnings of which were only suggested in middle period times, were enormously strengthened.

Final movements of the Cebolleta Anasazi people could have been only to the east or southeast. At any rate, no objective evidence of their migration in any direction exists at this time.

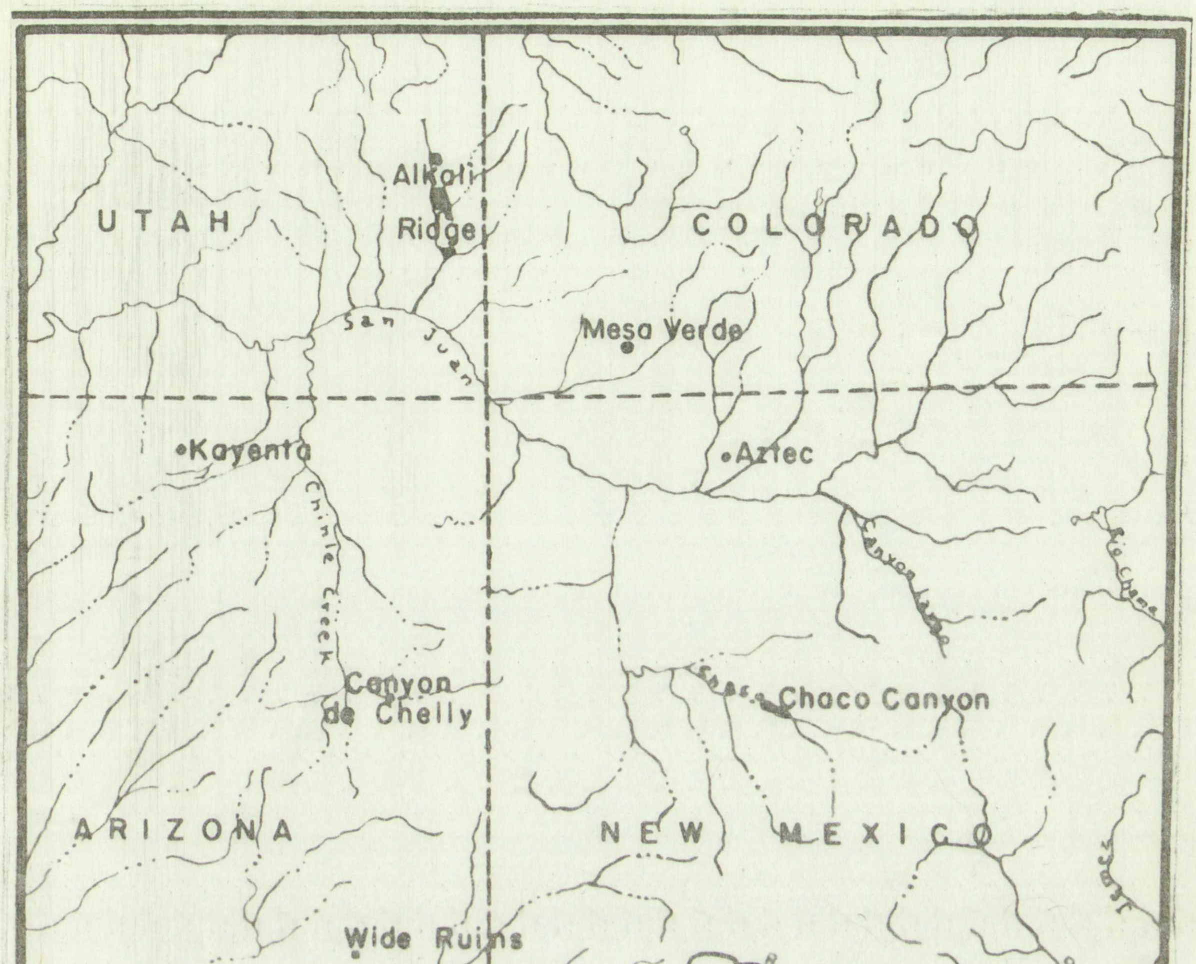

Fig. 1 Map showing the location of the Cebolleta Mesa area.

CHAPTER I

INTRODUCTION

During the summers of 1947 and 1948 investigations were carried on in the Cebolleta Mesa area,[1] the center of which lies twenty miles south of Grants,[2] New Mexico. Arbitrary boundaries for this area were defined at the 1948 Point of Pines Conference in order that better coordination could be established in connection with the Harvard University investigations centering to the south in the Plains of San Agustin.[3]

North to south the Cebolleta Mesa area lies between the San Jose[4] Valley or U. S. Highway 66 and the southern

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[1] Cebolleta Mesa area is an arbitrary name taken from the largest mesa in the area. Several other mesas are connected to it but all of these features can be treated as a unit.

[2] The U. S. Geographical Board has rendered a decision to the effect that the name of the town is "Grant" and this spelling is used on all U. S. Geological Survey maps and in their publications (Cf. Darton, N. H., 1928b). However, the U. S. Postal Guide (Part 1, July 1947, p. 294) lists the name as "Grants". Most maps, including New Mexico State Highway maps, U. S. Forest Service maps, and National Geographic Society maps use the name "Grants".

[3] Several variants of this name have been used, viz., "Augustin" and "Augustine". The U. S. Geographical Board has adopted the name "Agustin" (Cf. Darton, N. H., 1928b).

[4] Many maps use the Spanish spelling of "Jose". It would then carry an accent on the last syllable. However, the U. S. Geographical Board has adopted the English spelling with the elimination of the accent.

end of the North Plains. Westward, the area includes a portion of the McCartys basalt flow and the whole of the North Plains. In the east, the area is limited by the eastern slopes of Cebolleta and Putney Mesas. These features lie between 34° 30' and 35° 8' N. Lat. and between 107° 45' and 108° W. Long.[5]

A. GEOLOGY

Cebolleta Mesa is a lava-capped remnant of the Ortiz surface and covers approximately 110 square miles.[6] The Ortiz surface was named from the conical plain which surrounds the Ortiz Mountains on the east side of the Santo Domingo Valley. It was formed in the Late Pliocene or Pleistocene.[7] In some places basaltic lava extrusions were contemporaneous with the development of the Ortiz surfaces preserving them, in certain areas, at elevations somewhat above normal. The Mt. Taylor flows and the high-level basalts south of the Rio San Jose (Cebolleta Mesa basalt cap) are included in this group.[8]

---

[5] Rawlins, F. G. and Elliott, B., 1934.

[6] Wright, H. E., Jr., 1946, p. 443.

[7] Bryan, Kirk and McCann, F. T., 1936, p. 171.

[8] Bryan, Kirk, 1938, p. 218.
Bryan, Kirk and McCann, F. T., 1938, p. 11.

Near the Rio San Jose, the cliffs of Cebolleta Mesa consist of Upper Cretaceous Dakota sandstone with overlying sandstones of the Mancos shale formation capped by basalt. In the southern part of Township 10 North the Jurassic formations, including the Morrison formation,[9] the Todilto limestone, and the Wingate sandstone, appear beneath the Dakota sandstone. This face extends southward to T. 7 N. with short interruptions. Cliffs of the Morrison formation capped by Dakota sandstone are a prominent feature in T. 8 N. The contact between the Dakota sandstone and the Morrison formation is marked by an unconformity. To the east of this exposure are Cretaceous sandstones and shales extending to the lava cap.

In the northern part of T. 7 N. the Dakota sandstone and formations beneath it disappear only to reappear as islands termed Los Pilares in the southwestern part of T. 7 N., R. 10 W. The Morrison formation here is about 250 feet thick with twenty feet of white conglomerate at its base. Below it there is about forty feet of soft red Wingate

---

[9] N. H. Darton (1928a, pp. 129-130 and 1928b) called this formation the Navajo sandstone. In a more recent publication, A. A. Baker, C. H. Dane, and J. B. Reeside, Jr. (1936, Fig. 10, p. 47 and Fig. 16, p. 55) show that the Navajo sandstone is represented in New Mexico by only a small area in the extreme northwestern corner of the state. What Darton called the Navajo sandstone in the Cebolleta Mesa area is the Morrison formation.

sandstone, the Todilto limestone being absent. In T. 5 N. the cliffs consist of Mancos and Mesaverde sandstones which extend southward to T. 2 N. where they disappear beneath the andesite, latite, rhyolite, tuff, agglomerates, ash and other igneous rocks of the Datil Mountains.[10]

The Mancos shale formation and the Mesaverde formation represent the off-shore and near-shore facies respectively of the Upper Cretaceous seas which advanced from the northeast. Sandstone members of the Mesaverde formation interfinger with the upper part of the Mancos shale formation. These are white to buff sandstones commonly stained with limonite and bearing limonite concretions.[11] In the Datil Mountains and the Puertecito district, these beds are described as containing coal seams or being typically a coal-bearing sandstone.[12] In the Cebolleta Mesa area, however, they show only a few thin strata of lignite.

A columnar section of Cebolleta Mesa would show the following formations:

Basalt cap
Mesaverde formation
Mancos shale formation

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[10] Darton, N. H., 1928a, pp. 129-130 and 1928b.
Pike, W. S., Jr., 1947, pp. 62-75.

[11] Wright, H. E., Jr., 1946, p. 397.

[12] Lee, W. T., 1916, p. 44.
Wells, E. H., 1919, p. 11.

sandstone, the Baculite limestone being absent. In T. 8 N. the little tongues of Mancos and Mesaverde sandstone which extend southward to T. 5 N. where they disappear beneath the andesite, rhyolite, tuff, agglomerates, and other igneous rocks of the Datil formation.[10]

The Mancos shale formation and the Mesaverde formation represent the off-shore and near-shore facies respectively of the Upper Cretaceous seas which advanced from the north-east. Sandstone members of the Mesaverde formation interfinger with the upper part of the Mancos shale formation. These are white to buff sandstones commonly streaked with limonite and bearing limonite concretions.[11] In the Zuni Mountains and the Puertecito district, these beds are described as containing coal seams or being typically a coal-bearing sandstone.[12] In the Cebolleta Mesa area, however, they show only a few thin streaks of lignite.

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[10] Darton, N. H., 1928a, pp. 128-130 and 1928b. Pike, W. S., Jr., 1947, pp. 63-72.

[11] Wright, H. E., Jr., 1946, p. 387.

[12] Lee, W. T., 1916, p. 46. Wells, E. H., 1919, p. 11.

Dakota sandstone
Morrison formation
Todilto limestone
Wingate sandstone
Chinle formation[13]

On the west side of the northern thirty miles of Cebolleta Mesa lie the older Laguna basalts and the partially overlying, relatively fresh McCartys basalt flow. The latter has been dated by R. L. Nichols as between 700 and 900 A. D. or later on the basis of the following arguments:

1. The flow is not eroded.

2. It occupies a valley which is eroded through the older basalt flow by the Rio San Jose. This older flow is considered to be Late Pliocene or Pleistocene.[14]

3. It has a fresh appearance and retains the surface features.

4. Potsherds identified as "Pueblo I" have been found four feet below the top of the youngest valley fill near Laguna which is about seventeen miles down the valley from the terminus of the McCartys flow. This fill probably was buried by the McCartys flow.[15]

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[13] The Chinle formation does not appear on the western side of Cebolleta Mesa. However, Caswell Silver (1948, pp. 71-72) lists the Chinle formation beneath the Wingate sandstone in his graphic sections and description of formations on the east side of Cebolleta Mesa. His work centers at Petoch Butte south of Laguna, New Mexico.

[14] Bryan, Kirk and McCann, F. T., 1936, p. 171 and 1938, p. 11.

[15] Nichols, R. L., 1946, pp. 1052-1056.

In his argument concerning "Pueblo I" pottery, Nichols quotes Parry Reiche (1936, Preliminary Report on the Geomorphology of the Laguna District, unpublished manuscript).

It is difficult to believe that the flow is this young. The 1948 investigations brought to light comparable potsherds and sites situated on the flow. The aboriginal peoples would only venture into the lava fields for one of several reasons, i.e., to hunt, to cultivate, to build homes and live there, or to take refuge. None, with the possible exception of the last, would be possible until there was soil covering the lava beds, vegetation on the soil, and game animals which would depend upon the vegetation. Such a development, even with the most helpful of climatic conditions would require a long time. Therefore, it would appear more logical to place the date of the flow nearer 1 A. D. than between 700 and 900 A. D. or later.

South of the lava beds are the North Plains, a Quaternary alluvial grassland which forms a contrast to the headlands of Cebolleta Mesa. These plains extend as far south as T. 3 N. It is into this basin that precipitation falling on the western slopes of Cebolleta Mesa flows. On the eastern slopes of the mesa, the runoff reaches the Rio

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Nichols also adds an interesting point from N. H. Darton (1915, Guidebook of the Western United States, U. S. Geol. Survey, Bull. 613, p. 98) to the effect that Acoma Indians on whose reservation a small part of the McCartys flow is found have a legend that the flow covers land that their ancestors tilled. This legend, he states, if creditable, would date the eruption of the basalt flow as pre-Spanish but later than about 700 A. D. -- the beginning of the Pueblo civilization.

San Jose and the Rio Colorado in the north portion of the Mesa. Both of these rivers flow into the Rio Puerco. Drainage from the southern portion of the Mesa flows into the Rio Salado.[16]

B. TOPOGRAPHY

Cebolleta Mesa is a high tableland attaining an altitude over 8,500 feet above sea level. It is in the Datil Section of the Colorado Plateau Physiographic Province and is located east of the Zuni Uplift, the major feature of this section.[17]

The western side of Cebolleta Mesa is marked by steep cliffs, headlands formed by the numerous canyons, and isolated _pilares_. A step effect has resulted from the differences in erosion-resistant properties of the formations. Along this edge in the northern thirty miles are the lava beds which vary from _ca_. 6,650 feet above sea level in the San Jose Valley to 1,000 feet higher near their source twenty-five miles to the south. South of the lava beds, the North Plains form a comparatively level area averaging 7,300 feet above sea level. These plains end with the Continental Divide which borders both the west and south

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[16] Darton, N. H., 1928b.

[17] Fenneman, N. M., 1931, pp. 317-319.

sides.

The strata of Cebolleta Mesa have a gentle dip to the east with very little folding or warping. Several faults cut through the mesa, usually in a north-south direction. As a result of the eastward dip of the strata, the east side of Cebolleta Mesa has a gentle slope rather than the bold outlines of the west side.

C. CLIMATE

According to the climatic classification by Thornthwaite (DC'd)[18] and that of Köppen and Geiger (BShw)[19] the Cebolleta Mesa area falls into a steppe or semi-arid climate with a moisture deficiency during all seasons. Thornthwaite places the Precipitation/Evaporation Index between 16 and 31 with a Temperature/Efficiency Index _ca_. 48.

The 7,400-foot contour on the lower slopes of the Mesa is the approximate boundary between Köppen and Geiger's "h" and "k" types of BS climate; the "w" refers to a dry season in winter. However, this area has a decreasing proportion of the annual precipitation occurring in the spring and summer as compared with the Eastern Zone of New Mexico. The greater influence of Pacific Polar air tends to divide

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[18] Thornthwaite, C. Warren, 1931, pp. 633-655.

[19] Goode, J. Paul, 1939, pp. 20-21.

the year's precipitation more evenly. This reduction in directly useful moisture in spring and summer and the normally low total precipitation during the entire year result in a marked contrast between vegetative characteristics of this area and those of the Eastern Zone of New Mexico.[20]

Table I gives a climatic summary for weather stations near the Cebolleta Mesa area.

Since Cebolleta Mesa rises over 1,000 feet above the surrounding area, it receives a greater amount of moisture from the predominately westerly winds.[21] The western and southern exposure of the mesa to the sun and wind, however, causes greater evaporation. This, together with a medium absorptive vegetation association and sandy soil, results in lessened run-off except in restricted areas.[22] Where the run-off has been concentrated, extensive channel trenching (arroyo cutting) has taken place. Much of it in the Southwest has occurred within the memory of men now living. Often the cutting has occurred independent of grazing.[23] A case is Cebollita Canyon where an arroyo fifteen feet deep exists

---

[20] Dorroh, J. H., Jr., 1946, p. 9.

[21] Thornthwaite, C. Warren; Sharpe, C. F. Stewart; and Dosch, Earl F., 1942, p. 38.

[22] Dorroh, J. H., Jr., 1946, pp. 26-27.

[23] Bryan, Kirk, 1925, p. 343 and 1926, p. 17.

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[20] Dorroh, J. H., Jr., 1946, p. 9.

[21] Thornthwaite, C. Warren; Sharpe, C. F. Stewart; and Dosch, Earl F., 1942, p. 28.

[22] Dorroh, J. H., Jr., 1946, pp. 26-27.

[23] Bryan, Kirk, 1928, p. 343 and 1929, p. 17.

TABLE I

CLIMATIC SUMMARY[24]

		Temperature					Killing frost average dates				Average Precipitation													
County	Station	Length of record	January average	July average	Maximum	Minimum	Length of record	Last in spring	First in fall	Growing season*	Length of record	January	February	March	April	May	June	July	August	September	October	November	December	Annual
		Yr.	°F.	°F.	°F.	°F.	Yr.			Days	Yr.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Catron	Datil	16	27.6	65.0	98	-18	20	May 28	Sept. 24	119	27	.71	.71	.60	.74	.72	.81	2.56	2.65	1.61	.78	.67	.82	13.38
	Quemado	13	27.9	66.3	97	-29	13	May 31	Oct. 2	124	17	.84	.74	.70	.71	.71	.67	2.71	2.65	1.73	.71	.71	.90	13.78
McKinley	Ramah	-	-	-	-	-	-	-	-	-	14	.65	1.48	1.01	1.06	.79	.51	2.09	2.61	1.38	.92	.80	.78	14.08
Valencia	Bluewater	30	27.5	69.1	105	-25	30	Apr. 26	Sept. 25	122	30	.43	.53	.54	.50	.63	.51	2.15	2.21	1.46	.61	.38	.40	10.35
	Laguna	24	33.0	74.0	103	-20	21	Apr. 25	Oct. 17	175	26	.38	.52	.55	.86	.58	.91	2.39	1.78	1.45	.55	.46	.62	11.05
	San Fidel	19	30.0	72.0	100	-11	12	May. 2	Oct. 20	171	19	.30	.46	.40	.55	.86	.79	1.84	2.13	1.61	.53	.39	.41	10.27

* Length of growing season between average dates of last killing frost in spring and first in fall.

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[24] Hardy, Erle L., 1941, pp. 1011-1016.

today. At the time it was settled, Cebollita Canyon was without an arroyo and water from the spring at the head of the canyon drained into the lava beds. However, water began to follow the wagon tracks and cutting took place.

There are many theories as to why arroyo cutting has occurred. The evidence supports a slight change of climate toward a drier condition,[25] though it is probably not a progressive, constant change in any direction but merely a climatic fluctuation as has occurred in the past.[26]

D. SOILS

The soils of Cebolleta Mesa are much like those of the Capulin-Tucumcari area of New Mexico. They are Brown Soils typical of a continental and arid or semi-arid climate with summers long and hot, and winters moderate to cold. Parent materials for these soils are "Red Beds" or other sedimentary rocks, such as clays, shales and sandstones, or outwash from such beds. Usually they contain some basaltic material. In color the soils vary from light brown to greyish brown to brown or reddish. Most of these soils are calcareous and at Cebolleta Mesa they have an underlying stratum of adobe.[27]

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[25] Bryan, Kirk, 1925, p. 343.

[26] Thornthwaite, C. Warren; Sharp, C. F. Stewart; and Dosch, Earl F., 1942, p. 43.

[27] Kellogg, Charles E., 1938, pp. 1089-1090.

E. FLORA AND FAUNA

"The temperature during the season of growth and reproduction controls the ranges of animals and plants, and therefore determines the extent and limits of the several zones."[28] Most of Cebolleta Mesa falls into the Upper Sonoran Zone. Only the highest portions fall into the Transition Zone and the lowest portions verge on the Lower Sonoran Zone. Characteristically, the Upper Sonoran Zone lies above 5,000 feet above sea level and extends to 7,000 feet or 8,000 feet above sea level. The climate is mild and is without great extremes of heat or cold. This is mainly an arid zone but with sufficient moisture for good grass.[29]

Cebolleta Mesa is included in the Great Basin Division of the Upper Sonoran Zone. This division is again divided into an upper subdivision (nut pines and juniper) which includes the mesa proper and a lower subdivision which includes the North Plains. The latter is clothed with scattered grass, cacti, yucca, and low desert shrubs. Trees are absent in the lower subdivision.[30]

The following list includes the more common Upper

---

[28] Bailey, Vernon, 1913, p. 7.

[29] Bailey, Vernon, 1913, p. 24.

[30] Bailey, Vernon, 1913, p. 27.

Sonoran animals and plants which are encountered at Cebolleta Mesa.[31]

MAMMALS

- Plains White-tail Deer
- Grey Mule Deer
- Antelope
- Arizona Grey Squirrel
- Rock Chipmunk
- Grey-tailed Prairie Dog
- Large Kangaroo Rat
- Texas Jack Rabbit
- New Mexico Cottontail
- Plateau Wildcat
- Mexican Cougar
- Grey Fox
- Plains Coyote
- Mexican Wolf

BIRDS

- Rough Winged Swallow
- Mourning Dove
- Burrowing Owl
- Huachuca Spotted Owl
- Western Night Hawk
- Cat Bird
- Sage Thrasher
- Kingbird
- Pinon Jay
- Western Crow
- Nevada Sage Sparrow
- Brewer's Sparrow

REPTILES

- Many lizards
- Prairie Bull Snake
- Black-railed Rattler

PLANTS

- Pinon
- Silky Juniper
- Scrub Oak
- Mountain Mahogany
- Skunk Brush
- Sumac
- Manzanita
- Greasebrush
- Indian Paint Brush
- White, Black, and Brown Sage
- Salt Brush
- Prickly Poppy
- Rabbit Brush
- Prickly Pear
- Barrel Cactus
- Narrow and Wide Leaf Yucca
- Rocky Mountain Bee Weed
- Wild Four O'Clock

GRASSES

- Tall Grama
- Hairy Grama
- Rice Grass
- Feather Grass
- Bunch Grass
- Mutton Grass

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[31] Bailey, Vernon, 1913, pp. 32-38.
Merriam, C. Hart, 1898, p. 36.

The more common members of the Transition Zone animals and plants include the following:[32]

Grey-sided Chipmunk
Rocky Mountain Lion
Mountain Coyote
Ruby-throated Humming Bird
Mongollon Meadow Mouse
Mountain Bobcat
Red-shafted Flicker
Western Yellow Pine

Plants and animals of Cebolleta Mesa which are characteristic of the Lower Sonoran Zone include the following:[33]

Mocking Bird
Road Runner
Cactus Wren
Canyon Wren
Desert Thrasher
Hooded Oriole
Gamble's Quail
Four-toed Kangaroo Rat
Sonoran Pocket Mouse
Big-eared Bat
Creosote Bush
Mesquite
Acacia
Cacti
Yuccas
Agaves

F. HISTORICAL NOTES

There are a number of names for mesas and villages near Cebolleta Mesa which are identical or nearly so and can be confused with the mesa name. Also, there are a number of different spellings of the same word. Examples include Seboyeta or Cebolleta, a village eighteen miles north of Laguna; Cebolleta Mountain and Cebolleta Grant, both north of Laguna; and the village of Cebolletita southwest of Seboyeta. Most of the references in historical accounts

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[32] Bailey, Vernon, 1913, pp. 43-46.

[33] Merriam, C. Hart, 1989, p. 41.

deal with these places.[34]

The main reason that early information on this area is meager stems from the routes of travel and the circumstance that the lava flow would serve as a barrier to travel. These routes approximated U. S. Highway 66 and U. S. Highway 60, both leading in an east-west direction and are located on the north and the south sides, respectively, of the lava beds.

During the late 1880's and 1890's the first homesteaders settled in the Cebolleta Mesa area. The first areas to be occupied were those with sources of water of which only two springs are important. One is at the head of Cebollita Canyon, Sec. 9, T. 7 N., R. 9 W. These patents and grants are mostly in Spanish names. For several of these settlers, the worked stone in the ruins provided a source of building material but, in general, very few sites show evidences of "pot-hunting".

The other important spring is located in Sec. 19, T. 5 N., R. 10 W. Some facts concerning settlement of the area around it were supplied by Mr. Epafradito T. Baca. "My grandparents, Diego and Dolores Armijo, first settled

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[34] Twitchell, Ralph E., 1911, p. 441 and 1914, pp. 49, 76, and 373.

in Los Betios Canyon in the early 1920's.[35] They raised sheep, and the cabin also acted as a trading post for the Navaho[36] and other ranchers who settled nearby. In those days there were many settlers in the area. Most of these sold their land which is now consolidated into large ranches. My grandparents moved away during the depression but still own the land." When asked about the ruins he said, "These were considered to be old Spanish haciendas and definitely not Indian ruins. The Indians did not use stone masonry." He said that the place now called "The Narrows" was known as La Angostura. Here, the basalt flow and the sandstone cliffs come together.

G. SCIENTIFIC CONTACT

Scientific contacts began just prior to 1900 when C. L. Herrick, then president of the University of New Mexico, took a trip through the area and reported on its geology. His geologic map (Plate IX) shows the location of a number of ruins but there is no description of them in the text. His remarks about the road still hold true, i.e., "... the

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[35] Through preliminary tree ring studies in the area, several dry wood borings from the Armijo cabin showed that the timber was cut in 1921.

