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The Hogan Builders of Colorado

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Denver

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FOREWORD AND ACKNOWLEDGEMENTS

Since 1938 the writers have been engaged in a survey of archaeological sites in previously unreported districts of Colorado, with particular attention to the establishing of the chronological order of the many types of archaeological sites shown to be present. The well-known Early Man sites of Colorado, and notably the Lindenmeier site in northeastern Colorado, near Fort Collins, can account for only a very small part of the estimated twenty thousand years since the glaciers of the last Ice Age began to retreat—according to Dr. F. H. H. Roberts, probably less than one thousand years is represented by all three levels at Lindenmeier. Similarly, the demonstrated length of the Basketmaker-Pueblo occupation of the southwestern corner of the state is only about one thousand years, say from about 300 A. D. to about 1300 A. D. (though the earliest stages of Basketmaker culture must have begun long before). In late historical times the Ute Indians were in possession of the mountainous west half of the state, and the Cheyennes and Arapahos claimed the eastern half. However, the Utes were only just appearing on the borders of Spanish territory at the time of the Reconquest, some 250 years ago; while on historical evidence we know that the Cheyenne were still farming corn in North and South Dakota as late as the opening of the 19th century and actually were in command of eastern Colorado only from about 1830 to 1867. Thus, it is clearly apparent that the unknown sequences of Colorado prehistory must be five or six times as long as the sequences for which we have even approximate knowledge It was the purpose of our survey to attempt the establishing of certain fixed horizons to which other finds could be referred, thus gradually filling in the blanks of the long post-Pleistocene time scale.

Our survey contemplated: firstly, the identification of site types by surface survey, with particular attention paid to the location of "pure" sites and sites from which stratified records might be obtained; secondly, the test excavating of selected examples of particular types to obtain representative artifact series; and thirdly, the comparison of the recovered material and material culture traits with published archaeological, ethnological, and historical records to establish the proper vertical and horizontal relationships. Outline statements of the scope of the project and of its progress from time to time are available in the following places: Annual Reports of The Colorado Museum of Natural History, 1939, 1940, 1941; American Antiquity, Vol. V, No. 4, p. 345; Vol. VI, No. 3, p. 282; Vol. VII, No. 2, p 185; Journal of the Colorado-Wyoming Academy of Science, 1941, 1942; Year Book

of the American Philosophical Society, 1941; The Masterkey, July, 1940.

In order to be able to rule out recent intrusions and to provide a valid upper horizon and point of departure for the survey we devoted some time to the establishing of the Ute archaeological pattern. Excavation of a series of undisturbed Ute wikiup sites gave a very short, and as yet unsatisfactory, series of traits and artifact types, but these together with recently published ethnological trait lists permit the definite segregation of Ute sites. The surface camps of the historical Plains Indians, with their commercial glass beads, iron and pottery, should be ignored by the archaeologists since they are readily identifiable and can contribute nothing to what is already known from ethnological and historical sources.

Two very important gaps in the chronological continuity have commanded our particular attention: the post-Pluvial dry period, which according to most calculations must have begun about 10,000 years ago and continued up to shortly before the time of Christ; and the period between the withdrawal from Colorado of the Pueblo Indians sometime before 1300 A. D. and the arrival of the recent Ute Indians and Plains Indians. It is with this latter period that the present report is primarily concerned. We had hoped to continue our survey long enough to achieve completely definitive results, but the coming of the war and consequent curtailment of activities has made continuation of our program impossible. In fairness to others it seems advisable to publish the information we have already assembled, and to point out such relationships as now may be shown, at all times remembering the limitations of our present material. A preliminary statement which appeared in **American Antiquity** (Vol. VIII, No. 1, pp. 80-88) should be read in conjunction with the present report.

The final draft of this paper was prepared under considerable difficulties, both writers being engaged full time in other duties. In particular, library facilities were not available for the final crosschecking of the paging of references used; we believe, however, that errors and omissions in the citations and bibliography have been held to a minimum. The illustrations of stone artifacts and of pottery types are admittedly inadequate considering the scope of the project, unfortunately so since they are diagnostically important; however, it was simply a case of using what we had or nothing. The itemized trait lists showing the exact provenience of each artifact will in some degree compensate. We had hoped to prepare completely documented comparative trait lists making possible valid statistical comparison between the material culture of the Colorado hogan builders and related cultures, but this proved impracticable; we must refer the reader to the authorities cited.