[36] Three abandoned Navaho hogans were found on the ridge above the cabin and near the spring. Mr. Baca did not know to which group these Navaho belonged.

road lies at the foot of the cliffs and passes through the narrow interval between the cliffs and the lava beds, in some cases traversing the latter for short distances."[37] N. H. Darton has also reported on the geology of Cebolleta Mesa as far south as T. 7 N.[38] Recent geological studies have been made by W. S. Pike, Jr.[39] who shows columnar sections for several localities at Cebolleta Mesa, and by Caswell Silver[40] who worked on the east side of the mesa.

Archaeological contacts began in 1910 when J. L. Nusbaum and W. Hough traveled through the region by wagon. H. P. Mera and Stanley Stubbs of the Laboratory of Anthropology at Santa Fe, New Mexico have mapped several ruins and have made sherd collections from the northern portion of the area. Around 1940 Daniel McKnight and Wesley Hurt did intermittent surveying in the northern portion and around the edges of the North Plains. Deric O'Bryan of Gila Pueblo at Globe, Arizona has collected wood specimens from a ruin about ten miles south of U. S. Highway 66. In 1947, a Mr. Simmons dug a number of rooms in several sites in and near Cebollita Canyon. However, none of these field contacts

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[37] Herrick, C. L., 1900, p. 345 and Plate IX.

[38] Darton, N. H., 1928a, pp. 129-130.

[39] Pike, W. S., Jr., 1947, p. 68.

[40] Silver, Caswell, 1948.

have resulted in published reports.

H. PRESENT INVESTIGATIONS

The investigations covered by this report were started in March of 1947 when a preliminary survey was made. However, actual work did not begin until June of 1947. The project was undertaken to provide a basis for a Master of Arts thesis in Anthropology at the University of New Mexico. Problems based on the preliminary survey included the following:

1. To make a site survey of a limited area along the western edge of Cebolleta Mesa in order to ascertain the number and sizes of the ruins, the types represented, architecture, masonry, sherd counts, description of other immovable cultural items, and a population estimate of the archeaological periods represented.

2. To study this area in relation to its proximity to the boundary between the Anasazi and Mogollon areas, as described by Eric Reed.[41] Such investigations should shed light upon the peripheries of the two cultural areas.

3. To investigate possibilities of movements through this area and their effects, with special reference to architecture.

4. To construct a Master Chart for the dating of wood specimens from the ruins.

During the first season's work a number of other problems were recognized and another season was planned before writing a report. These include the following:

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[41] Reed, Eric K., 1946, p. 300.

5. At least one kiva must be excavated to find what features they include.

6. Enough rooms at site 14-A must be completed in order to give a clear picture of this unit's development.[42]

7. In sites such as 27-A, it became evident that one family might occupy two or more rooms at a single instance. It is possible that they also had a granary or shared one with another family. In other sites, such as 14-A, one family would use only one room as all the necessary equipment was at hand. Future investigations should give a better idea of occupancy in the different sites.

8. Some excavations of the depressions[43] should be carried out to determine their use.

9. During the summer of 1947, a number of ruins were visited to the north (on Mr. Arthur Bibo's ranch twenty-one miles north of T. 5 N., R. 11 W.) and to the south (on Mr. Sam Luedecke's ranch fifteen miles south of T. 5 N., R. 11 W.) of the Township where concentrated work was conducted. From surface sherd collections and the appearance of the masonry, it could be said that all three areas, ostensibly, are closely related. However, more work should be done to form a convincing basis for the above statement.

A statement of the relationship of the fieldwork to these problems is contained in the chapter, "Conclusions and Conjectures".

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[42] During the first season three rooms were completely excavated, two rooms were partially excavated, and the kiva walls were outlined at this site.

[43] As used in this paper, the term "depression" refers to circular hollows in the ground usually associated with a ruin. These are distinct from the irregular, natural, clay-bottomed depressions of the North Plains and the rock-bottomed depressions of the mesa-top. (See Ch. II, part F, section 2).

8. At least one kiva must be excavated to find what features they include.

6. Enough rooms at site 14-A must be completed in order to give a clear picture of this unit's development.[41]

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8. Some excavations of the depressions[42] should be carried out to determine their use.

9. During the summer of 1967, a number of ruins were visited to the north (on Mr. Arthur Allen's ranch twenty-one miles north of T. 6 N., R. 11 E.) and to the south (on Mr. Joe Luedecke's ranch 12 to 14 miles south of T. 6 N., R. 11 E.) of the Township where concentrated work was conducted. From surface sherd collections and the appearance of the masonry, it could be said that all three areas, outwardly, are closely related. However, more work should be done to form a convincing basis for the above statement.

A statement of the relationship of the fieldwork to these problems is contained in the chapter, "Conclusions and Conjectures".

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[42] As used in this paper, the term "depression" refers to circular hollows in the ground usually associated with a ruin. These are distinguished from the irregular, natural, clay-bottomed depressions of the mesa-top. (See Ch. II, part 1, section 2)

I. ACKNOWLEDGMENTS

During the summer of 1947, Mr. W. F. McConnell and the author formed the party. For short periods other students visited the camp and were of considerable help. These included Mr. and Mrs. H. W. Dick, Mr. and Mrs. Charles Groffman, Miss B. J. Kuykendall, Mr. Gordon Carter, and Mr. Jeff Morris. The 1948 party was somewhat larger. Mr. and Mrs. R. J. Ruppe, Jr. and Mrs. A. E. Dittert, Jr. were along during the entire season. For shorter periods, Mr. Reed Varley, Miss Judith Richard, and Mr. and Mrs. Franklin Van Wart joined the party.

In addition to the above, I wish to express my appreciation to the many people who helped to make these investigations possible, especially to Mr. Arthur Bibo who gave much of his time and materials. Mr. M. E. Colclazier granted permission for the use of his property where a large portion of the work was done. Mr. Lloyd Colclazier and Mr. Sam Luedecke extended many courtesies to us. And, lastly, I wish to thank the University of New Mexico, Anthropology Field Sessions for the use of their equipment.

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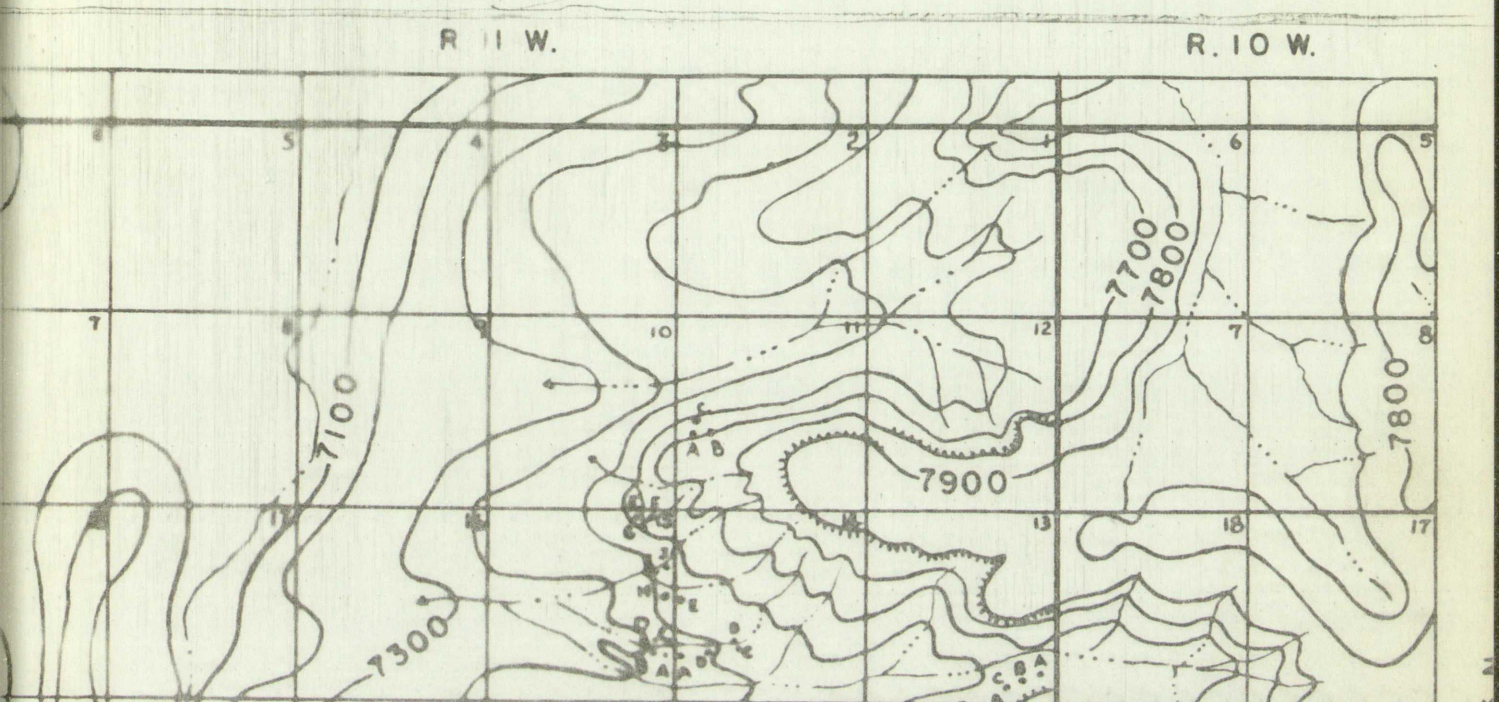

Fig. 2 Map of the area which was surveyed showing the location of the

CHAPTER II

SITE SURVEY

As a result of the preliminary survey made in March 1947, it became apparent that the investigations of 1947 and 1948 would have to be confined to a limited area. On the basis of the number of sites present, the variation in types of sites represented, the range and variety of sherds present, and proximity to a permanent source of water, T. 5 N., R. 11 W. was selected. The varied topography of this Township permits conclusions as to the aboriginal choice of situation for homes and fields. Outcrops of sandstone, timber stands and adobe deposits permit vast variation in mode of construction.

In the process of surveying Los Betios Canyon, four additional sites were found in Sec. 19, T. 5 N., R. 10 W. These have been included in this report. A tabulation of the sections which were surveyed completely or in part and the number of sites found in each is contained in Table II.

Township 5 N., R. 11 W. is centered about thirty-five miles south of Grants and four and one-half miles south of the Point of the Malpais along New Mexico State Highway 117. In relation to the Cebolleta Mesa area as a whole, it is near the southern boundary. Virtually all of the area surveyed lies to the west of the Mesa proper, and includes some of the western slopes. The mesa top and the eastern

TABLE II

SECTIONAL SURVEY TABULATION

T. 5 N., R. 10 W.

Section	Portion Surveyed	Number of sites
7	Complete	0
8	W½	0
17	NW¼	0
18	N½	0
19	W½	4
30	W½	0
T. 5 N., R. 11 W.		
10	E½	0
11	Complete	3
12	S½	0
13	N½, SE¼	3
14	W½, SE¼	5
15	Complete	10
16	Complete	0
17	Complete	0
20	Complete	0
21	Complete	0
22	Complete	0
23	Complete	15
24	Complete	7
25	Complete	1
26	Complete	7
27	Complete	3
28	Complete	0
33	Complete	0
34	Complete	1
35	Complete	4
36	W½	0

Totals for both Townships:
Number of sections - 72
Sections completely surveyed 17
Sections partially surveyed 10
Sections excluded - 45
Number of sites - 63

slopes were not included. The headlands and the western slopes of Cebolleta Mesa are included in the eastern half of this Township, while the western half forms a portion of the North Plains, to the west of the mesa.

A. PROCEDURE

A total of twenty-five days was devoted to site surveying during the summers of 1947 and 1948. In this time, sixty-three sites were mapped. The remainder of the time was devoted to excavation. As most of the area surveyed is covered with pinon and juniper, it was necessary to traverse it on foot at intervals of forty to fifty yards. By means of a Brunton compass, the sites were plotted on the U. S. Department of the Interior, Grazing Service Map, New Mexico Region No. 7. The sites were designated alphabetically by section, i.e., Section 14 would have sites 14-A, 14-B, 14-C, and so on. Each site was mapped in order to show each individual room outline as accurately as possible. A sherd collection was made at each site in which a careful search was made for every sherd exposed on the surface. The area of collection varied with each site. The result has been noted in Table VI, "Site Survey Summary". Notes taken at each site concern its resources, situation and defensibility, type, size and condition, and other surface features.

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A. PROCEDURE

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B. RESOURCES

The aboriginal basis of subsistence in the Cebolleta Mesa area was predominately a maize economy which was carried on under disadvantages. At present the streams flow only after rains and agriculture is feasible only by flood-water irrigation. Presumably a like situation existed in late pre-Columbian times.

There are no known evidences to indicate that water was artificially impounded for use in irrigation. Fields would have to have been watered by runoff from an area much larger than that actually cultivated. Between rains growth of the crops would depend upon moisture stored in the soil. This probably would be sufficient today except during periods of drouth. Fields must have been located where quantities of water would have passed over them but not so rapidly as to wash away the potential crop.[44]

The western slopes of Cebolleta Mesa are ideally suited to this method of agriculture. Numerous washes drain large areas and then spread the water over alluvial fans in the form of sheet-wash. Such fans hold moisture even in the driest part of the summer. At the juncture of two or more

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[44] Hack, John T., 1942, p. 26.

Products of hunting and gathering would form a portion of the food supply. The available plants and animals have been included in Chapter I.

small washes, arable sandy flats varying from four to ten acres were formed. Several of these plots under cultivation would yield enough produce to supply the population of the smaller sites.[45] Larger acreages for cultivation occur on the outwash plains of the major arroyos where, during heavy rains, sheet-wash now covers a hundred acres or more with from one to three inches of water. At present, several residents in the region raise crops of corn, oats and barley, and maintain successful vegetable gardens.

Today there are only two permanent springs on the west side of Cebolleta Mesa but water is available from other sources. One small seepage and evidences of two others were located during the site survey. These may well have supplied water to some of the earlier peoples living near them. In many of the washes, water collects in holes dug from one to two feet into the sandy bottoms. These, however, are temporary and necessitate repeated renewal. After rains the water collects in pockets in the rocks, in rock-bottomed

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[45] Hack, John T., 1942, Fig. 15. Hack shows a typical present-day flood-water irrigated plot that is cultivated by one man at Hopi. This plot contains *ca.* 10.4 acres.

Forde, C. Daryll, 1931, p. 330. The Hopi make use of several fields in case one is destroyed. When using primitive tools, a corn plot is usually one acre in extent.

Hill, W. W., 1938, p. 20. The usual size of a field among the Navaho is six acres, however, a man might cultivate two fields. Placement of the fields is similar to that described in the text above.

small washes, [illegible]
acres were formed [illegible]
would yield [illegible]
smaller sites.[45] [illegible]
the mountain pl[illegible]
wilms, shelt-wall [illegible]
from one to three [illegible]
residents in the [illegible]
and maintain [illegible]

Today [illegible]
east side of [illegible]
other sources. [illegible]
were located d[illegible]
supplied water [illegible]
them. In many [illegible]
from one to two [illegible]
are temporary, [illegible]
the water collects [illegible]

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[45] Bock, [illegible]
twenty-five [illegible]
one man at Hopi. [illegible]
of several [illegible]
primitive [illegible]
field area, [illegible]
cultivate [illegible]
as that [illegible]

depressions on the mesa top and in clay depressions in the North Plains. These store water for several weeks at a time. In T. 7 N., R. 10 W. there is a large number of wind-eroded holes in the sandstone which store ten to a hundred gallons of water. Many of these contain water throughout the year. During the months from October to April snow provides a source of water.

Thus, these four sources of water, in addition to the springs, should have been sufficient for the prehistoric population. Storage of water in ollas was doubtlessly practiced and the amount necessary totaled considerably less than we consider essential. Under the conditions which existed during the time the sites were occupied a family of four could have sustained itself on four quarts of water per day. This estimate is based on the present-day U. S. Army procedure. World War II soldiers under combat conditions could, if necessary, wash their face, brush their teeth and have enough water to drink when given one quart of water a day. While hardly an apt comparison, a water discipline of this sort may well have been common among the Indians of the Southwest when required. Therefore, the above amount is not unreasonable.

Natural resources for the construction of dwellings are plentiful in the area. At this location the pinon - - juniper association appears to begin with the 7,500-foot

contour and forms a thick cover for the slopes of the mesa. Pines occur as low as the 7,600-foot contour and are common above 7,800 feet. Parallel-bedded sandstone outcroppings form sources of easily shaped building blocks. Massive sandstones are also present but were not used architecturally to so great an extent. Adobe is found in all of the washes. Basalt blocks were used in walls built on or near the malpais.

Grinding tools were made from sandstone or basalt. Mauls, axes and arrowshaft straighteners were commonly of igneous materials such as basalt, andesite or rhyolite. The latter rocks are obtainable either to the south, near Pie Town, or on the top of Cebolleta Mesa.

Clay suited for pottery occurs in drainage pockets. In most cases its origin can be traced to the erosion of shaly material in strata above the deposit. These pockets have acted as settling basins for the waters transporting the clay.

Material breaking with a conchoidal fracture includes obsidian, chalcedony, jasper, agate, rhyolite, fine-grained basalt and chert. These all occur over much of the area surrounding Cebolleta Mesa. Only one deposit of chert was found on the western slope of the Mesa proper. Most of the fine-grained igneous material used in chipping probably came from the area near Datil. Quartzite, agate, chalcedony and

chart can be found in the Datil - - Aragon region. The occurance of petrified wood is common in the lower Rio San Jose and in the Rio Puerco (East) drainages.

C. SITUATION AND DEFENSIBILITY

Remarks intended to include all of the sites in the area investigated must be generalized in character. For the purposes of this paper, the sites now known can be subdivided between three categories on the basis of the proportionate sherd types. The earliest sites show a predominance of Kiatuthlanna Black-on-White and Kana-a Grey (Neck Banded) sherds. Sites of the middle periods are characterized by a predominance of Cebolleta Black-on-White, early varieties of Socorro Black-on-White and Exuberant Corrugated sherds. In the late sites Tularosa Black-on-White, Socorro Black-on-White, St. Johns Polychrome, Los Lunas Smudged and Grey Corrugated sherds are predominate. In general, the three categories follow these time periods: early, 700 to 900 A. D., middle, 900 to 1100 A. D., and late, 1100 to 1350 A. D.[46]

The early sites usually occupy points of land at the juncture of two intermittent watercourses which serve as

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[46] Colton, H. S. and Hargrave, L. L., 1937.
Hawley, F. M., 1936.
Also, see Part E of this chapter.

tributaries to main washes flowing into the North Plains. These prehistoric people seemed to prefer situations on the sides of a large canyon well away from its mouth. A few sites occupy tributary canyons branching from the main canyon. Mera suggests that such a location is defensible[47] and it is quite probable that defense was a genuine consideration. However, the degree of defensibility of any one site depends primarily upon the method of attack. While some of the early sites are easily defensible in terms of hand-to-hand combat and thrown rocks, they possess few possibilities of defense against bow-and-arrow combat or that of rocks rolled from the ridges above.

Another consideration for situation is that since the early groups were small the necessary farming area need not have been great. The watercourse junctures provide small areas where crops could be raised by flood-water irrigation without danger of erosion.[48] If the selection of the field preceded house-building, an ideal location for residence would be the small points of land above the fields. Also, some measure of protection from the elements is provided by the natural topography of the canyon.

Locations of sites belonging to the middle period

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[47] Mera, H. P., 1935, p. 7.

[48] Hack, John T., 1942, p. 26.

reflect no radical shift. Many even are found superimposed on the older ones. A few occur farther down the canyons where larger fields were available. Many of the middle period sites located near the mouth of a canyon have late sites superimposed on them. The middle period sites tend to be slightly larger in area than the early ones.

Late site locations are not limited by topography except in the center of the North Plains and on the tops of the higher mesas, i.e., those exceeding 8,000 feet above sea level. The maximum extent of sites into the North Plains appears to be about one and one-fourth miles and this occurred only with the later sites of the late period. With the above exceptions, the late sites can be found near any area where flood-water cultivation could have been practiced. A slight rise in the land, or the side of a rolling hill, appears to have been preferred.

For the most part, late sites would not have been subject to destruction by rolling rocks. However, the advantage in hand-to-hand combat or in use of the bow-and-arrow was usually with the offense. A direct assault on these structures would not have been profitable. If, however, the offense were to surround them, the inhabitants would be effectively isolated and could not secure aid. The defense would then be forced to attack an entrenched group.

A large proportion of the sites in all three cate-

gories show surface indications of burning. Other than this, no evidence of violence has been found. If burning is considered a criterion of intercommunal aggression, and if the situation of the early sites is considered defensive, it would be difficult to explain the location of the later sites in the open plains, which occupied less defensible situations except in terms of greater population.

Three noteworthy exceptions to the indefensibility of late sites are known. Two of these occur on the mesas bordering Cebollita Canyon and one is located on a high mesa in Cebolla Canyon. Both locations are north of T. 5 N., R. 11 W. All three sites have steep approaches and have walls sixteen to twenty-four inches thick at the topographic points which are vulnerable. The site near the head of Cebollita Canyon has walls that are still standing seven to ten feet high.

D. TYPES SIZES AND CONDITION OF SITES

On the basis of architecture, the sites may be divided between three main types, <u>viz</u>., sites of jacal units, sandstone masonry sites and those which are predominately of "turtleback" adobe walls with one or two rooms of sandstone masonry.

1. Jacal Unit Sites

The term "jacal unit" applies to a complete structure of jacal. In some cases it may consist of only one room or, as in the unit that was excavated, it may have one room and an adjoining ramada or shed. From surface indications it is difficult to determine with certainty the number of structures present in each unit. However, the presence of a unit was more obvious.

The jacal units show a predominance of Kiatuthlanna Black-on-White and Kana-a Grey sherds. The sites consist of from one to seven noncontiguous jacal units. Surface indications consist of low mounds from one to one and one-half feet high. The earth in the mounds is usually darkened by charcoal or, in places, stained red or orange as a result of oxidation by fire. Over many mounds this discoloration is hidden by a layer of humus. If erosion has proceeded far enough, fragments of burned adobe and pieces of charcoal are exposed. In most cases there was a large quantity of sherds littered over the site. All jacal units found showed some of the above characteristics, and all evidenced fire.

Site 19-A (T.5 N., R. 10 W.) is a jacal site lacking and overburden of later materials. This site, located on the slope of a pointed hill, includes seven identifiable units. All appear to have been burned and fragments of burned adobe,

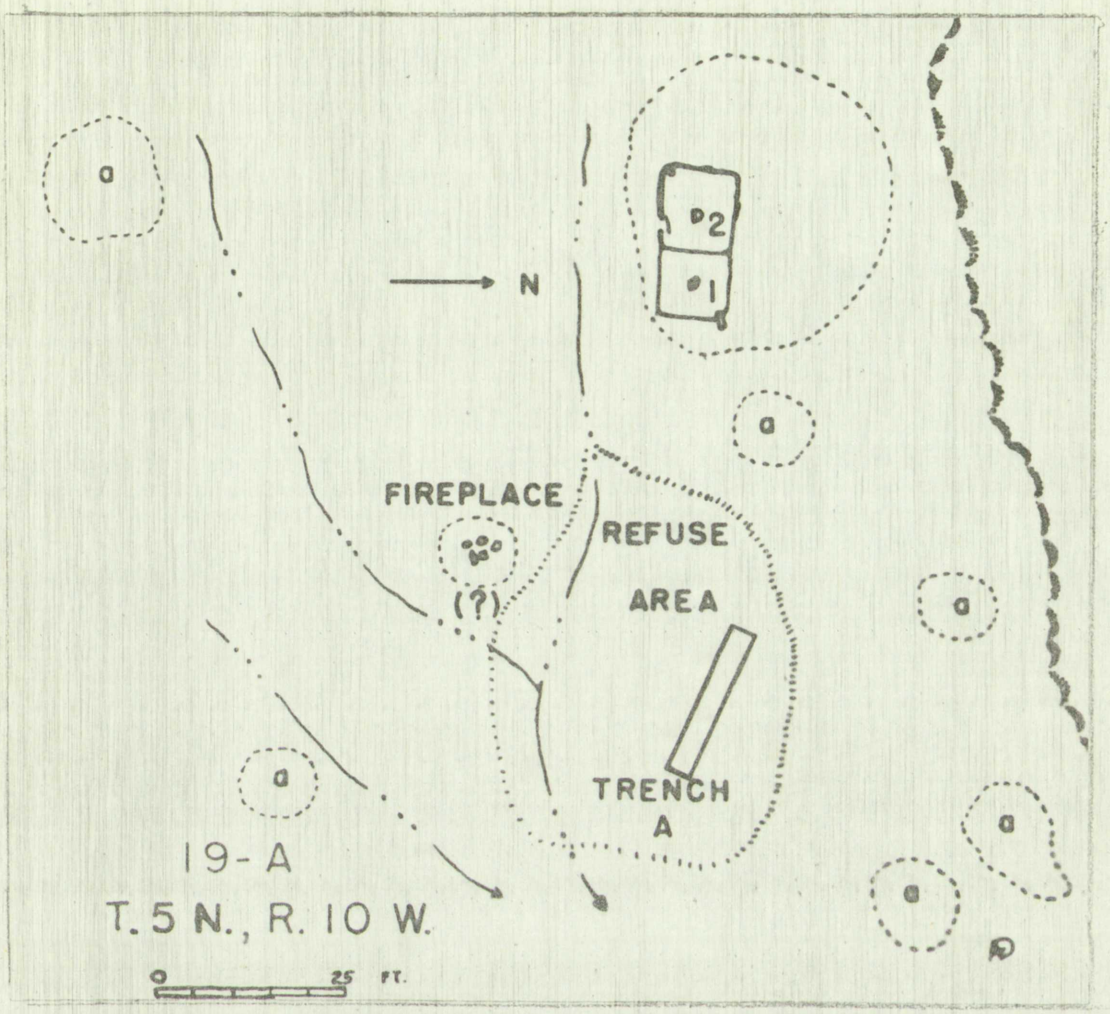

Fig. 3 Ground plan of site 19-A; rooms 1 and 2, the jacal unit that was excavated and a. other jacal units.

charcoal and sherds have been eroded from the mounds. The units possessed no formalized arrangement but were scattered over the hillside. One group of sandstone blocks appears to mark remains of an outdoor fireplace. This occupied a central position in the cluster of units. There was no evidence of a kiva. A well-defined refuse area lay on the east slope of the site.

Other sites at which jacal units were found include 24-A, 24-B, 24-C, 26-F and 35-A (T. 5 N., R. 11 W.).

2. Sandstone Masonry Sites

Masonry of the sandstone sites falls into three structural subdivisions. The first subdivision includes those walls in which the blocks were derived from a bedded outcrop and shaped to the extent of approximately squaring the ends of the blocks. These walls are found in middle period sites with Cebolleta Black-on-White, early varieties of Socorro Black-on-White and Exuberant Corrugated as the characteristic sherd types. Surface indications, in addition to sherds, consist of a mound of sandstone blocks which is one to three feet high. The number of rooms appears to vary from one to sixteen. In most sites, these rooms are contiguous and form a rectangular outline. Wall outlines are usually clear enough to make possible a map showing room walls.

Refuse mounds are well defined. Sherds, chippings and fragments of charcoal are being eroded out in large quantities. Regardless of predominate wind direction, the location of the refuse area was standardized only to the extent of existing on a slope rather than in a level area near the site.

Only one site in this group - - 24-D (T. 5 N., R. 11 W.) - - has a definite depression. Surface indications

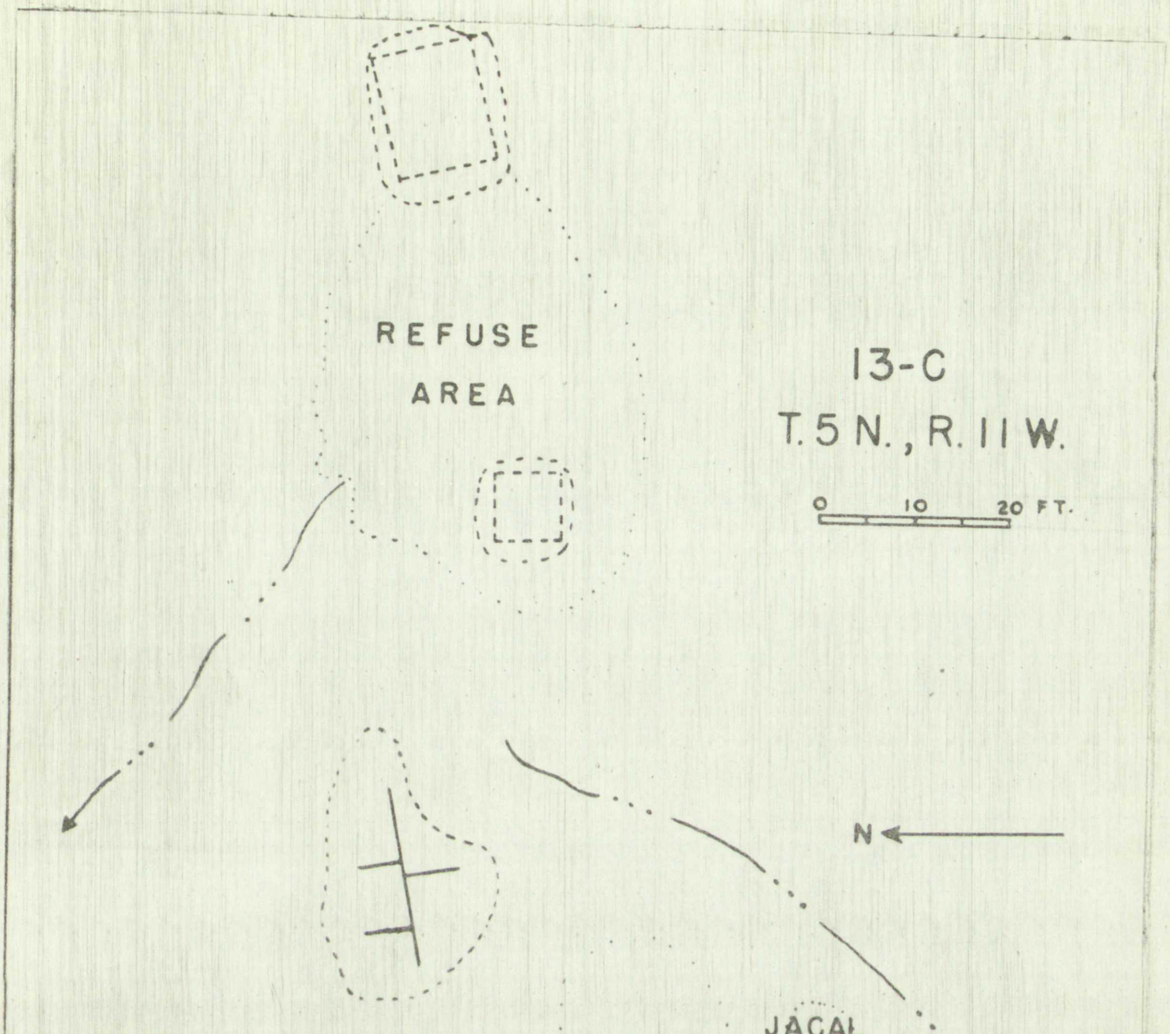

Fig. 4 Ground plan of 13-C, a middle period site in which the rooms are scattered over the slope of a hill.

at most of these sites show them to have been superimposed over jacal units.

Site 13-C (T. 5 N., R. 11 W.) is an example of this masonry type in which the rooms are scattered over the slope of a hill in much the same fashion as the jacal units. There are five units, four of which are single rooms. One unit contains five rooms. In the latter the sandstone blocks show evidence of more shaping then in the single-room units. In two of the single-room units large sandstone boulders serve as masonry.

Each unit in this site is now reduced to a mound of sandstone blocks. Most units show evidences of fire. There are dump areas on the northeast and west slopes of the site.

Site 24-B (T. 5 N., R. 11 W.) will serve as an example of the larger structures in this masonry type. It is situated on a tongue of land near the south wall of Los Betios Canyon. The structure consists of about sixteen rooms in an irregular arrangement. The mound of sandstone blocks is two to two and one-half feet high. The wall outlines are distinct. In some of the rooms the sandstone blocks facing the interior show evidences of fire. Many of the blocks have a discoloration extending as much as one inch into the block. The dump area is well defined on both the north and west slopes of the site. There are no surface indications that features such as depressions exist. Insofar as the location is on a level bench,

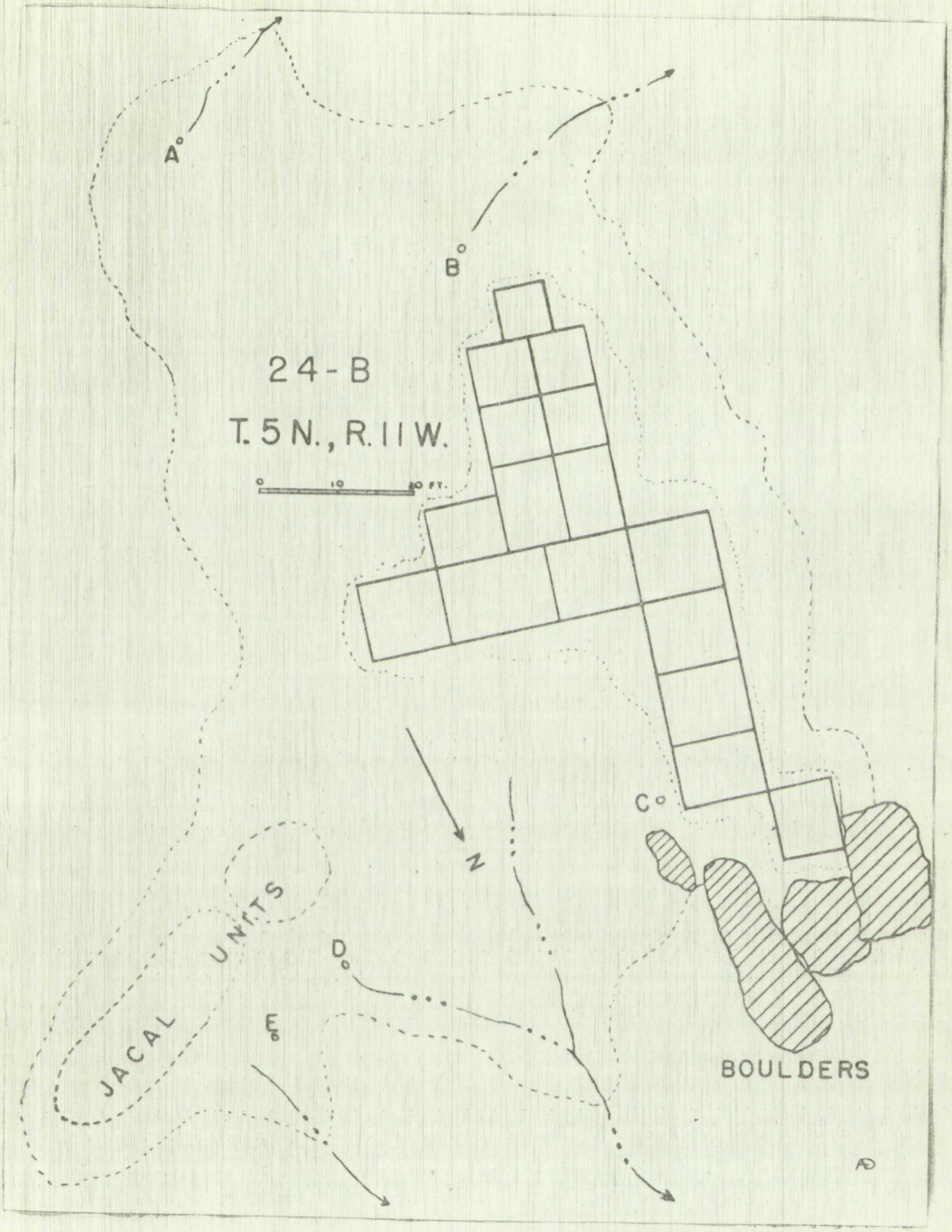

Fig. 5 Example of a middle period site having an irregular ground plan. Remains of jacal units were found on the east side of the site. Lettered areas indicate location of sherd collections.

extensive deposition has occurred in the site area and could have removed all traces of a depression. In turn, erosion on the slopes has exposed a group of jacal units and, judging from the distribution of sherds, other jacal units occur around the site. Sites 19-B and 19-D (T. 5 N., R. 11 W.) and sites 13-A, 13-B, 24-A, 24-C, 24-D, 24-F and 24-F (T. 5 N., R. 11 W.) are others which illustrate this masonry type.

Site 25-A (T. 5 N., R. 11 W.) is one of the few which appear to illustrate the continuum between the sandstone masonry sites, characterized by blocks with only squared ends, and the sites with blocks which have the entire surface shaped by pecking. This is a one-room-and-bin site located on the slope of a rolling hill near a small valley. An intermittent stream is in process of cutting through the ruin and has removed a portion of one wall and exposed portions of others. The sandstone blocks show pecking. This does not occur on all of the blocks nor over the entire surface of any one block.

The sherds are characteristic of a transition between middle and later sites. Cebolleta Black-on-White and Socorro Black-on-White remain the predominate types. However, the Socorro Black-on-White shows designs that are typical of this sherd type when found in late sites. The culinary ware has changed from Exuberant Corrugated to a finely corrugated grey ware.

The bin and room form a contiguous unit and are built of the same type of masonry. The bin is only half as large as the room. There are no surface indications of other features nor was there a clear dump area.

The second and third subdivisions of sandstone masonry often occur in the same site. The former, pecked sandstone blocks, appears to be the earlier of the two. Walls constructed of pecked blocks occupy the central portion of the site and are surrounded by rooms with walls of selected stones. Often the walls of selected blocks include a few of pecked sandstone. In this case the pecked blocks seem conspicuously out of place and often show evidences of more intensive burning than the others in the wall.

These masonry types fall into the late group of sites or those in which Tularosa Black-on-White, Socorro Black-on-White, St. Johns Polychrome, Los Lunas Smudged and Grey Corrugated sherds are typical. They are generally rectangular or L-shaped dwellings having as many as forty-six rooms. The surfaces appear as mounds from one to fifteen feet high. Walls are distinct and often project above the debris.

Refuse areas at these sites are poorly defined or nonexistent. In the case of site 14-A (T. 5 N., R. 11 W.), refuse had been placed in abandoned rooms. Only a thin lens of refuse from the early portion of the site was found

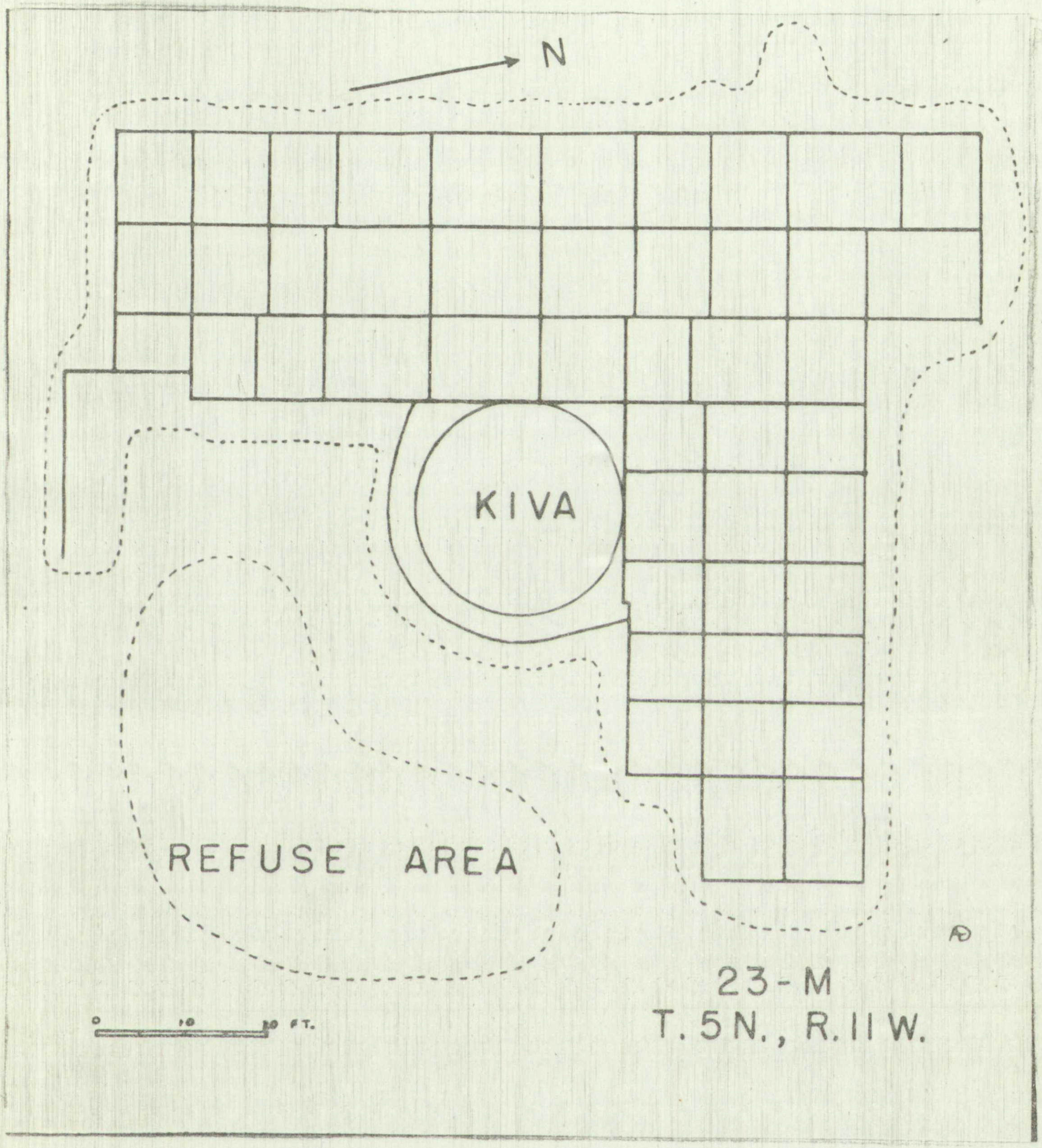

Fig. 6 Ground plan of a large, L-shaped late site built of pecked and selected sandstone blocks. The kiva has been incorporated into the contiguous house unit.

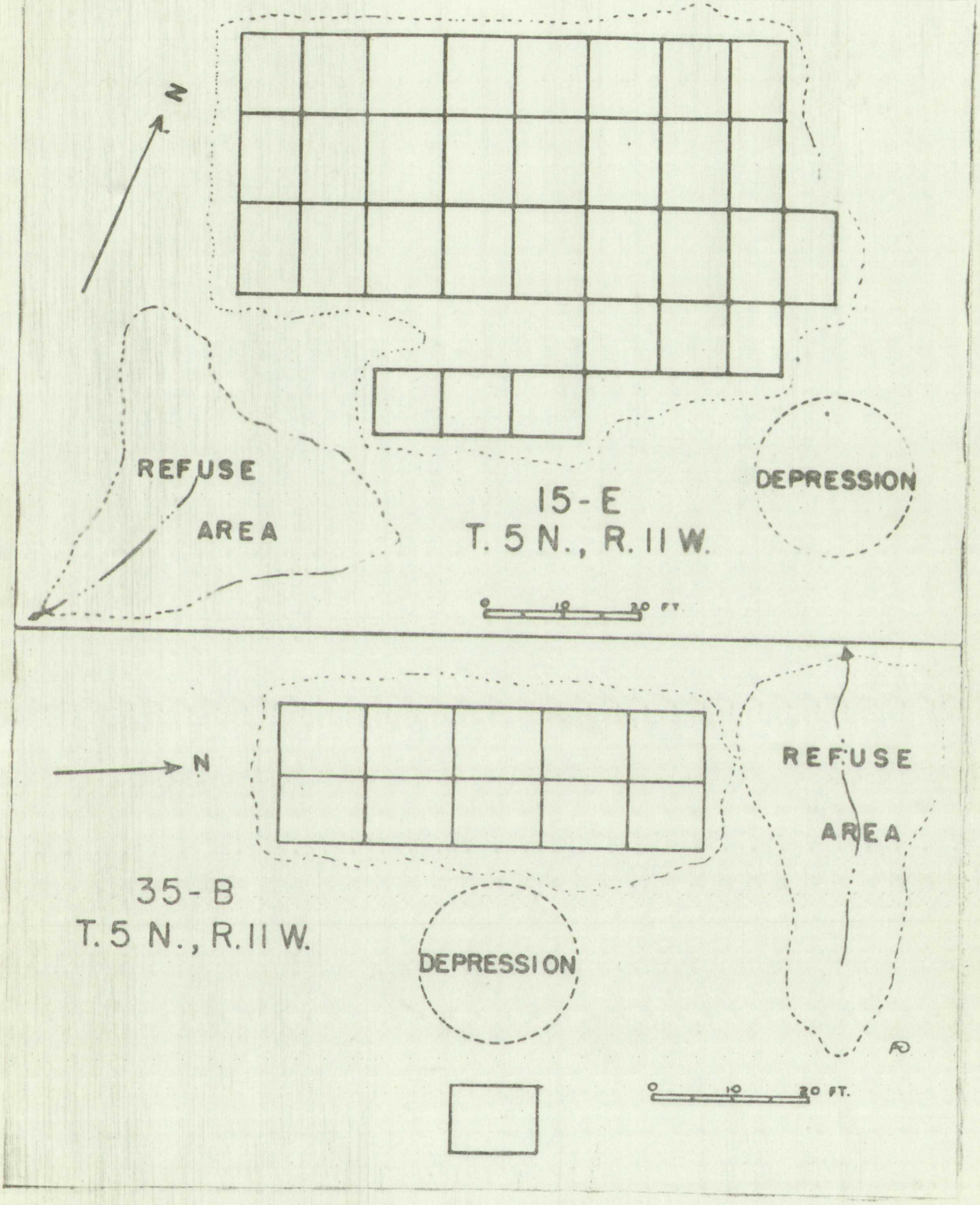

Fig. 7 Examples of rectangular unit structures. Both are late period sites built of pecked and selected sandstone blocks. The depressions, in both cases, are probably earth walled kivas. Site 35-B illustrates a detached room.

in excavations beneath the later set of rooms.

Other features that frequently occur in conjunction with these sites include circular depressions, an outlying room or bin and, in two cases, a kiva incorporated within the unit (see later description). Many sites appear to be superimposed on earlier levels of occupation.

Examples of the larger sites in this group include 14-A, 14-B, 14-C, 15-E, 15-F, 23-M, 35-A and 35-C. .Sites 14-E, 15-I, 15-J, 23-F, 23-G and 35-B are examples of the smaller sites.

Site 15-E will illustrate the larger ones. It is situated on a high knoll that overlooks the North Plains and has a degree of geographical advantage for defense usually lacking in this group. The blocks of sandstone form a mound four to five feet high but most of the wall outlines are distinct. The rooms form a rectangular unit. Masonry dichotomy in this site is clearly marked. Both surface indications and the wall exposed in pits dug by vandals displayed the different types. Again, indications of fire were present.

Near the east corner of the site there is a small circular depression twenty feet in diameter. There is no masonry. The only area for refuse was on the south side.

3. "Turtleback" Adobe Wall Sites

Sites that are predominately of "turtleback" adobe walls are characteristic of the terminal part of the late category. They show the same sherds as other late sites but with a greater percentage of Pinedale Polychrome, Four-Mile Polychrome and Suni Glaze sherds. Tularosa Black-on-White also increases in percent. These sites tend to occupy the North Plains or the lower slopes of Cebolleta Mesa and rarely occur in canyons or above the foothills. They are often proximal to sandstone sites of the late category.

Characteristically, these sites are rectangular units. One room built of irregular, linear blocks of sandstone has often been added onto the ends of the long axis. These blocks show no indications of having been altered. The sites are now reduced to low mounds, one to one and one-half feet high, of adobe and scattered pieces of sandstone. In contrast, the sandstone walls are distinct. In most cases the site appears to have been burned.

There is commonly a circular depression twenty to seventy-five feet in diameter in association with these sites. Refuse areas are nonlocalized.

Site 27-A (T. 5 N., R. 11 W.) is situated in the North Plains about one and one-fourth miles from the nearest slopes of Cebolleta Mesa. It is a U-shaped structure having

forty-two rooms of "turtleback" walls. On each end of the long axis of the structure there is a room of coursed sandstone. This masonry differs from the previously described types in having a high percentage of irregular linear blocks.

The site now forms a mound one to one and one-half feet high. The visible wall outlines are marked by areas of burned adobe. On the south side of the structure is a large circular depression seventy-five feet in diameter. A low ridge of debris borders the depression but no indications of walls occur. The refuse area is on the east side of the site and covers approximately ten acres. However, the stratum is a thin one (see Fi . 20).

Other sites that fall into this category include 15-A, 15-B, 23-A, 23-D, 27-B and 27-D (T. 5 N., R. 11 W.).

4. Range in Size of the Sites

The range in number of rooms varied from one to forty-six. The average number of rooms was 10.9 while one room per site was the most frequent and the majority of the sites had less than ten rooms. The maximum number of rooms found in early sites is seven; middle period sites have a maximum of sixteen while late sites have up to forty-six.

Table III gives the range of room numbers by period. Where earlier rooms were distinguished, they have been entered in the appropriate column. Consequently, the total

TABLE III

RANGE IN NUMBER OF ROOMS PER SITE

Rooms	Early	Middle	Late	Total
1	6	1	2	9
2		4	3	7
3	1	1	3	5
4		2	5	7
5			3	3
6		1	2	3
7	1		3	4
8		1	3	4
9		1	1	2
10			2	2
11			1	1
12			3	3
13		1		1
14			1	1
15			1	1
16		1	1	2
20			1	1
25			2	2
28			1	1
30			1	1
31			2	2
34			1	1
35			1	1
38			1	1
42			2	2
46			1	1
Totals	8	13	47	68

Total number of rooms in all sites - - 745

number of sites has been raised to sixty-eight for the purposes of this table.