The field work on which this communication is based was carried on during the seasons of 1939, 1940, and 1941, under permits from the Department of Interior and the Department of Agriculture. In 1939 expenses were borne by the writers aided by a specific grant from The Colorado Museum of Natural History. In 1940 the writers were assisted by a grant from the Permanent Science Fund of the American Academy of Arts and Sciences. The 1941 expedition was financed by a grant from the Penrose Fund of the American Philosophical Society, matched in part by aid from the Colorado Museum of Natural History. To the administrators of these funds and to the friends whose endorsements of our program made possible the securing of the grants, we are sincerely thankful, and we hope their confidence in us will not be found misplaced.

In the carrying on of our survey we have been greatly aided by our many friends and acquaintances throughout Colorado who have contributed information and time; we cannot hope to name all such persons, but should mention particularly Mrs. W. H. Boyd, Mr. George Calhoun, Mr. Jack Coombs, Mr. William Daughenbaugh, Mr. H. Davenport, Mr. Thomas Hansen, Mr. Morgan Hendrickson, Mr. David Leach, Mr. Jack Nelson, and Mr.

William Veldkamp. For professional services or advice we are especially indebted to the following persons and the institutions they represent: Mr. Gordon Baldwin, Mr. F. H. Douglas, Mr. Alvin Kezar, Dr. Clyde Kluckhohn, Mr. Robert Landberg, Dr. H. P. Mera, Mr. E. H. Morris, Dr. Morris Opler, and Mr. Charles Sperry.

Our field assistants have been Lyle Adams, Edward Casebier, Haldon Chase, Frank Darnell, and Howard Wirtz. Miss Jean Evans has given invaluable assistance in the laboratory.

THE HOGAN BUILDERS OF COLORADO

I. DESCRIPTION OF SITES

Introduction

The writers on several occasions have called attention to the existence in the mountainous regions of southern and western Colorado of circular stone houses, some examples within the accepted Pueblo boundaries, others considerably beyond and higher in the hills. At the present time some thirty-five locations are known with a total of more than two hundred buildings, all falling in this same general classification. Individual houses, even in a single group, may show considerable variation, but all sites agree in having circular or at least curved walls of dry-laid masonry,* and usually the locations are on conspicuous elevations.

Because of their prominent locations, on hilltops, on mesa rims, or on the slopes of steep-sided bluffs, such houses often are known locally as "Indian forts," and arrowheads found nearby are cited as proof that the place must have been a bloody battleground.** Sometimes these stone house rings have been identified as "tipi rings," and in certain instances the stones actually may have been laid to anchor a conical skin-covered roof, but in the majority of cases a central pit and a definite wall clearly indicate a different construction. Still again, someone will notice that the houses often face east, or that a certain two rocks seem purposely to be placed in line (according to Euclid any two rocks will be in line!), and a story will start that the buildings are temples or shrines of some mysterious sun-worship cult.

There is nothing particularly new or surprising about these sites since similar ruins have been known for many years from all parts of the Pueblo Southwest and beyond in almost every direction. However, they never before had been reported from much of the region we have been exploring and until the very last few years they never had been studied in detail anywhere. Actual examination reveals little of mystery about the houses themselves; they positively may be identified as belonging to the same class of circular dwelling to which the modern Navaho stone hogan and the recent Ute wikiup belong. The big problems are when the houses were built, who the builders were, and what their relationships were with the surrounding tribes.

Ethnologists know that up to less than a hundred years ago a house type basically similar to the Ute brush wikiup was widely spread from the Canadian Arctic region on the north far down toward the line of Old Mexico

*Dry-laid masonry consists of rocks laid into a wall without the use of adobe mortar to bind the stones together. In this work we follow the minimal definition given by Keur (1941, p. 26) in describing Navaho hogans: "If the stones delimiting the hogan are more than a single row high, the term masonry has been applied. The masonry is, on the whole, extremely crude." The criterion is valid since it implies the laying of one stone above another which is fundamental to masonry, and it excludes the spaced rocks of tipi rings. It is understood, of course, that this minimum is surpassed at many of the sites.

**Such a site is described in a recent account by Harvey (1942, pp. 213-5) supposedly linked with a battle between Utes and Kiowas, in the historical period. Whether the account is apocryphal or not, the site described tallies exactly with numerous other "fortifications" certainly not built by either Utes or Kiowas.