There is only a gross correlation between area and total number of rooms in the sites. An irregularly arranged site having eight rooms often covers as large an area as a compact, rectangular one with ten or twelve rooms. Room sizes also differ, thus adding another variable. Insofar as the bulk of the sites showed distinct wall outlines, total surface area was disregarded as a criterion except in the few cases where this was the only means of arriving at an estimate for the number of rooms.

E. POTTERY

It is unfortunate that sherd types must be stressed as the main criterion for dating. At present, tree-ring studies in this area have not proceeded far enough to provide a method of dating wood specimens from the ruins. Preliminary studies have revealed the necessity of making a Master Chart for this area. Dating by means of existing charts does not appear feasible.

Architectural types can be used by comparing the types at Cebolleta Mesa with those of nearby areas. However, architecture, when considered by itself, is less accurate than pottery.[49] When types of pottery and types of archi-

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[49] Cf. Brew, John Otis, 1946, p. 215.

number of sites has been [illegible] for [illegible] the purposes of this table.

There is only a gross correlation between the total number of rooms in the sites. An example, a site having eight rooms often covers the same area as a compact, rectangular one with ten or twelve rooms. Room sizes also differ, thus adding another variable. Then, as the bulk of the sites lacked distinct wall outlines, total surface area was disregarded as a criterion except in the few cases where this was the only means of arriving at an estimate for the number of rooms.

B. POTTERY

It is unfortunate that sherd types must be chosen as the main criterion for dating. At present, tree-ring studies in this area have not progressed far enough to provide a method of dating wood specimens from the area. Preliminary studies have revealed the necessity of making another Chart for this area. Dating by means of obsidian does not appear feasible.

Architectural types can be used by comparing these types at associated sites with those of nearby areas. Architecture, when considered by itself, is less accurate than pottery.[49] Some types of pottery and [illegible]

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[49] Cf. Dean, [illegible], 1961, p. 218.

tecture are found in consistent association and when the sherd types that have been dated elsewhere occur consistently, then we have one multifaceted tool for cautious use.

Several factors have altered the sherd percentages. One of these, and probably the most significant, is the factor of erosion. At several places sites occur in clusters. At other places, they occur downhill from sites. In these cases erosion and the consequent movement of sherds have mixed the surface materials to a small extent. Evidences of this can be seen where there are no sites and, yet, sherds still can be found. A second factor is the superimposition of late sites with subsequent obliteration of earlier ones. Fortunately, there were few sites with high percentages of early sherd types at which structures characteristic of the early sherds could not be identified. Use of temporary structures placed on or near an earlier site would tend to alter the sherd percentages. One case in point is that of site 24-C (T. f N., R. 11 W.). The Zuni Glaze and St. Johns Polychrome sherds appear to be out of context at this site. Advantages offered by the quantity of arable land near the site do not brand the idea of temporary field houses as being unreasonable.

A third factor may have been one of curiosity. On several sites, worked sherds of Kiatuthlanna Black-on-White were found. These were unique in the sampling. It can be

inferred that the people at that time picked up curiousities as keepsakes in the same way that one would be attracted by a novelty today. Along with the two preceding factors, this did not play a significant part in the final analysis.

In the subsequent description and in Tables IV and V the listing of sherd types followed a chronological sequence by area. The first division was on the basis of firing methods, i.e., reducing and oxidizing atmospheres. The sherds in the reducing atmosphere were divided between Black-on-White and culinary wares. Those sherds in the oxidizing atmosphere class were divided between wares characteristic of northeastern Arizona and the wares associated with the Mogollon culture to the south. The types followed a chronological sequence from early to late. Even though it was unintentional, the divisions approximate a series.[50]

The following is a compiled and annotated list of the sherd types which were collected during the survey. Sherd types that occur in large enough quantities to be characteristic of this area are emphasized at the expense of those which can be classed as trade sherds.

1. Kiatuthlanna Black-on-White - - P. I type dating 800 to 870 (900) A. D. Found in the Gallup district, eastern San Juan, Rio Grande and New Mexico Rio Puerco.

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[50] Colton, H. S. and Hargrave, L. L., 1937, pp. 1-5 and Chapters X and XI.

Sherds representing the continuum into Cebolleta Black-on-White are similar to Gladwin's Red Mesa Black-on-White but there was no definite point of separation in the series.[51]

2. Kiatuthlanna Black-on-White interior, Kana-a Grey exterior - - Typically Kiatuthlanna Black-on-White on the interior with a wide neck banding on he exterior. Probably an individualistic variation.

3. Cebolleta Black-on-White (new type) - - P. II to early P. III dating *ca.* 900 to 1150 (?) A. D. Dates not established by tree-ring studies as yet. Found throughout Cebolleta Mesa area. Known extent: north to area eight miles north of Cubero, east to Acoma, south to Pie Town and west possibly as far as Zuni. Type is based on high percentage of occurrence at sites which were surveyed and random samplings in the total area. Derivation from Kiatuthlanna Black-on-White. Construction by coiling. Walls are four to six mm. thick. Rim types are I, A, with forms 2, 3 and 4 according to Colton and Hargrave classification. Uniform walls with a rounded top is the usual rim type. Paste is fine, hard, dark grey to white. It is usually white with a dark center. Temper is about 2/3 fine sand and 1/3 sherd. Generally slipped white on both surfaces. The better polish is on the decorated side. Temper sometimes shows through slip, especially in the earlier pieces. Slip often shows crackling. Designs in dull, black iron paint applied over the polish. Earlier designs are similar to Kiatuthlanna Black-on-White but are heavier. Solid squares, diamonds and triangles are common. Stepped elements opposed to parallel hatching occurs. Hatchure lines are usually as wide as the space between them. Most of the designs are carefully executed. Forms include bowls, jars, pitchers, scoops, and ladles.

Cebolleta Black-on-White appears to be a variant or close relative of Puerco Black-on-White which is found in the Arizona Rio Puerco area. Both appear to stem from Kiatuthlanna Black-on-White and develop into Tularosa Black-on-White. However, Cebolleta Black-on-

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[51] Gladwin, H. S., 1945, pp. 24, 41-42, 45, 56, and 63.

Hawley, F. M., 1936, pp. 27-28.
Roberts, F. H. H., Jr., 1931, pp. 114-130.

White appears to have a better slip and polish than is true for Puerco Black-on-White. Also, the designs are more carefully executed in the former type. A number of elements similar to Escavada Black-on-White and to Gallup Black-on-White are recognizable. In the last phases of Cebolleta Black-on-White, a number of elements of Socorro Black-on-White are found in the designs.[52]

The validity of Cebolleta Black-on-White can be based on its deviation from Puerco Black-on-White; the closest type which has been described. This deviation becomes more marked in the later phases of each type. The end product of both, Tularosa Black-on-White, is similar in both areas as to slip and finish but differs in design elements.

4. Escavada Black-on-White - - P. II type dating <u>ca</u>. 900 to 1000 A. D. Found in Chaco and Gallup districts. Deterioration from Kiatuthlanna - - Red Mesa Black-on-White with heavier designs.[53]

5. Gallup Black-on-White - - P. II to P. III type dating <u>ca</u> 1000 A. D. Found in Chaco and Gallup districts. Shows resemblances to Gladwin's Red Mesa Black-on-White from P. II times. Hatching more common.[54]

6. Socorro Black-on-White - - P. II to P. III at Cebolleta Mesa. Dates <u>ca</u>. 950 to 1300 A. D. based on associations in the area. Designs in early phases show similarities to Kiatuthlanna - - Cebolleta designs. Later designs are more Chaco-like. Cebolleta Mesa appears to approximate the western boundary of this type.[55]

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[52] Gladwin, W. and H. S., 1931, pp. 24-26 and 32-35.
Hawley, F. M., 1936, p. 34.
Mera, H. P., 1935, pp. 27-28.

[53] Hawley, F. M., 1936, pp. 32-33.
Mera, H. P., 1935, pp. 3-4.

[54] Hawley, F. M., 1936, pp. 42-43.
Mera, H. P., 1935, pp. 3-4.

[55] Hawley, F. M., 1936, p. 36.
Mera, H. P., pp. 27-28 and p. 34.

7. Tularosa Black-on-White - - P. III type dating ca. 1050 to 1250 A. D. Area includes Little Colorado and Upper Gila. Occurs over the whole of Cebolleta Mesa. Designs show a retention of the Kiatuthlanna - - Cebolleta tradition as well as the interlocking rectilinear or curvilinear scroll and contrasting solid and hatched elements that are characteristic of Tularosa Black-on-White elsewhere.[56]

The exact point of separation between Tularosa Black-on-White and Cebolleta Black-on-White is difficult to determine. In some cases, the choice is admittedly arbitrary.

8. Tularosa Black-on-White interior, Grey Corrugated exterior - - Typical Tularosa Black-on-White interior with a corrugated exterior as in P. III corrugated wares.

9. Chupadero Black-on-White - - Late P. III type east of Cebolleta Mesa and south of Estancia Valley in New Mexico. Represented only by one sherd.

10. Unidentified White - - This includes sherds that are of the polished white wares but could not be identified for one of the following reasons; loss of paint through erosion, recovery of an area of the vessel that had no design, or too small a sherd for a definite classification.

11. Kana-a Grey - - P. I type dating ca. 700 to 875 A. D. Common utility ware found in southwestern Colorado, northwestern New Mexico and northern Arizona. Forms of it occur into P. II. The latter show a decrease in the width of the neck bands.[57]

12. Exuberant Corrugated - - P. II type dating ca. 850 to 1000 A. D. Found in northern Arizona and northwestern New Mexico. Coils are pinched together so as

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[56] Colton, H. S. and Hargrave, L. L., 1937, pp. 240-241.

Gladwin, W. and H. S., 1931, pp. 32-35.
Hawley, F. M., 1936, pp. 46-47.

[57] Colton, H. S. and Hargrave, L. L., 1937, pp. 195-196.

Hawley, F. M., 1936, pp. 25-26.

to leave very heavy corrugations.[58]

13. Grey Corrugated - - P. III type dating *ca.* 1000 to 1300 A. D. Has been variously called Chaco Corrugated, P. III Corrugated, Northern Grey Corrugated and so on. Common P. III culinary ware with smaller corrugations than Exuberant Corrugated.[59]

14. Plain Grey Culinary - - Not a period indicator. This term is used for any piece of culinary ware that has no exterior indentations or corrugations. Most common in P. I associations. Sherds from the bottoms of culinary vessels that have corrugated or banded necks.

15. Woodruff Red - - BM. III type pre-dating 800 A. D. Found in Petrified Forest district of Arizona.[60]

16. Forestdale Smudged - - Late BM. III to P. I ware. Found in the Forestdale area, White Mound Village and at Snaketown in the Gila Butte Phase. Considered to be a northern member of the Mogollon wares.[61]

17. Wingate Black-on-Red - - Late P. II type dating *ca.* 950 A. D. Ranges in the eastern section of the Little Colorado. Design elements similar to Tularosa Black-on-White.[62]

18. Puerco Black-on-Red - - P. II to P. III type post-dating 950 to pre-1150 A. D. Found in Arizona Rio

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[58] Hawley, F. M., 1936, p. 33
Roberts, F. H. H., Jr., 1935, p. 13.

[59] Hawley, F. M., 1936, p. 44.

[60] Colton, H. S. and Hargrave, L. L., 1937, pp. 58-59.
Hawley, F. M., 1936, p. 24.

[61] Haury, Emil W., 1940, pp. 73-75.
Haury, Emil W. and Sayles, E. B., 1947, pp. 53-54.

[62] Colton, H. S. and Hargrave, L. L., 1937, pp. 118-119.
Gladwin, H. S., 1945, pp. 71-73.
Gladwin, W. and H. S., 1931, pp. 29-31.
Hawley, F. M., 1936, p. 48.

Puerco east into New Mexico and north into the Chaco.[63]

19. Winona Red-on-Buff - - P. II to P. III dating 1050 to 1150 A. D. Found especially at Winona Village and Walnut Creek drainage in Arizona.[64]

20. Showlow Black-on-Red - - P. II (?) to P. III type pre-dating 1200 A. D. Found in the upper and middle Little Colorado drainage. Probably should be included in Mogollon brown wares.[65]

21. St. Johns Polychrome - - P. III type dating 1100 to 1200 A. D. Center near St. Johns in the Little Colorado area. Common P. III type at Cebolleta Mesa.[66]

22. St. Johns Polychrome variant - - Similar to the variant described at Kinishba.[67]

23. Heshotauthla Polychrome - - P. III to early P. IV type dating 1200 to 1250 A. D. El Morro - - Zuni district. Is an early member of the Hawikuh Series.[68]

24. Pinedale Polychrome - - P. III to P. IV type

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[63] Colton, H. S. and Hargrave, L. L., 1937, pp. 120-121.
Hawley, F. M., 1936, p. 47.

[64] Colton, H. S. and Hargrave, L. L., 1937, pp. 181-182.

[65] Colton, H. S. and Hargrave, L. L., 1937, pp. 78-79.
Gladwin, W. and H. S., 1931, pp. 27-28.
Haury, Emil W. and Hargrave, L. L., 1931, pp. 28-29.
Hawley, F. M., 1936, pp. 47-48.

[66] Colton, H. S. and Hargrave, L. L., 1937, pp. 104-106.
Gladwin, W. and H. S., 1931, pp. 36-40.
Hawley, F. M., 1936, p. 49.

[67] Cummings, Byron, 1940, p. 17.

[68] Colton, H. S. and Hargrave, L. L., 1937, pp. 113-114.
Hawley, F. M., 1936, p. 76.
Kidder, A. V., 1936, p. 365.

dating ca. 1250 to 1325. Occurs in the Silver Creek drainage south to the Salt River and east to Sierra Ancha. Beginning of the Glaze Wares.[69]

25. Zuni Glazes - - P. III to early P. IV type dating ca. 1250 to 1400 A. D. Found in the El Morro - - Zuni district. These definitely belong to the Hawikuh Series but do not conform in all details.[70]

26. Querino Polychrome - - P. III type dating ca. 1250 to 1300 A. D. Abundant along northern tributaries or Arizona Rio Puerco, in Nutria Canyon, New Mexico and to the head of Rio Pueblo Colorado in northeastern Arizona.[71]

27. Four-Mile Polychrome - - Early P. IV type dating 1350 to 1400 A. D. Specialization as early as 1330 A. D. Focal point below the Mogollon Rim and concentrated east of the Sierra Ancha.[72]

28. Plain Mogollon Brown Ware - - Occurs with P. I and P. II sites. Shows southern influence but probably made in the Cebolleta Mesa area. Similar to Alma Plain, Woodruff Brown, Winona Brown and others. Has a medium to good polish but not slipped or painted. Many pieces may be the lower portion of vessels having corrugated or banded necks.

29. Corrugated Mogollon Brown Ware - - Also occurs with P. I and P. II sites. Paste and temper is the

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[69] Colton, H. S. and Hargrave, L. L., 1937, pp. 107-108.

[70] Hawley, F. M., 1936, p. 77.

[71] Colton, H. S. and Hargrave, L. L., 1937, pp. 122-123.

Hawley, F. M., 1936, p. 50.
Roberts, F. H. H., Jr., 1932, p. 111.

[72] Colton, H. S. and Hargrave, L. L., 1937, pp. 109-110.

Gladwin, W. and H. S., 1931, pp. 43-45.
Haury, Emil W. and Hargrave, L. L., 1931, pp. 31-42.

Hawley, F. M., 1936, p. 72.

same as in No. 28. Surface treatment is a copy of Kana-a Grey and Exuberant Corrugated. Merges into Upper Gila Corrugated. Some are similar to Alma Neck Banded.

30. San Francisco Red - - Georgetown to Mimbres Phases. Type pre-dates 700 to ca. 1100 A. D. Found in southwestern New Mexico and southeastern Arizona.[73]

31. Alma Scored - - Prominent early, beginning in Georgetown Phase (500 to 700 A. D.). Almost absent by Mimbres Phase (1000 A. D.). Found in southwestern New Mexico and southeastern Arizona.[74]

32. Los Lunas Smudged - - P. III type derived from the southern brown group. Some of the sherds resemble Three Circle Neck Corrugated. Los Lunas Smudged occurs over the same area as Socorro Black-on-White.[75]

33. Upper Gila Corrugated - - P. III type derived from the southern brown group. The sherds of this type that are found at Cebolleta Mesa tend to be more tan in color that the classic type and they do not show the white design on the exterior. There is some evidence that this variation may have developed from the Corrugated Mogollon Brown Ware found in the area.[76]

Table IV has been included to present the relative importance of the sherd types. All the sherds in the samplings taken from all of the sites listed in Table VI,

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[73] Colton, H. S. and Hargrave, L. L., 1937, pp. 48-49.
Haury, Emil W., 1936, pp. 28-31.
Hawley, F. M., 1936, p. 104.

[74] Haury, Emil W., 1936, p. 38.
Hawley, F. M., 1936, p. 106.

[75] Hawley, F. M., 1936, p. 37.
Mera, H. P., 1935, pp. 28-29.

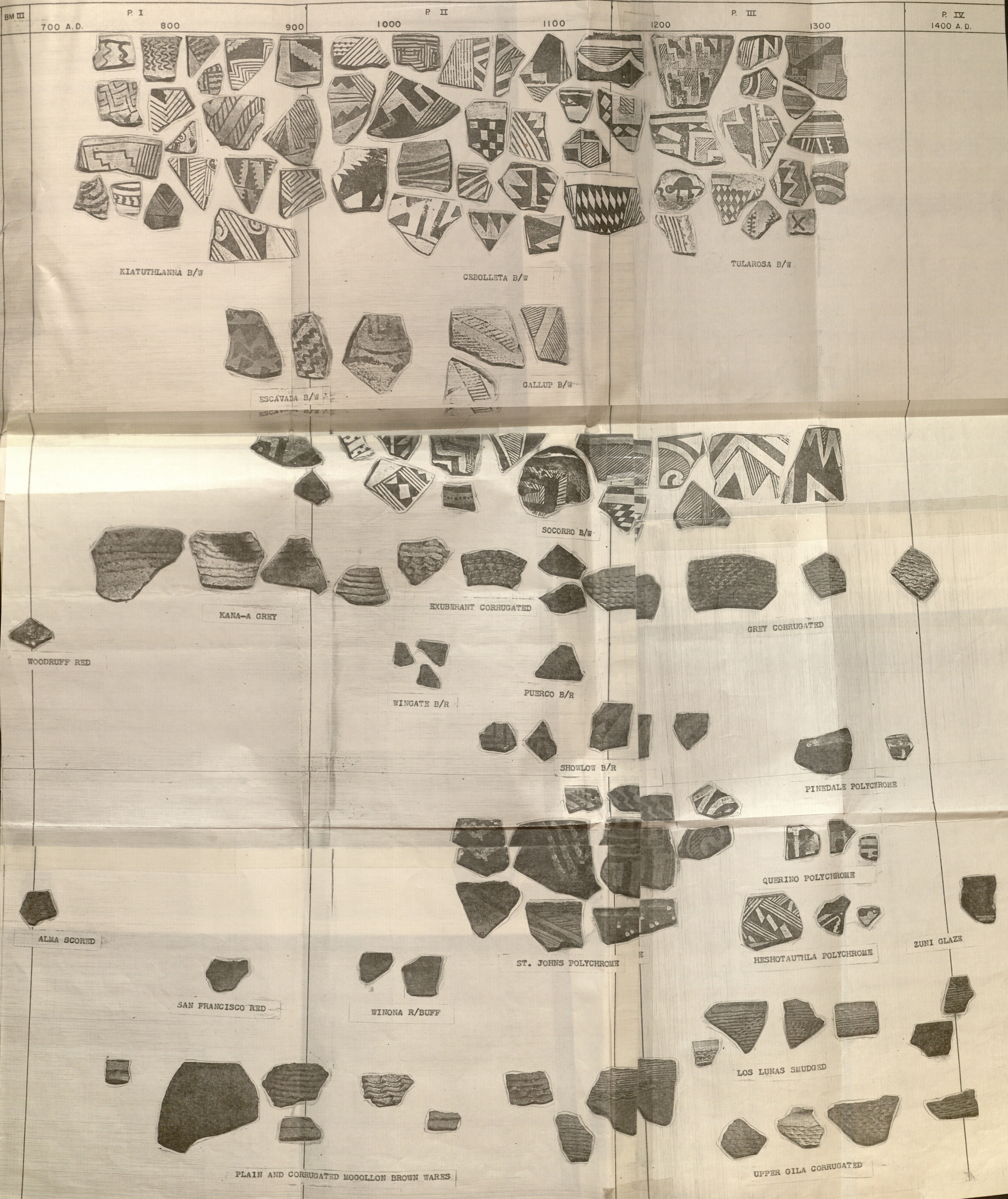
[76] Hawley, F. M., 1936, p. 53.

TABLE IV

PERCENTAGES OF SHERD TYPES

Type	Total number of sherds	Percentage
1. Kiatuthlanna B/W	824	9.76
2. Kiatuthlanna B/W interioir, Kana-a Grey exterior	1	.01
3. Cebolleta B/W	836	11.09
4. Escavada B/W	10	.12
5. Gallup B/W	11	.13
6. Socorro B/W	444	5.26
7. Tularosa B/W	436	5.17
8. Tularosa B/W interior Grey Corrugated exterior	4	.05
9. Chupadero B/W	1	.01
10. Unidentified White	1,609	19.07
11. Kana-a Grey	228	2.70
12. Exuberant Corrugated	132	1.56
13. Grey Corrugated	1,597	18.92
14. Plain Grey Culinary	501	5.94
15. Woodruff Red	1	.01
16. Forestdale Smidged	3	.03
17. Wingate B/R	35	.41
18. Puerco B/R	6	.07
19. Winona R/Buff	3	.03
20. Showlow B/R	11	.13
21. St. Johns Polychrome	424	5.02
22. St. Johns Polychrome variant	28	.33
23. Heshotauthla Polphrome	3	.03
24. Pinedale Polychrome	13	.15
25. Zuni Glazes	6	.07
26. Querino Polychrome	5	.06
27. Four-Mile Polychrome	1	.01
28. Plain Mogollon Brown Ware	540	6.39
29. Corrugated Mogollon Brown Ware	298	3.53
30. San Francisco Red	4	.05
31. Alma Scored	4	.05
32. Los Lunas Smudged	266	3.15
33. Upper Gila Corrugated	52	.62
Totals	8,437	99.93

CEBOLLETA MESA SHERD TYPES



"Site Survey Summary", are compiled in Table IV.

Many factors affect the comparison of Table IV to other collections. The more important include the proportion of early and late sites within each area, the size of the refuse areas and amount of erosion that affected them, the size of the sites and the amount of trade.

Table V presents the sherd types in a graphic form in order to illustrate seriation and time span.

F. MISCELLANEOUS FEATURES

There remain four other features which occur sporadically. These include the dump or refuse areas, depressions, detached rooms or bins, and kivas. All have been mentioned in passing but merit supplementary discussion.

1. Refuse Areas

On the west side of Cebolleta Mesa the prevailing winds are from the southwest. Therefore, one might expect the refuse areas to be located on the north or east side of the site. Of these choices, the north side should be the most desirable for, in most cases, the greater amount of deposition and erosion has its source in the uphill slopes to the east. In actuality, however, when a refuse area can be defined, it is found to occur in any and every relationship to the site. This is particularly true where sites are

located on level areas. Those located on points or slopes of hills usually take advantage of the declines around the site, as a refuse area, irregardless of wind direction.

Locations of former refuse areas often are difficult to determine. Some sites have been badly eroded and, consequently, the refuse has been scattered. At other sites there are indications that natural deposition may have completely covered the surface of the dump. Further, a brief occupation of some of the sites would leave an insignificant quantity of refuse.

2. Depressions

Depressions consist of circular hollows in the ground varying from twenty to seventy-five feet in diameter and from one-half to two feet deep. They occur contiguous to or near a site and usually on the uphill side. None of the depressions which were surveyed showed evidences of walls even though there was an accumulation of debris around the edge of many depressions.

These depressions are particularly frequent in connection with the late sites. Site 34-A (T. 5 N., R. 11 W.) has at least five depressions near it. One depression has been defined with the middle sites and none with the earliest ones.

The use of the depressions is, as yet, unknown. They

appear not to be the product of natural causes in that the circular depressions have not been found at a significant distance from sites. They are distinct from the natural, irregular, clay-bottomed depressions of the North Plains. This leaves three major possibilities, that they served as barrow pits for obtaining adobe for building, that they were maintained as reservoirs after being excavated or built by the accumulation of debris,[77] or that they are the surface remains of earth walled kivas.[78] The depression in association with site 23-J (T. 5 N., R. 11 W.), can be considered a reservoir because it is situated on bed-rock and the sandstone rubble enclosing it is not typical of any of the masonry forms. The depression at site 35-B (T. 5 N., R. 11 W.), is different in all details. It is located between the main house block and an outlying room in a manner that would not lend itself to the collection of water. This is probably an earth walled kiva. Until excavations in the area have proceeded farther, only conjectures can be formed as to the use of the depressions. It is entirely possible that both reservoirs and earth walled kivas exist.

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[77] Roberts, F. H. H., Jr., 1930, pp. 21, 33, 53-54, 55-56 and 58-59.

[78] Roberts, F. H. H., Jr., 1932, pp. 72-85.

3. Detached Rooms or Bins

In the early sites and in many of the middle sites, noncontiguous rooms appear to be part of the total ground plan. In the late sites the rooms are commonly in a contiguous block but occasionally there were evidences of a structure that was not connected to the main unit. Examples of this exist at sites 14-A, 14-C, 14-D, 15-C, 15-F, 23-L and 26-D (T. 5 N., R. 11 W.).

In these noncontiguous structures, the areas enclosed within the walls averaged less than the area of the rooms inside the house unit. This consideration suggests that they were bins. In a few sites, the outlying structure is fully as large as any room in the house unit, _i.e._, the outlying room at site 35-B.

4. Kivas

Only two kivas have been definitely defined. Both are incorporated into the contiguous house unit and both are associated with late sites (14-A and 23-M). The kiva at site 14-A was excavated and will be described in the following chapter.

G. LIMITATIONS OF THE SITE SURVEY

In the process of an archaeological survey it is a

truism that surface indications are often misleading. Further, conclusions drawn from them are, of necessity, equally tenuous. One illustration of this point is included in the following quotation. "...Haury ran onto a row of 5 rectangular rooms which at first looked as if they might be living rooms, but excavation made it clear that they must have been used for storage..."[79] Excavation is the only final proof of the conclusions drawn in this paper. While much information was gained in the excavations that followed the site survey, these are almost insignificant in relation to the total amount of excavation to be desired.

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[79] Gladwin, H. S., 1945, pp. 19-20.

KEY TO TABLE VI

Attribute	Code
I. Situation and Defensibility	
A. Situation	
1. On a mesa top	A
2. On the point of a hill formed by juncture of two intermittent streams. Near the wall of a canyon	B
3. On a tongue of land extending from the headlands of Cebolleta Mesa	C
4. On a slight rise above the floor of a canyon.	D
5. On a level area near the mouth of a canyon and on the edge of the North Plains	E
6. On a slight rise at the edge of the North Plains	F
7. On the North Plains away from the slopes of the mesa.	G
8. On the slopes of a rolling hill.	H
B. Resources for cultivation	
1. Area	
a. Small - 1 to 9 acres.	1
b. Medium - 10 to 24 acres.	10
c. Large - 25 acres and over.	25
2. Proximity to site	
a. Nearby - 1 to 300 feet away.	a
b. At a distance - over 300 feet.	b
C. Defensibility	
1. Excellent - defensible from all forms of attack.	E
2. Medium - vulnerable from one direction.	M
3. Fair - defensible in hand-to-hand combat and from rolling rocks. Vulnerable to bow-and-arrow or thrown rocks.	F
4. Poor - Not vulnerable to rolling rocks but no other geographical advantages for defense	P
5. Lacks defense against any mode of attack.	L
II. Type	
A. Building material	
1. Jacal.	I
2. Sandstone.	II

Attribute	Code
a. Blocks with squared ends.	a
b. Pecked blocks.	b
c. Selected blocks.	c
3. "Turtleback" adobe.	III
B. Shape	
1. Structure	
a. Single room.	A
b. Noncontiguous units; not over 5 rooms per unit.	B
c. Noncontiguous units; some units have over 5 rooms.	C
d. Single unit; not over 3 rooms	D
e. Irregular unit structure; over three rooms.	E
f. Rectangular unit; over 3 rooms.	K
g. L-shaped unit; over 3 rooms	L
h. Single row or rooms; over 3 rooms	R
i. S-shaped unit; over 3 rooms	S
j. T-shaped unit; over 3 rooms	T
k. U-shaped unit; over 3 rooms	U
2. Miscellaneous features	
a. Detached room or bin	b
b. Depression	d
c. Kiva	k
III. Size and condition	
A. Area of site - given in square feet.	
B. Rooms - estimate of number of rooms.	
C. Condition	
1. Height of mound	
a. 1 to 3 feet high	I
b. 4 to 6 feet high	II
c. Above 7 feet high	III
2. Evidences of fire	
a. Evidences of burning	f
b. No evidences of burning	nf
IV. Pottery	
A. Area of collection	
B. Sherd types represented by over 5% of the total.	
C. Number of sherds collected.	
D. Abbreviations	
1. Black-on-Red	B/R
2. Black-on-White	B/W
3. Corrugated	Corrug.
4. Corrugated Mogollon Brown Ware	Corrug. Mog. Br. W.
5. Culinary	Culin.

Attribute	Code
6. Plain Mogollon Brown Ware	Plain Mog. Br. W.
7. Polychrome	Poly.
8. Red-on-Buff	R/B
9. Unidentified	Unident.

Site	Situation Defensibility	Type	Size Condition	Pottery	
14-B	F - - 25a - - P	IIb,c, III	Area: 9,000	Site and 20' radius	
		- - L	Rooms: 42	Cebolleta B/W	8.7
			II - - f	Tularosa B/W	12.5
				Unident. White	15.0
				Grey Corrug.	43.8
				St. Johns Ploy.	8.7
				Los Lunas Smudged	7.5
				80 sherds	
14-C	F - - 10a - - P	IIb,c - -	Area: 1,440	Two 20' squares	
		Kb	Rooms: 31	Cebolleta B/W	10.0%
			II - - nf	Tularosa B/W	10.0
				Unident. White	6.0
				Grey Corrug.	49.0
				St. Johns Poly.	12.0
				Los Lunas Smudged	8.0
				100 sherds	
14-D	F - - 10a - - P	III - - K	Area: 700	Site and 10' radius	
			Rooms: 6	Cebolleta B/W.	9? [illegible].5%
			I - - f	Socorro B/W	9? [illegible].5
				Tularosa B/W	11.8
				Unident. White	16.7
				Grey Corrug.	35.8
				Plain Grey Culin.	8.8
				42 sherds	
14-E	E - - 10a - - P	IIc - - R	Area: 1,100	Two 10' squares	
			Rooms: 8	Tularosa B/W	21.6%
			I - - f	Unident. White	6.8
				Grey Corrug.	46.5
				St. Johns Poly.	10.4
				St. Johns Poly. (var)	5.4
				116 sherds	
15-A	E - - 25a - - P	IIc, III -	Area: 1,400	Site and 20' radius	
		- L	Rooms: 8	Cebolleta B/W	7.8%
			I - - nf	Socorro B/W	6.4
				TularosaB/W	8.5
				Unident. White	16.3
				Grey Corrug.	36.9
				St. Johns Poly.	7.8
				Los Lunas Smudged	8.5
				Upper Gila Corrug.	5.7
				141 sherds	
15-B	E - - 25a - - P	IIc, III -	Area: 875	Two 20' squares	
		- K	Rooms: 10	Cebolleta B/W	14.5
			I - - nf	Tularosa B/W	9.4
				Unident. White	8.4
				Grey Corrug.	38.5
				St. Johns Poly.	11.[illegible]
				Los Lunas Smudged	[illegible].9
				131 sherds	
15-C	D - - 25a - - P	IIc, III -	Area: 3,600	Area 10' x 30'	
		- K	Rooms: 8	Cebolleta B/W	? [illegible].1%
			I - - f	Tularosa B/W	8.4
				Unident. White	7.0
				Grey Corrug.	47.1
				St. Johns Poly.	13.5
				Los Lunas Smudged	6.2
				178 sherds	
15-D	E - - 25a - - P	IIc, III -	Area: 2,400	Area 10' x 20'	
		- Kd	Rooms: 12	Cebolleta B/W	5.6%
			I - - f	Socorro B/W	6.0
				Tularosa B/W	11.1
				Unident. White	12.8
				Grey Corrug.	2.5
				St. Johns Poly.	6.7
				Los Lunas Smudged	18.0
				117 sherds	
15-E	C - - 25b - - M	IIb,c - -	Area: 4,125	Two 20' squares	
		Kd	Rooms: 31	Cebolleta B/W	8.0
			II - - f	Socorro B/W	7.[illegible]
				Tularosa B/W	11.[illegible]
				Unident. White	5? [illegible].5
				Grey Corrug.	21.5
				St. Johns Poly.	26.0
				200 sherds	
15-F	C - - 25b - - P	IIb,c - -	Area: 6,000	Two 10' squares	
		Kd	Rooms: 34	Tularosa B/W	19.6%
			II - - f	Unident. White	9.8
				Grey Corrug.	41.5
				Showlow B/R	5.4
				St. Johns Poly.	6.5
				St. Johns Poly. (var)	7.6
				Pinedale Poly.	5.4
				93 sherds	
15-G	C - - 25b - - P	IIa - - K	Area: 305	No sherds collected.	
			Rooms: 4	Those present were too near	
			I - - nf	site 15-F.	

Site	Situation Defensibility	Type	Size Condition	Pottery	
15-H	F - - 10a - - P	IIc - - S	Area: 900	Site and 20' radius	
			Rooms: 7	Grey Corrug.	69.5%
			I - - f	St. Johns Poly.	19.4
				98 sherds	
15-I	F - - 10a - - P	IIc - - K	Area: 400	Site and 20' radius	
			Rooms: 4	Cebolleta B/W	8.7%
			I - - nf	Tularosa B/W	13.4
				Unident. White	27.0
				Grey Corrug.	28.0
				St. Johns Poly.	8.7
				Los Lunas Smudged	6.7
				104 sherds	
15-J	F - - 10a - - P	IIb - - K	Area: 330	Site and 20' radius	
			Rooms: 5	Cebolleta B/W	12.5%
			I - - f	Tularosa B/W	25.0
				Unident. White	12.5
				Grey Corrug.	25.0
				St. Johns Poly	12.5
				Upper Gila Corrug.	12.5
				8 sherds	
23-A	E - - 10a - - P	IIb,c, III - - Cd	Area: 13,600	One 20' square	
			Rooms: 25	Tularosa B/W	16.4%
			I - - f	Unident. White	10.1
				Grey Corrug.	45.7
				St. Johns Poly.	11.2
				116 sherds	
23-B	E - - 10a - - P	IIb - - Dd	Area: 525	Site and 20' radius	
			Rooms: 3	Grey Corrug.	70.0%
			I - - f	St. Johns Poly.	17.2
				70 sherds	
23-C	E - - 25a - - P	IIc, III - - Kd	Area: 2,000	Site and 10' radius	
			Rooms: 12	Cebolleta B/W	10.0%
			I - - f	Tularosa B/W	9.0
				Unident. White	7.0
				Grey Corrug.	45.0
				St. Johns Poly.	13.0
				100 sherds	
23-D	E - - 25a - - P	III - - L	Area: 2,100	Site and 10' radius	
			Rooms: 5	Tularosa B/W	12.8%
			I - - f	Grey Corrug.	59.6
				St. Johns Poly.	14.9
				91 sherds	
23-E	E - - "5a - - P	III - - Ld	Area: 5,600	Area of the site	
			Rooms: 10	Cebolleta B/W	23.4%
			I - - f	Socorro B/W	16.9
				Tularosa B/W	13.0
				Unident. White	15.6
				Grey Corrug.	11.7
				St. Johns Poly.	9.1
				Los Lunas Smudged	7.8
				77 sherds	
23-F	E - - 25a - - P	IIc - - Kd	Area: 1,250	Site and 20' radius	
			Rooms: 14	Socorro B/W	5.6%
			I - - nf	Tularosa B/W	5.6
				Unident. White	5.6
				Grey Corrug.	83.3
				18 sherds	
23-G	E - - 25a - - P	IIc - - K	Area: 256	Site and 20' radius	
			Rooms: 4	Grey Corrug.	77.0%
			I - - nf	St. Johns Poly.	15.4
				Los Lunas Smudged	7.7
				13 sherds	
23-H	E - - 25a - - P	IIc, III - - Kd	Area: 4,200	Two 20' squares	
			Rooms: 28	Cebolleta B/W	11.2%
			I - - f	Tularosa B/W	15.3
				Unident. White	8.2
				Grey Corrug.	41.9
				St. Johns Poly.	14.8
				98 sherds	
23-I	E - - 25a - - P	IIc - - A	Area: 81	Site and 25' radius	
			Rooms: 1	Tularosa B/W	12.5%
			I - - nf	Tularosa B/W; corrug. exterior	6.3
				Grey Corrug.	75.0
				St. Johns Polyl	6.3
				16 sherds	
23-J	D - - 10a - - L	IIc - - Ld	Area: 486	Site and 50' radius	
			Rooms: 4	Cebolleta B/W	10.0%
			I - - f	Socorro B/W	20.0
				Tularosa B/W	10.0
				Unident. White	20.0
				Grey Corrug.	35.0
				20 sherds	

Site	Situation Defensibility	Type	Size Condition	Pottery	
23-K	F - - 10b - - M	IIc - - K	Area: 500 Rooms: 6 I - - nf	Site and 20' radius Socorro B/W Tularosa B/W Unident. White Grey Corrug. St. Johns Poly. 53 sherds	 5.7 13.2 11.2 52.0 13.2
23-L	H - - 10b - - P	IIb,c - -Kd	Area: 3,6000 Rooms: 15 II - - f	Site and 25' radius Tularosa B/W Grey Corrug. St. Johns Poly. 52 sherds	 11.5 69.2 5.8
23-M	C - - 25b - - M	IIb,c - -LK	Area: 9,900 Rooms: 46 II - - f	Three 10' squares Cebolleta B/W Tularosa B/W Unident. White Grey Corrug. St. Johns Poly. Los Lunas Smudged 86 sherds	 7.0 9.[illegible] 5.8 45.3 10.5 8.1
23-N	E - - 25a - - P	IIc, III - - D	Area: 162 Rooms: 3 I - - nf	Site and 20' radius Cebolleta B/W Tularosa B/W Unident. White Grey Corrug. St. Johns Poly. Los Lunas Smudged 39 sherds	 5.1 25.6 7.7 33.4 5.1 20? 20.5
23-O	E - - 25a - - P	IIc, III - -K	Area: 273 Rooms: 5 I - - nf	Site and 20' radius Tularosa B/W Unident. White Grey Corrug. St. Johns Poly. 12 sherds	 8.3 8.3 75.0 8.3
24-A	B - - 1a - - M	I, IIa - - R	Area: 1,400 Rooms: 5 I - - f	Site and 50' radius Kiatuthlana B/W Unident. White Exuberant Corrug. Plain Grey Culin. Plain Mog. Br. W. Corrug. Mog. Br. W. 127 sherds	 11.0 13.4 8.7 7.9 25.2 28.0
24-B	B - - 10b - - M	I, IIa - - L	Area: 16,800 Rooms: 19 I - - f	Five 25' squares. Percentage given is representive. Kiatuthlana B/W Cebolleta B/W Unident. White Kana-a Grey Plain Grey Culin. Plain Mog. Br. W. 278 sherds	 27.3 16.6 28.8 6.5 10.0 7.9
24-C	B - - 10b - - F	I, IIa - - D	Area: 150 Rooms: 3 I - - f	Site and 50' radius Kiatuthlana B/W Cebolleta B/W Unident. White Kana-a Grey Grey Corrug. Plain Grey Culin. 167 sherds	 22.[illegible] 5.4 18.2 7.2 5.4 27.6
24-D	B --- 10b - - M	IIa - - Cd	Area: 7,200 Rooms: 13 I - - f	Site and 50' radius Kiatuthlana B/W/ Cebolleta B/W Unident. White Plain Grey Culin. Plain Mog. Br. W. Corrug. Mog. Br. W. 405 sherds	 11.9 15.3 24.1 8.4 11.6 7.4
24-E	B - - 1b - - M	Sherd area but no structure	Area: 5,000 Rooms: (?)	Area of the knoll Kiatuthlana B/W Cebolleta B/W Unident. White Kana-a Grey Plain Grey Culin. Plain Mog. Br. W. Corrug. Mog. Br. W. 206 sherds	 17.8 6.3 20.4 6.8 17.0 16.5 5.3
24-F	B - - 1a - - M	IIa - - B	Area: 1,200 Rooms: 3 I - - f	Site and 50' radius Kiatuthlana B/W Cebolleta B/W Unident. White Kana-a Grey Plain Grey Culin. Plain Mog. Br. W. Corrug. Mog. Br. W. 78 sherds	 23.1 8.9 28.3 5.1 5.1 14.1 11.5

Site	Situation Defensibility	Type	Size Condition	Pottery	
24-G	B - - 1a - - M	I - - B (?)	Area: 5,000	Site and 50' radius	
			Rooms: (?)	Kiatuthlana B/W	27.0
			f	Cebolleta B/W	17.6
				Socorro B/W	6.3
				Unident. White	24.2
				Plain Mog. Br. W.	10.7
				Corrug. Mog. Br. W.	8.5
				409 sherds	
25-A	H - - 10a - - P	IIa - - A	Area: 120	Site and 20' radius	
			Rooms: 1	Cebolleta B/W	12.5
			I - - f	Socorro B/W	20.8
				Unident. White	10.4
				Plain Mog. Br. W.	41.7
				Corrug. Mog. Br. W.	6.[illegible]
				48 sherds	
26-A	H - - 10a - - P	IIb - - K	Area: 3,400	Two 20' squares	
			Rooms: 16	Cebolleta B/W	[illegible].7
			II - - nf	Socorro B/W	15.[illegible]
				Tularosa B/W	8.0
				Unident. White	6.9
				Grey Corrug.	31.0
				St. Johns Poly.	6.2
				Los Lunas Smudged	17.7
				113 sherds	
26-B	H - - 10a - - P	IIa - - D	Area: 350	Site and 20' radius	
			Rooms: 3	Socorro B/W	41.[illegible]
			I - - f	Unident. White	45.[illegible]
				22 sherds	
26-C	H - - 10a - - P	IIa - - L	Area: 1,625	Two 10' squares	
			Rooms: 7	Kiatuthlana B/W	7.1
			I - - f	Cebolleta B/W	21.1
				Socorro B/W	[illegible]
				Tularosa B/W	10.[illegible]
				Unident. White	14.[illegible]
				Los Lunas Smudged	11.8
				85 sherds	
26-D	A - - 10a - - E	IIc - - C	Area: 3,000	Site and 50' radius	
			Rooms: 12	Kiatuthlana B/W	8.6
			I - - nf	Socorro B/W	5.7
				Tularosa B/W	40.[illegible]
				Unident. White	34.3
				Los Lunas Smudged	11.4
				35 sherds	
26-E	B - - 10b - - M	IIa - - Kd	Area: 2,700	One 20' square	
			Rooms: 7	Cebolleta B/W	27.1
			I - - f	Socorro B/W	34.4
				Unident. White	19.8
				233 sherds	
26-F	B - - 10b - - K	IIa - - B	Area: 2,450	One 20' square	
			Rooms: 4	Kiatuthlana B/W	34.2
			I - - f	Cebolleta B/W	11.5
				Unident. White	47.2
				Plain Grey Culin.	6.9
				87 sherds	
26-G	B - - 10b - - M	IIc - - D	Area: 224	One 20' Square	
			Rooms: 2	Tularosa B/W	10.9
			I - - nf	Unident. White	9.8
				Grey Corrug.	57.2
				82 sherds	
27-A	G - - 25a - - P	III - - Ud	Area: 16,650	One 20' square	
			Rooms: 42	Socorro B/W	8.9
			I - - f	Tularosa B/W	14.1
				Unident. White	6.7
				Grey Corrug.	37.0
				St. Johns Poly.	23.0
				135 sherds	
27-B	G - - 25a - - P	IIc, III - -K	Area: 190	Site and 20' radius	
			Rooms: 4	Tularosa B/W	15.8
			I - - nf	Unident. White	7.9
				Grey Corrug.	58.0
				St. Johns Poly.	5.3
				Zuni Glaze	5.5
				38 sherds	
27-C	G - - 25a - - P	III - - L	Area: 3,060	One 20' square	
			Rooms: 25	Cebolleta B/W	6.1
			I - - f	Tularosa B/W	16.8
				Unident. White	[illegible].2
				Grey Corrug.	46.[illegible]
				St. Johns Poly.	12.2

Site	Situation Defensibility	Type	Site Condition	Pottery	
34-A	F -- 10a -- P	IIb,c -- Dd	Area: 162 Rooms: 8 I -- f	Site and 20' radius	
				Cebolleta B/W	18.2%
				Socorro B/W	21.8
				Tularosa B/W	6.7
				Unident. White	14.9
				Grey Corrug.	27.0
				Los Lunas Smudged	12.1
				74 shords	
35-A	H -- 25b -- F	IIb,c -- C	Area: 6,800 Rooms: 20 I -- f	One 20' square	
				Cebolleta B/W	6.5%
				Socorro B/W	15.1
				Unident. White	7.8
				Grey Corrug.	35.6
				St. Johns Poly.	11.6
				Los Lunas Smudged	[illegible]
				225 shords	
35-B	H -- 25b -- F	IIb -- Cd	Area: 5,135 Rooms: 11 I -- f	One 20' square	
				Tularosa B/W	17.5%
				Grey Corrug.	41.9
				St. Johns Poly.	18.9
				Plain Log. Br. W.	20.8
				Los Lunas Smudged	1.6
				74 shords	
35-C	H -- 25b -- F	IIb -- Bd	Area: 4,800 Rooms: 30 II -- f	One 20' square	
				Cebolleta B/W	8.0%
				Socorro B/W	15.2
				Tularosa B/W	8.0
				Unident. White	11.6
				Grey Corrug.	24.7
				St. Johns Poly.	15.2
				Los Lunas Smudged	[illegible]
				[illegible] shords	
35-D	H -- 25b -- F	IIa,b -- R	Area: 798 Rooms: 9 II -- f	Site and 20' radius	
				Tularosa B/W	3.9%
				Unident. White	8.3
				Grey Corrug.	54.1
				St. Johns Poly.	10.5
				72 shords	

CHAPTER III

EXCAVATIONS AND ARCHITECTURE

During the 1947 and 1948 seasons in the field, excavations were conducted at four sites, 19-A (T. 5 N., R. 10 W.) and 14-A, 27-A and 35-A (T. 5 N., R. 11 W.). At 19-A one jacal unit consisting of a room and ramada was excavated. In addition, a stratigraphic trench was dug in the refuse area. Two rooms were cleared at 27-A and two trenches and two test pits were dug at 35-A to determine stratigraphy. The major work was accomplished at 14-A. This included the excavation of six rooms and one kiva. Two other rooms were not completely excavated for reasons of safety.

Approximately seventy-five days were spent in excavation during the two seasons with an average of three and one-half persons working per day.

A. SITE 19-A (JACAL UNIT)

The location and surface features of 19-A have already been described at length in Chapter II. It was demonstrated that the location of 19-A was contiguous to a desirable area for cultivation as well as offering some geographical advantages for defense. Burned bits of adobe with imprints of twigs and poles and sandstone slabs, which

also showed evidences of fire, were concentrated around the mounds. Sherds were eroding from the slopes of the site in large quantities.

Unlike other sites at which jacal structures were identified, 19-A had no overburden of later materials and for that reason, the probability of uncovering a complete and unaltered jacal structure was considered excellent. This was of value in defining this type of architecture and, in addition, made possible a better description of similar structures when encountered in an altered condition beneath other rooms.

1. Method of Excavation

After several tests, the edge of a structure was encountered. The point of departure proved to be the east edge of the ramada (Room 1). Then began a slow process of stripping the humus and washed sand from the top of the mound. This exposed a layer of burned adobe varying from three inches thick at the east edge of Room 1 to eighteen inches thick at the west end of Room 2. The stripping of the burned adobe followed two to three feet behind the removal of the humus and sand.

Insofar as this unit had been constructed on the slope of a hill, the fill became deeper as the excavation proceeded from Room 1 to Room 2. This proved to be bene-

ficial for the walls in the western half of Room 2 were preserved to a height of twenty-two inches. Until these walls were encountered, the limit of the floor was the only indication of the extent of the structure.[80]

2. The Jacal Unit

Room 1 was the first part of the unit to be excavated. In ground plan the room was rectangular. However, a portion of the eastern end had been washed away and the maximum extent is unknown. Burned roof material was present but adobe molds characteristic of the walls were not encountered in the fill until the excavations approached Room 2.

The floor of both Room 1 and Room 2 differed from the floors subsequently excavated in that it was only an area of packed earth and ash. During its use, a heterogeneous layer of ash and dirt one to two inches thick had accumulated. It did not appear that this was intentional but rather, the result of compacting ash that had escaped the fire area. The floor thus produced did not withstand the impact of the burning roof material and had been pitted and rendered uneven.

Near the center of the floor in both rooms was a fire

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[80] The excavation and analysis of the stratigraphic trench does not fall into the scope of this paper. This will be considered in a subsequent paper dealing with stratigraphy and movable culture of the area.

area. Over these lay a D-shaped slab of sandstone which had served as a deflector. The circular area which was marked by a greater amount of burning than the rest of the floor was eleven inches in diameter. There were no rocks or ridges of adobe to mark the area. A shallow trough in the floor six inches south of the fire area marked the original position of the deflector. There was no evidence that walls had been present except the wall common to both Rooms 1 and 2. No other furniture was encountered.

The floor level of Room 2 was six inches higher than that of Room 1. Only a few traces remained of a wall between Rooms 1 and 2. However, in the western half of Room 2 portions of walls were still intact. In the southwest corner of the room the walls had been burned to a tile-like consistency. These were seven inches thick, stood twenty-two inches high and with round corner. The north wall had been damaged by roots of a juniper. Enough of the wall remained along the south side to show a doorway sixteen inches wide. A stone slab found inside the door measured nineteen by twenty-three inches.(Fig. 8).