PLATE I

on the south. The Navaho stone hogan often has been supposed to be a recent compromise between that conical brush house and the mud-laid Pueblo masonry house. It may come as a surprise to some, then, to learn that the stone hogan is a very old and widely distributed house type; about all the surviving Navaho form owes to Pueblo influence is a limited use of adobe mortar, and the occasional adoption in comparatively recent times of cribbed-roof framing in place of the original conical roof.*

Distinctions and distributions might be clarified by a redefinition of terms.** Thus we might properly include under the term "wikiup" all tripod-framed brush- or bark-covered houses such as the Navaho "forked stick" summer hogan; likewise we might well extend the name "hogan" to describe the much wider variety of circular and curvilinear, stone-walled or stone-outlined, houses with which the hogan proper is archaeologically continuous.*** The name "hogan" will be so used in the present paper, though a direct lineal connection with the Navaho hogan is, of course, in no case implied.

In this article the writers discuss selected examples of this distinctive type of building from widely scattered sites in southern and western Colorado, on both sides of the Continental Divide (see trait distribution map, Pl. IV, fig. h). Individual buildings will be described, some of which will be seen to differ greatly from the Navaho hogan as now built, but all are referable to the general classification outlined above: that of sites showing circular or curvilinear walls of dry-laid masonry and characteristically built in prominent locations. Actually straight-walled buildings often occur among others at these sites, some sites are not located on hilltops and may even be hidden away in little pockets in the hills, others can hardly have been houses in our sense of the word—since they apparently had no floors—but all have enough features in common to justify including them in a general classification of non-Pueblo masonry ruins of Colorado.

Upper Rio Grande Drainage

One of the more important concentrations of these hogan sites is along the western edge of the San Luis Valley, in southern Colorado, from the neighborhood of the town of Villagrove, Saguache County, on down to and beyond the Rio Grande.**** Here where the great lava flows of the San Juan dome dip beneath the level floor of the San Luis Valley a typical seacoast topography has developed. Jutting out into the sandy sea of the plain are long peninsulas tipped by rugged promontories and separated by re-entrant

*The Pueblo draft deflector has been noted at certain Navaho archaeological sites (Keur, 1941, p. 34).

"Wikiup" is a word from the Eastern Algonquians (Menominee, **wikiop; Sac and Fox, **wikiyap,** a dwelling) and originally applied to a bark-covered house, such as the elmbark-covered or birchbark-covered huts of the Great Lakes region. For some reason the term "wigwam," although of the same derivation, applies particularly to the eastern dome-shaped lodge and has never been extended to include the very similar western dome-shaped lodge. "Hogan" is from the Navaho word **quoghan,** and simply means "house." Special descriptive terms had to be added for various types of hogans. Thus, **khegai** is "winter hogan," and **kheshi** is "summer hogan." Other terms described the ancestral subterranean hogan, the stone hogan, the octagonal log hogan, the ceremonial, or **yebitcai** hogan, the sweat lodge, etc. See Mindeleff, 1898; Franciscan Fathers, 1910.

***A documented discussion of the Navaho stone hogan follows under the heading "Archaeological and Ethnological Background."

****Indian "forts" of masonry in the Saguache area were first described by Lieutenant Ruffner, 1874. A site to the north of the San Luis Valley, on the Arkansas River near Buena Vista in Chaffee County, has been almost destroyed by hunters "for buried Spanish treasure." It agrees in all essential respects with the sites to be described. Some of the sites listed by Pearsall (1949) for the Rio Grande Valley south of Monte Vista seem to be related. Rhoda (1877, p. 306) described a masonry ring built, of all places, on the very summit of Mount Blanca (elev. 14,363 feet), "the only relics of former visitants consisted of a curious circular excavation 6 to 8 feet across, surrounded by a wall of loose rock 1 to 2 feet high, which must have been the work of an Indian. . . . It would be useless as a lookout. . . . It could not have been used in hunting game. . . .".

make surprise attack difficult, and a breastwork might be added to make the house group as a whole the more easily defended. On the other hand a fort is a structure primarily devoted to military uses, and within it living requirements must be subordinated to the exigencies of warfare.. Such a structure does not become a house even though on occasion it may be lived in continuously over long periods.