At uneven intervals inside the walls there were upright poles varying from three to four inches in diameter. The spaces between the poles were filled with split planks of juniper, twigs, brush and split poles. The molds showed that these were bound with yucca and small branches. The [illegible] which had served as a [illegible] area which was marked by a greater amount of burning than the rest of the floor was [illegible] in [illegible]. There was no trace or vestige of [illegible] the [illegible]. A [illegible] trough in the floor six inches across [illegible] the original position of the [illegible]. There was no evidence that walls had been present except the wall [illegible] both Rooms 1 and 2. No other furniture was encountered.

The floor level of Room 2 was six inches higher than that of Room 1. Only a few traces remained of a wall between Rooms 1 and 2. However, in the southern half of Room 2 portions of walls were still intact. In the southwest corner of the room the walls had been burned to a tile-like consistency. These were seven inches thick, about twenty-two inches high and with round corners. The north wall had been damaged by [illegible], [illegible] of the wall remained along the south side to show a doorway sixteen inches wide. A stone slab found inside the door measured nineteen by twenty-three inches (Fig. 9).

At the [illegible] inside the walls there were upright poles [illegible] inches in diameter. The spaces between the poles [illegible] walls of [illegible]. The [illegible] [illegible] from the [illegible]

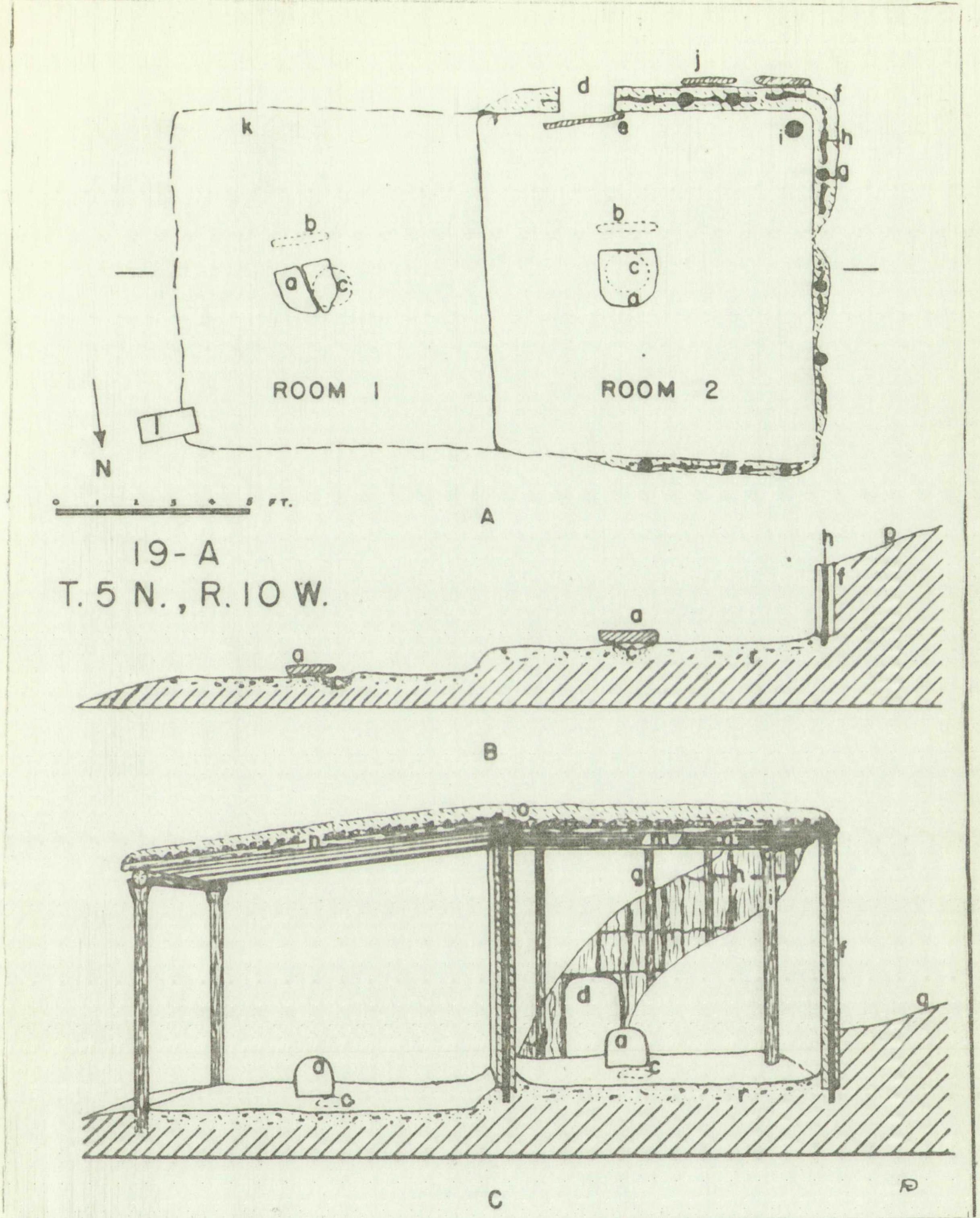

Fig. 8 A. Ground plan, B. cross-section and C. postulated reconstruction of a jacal unit: a. deflector, b. original position of the deflector, c. fire area, d. ventilator-doorway, e. doorway slab, f. jacal walls, g. main support poles, h. slabs of split juniper, i. roof support pole, j. slabs of sandstone placed against the outside of the wall, k. edge of floor area, l. test pit, m. smokehole, n. roof beams, o. adobe covering on the roof, p. present ground-level, q. original ground-level and r. packed ash and adobe floor.

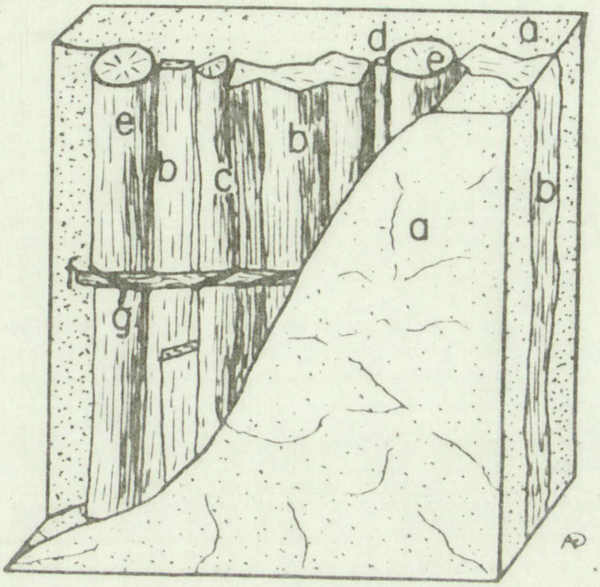

Fig. 9 Section of a jacal wall: a. adobe covering, b. slabs of split juniper, c. split poles, d. twigs, e. main wall support poles, f. cross piece and g. yucca tie.

framework was then plastered on both sides with adobe. The poles which formed the main support were set into shallow holes and the rest of the wall was built from the floor upwards instead of being set into a trench (Fig. 9). On the outside of the wall, a row of sandstone slabs had been leaned against the walls to protect them from damage by erosion.

Only one posthole that could have contained a supplementary roof support was found. This was near the southwest corner of the room. It measured five inches in diameter and

had been sunk eight inches into the ground. The forked top of a roof support post was found in the roof fill near the northeast corner of the room. The crotch of the fork had been smoothed and a small pole lay in the crotch.

The roof had been constructed of small poles two to four inches in diameter, split poles, sticks, brush and grass. Afterwards, a layer of adobe two to three inches thick had been placed on top. The roof had evidently fallen first and was identified by the layer of burned adobe lying on the floor. Later, the walls fell onto the roof material. In places, these layers were separated by several inches of water-washed sand and humus.

It appears that the main support of the roof came from the walls. The walls of the structure were perpendicular to the floor instead of slanting as they are in some cases.[81]

B. MIDDLE PERIOD SITES

No excavations were made at sites belonging to the middle group. However, it was possible to define this masonry type from walls that projected above the debris

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[81] Comparisons between structures described in this chapter and structures in surrounding areas will be considered in Chapter V.

Fig. 10 Sandstone masonry in which the ends of the blocks have been squared: a. sandstone block, b. adobe mortar and c. plaster.

(Fig. 10). Characteristically, the walls are constructed of large blocks of sandstone which were obtained from a parallel-bedded stratum. The only attempt at altering the blocks was to square the ends by breaking and removing sharp projections. These blocks were then set with adobe mortar, making a wall the thickness of one block (eight to ten inches). Bedding plane surfaces usually faced the sides of the wall rather than forming the joints. This resulted in a smooth surface which could have been plastered.

C. SITE 14-A
(PECKED AND SELECTED SANDSTONE MASONRY)

Site 14-A was situated on a level area near the mouth

FIG. 10 Sandstone masonry in which the ends of the blocks have been [illegible]. a. sandstone block, b. adobe mortar and c. plaster.

(Fig. 10). One outstanding [illegible] this masonry constructed of large blocks of sandstone which were obtained from a parallel-bedded outcrop. The only attempt at shaping the blocks was to dress the ends by breaking the remaining thin projections. These blocks were then set with adobe mortar, making a wall the thickness of one block (eight to ten inches). Chinking stones were rarely found and the face of the wall rather than [illegible] the joints. This resulted in a smooth [illegible] could [illegible].

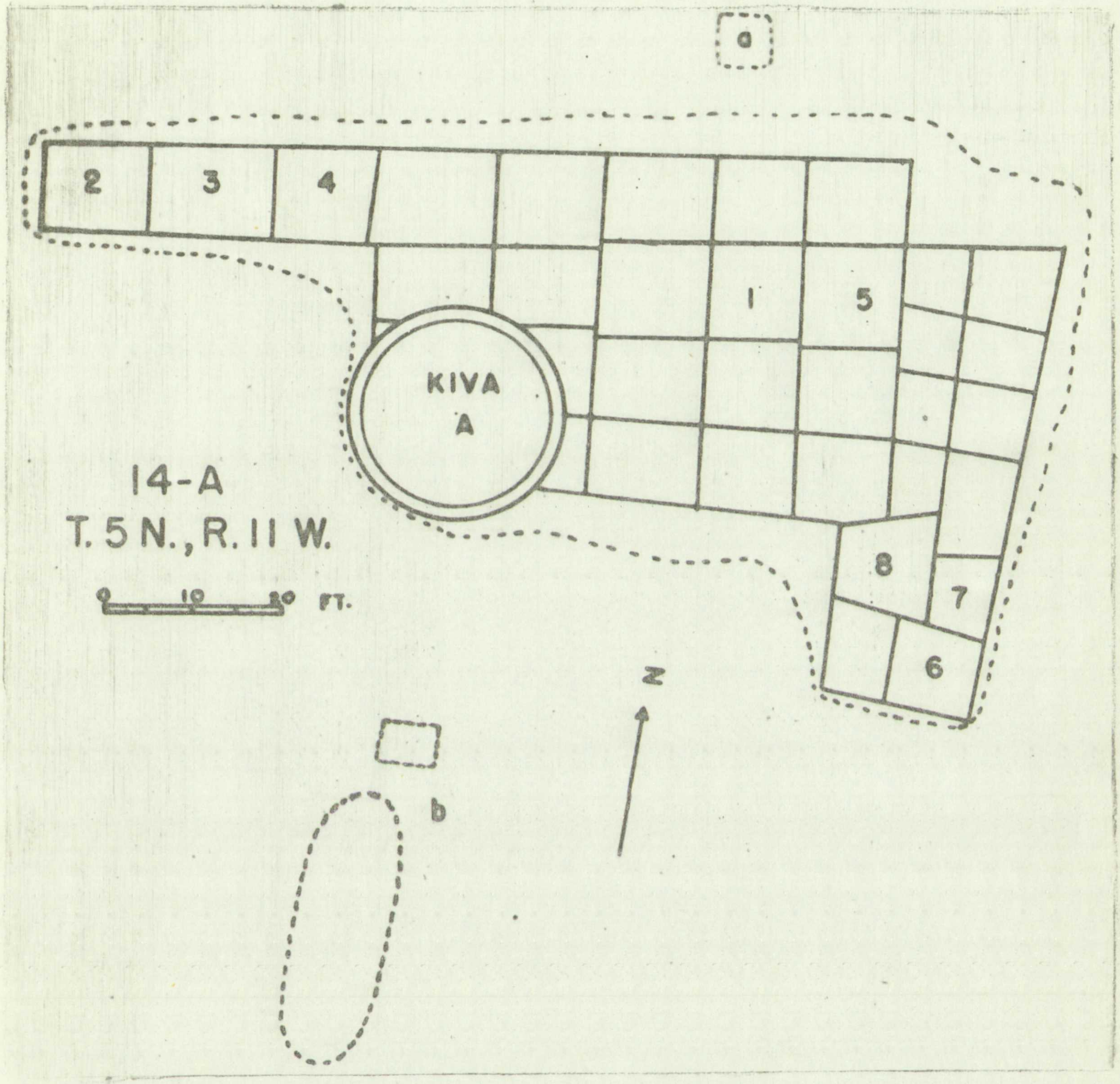

Fig. 11 Ground plan of site 14-A showing position of the kiva and rooms which were excavated: a. bin detached from the unit and b. "turtleback" adobe site with one room of sandstone masonry.

of Los Betios Canyon. There was a large area to the south that was suitable for cultivation. Recently, an uncle of Mr. E. T. Baca successfully raised corn near the site.

Several factors contributed to the selection of 14-A as the most suitable of its type for excavation. The ruin was large enough to display most of the characteristics of the sandstone sites. Both pecked and selected sandstone was evident from surface indications and it was hoped that a definite sequence of types might be found. Since the mound of debris was still fifteen feet high, there was a good possibility that portions of a second-story room would remain. Unlike most sites which were surveyed, a kiva was incorporated in the unit.

1. Method of Excavation

In all rooms, the lowest part of the fill at the surface was selected as the point of departure. The fill was cleared to this level. With the exception of Rooms 1 and 5, the next level extended to the top of the roof material. This was removed and the floor cleared. Artifacts found within the rooms were divided on the basis of the above levels.

After the first level had been removed from Rooms 1 and 5, subsequent fill was stripped in eighteen-inch layers. In the case of Room 5, clearing the first level revealed a second-story floor intact. This was carefully measured and photographed before proceeding into the fill. Before the second-story floor had been constructed, Room 5 had been

[illegible]
as the most suitable of [illegible]
was large enough to display most of [illegible]
the sandstone sites. Both posed and [illegible]
evident from surface indications and [illegible]
definite sequence of types might be found. Since the [illegible]
of debris was still fifteen feet high, there was a good
possibility that portions of a second-story room [illegible]
Unlike most sites which were surveyed, a [illegible]
in the unit.

4. Method of Excavation

In all rooms, the lowest part of the fill [illegible]
surface was selected as the point of departure. [illegible]
was cleared to this level. With the exception of [illegible]
and 5, the next level extended to the [illegible]
material. This was removed and the [illegible]
found within the rooms were divided on [illegible]
above levels.

After the first level had been removed from [illegible]
1 and 2, [illegible]
In the case of Room 5, clearing the first level [illegible]
second-story floor intact. This was carefully [illegible]
photographed before proceeding into the [illegible]
[illegible] and [illegible]

filled with refuse. The location of artifacts found in the refuse was measured from both the southeast and the southwest corners of the room. Unfortunately, the excavation of Rooms 1 and 5 was not completed. The rains caused deterioration of the walls and until shoring material could be obtained, further work was considered dangerous.

Kiva A posed a somewhat different set of problems. After it was determined that the kiva had not be intentionally filled, the dirt was removed to a level with the existing portion of the south wall. The next step was to remove the dirt in the west, north and east portions of the kiva as far down as the roof material while leaving a small wheelbarrow ramp on the south side. The ramp was the last portion of the fill to be excavated. Artifacts and wood specimens were divided on the basis of position above or below the adobe layer marking the top of the roof material.

2. Rooms 1 and 5

With the exception of the features on the second-story floor of Room 1, Rooms 1 and 5 can be considered together. As neither was completely excavated, floor furnishings that occur with this masonry type are unknown. Both rooms were rectangular and constructed of pecked sandstone masonry. (Figs. 12 and 13). As in the previous type, these blocks were obtained from a parallel-bedded stratum. However, the

bedding plane surfaces usually form the vertical joints. On most of the blocks, at least one surface was altered by pecking until a smooth face was obtained. The blocks were laid in courses with adobe mortar and chinking of sherds and sandstone spalls. A double wall averaging fifteen inches thick with a thin adobe core was thus formed. Remnants of plaster were found on all walls of this type. None of the corners were tied; rather, they were abutted.

A doorway sixteen inches wide and thirty inches high was found in the south wall of Room 1. This probably opened onto the roof of the room to the south. A floor level was not reached.

Room 5 illustrated the method of securing roof beams. Niches six inches deep were left in the walls and the main roof beams were socketed here.

3. Rooms 2, 3, 4, 6, 7 and 8

This group of rooms and the second-story floor of Room 5 contained many features in common. With the exception of Room 7, all had a round to square, sandstone-lined firepit located near the center of the room, and a ventilator in the south wall. In Rooms 2, 3 and 6, there were no evidences of ladder-post holes and it is possible that the ventilator also acted as a doorway. Entrance to Rooms 4 and 8 was gained by a ladder. The south wall of Room 5 did not extend

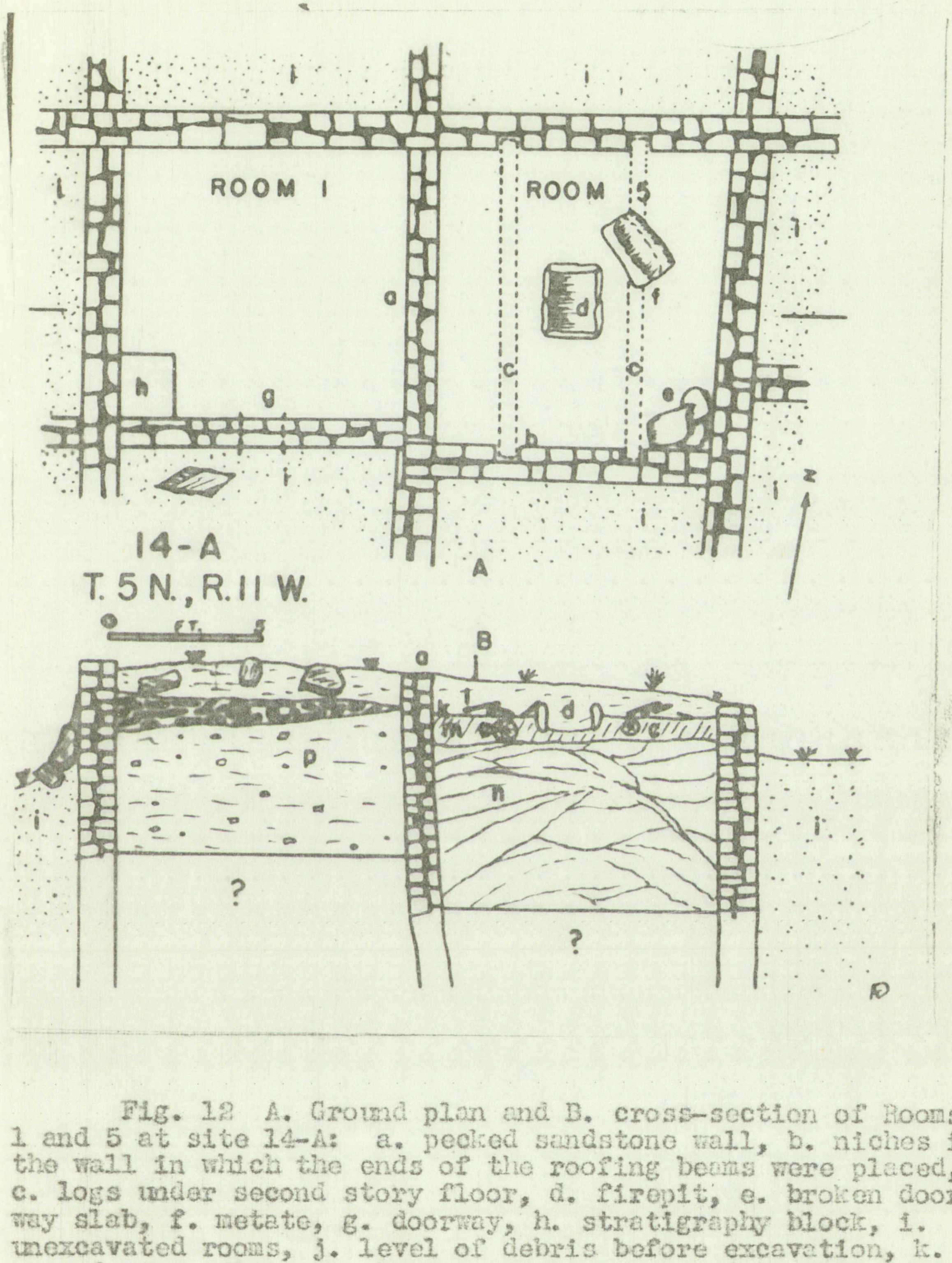

Fig. 12 A. Ground plan and B. cross-section of Rooms 1 and 5 at site 14-A: a. pecked sandstone wall, b. niches in the wall in which the ends of the roofing beams were placed, c. logs under second story floor, d. firepit, e. broken doorway slab, f. metate, g. doorway, h. stratigraphy block, i. unexcavated rooms, j. level of debris before excavation, k. second story floor, l. burnt roof beams, m. adobe fill over refuse, n. refuse, O. burnt corn and p. fill consisting of stones, ash, sand, charcoal and a few sherds. The latter was not refuse as in the case of Room 5.

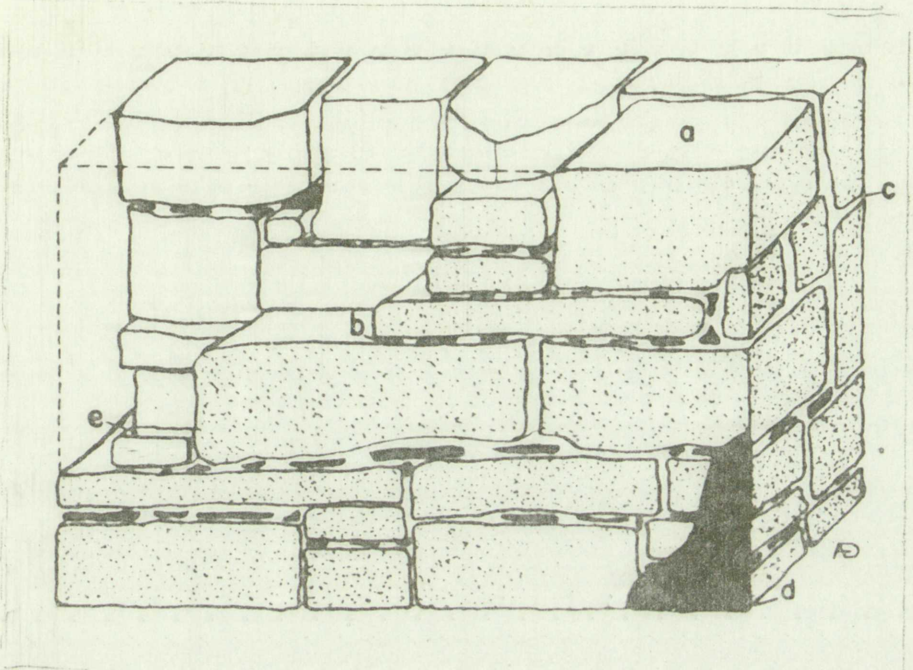

Fig. 13 Pecked sandstone masonry: a. shaped and pecked sandstone block, b. sherd and sandstone spalls, c. adobe mortar, d. plaster and e. shaped but unpecked sandstone block.

far enough above the floor-level to show a ventilator although one undoubtedly had been present. Pieces of a sandstone doorway slab were found in the southeast corner of the room.

Deflectors were found in Rooms 2 and 3. In Room 8, a sandstone slab placed against the ventilator opening could have been used to regulate the draft. South of the deflector in Room 2 was a shallow bin which had been covered with a sandstone slab.

Room 2 also contained a fireplace in the southeast

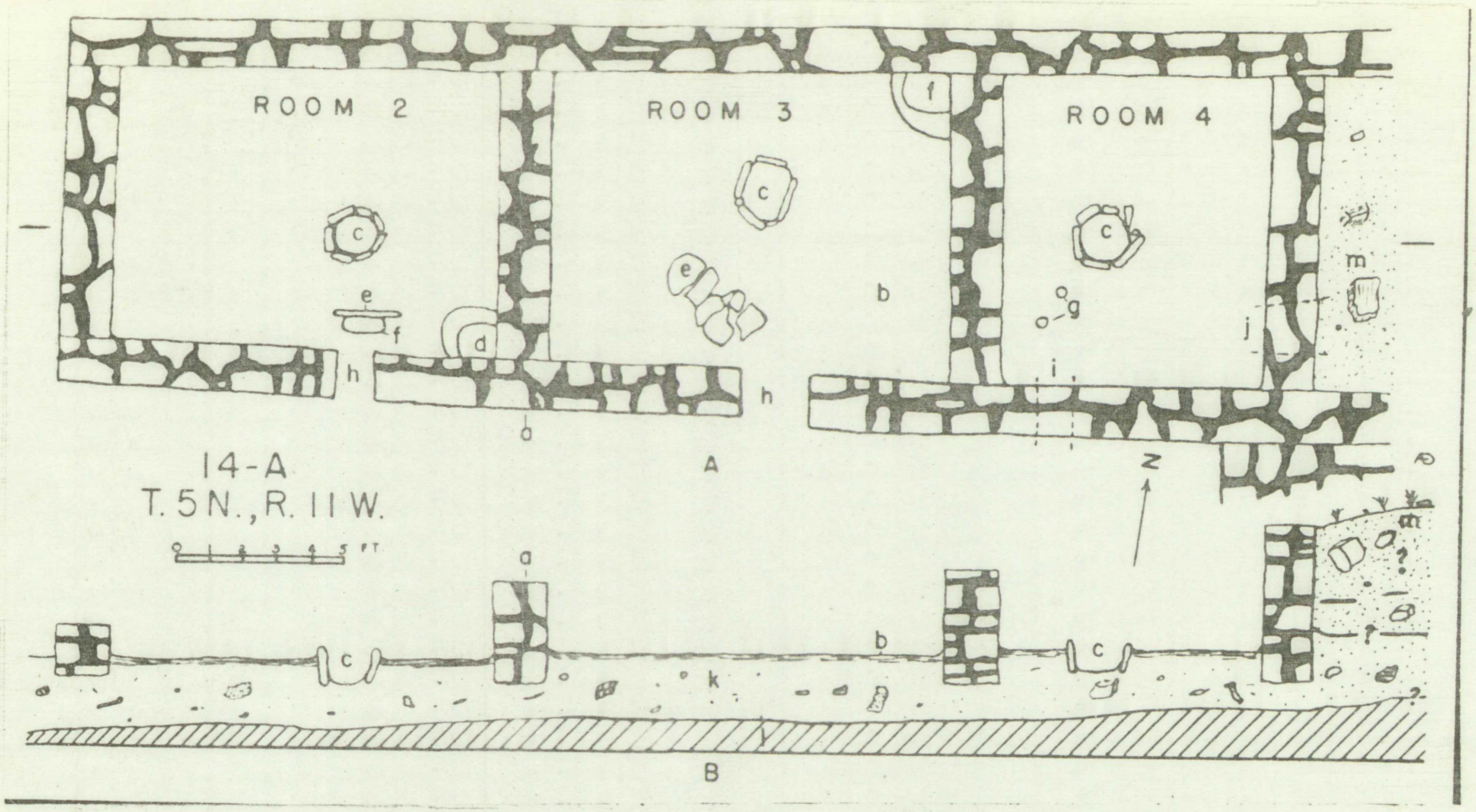

Fig. 14 A . Ground plan and B. cross-section of Rooms 2, 3, and 4 at site 14-A; a. Walls of selected sandstone blocks, b. packed adobe floor, c. firepits, d. corner fireplace, e. deflector, f. sub-floor bins, g. ladder holes, h. ventilator-doorway, i. ventilator, j. partially sealed doorway, k. refuse from earlier portion of the site and l. sand and adobe.

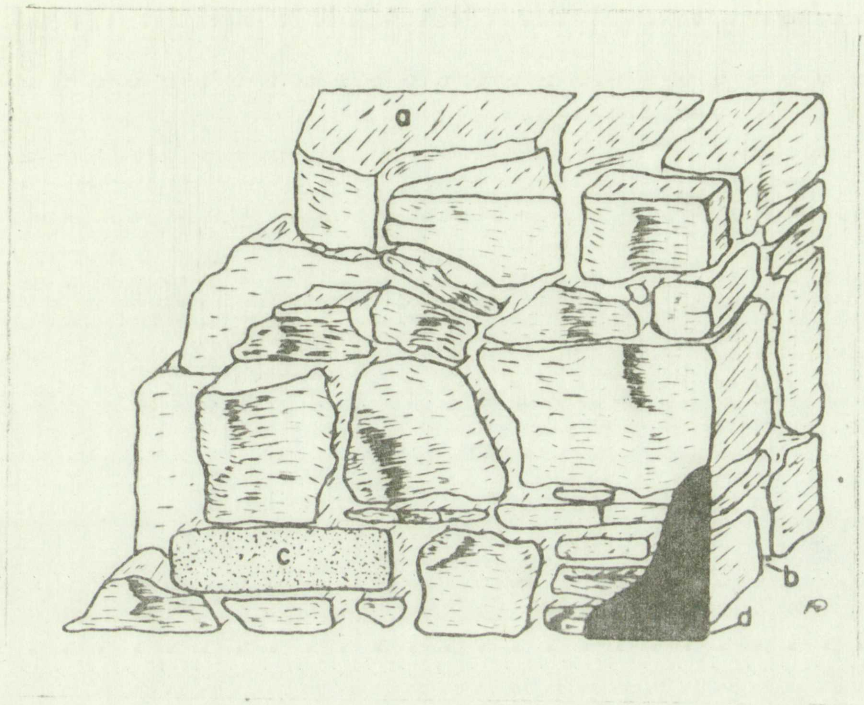

Fig. 15 Masonry of selected sandstone blocks: a. sandstone block, b. adobe mortar, c. reused pecked sandstone block and d. plaster.

corner. This was formed by a lip of adobe three inches high. Ash and half of a bowl were found in the fireplace when the room was excavated.

The deflector in Room 3 had been broken when the wall fell but the pieces still lay together south of the firepit. This room also had a small sub-floor bin in the northeast corner.

An additional feature in Room 4 was the partially sealed doorway leading from the room on the east. This was filled in with masonry.

Beneath Rooms 2, 3 and 4 was a stratum of refuse from the earlier occupation of the site. This was one and one-half to two feet thick and the foundations for the walls of these rooms had been placed in a shallow trench excavated into the refuse.

Masonry of Rooms 2, 3 and 4 was of sandstone blocks with one flat surface. They were set with adobe mortar. Both massive and bedded sandstone blocks were used as well as re-used pecked sandstone blocks. The latter were in the minority and often appeared to be burned to a greater degree than the others. Unlike their position in the walls of Rooms 1 and 5, these pecked blocks were set at any angle. The walls thus formed were double-faced with an adobe core.

Room 6 contained two floor-levels separated by eleven inches of fill. The construction of the latter filled the firepit so that only the tops of the slabs showed on the surface. If a deflector had bemn present originally, it had been removed during the remodeling.

Room 7 probably had served as a bin for storage of food. It contained no furniture but there was a small opening into it from the room to the north and there was a doorway from Room 8. Below the floor of the northwest corner was a small ash lens extending under the west wall. Below Room 8, this lens developed into a stratum of refuse covering what had been an outdoor firepit.

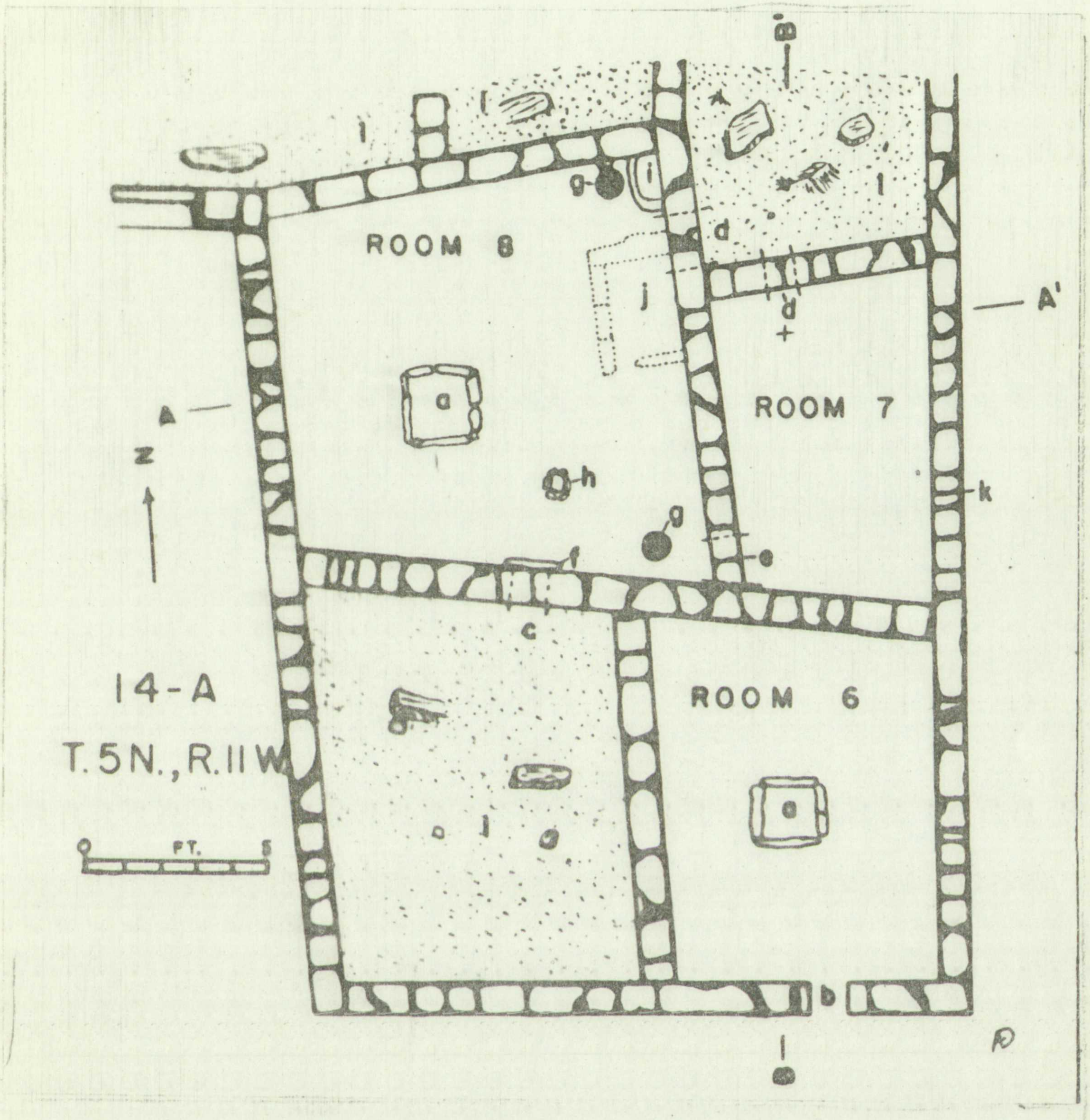

Fig. 16 Ground plan of Rooms 6, 7 and 8 at site 14-A: a. firepits, b. ventilator-doorway, c. ventilator, d. small openings between rooms, e. doorway, f. sandstone slab in front of the ventilator, g. roof support post-holes, h. sandstone lined ladder hole, i. sub-floor bin, j. mealing bin below the present floor-level, k. selected sandstone masonry and l. unexcavated rooms.

In the northeast corner of Room 8 there was a sub-floor bin. A mealing bin was located near the center of the

east wall. The latter had been used during the time floor-levels C and D were extant. In all, Room 8 had six floor-levels.

The walls of Rooms 6, 7 and 8 were constructed of the same type of blocks as that in Rooms 2, 3 and 4. However, the walls were single, being only the thickness of one block. Re-use of pecked sandstone blocks was also apparent.

In all rooms, the method of roof construction appeared to be similar. The main roof beams averaged five inches in diameter and probably were set into wall niches similar to those of Room 5. Room 8 had additional roof support posts. Across the beams, poles, split poles and planks were laid. Then a covering of twigs, grass and adobe was placed on top. Planks were not as common as at Site 27-A.

4. Kiva A

Kiva A was a circular structure nineteen feet, eight inches in diameter. The original ground-level was even with the top of the bench which attained a height of twenty-eight inches above the floor. The break in the bench on the south side of the kiva probably represented the alcove or recess feature. Two pilasters extended upward from the bench. These were located on the east and northwest sides of the kiva. To the south, an opening was constructed which

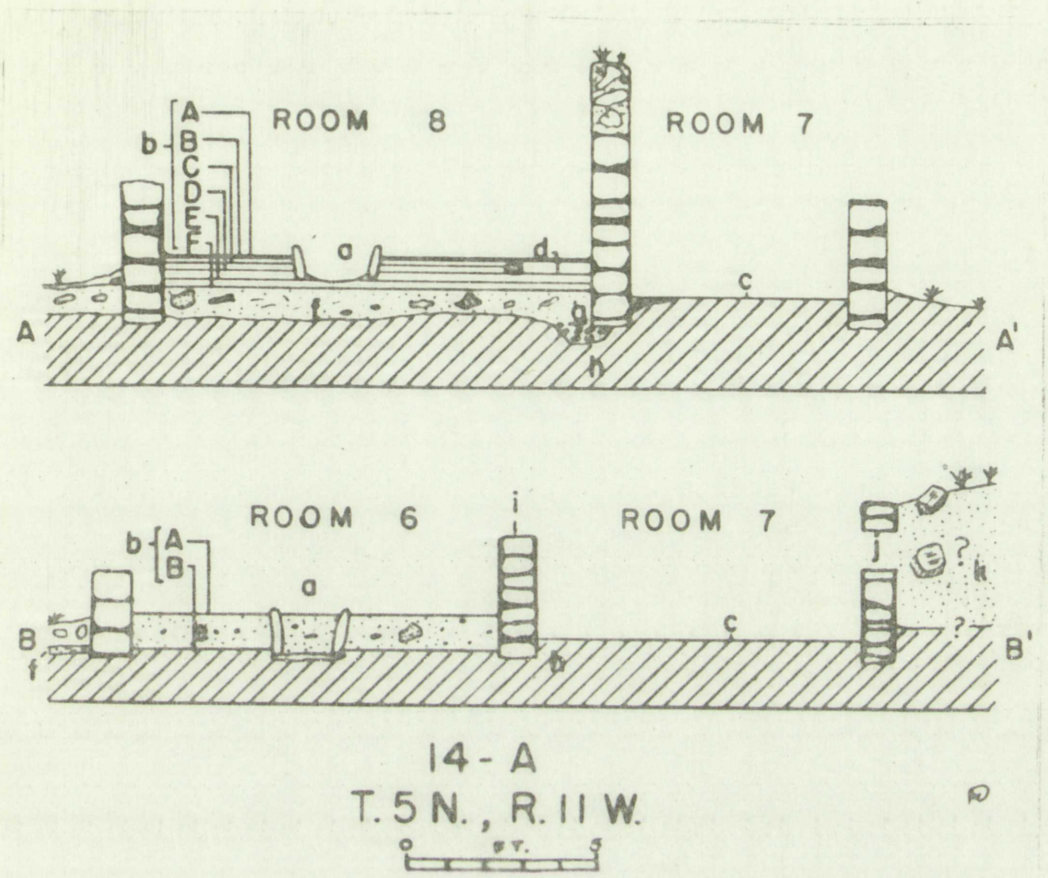

Fig. 17 Cross-sections A - - A' and B - - B' of Rooms 6, 7 and 8 at site 14-A: a. firepit, b. floor-levels, c. packed sand floor, d. mealing bin in floor levels C and D, e. fill between floor levels A and B, f. refuse from earlier portion of the site, g. outdoor firepit during occupation of earlier portion of the site, h. sand and adobe, i. selected sandstone masonry, j. small opening between Room 7 and unexcavated room and k. unexcavated room.

communicated with the plaza. Another opening connected the kiva with the room to the northeast of it. Two "katchina niches" were located in the north part of the bench, the smaller one above the large one. The latter extended below the floor and a "sipapu" had been constructed in the bottom

of this niche. In front of these niches was a sandstone slab which served as a cover.

Another bench feature was a small depression, as that of a paint mortar, which had been ground into one of the sandstone blocks forming the top of the bench.

Floor features included an adobe-lipped firepit, a sandstone block set in the lip which contained a ladder socket, a masonry deflector, a ventilator opening and a slab cover, adobe lips marking the position of the roof support posts and a series of small, flat pieces of sandstone arranged in lines. One line of five stones extended east - - west just north of the roof support posts; the other line of three stones ran north - - south on the west side of the roof support posts. As yet, no explanation has been derived for these.

The length of the ventilator shaft was not determined, however, the portion that was excavated was masonry lined and roofed over with poles, slabs of juniper and mortar. The floor area was covered with flagstone.

Below the kiva floor, a second flagstone floor was found. In addition to the above features, there had been a sub-floor vault in use before the second floor was added. This vault was west of the firepit (Fig. 18). There was no evidence of a stratum of refuse below the kiva floor. It may, however, have been removed when the kiva was built.

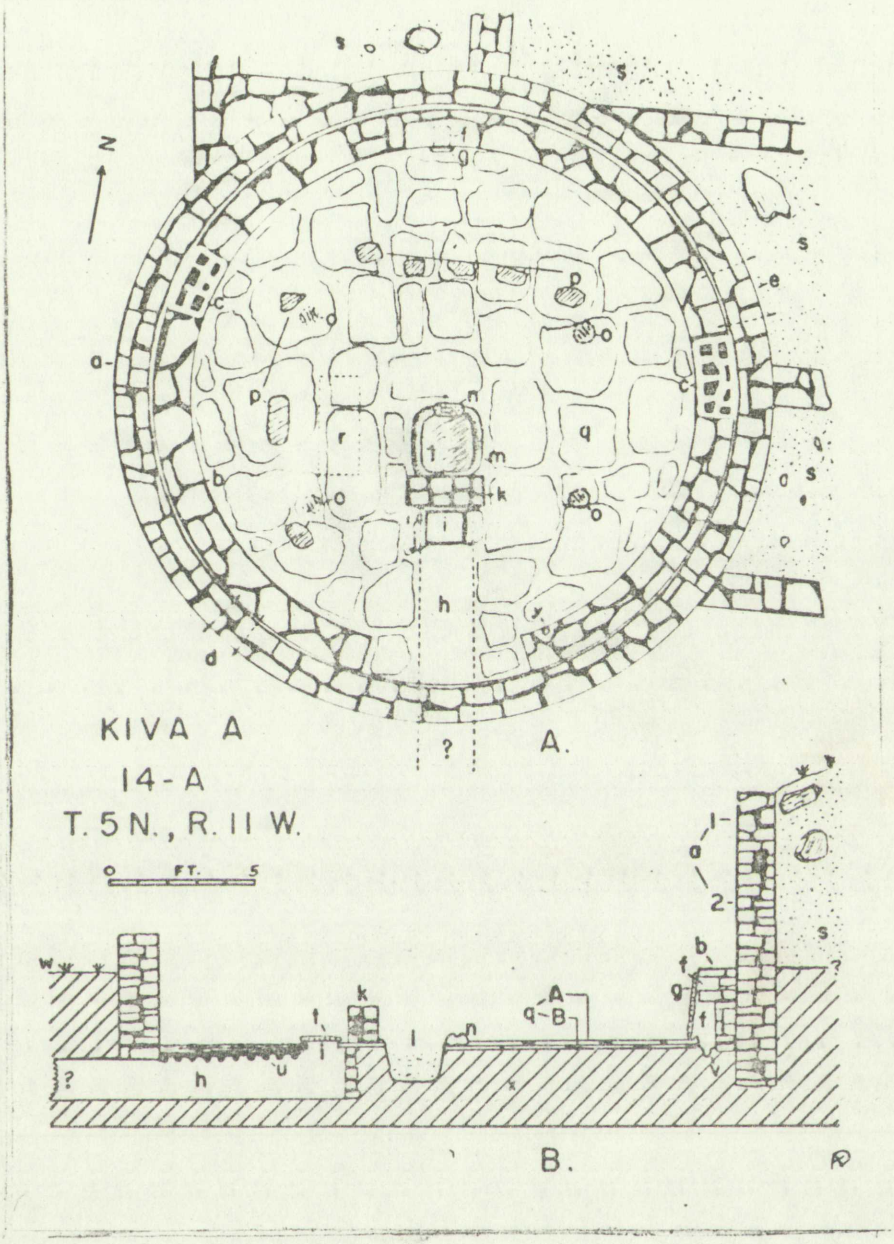

Fig. 18 A. Ground plan and B. cross-section of Kiva A, site 14-A: a. kiva wall (1. selected sandstone masonry and 2. pecked sandstone masonry), b. bench, c. pilasters, d. window looking onto the plaza, e. opening from kiva into unexcavated room, f. "Katchina niche", g. sandstone slab covering niches, h. ventilator shaft, i. ventilator shaft opening, j. sandstone block which probably was used as a prop for the ventilator cover in regulating the draft, k. deflector, l. firepit, m. adobe lip, n. sandstone block in adobe lip with the ladder hole carved into it, o. position of roof support posts, p. small slabs of sandstone arranged on the floor, q. flagstone floor (two layers), r. sub-floor vault beneath floor B, s. unexcavated rooms, t. ventilator opening cover, u. roofing over ventilator shaft, v. "sipapu", w. original ground-level, x. sand and adobe and y. paint mortar.

It was evident from the masonry that the kiva had been remodeled. With the exception of the upper two feet of the north wall, all the masonry was of the pecked type. The upper two feet of the north wall was of selected sandstone but this included a high percentage of re-used blocks. Many of these had been broken and were placed at various angles so as to intersperse the massive sandstone blocks.

It appeared from the position of the timbers in the fill that the roof of the kiva had been almost flat rather than attaining a cribbed effect. The larger beams averaged four to six inches in diameter and were oriented east and west. It is possible that the ends of these beams were placed in wall niches while the center portion rested on the roof support posts. Over these were placed smaller poles that ran in a north-south direction. Use of juniper planks was evident. Finally, a layer of brush, grass and adobe was added.

D. SITE 35-A

Rooms in site 35-A were constructed predominately of pecked sandstone. The site was composed of two rectangular units with a total of twenty rooms. It was located on the slope of a rolling hill that overlooked a wide valley in which there was ample area for cultivation.

Two trenched and two test pits were excavated, the

primary purpose of which was to obtain a stratigraphic section through the refuse area. The sherd sampling indicated a possible occupation of the site prior to the time that pecked sandstone masonry was used. Therefore, Trench 1 was excavated on the outside of a pecked sandstone wall in an attempt to determine the relationship between the strata and the time at which the wall was constructed.

While analysis of the material from the trenches is the subject of another paper, a brief description of Trench 1 is necessary to demonstrate the relationship of the strata to the wall. Below the surface material of wall debris was a refuse stratum. This varied from one and one-half to two feet thick and probably was deposited at the time the pecked sandstone masonry room was occupied. Sherds of Tularosa Black-on-White, Cebolleta Black-on-White and Grey Corrugated were predominant. The foundation of the wall was set in a second stratum which continued under the wall. A higher percentage of Cebolleta Black-on-White occurred, with a few Exuberant Corrugated sherds. This stratum in turn covered a layer of water-washed sand and the remains of a jacal wall. No sherds were found in association with the structure.

The jacal wall was similar in construction to that found at 19-A. Also, sandstone slabs occurred on the outside of the wall. Two additional features were found; first, a posthole outside of the wall and, second, a third wall

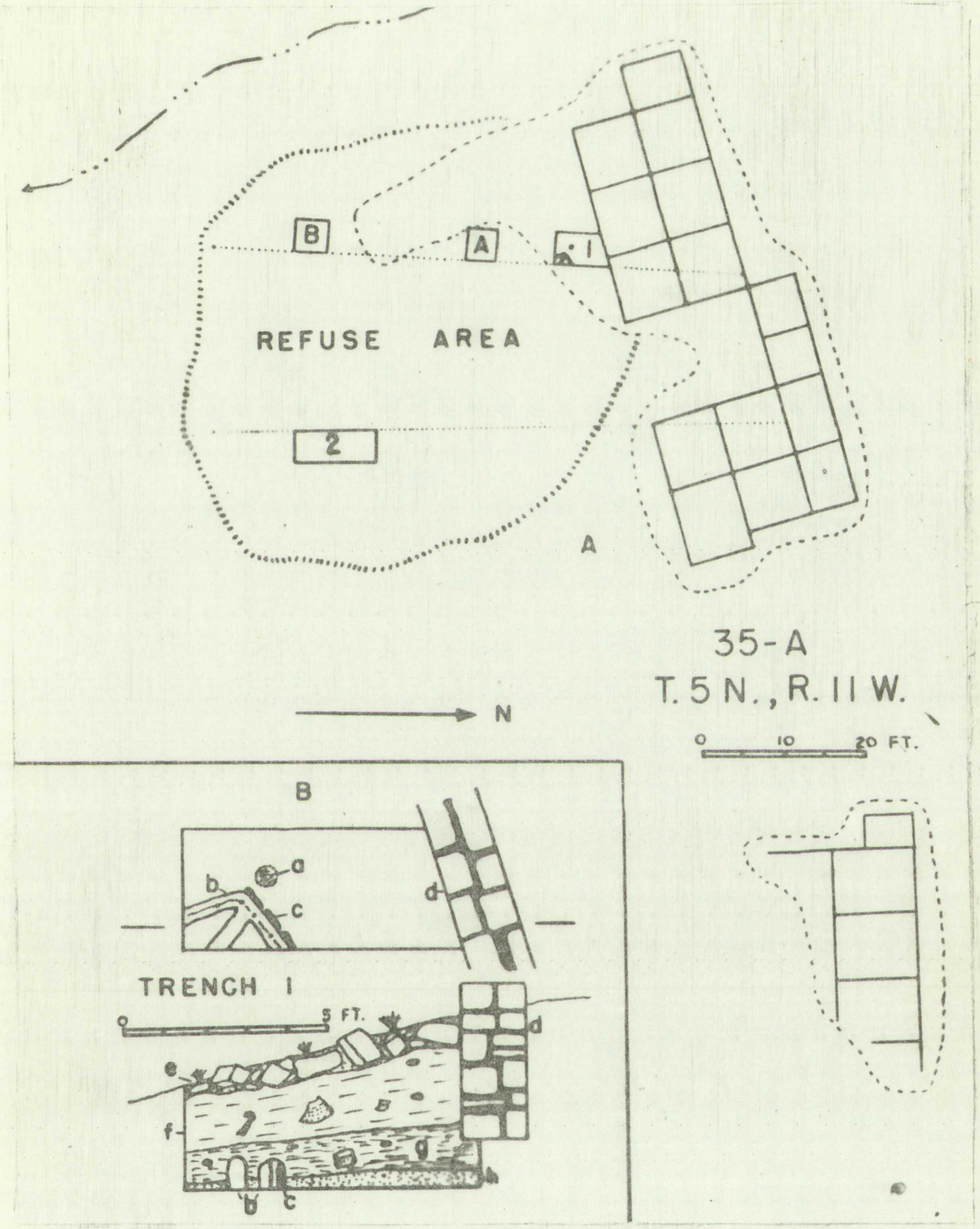

Fig. 19 A. Ground plan of site 35-A and B. detail of Trench 1: a. posthole, b. jacal wall, c. sandstone slabs set against the wall, d. pecked sandstone masonry wall, e. wall debris, f. refuse stratum, g. refuse from earlier portion of the site and h. water washed sand.

extending at a forty-five degree angle from the corner. The sequence obtained was valuable in determining relationships of sherd types to the masonry types.