A very exact analogy is afforded by the log blockhouse of our own Colonial period. As originally conceived, and as built in New England, dwellings might have an overhanging second story which enabled the besieged occupants to shoot down on any enemy attempting to break into or set fire to the lower story. The top-heavy log house proved so relevant to the situation and so adaptable to purely military needs that the design was expanded eventually to the huge, octagonal, log forts of the Ohio Valley. In these western settlements a blockhouse fort dominated the center of a palisaded village. Under attack, all persons took refuge in the blockhouse where they were able to withstand siege for considerable periods of time; the defensible house had evolved into a liveable fort. Applying the distinction to our ruins, the hogan builders were house builders, though the sites and structures clearly show that these people kept in mind the probability of attack.

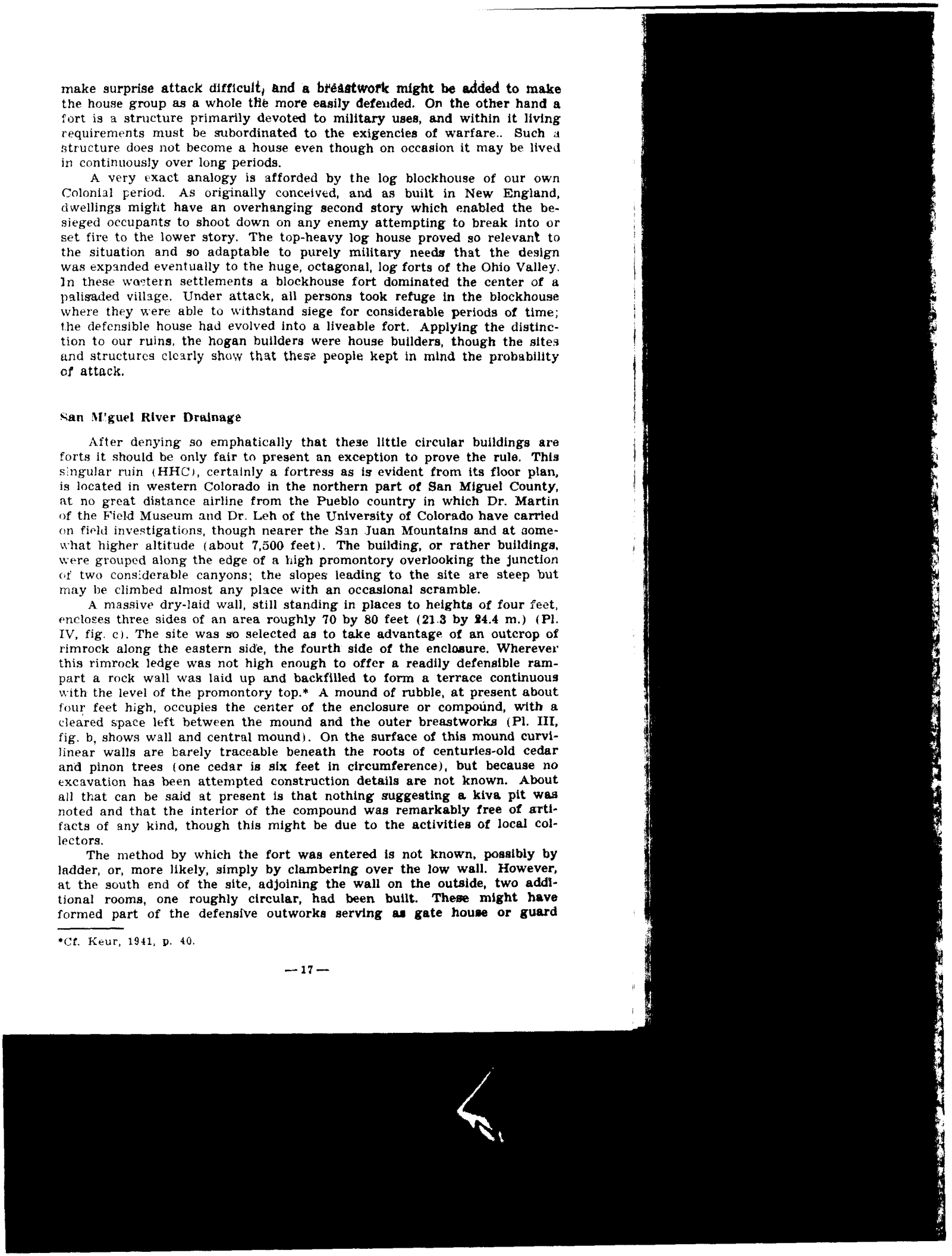
San M'guel River Drainage

After denying so emphatically that these little circular buildings are forts it should be only fair to present an exception to prove the rule. This singular ruin (HHC), certainly a fortress as is evident from its floor plan, is located in western Colorado in the northern part of San Miguel County, at no great distance airline from the Pueblo country in which Dr. Martin of the Field Museum and Dr. Leh of the University of Colorado have carried on field investigations, though nearer the San Juan Mountains and at somewhat higher altitude (about 7,500 feet). The building, or rather buildings, were grouped along the edge of a high promontory overlooking the junction of two considerable canyons; the slopes leading to the site are steep but may be climbed almost any place with an occasional scramble.

A massive dry-laid wall, still standing in places to heights of four feet, encloses three sides of an area roughly 70 by 80 feet (21.3 by 24.4 m.) (Pl. IV, fig. c). The site was so selected as to take advantage of an outcrop of rimrock along the eastern side, the fourth side of the enclosure. Wherever this rimrock ledge was not high enough to offer a readily defensible rampart a rock wall was laid up and backfilled to form a terrace continuous with the level of the promontory top.* A mound of rubble, at present about four feet high, occupies the center of the enclosure or compound, with a cleared space left between the mound and the outer breastworks (Pl. III, fig. b, shows wall and central mound). On the surface of this mound curvilinear walls are barely traceable beneath the roots of centuries-old cedar and pinon trees (one cedar is six feet in circumference), but because no excavation has been attempted construction details are not known. About all that can be said at present is that nothing suggesting a kiva pit was noted and that the interior of the compound was remarkably free of artifacts of any kind, though this might be due to the activities of local collectors.

The method by which the fort was entered is not known, possibly by ladder, or, more likely, simply by clambering over the low wall. However, at the south end of the site, adjoining the wall on the outside, two additional rooms, one roughly circular, had been built. These might have formed part of the defensive outworks serving as gate house or guard

*Cf. Keur, 1941, p. 40.



house, or they may be simply the homes of Johnny-come-lately refugees who arrived too late to build within the walls.* These latter walled rooms are certainly dry-laid, like the breastwork, and offer a good argument that in the central mound also the walls will be found to be dry-laid. Both the room walls and the breastwork walls in places show quite consistent coursing.

The surrounding surface was searched for a dump area where we might hope to recover identifiable potsherds, but the only signs of dump we could find were traces of black-stained slide down the slope to the east below the terraced wall. A careful search here revealed no pottery whatsoever, but a number of small arrowheads, several one-hand manos, and a great many small hammerstones were found. Scrapers were nearly all side-scrapers, roughly banged out of just any old flake with little or no retouching. There was enough of this debris scattered down the slope to justify the belief that the fortress had been occupied over a considerable period of time, whether all at once or only periodically during times of danger, of course we cannot say.

About a hundred yards south of the building proper another artifact area was found but this seemed almost entirely a work-floor, a chipping space where stone weapons and implements had been fashioned. Here, among quantities of chippings, were numbers of the characteristic corner-notched points we have come to associate with the dry-laid masonry ruins, though at this spot they averaged somewhat longer than elsewhere. Until more such sites have been explored it will remain impossible to say whether the longer points actually represent a consistent difference. Possibly they typify a later stage in the development of the point form we have described previously, possibly they are the variety of point made especially for warfare as distinguished from the shorter hunting points found with the household debris, or perhaps they simply represent some old arrowhead-maker's idea of the very latest and best in arrowheads.

In the autumn of 1776 Father Escalante explored the region between the San Juan Mountains and the present Utah state line, and in his journal we find the first published record of fortifications in that region. While travelling up the San Pedro River (present San Miguel) toward the Dallas Divide in the southeast, he noted "a valley affording good pasturage, and near it a piece of ground shaped like an eyebrow, upon which we found the ruins of an ancient town, whose houses seem to have been built of stone; with this material the Tabehuachis Yutas (Tabeguache Utes) have constructed a frail and crude entrenchment (for "entrenchment" we should understand "fortification")." (Harris, 1909, p. 141). Without discussing in detail here our reasons for rejecting the Utes as builders of masonry structures, it seems clear that Escalante had found a village site with walls showing signs of two periods of building. Because we have been particularly interested in the establishment of a comparative chronology we tried to locate the town of which he speaks, hoping to be able to demonstrate the relative ages of the two types of buildings.