E. SITE 27-A

This was the only excavated site with "turtleback" adobe walls. It was located on the North Plains approximately one and one-quarter miles from the western slopes of Cebolleta Mesa. As in other sites of this type, there was a sandstone masonry room at either end of the unit. However, these had been added laterally instead of at the usual location on the ends of the long asix.

There were forty-two rooms, all of which had been burned. South of the unit there was a depression seventy-five feet in diameter. It was encircled by a low ridge of debris but there was no evidence of walls. This depression could represent the remains of the barrow pit, water storage pit, or great kiva. However, no excavations were made to determine its use.

Neither Room 1 nor Room 2 contained immovable furniture. Nor did either show evidences of a doorway or ladder-post hole. However, the walls remained only twelve to twenty inches high and it is possible that a door sill occurred above the remaining walls. In both rooms, sandstone doorway slabs were found.

extending at a forty-five degree angle from the [illegible]. The sequence obtained was valuable in determining [illegible] of sherd types in the masonry types.

B. SITE [illegible]

This was the only excavated site with [illegible] adobe walls. It was located on the north [illegible] one and one-quarter miles from the [illegible] of [illegible] Mesa. As in other sites of this type, there [illegible] masonry room at either end of the unit. However, [illegible] been added internally instead of at the [illegible] ends of the long axis.

There were forty-two rooms, all of which had been burned. South of the unit there was a depression [illegible] feet in diameter. It was encircled by [illegible] but there was no evidence of walls. This depression [illegible] represent the remains of the earlier [illegible] or great kiva. However, no excavations [illegible] since [illegible].

Neither Room 1 nor Room 7 contained [illegible] furniture. Nor did either show evidence of [illegible] ladder-pole holes. However, the [illegible] to twenty inches high and it is possible that [illegible] occurred above the remaining walls. In such cases, those masonry slabs were found.

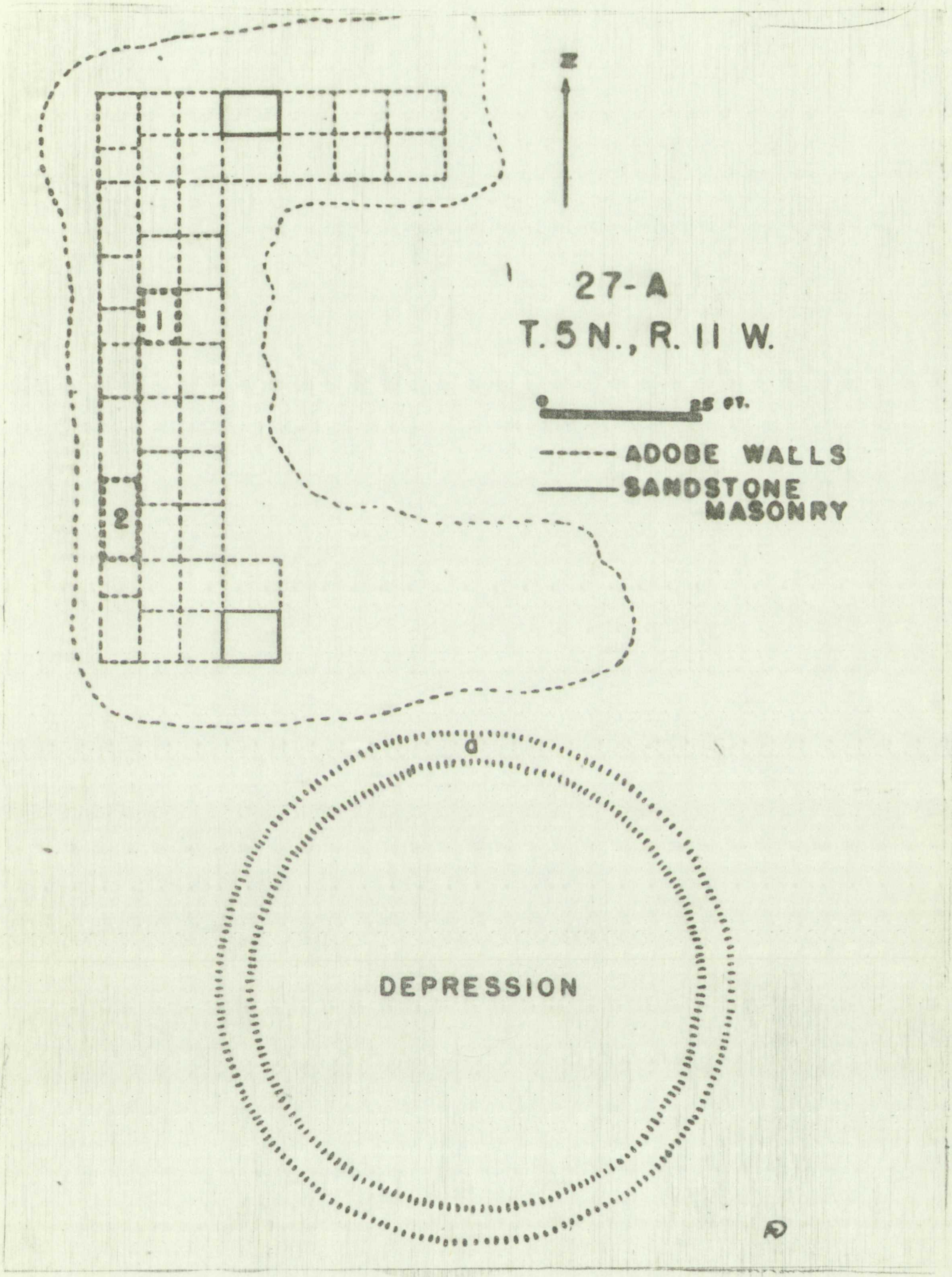

Fig. 20 Ground plan of site 27-A showing position of Rooms 1 and 2: a. low ridge of debris that encircled the depression.

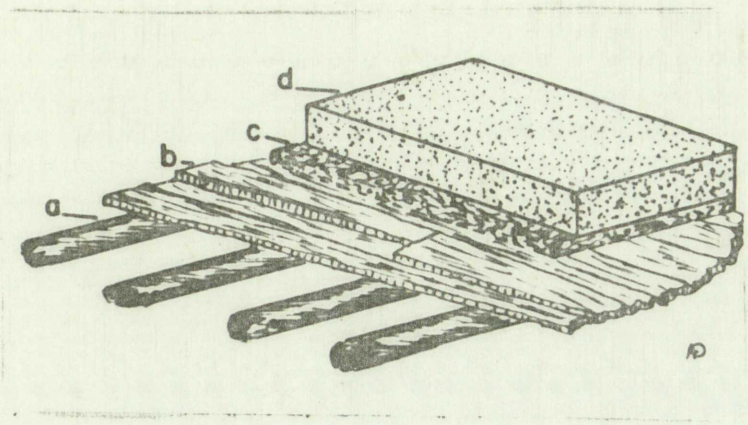

Fig. 21 Postulated roof construction of Rooms 1 and 2 at site 27-A (T. 5 N., R. 11 W.); a. roof beams, b. juniper planks, c. twigs and grass and d. adobe.

Room 2 had been a mealing room. Two metates and seven manos were found on the floor. Room 1, on the other hand, contained no grinding equipment. Nevertheless, an abundance of food and pottery had been placed on the roof. The latter feature had been preserved well enough by the burning so that a reconstruction was possible.

It did not appear that there had been main roof beams to support the numerous small poles. These averaged three inches in diameter and probably extended east-west. Over these, planks of juniper one inch thick and four inches wide were placed. This was covered by grass, twigs, and finally a layer of adobe.

In constructing the "turtleback" walls, the adobe was first kneaded and then used in a dough-like consistency. Each section was built up as far as it would hold and then

left to dry. In the meantime, the wall surfaces were smoothed. Sand and other inclusions probably were unintentional. Neither grass nor twigs were added (Fig. 22).

Masonry structures consisted of a single wall of predominately linear sandstone blocks and a few massive blocks. Neither showed evidences of alteration (Fig. 23). Plaster had been added to the adobe walls but it was not known to have been used on the masonry ones.

Fig. 22 Section of "turtleback" adobe wall: a. plaster, b. adobe, c. fine cracks in the adobe marking the limit of the "turtlebacks" and d. sand, pebble and charcoal inclusions.

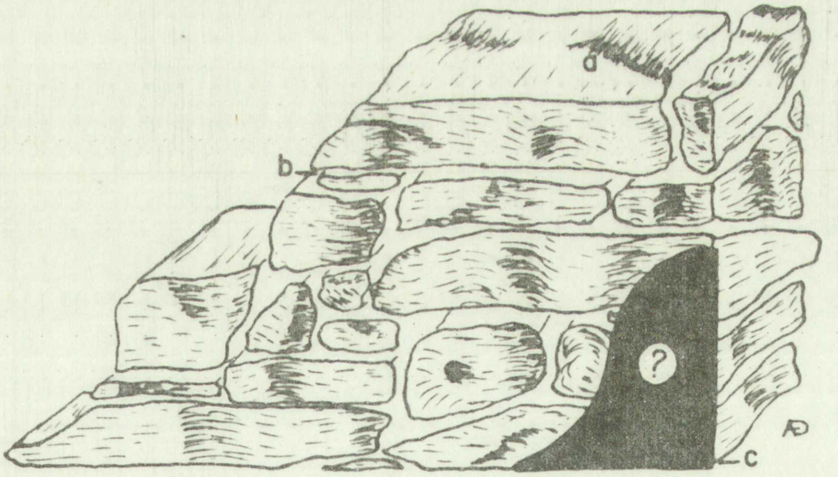

Fig. 23 Linear sandstone masonry found in association with "turtleback" adobe walls: a. sandstone block, b. adobe mortar and c. plaster (?) covering.

APPENDIX

TABLE VIII

ROOM MEASUREMENTS
(Taken through center of Rooms)

Site	Room No.	Inside measurements E - - W ft.	 in.	 N - - S ft.	 in.	Maximum Wall Height ft.	 in.
19-A	1	7	6	8	8	-	-
	2	8	5	9	0	1	10
14-A	1	9	3	8	6	6	(excavated)
	2	11	6	8	6	2	6
	3	12	1	9	0	2	6
	4	8	0	9	5	3	11
	5	9	11	9	5	1 7	(2nd story) (excavated)
	6	7	6	9	9	2	1
	7	5	7	8	6	3	8
	8	11	2	10	6	5	1
	Kiva A	19	8	19	9	8	7
27-A	1	6	3	8	2	2	1
	2	5	0	12	2	1	7

CHAPTER IV

POPULATION

In estimating the prehistoric population of the area surveyed, figures obtained by Mr. Lloyd Pierson were used.[82] The method, as developed in his thesis applies to Chaco Canyon but it should be applicable to other selected portions of the Anasazi area. The method presupposes that, if the present day Pueblo Indians are descendants of the ancient Pueblo Indians, then it is possible that the persons-per-room ratio has remained about the same through their historical emergence. Thus, figures obtained from studies of present day Pueblo villages can be applied to the prehistoric population.

By using a statistical approach based on maps, aerial photos and census bureau figures, Pierson arrived at a mean of 1.9 persons per room with a range of 1.14 to 2.66. When computing the population of a site, complete occupation was assumed for the period represented by the largest percentage of contemporaneous sherds. The rooms occupied for other periods was postulated as being proportionate to the pottery percentages representing that period, i.e.,

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[82] Pierson, Lloyd, 1949, personal communication.

$$\frac{10 \text{ (total number of rooms)}}{70 \text{ (highest percent of contemporaneous sherds)}} \text{ X } \frac{x \text{ (rooms)}}{20 \text{ (lower percentage of contemporaneous sherds)}}$$

$$X = 2.85 \text{ rooms}$$

For jacal units and pit houses, the family figure of 3.5 persons was used.

Table VII gives a list of the sites, postulated time span of occupation, postulated number of rooms involved and the population estimate. It must be remembered that these figures represent the number of people present during the entire period, not the number present at any one year. Until tree-ring studies can be completed, the time span must be considered tentative and approximate. Also, the sites which were surveyed do not represent the total present in T. 5 N., R. 10 W. and T. 5 N., R. 11 W. During a recent one-day trip to Cebolleta Mesa, at least thirty more ruins were located. Many of these are on the north side of Los Betios Canyon, an area which was previously by-passed for lack of time. The sites showed no radical differences from many of those already described. Nevertheless, they are important in contrasting the sampling surveyed with the balance remaining.

TABLE VII

ROOM ESTIMATES

Site	Time							
	700	800	900	1000	1100	1200	1350	1400
T. 5 N., R. 10 W.								
19-A		7						
19-B				8	1			
19-C			1					
19-D					2			
T. 5 N., R. 11 W.								
11-A				9	35			
11-B				6 (?)				
11-C				2	1			
13-A		1		2	1			
13-B		1 (?)		2				
13-C		6		9	1			
14-A				3		32	1	
14-B				2		42	3	
14-C				3		31		
14-D				1		6		
14-E						8		
15-A	(?)					8	1	
15-B					1	10		
15-C					1	6	1	
15-D				1		12		
15-E				3		31	1 (?)	
15-F					2	34	2	
15-G				4 (?)				
15-H						7		
15-I					1	4		
15-J						5		
23-A						25		
23-B						3		
23-C					1	12		
23-D						5		
23-E					2	10		
23-F						14		
23-G						4		
23-H					1	28		
23-I						1		
23-J						4		
23-K						6		
23-L					1	15		
23-M					2	46		
23-N						3		
23-O						5		
24-A		2		4				
24-B		5		16				
24-C		1		2				
24-D		2		13				
24-E		(?)		(?)				
24-F		3		3				
24-G		(?)		(?)				
25-A				1				
26-A					1	16		
26-B					3			
26-C			1	7	2			
26-D			1			12		
26-E			1	7	1			
26-F			4	4				
26-G			1	1	2			
27-A			(?)			42	1	
27-B						4	1	
27-C						25		
34-A					2			
35-A			1		2	20		
35-B						11		
35-C					4	30		
35-D					1	9		
Totals:		37 units		136		638	11	
Population:		129.5		258.4		1,212.2	20.9	

CHAPTER V

CONCLUSIONS AND CONJECTURES

There are three major reasons why a study of the area immediately west of Cebolleta Mesa is important. First, it adjoins several areas which have been partially investigated, *i.e.*, middle Rio Grande Valley, New Mexico Rio Puerco, Chaco, Red Mesa, the Rio Puerco of Arizona, Zuni, Quemado, Reserve and the Plains of San Agustin. Thus, it could offer a key to studies of trade, movements of people and diffusion of culture. Second, the area is bounded on the south by an archaeological *tierra incognita*, and this study extends into and lessens this archaeologically unknown area.

The third reason lies in the value of the region studied. By considering it as a unit, local developments and effects of outside influences on these developments can be ascertained. As Taylor recently pointed out, the interrelationships which existed within a particular cultural entity are basic to an archaeological study.[83] However, by reason of limited sampling, and lacking an analysis of all the material obtained, little more than a comparative approach is possible at this time.

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[83] Taylor, Walter W., 1948, p. 7.

In returning to the problems put forth in Chapter I, we must first delimit those on which significant work was impossible by reason of limited time. A Master Chart for the dating of wood specimens from the ruins could not be completed. Preliminary studies have been confined to the charting of borings from live trees and logs which were used in modern structures. The specimens obtained from the ruins were mostly juniper and pinyon of which a few have been studied. However, none of the specimens from the ruins has been dated.

No excavations were conducted in relation to the depressions. A discussion of the possibilities of their use is included in Chapter II but none of these have been finally established. Also, the much desired additional excavation at site 27-A was impossible. The two rooms excavated during the first season provide illustrations of the wall type and room structure but do not give sufficient information concerning differences in room use.

In addition to the investigations around Los Betios Canyon, six weeks were spent surveying Cebollita Canyon and Los Pilares Canyon, twenty-one miles to the north. This was accomplished under the direction of Mr. R. J. Ruppe, Jr. Some of the information obtained during the above survey will be incorporated in the following discussion.

The other points with which this paper was concerned

can be summarized as follows: a site survey of a limited area along the western slopes of Cebolleta Mesa; the number and sizes of the ruins, the types represented, architecture, masonry, sherd counts; description of other immovable cultural items and a population estimate of the archaeological periods represented. When this was sampled, excavations were necessary as a check on the masonry types and to determine what room furnishings were present. This information was then compared with that of other nearby areas in order to establish the cultural affinities and dissimilar traits.

On the basis of the evidence contained in the preceding chapters, the following conclusions and conjectures can be presented in relation to each period in chronological order.

While there are surface pottery types of earlier periods in Cebollita Canyon, the earliest building which was excavated in the jacal unit at site 19-A. It is similar basically to those of the Piedra,[84] La Plata,[85] Kiatuthlanna,[86] Alkali Ridge[87] and Red Mesa.[88] Even so, there are

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[84] Roberts, F. H. H., Jr., 1930, pp. 19-66.

[85] Morris, Earl H., 1939, pp. 29-32.

[86] Roberts, F. H. H., Jr., 1931, pp. 86-90.

[87] Brew, John Otis, 1946, pp. 115-124.

[88] Gladwin, H. S., 1945, pp. 49-56.

was an examination of surface sites in a limited area along the eastern end of Cebollita Mesa, the age and state of the ruins, the types represented, masonry, sherd content, descriptions of other important cultural items and a population estimate of the chronological periods represented. When this was completed, excavations were necessary as a check on the masonry types and to determine what room furnishings were present. This information was then compared with that of other localities in order to establish the cultural affiliations and distinctive traits.

On the basis of the evidence contained in the preceding chapters, the following conclusions and conjectures can be presented in relation to each period in chronological order.

While there are surface pottery types of earlier periods in Cebollita Canyon, the earliest habitation unit was excavated in the jacal unit at site 12-A. It is similar basically to those of the Piedra,[84] La Plata,[85] Kiatuthlanna,[86] Alkali Ridge[87] and Red Mesa.[88] Even so, there are

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[84] Roberts, F. H. H., Jr., 1930, pp. 59-92.

[85] Morris, Earl H., 1939, pp. 29-32.

[86] Roberts, F. H. H., Jr., 1931, pp. 85-90.

[87] Brew, John Otis, 1946, pp. 112-114.

[88] Gladwin, H. S., 1945, pp. 43-55.

a few differences in method of construction, principally in the addition of split juniper slabs between the poles. Several sites appeared to show some variation from the basic jacal construction but none of these was excavated.

According to the Pecos classification, the jacal unit fits into Late Pueblo I.[89] In the Gila Pueblo system, it belongs to the Basketmaker (Anasazi) Root, Little Colorado Stem and probably represents an early phase of a branch that separated from the Chaco Branch about the time of the Kiatuthlanna Phase.[90]

During this period, the population appears to have been concentrated in the northern portion of the region studied while there was only a scattering of people throughout the rest of the area.

The next structural type is that of sandstone blocks with squared ends. This occurs in Middle Pueblo II times[91] and is a continuation of the branch described for 19-A. On the basis of present knowledge, the only other areas which combine sherd and architectural types similar to the Cebolleta Pueblo II type are the Wingate Phase of the Red Mesa Valley[92] and the third stage of the surface structure

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[89] Roberts, F. H. H., Jr., 1935, p. 11.

[90] Gladwin, W. and H. S., 1934, Fig. 4.
Gladwin, H. S., 1945, pp. 41-48.

[91] Roberts, F. H. H., Jr., 1935, p. 11.

[92] Gladwin, H. S., 1945, pp. 67-77.

at Kiatuthlanna.[93] In addition in the Cebolleta area, there were influences from the (western) Puerco Phase which were especially noticeable in the sherd types.

An indication of the western cultural influences comes in part from negative evidence for Mera states that east of the upper Rio Puerco (of New Mexico) and the Rio San Jose, the structures are of adobe.[94]

The population of the area was more evenly distributed during Middle Pueblo II times. However, those in the southern portion of the region appeared to have received influences from an extension of the Mogollon Brown Wares from the south. This trend started during the preceding period but became more marked in Pueblo II sites. In the short distance between Los Betios and Cebollita Canyon there is a decrease in percentage of the brown wares from south to north. Also, carbon paint wares occur in the latter area but have not been found to the south.

During the Pueblo III period, the region experienced a large increase in population.[95] By this time, the branch represented at Cebolleta was almost entirely divorced from influences of the Chaco Branch but yet retained a Chacoan

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[93] Roberts, F. H. H., Jr., 1931, Fig. 15 and Plate 9.

[94] Mera, H. P., 1935, p. 7.

[95] Roberts, F. H. H., Jr., 1935, p. 11.

character. However, some [illegible]
were received from the [illegible]
Brands Tilley.[97] The [illegible]
[illegible] and Upper Gila [illegible]

Recently, on [illegible]
identical with the type [illegible]
Great Kivas.[98] However, [illegible]
closest similarity with [illegible]
latter belongs to the [illegible]
structure.[99] Roberts, at [illegible]
points to the Chacoan character [illegible]
pottery.[100] Here also [illegible]
the result of a wave of Chaco [illegible]
. . . After the middle of [illegible]
structures are found in the [illegible]
to the north and east [illegible]
site and Four Mile [illegible]
or the sites farther north. [illegible]

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[96] Gladwin, H. [illegible]

[97] Haury, E. W., [illegible]

[98] Roberts, F. H. H., [illegible]

[99] Roberts, F. H. H., [illegible]

[100] Roberts, F. H. H., [illegible]

[101] Haury, E. W., [illegible]

is also encountered at the "turtleback" structures. At this point, it appears that the branch represented at Cebolleta was affiliating with the Cibola Branch.[102]

The investigations described have shown the Cebolleta area to have been occupied by an Anasazi population during recent archaeological times. The sites and pottery reported appear to occupy a time span, in approximate figures, from 800 A. D. to 1400 A. D. However, it is probable that these dates will be altered when a separate tree ring chronology for the area is completed.

The area is essentially a peripheral one, with centers of higher Pueblo culture on several sides. Perhaps with small increments of population, the Cebolleta region received, at different times, cultural impulses or impetus from different surrounding areas of greater population. These influences are evidenced chiefly by the more important archaeological traits such as masonry types, house types and pottery.

The occupation of the region studied includes three temporal subdivisions: early, middle and late. All three subdivisions fall within the approximate date span given above. During the early period, outside influences from the northwest (Chaco) appear to have been strongest. This

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[102] Gladwin, W. and H. S., 1934, Figs. 3 and 4.

is demonstrated by the jacal unit and by pottery types. During the middle period the northwestern contacts were supplemented by strong influences from the western (Cibola) area. Also during the middle period, the pottery demonstrates contacts with the area to the southwest.

The third and final period of Anasazi occupation of the area saw few if any continued contacts with the northwestern (Chaco) peoples, a weakened continuation of western (Cibola) contacts and loss of many of the southwestern relationships. On the other hand, influences from the east (Rio Grande), the beginnings of which were only suggested in middle period times, were enormously strengthened.

Final movements of the Cebolleta Anasazi people apparently could have been only to the east or southeast. At any rate, no objective evidence of their migration in any direction exists at this time.

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An important part of every introduction to an archaeological area in the definition of problems which need future attention. In this instance, these include the following: first, the artifacts obtained during the excavations should be described, classified and synthesized. Additional excavations are nec   e

Pueblo II str   ex-

amples of architecture. The next step would be in selec-

ting other sample areas at varying distances from Los Betios Canyon where the process could be repeated in order to define the range of the complex. When this procedure achieved a point of diminishing returns, then a more detailed history and cultural interpretation can be written.

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