There are, as we found, at least three masonry villages in the general region Father Escalante specifies (besides the San Miguel County fortress just described), but at no one of these sites were we able to imagine a resemblance to an eyebrow, whether a Spanish eyebrow or a Ute eyebrow. One site is, indeed, in an open park where good pasturage for horses might be found. The mound is located on top of a slight rise, from which the ground slopes away gradually in all directions. The ruin consists of traces of an oval compound wall enclosing a low central mound. Bedrock does not outcrop here and building stone was scarce, so in the building almost any size and shape of random rock was used, much of it in quite small pieces

*Several worn metates of the deep, oval bowl type built into these walls (bowl side down) suggest a later date for the outside rooms.

(some of the larger surface rock may have been hauled away for the foundation of a nearby farmhouse). We cannot say whether the walls had been adobe-laid or dry-laid and since buried by wind-blown sand. There is no visible sign of a kiva pit, we saw no pottery at all and artifacts of any kind were very scarce. Because of the situation of this ruin it is not so clearly a fortress as in the preceding case, but there is probably a close relationship between the two sites. According to our information there are at least two (similar?) building concentrations within a radius of two miles but, as yet, we have been unable to verify the reports personally.

Another comparable site, first described by George and Edna Woodbury (1932), is located on Naturita Creek near Norwood. This village was built on the rim of the canyon and descriptions agree that it once had walls standing to several feet in height. Almost all surface rock has been hauled away for building purposes, however, and now it is impossible to say whether the site had an enclosing wall or not, in fact one cannot really say where the site begins and where it leaves off. At the time we first saw the place, several years ago, it was being destroyed rather rapidly by the digging of curio hunters. A section of floor was visible in one pit and we cleared enough of the room to examine it to a little better advantage than had been possible to the Woodburys. The room we saw was quite small, about 4½ feet (1.4 m.) across, and had definitely rectangular corners. The floor had been sunk into the ground something over one foot (.3 m.), and was readily traceable as a packed clay surface. From the amount of charcoal present the building almost certainly had burned. Potsherds and arrowpoints agreed with the descriptions given by the Woodburys for their Paradox Valley site. The masonry was of large random slabs, apparently completely untrimmed, and we saw no definite evidence of mortar. If detailed excavation should verify this supposed lack of mortar, the site would fall into place as a form intermediate between the dry-laid fortress compounds, and the true Pueblo ruins a hundred miles farther southwest. This site once may have answered the description given by Escalante, but we cannot say for sure because so much of it has been destroyed.

A fourth ruin (HHR) in this general region answers much more nearly to Escalante's description. It is located on the south slope of the Uncompahgre Plateau, on the canyon rim of one of the lesser tributaries of the San Miguel, not far from the Tabeguache Basin country where Dr. Hurst has been investigating remains of the early Basketmakers. The canyon has a small permanent stream running through it and before settlement probably afforded considerable pasturage in the open sagebrush parks. In the center of the valley stands a long residual hill which conceivably might be the "eyebrow" referred to by Escalante, but only one, or at best, two, house foundations may be identified here. On the north rim of the canyon is a cluster of buildings which fit the Escalante description except that they are not located on the "eyebrow."

This ruin is in the doubtful class. It may represent a Puebloan ruin with hogans built above it, it may record a true association of Puebloans with the hogan builders, or it may be a hybrid Puebloid site with elements of both. The site must be studied in detail eventually, but excavation will be a considerable undertaking because of the size of the ruin.

The greatest length of the ruin is about 120 feet east-west and about 60 feet north-south. The margins of the ruin are fairly well delineated, and just inside the outer ridge in the southwest quadrant is a large oval depression measuring about 25 feet east-west and 40 feet north-south. This depression might be interpreted in two ways, it might indicate a large "great kiva" type of communal pit with rooms clustered around the periphery (if so, it marks a new north-east for the type), or it may be simply the floor of a walled compound, as at the San Miguel County site, but with the buildings grouped in the northeastern half of the enclosure. Considering

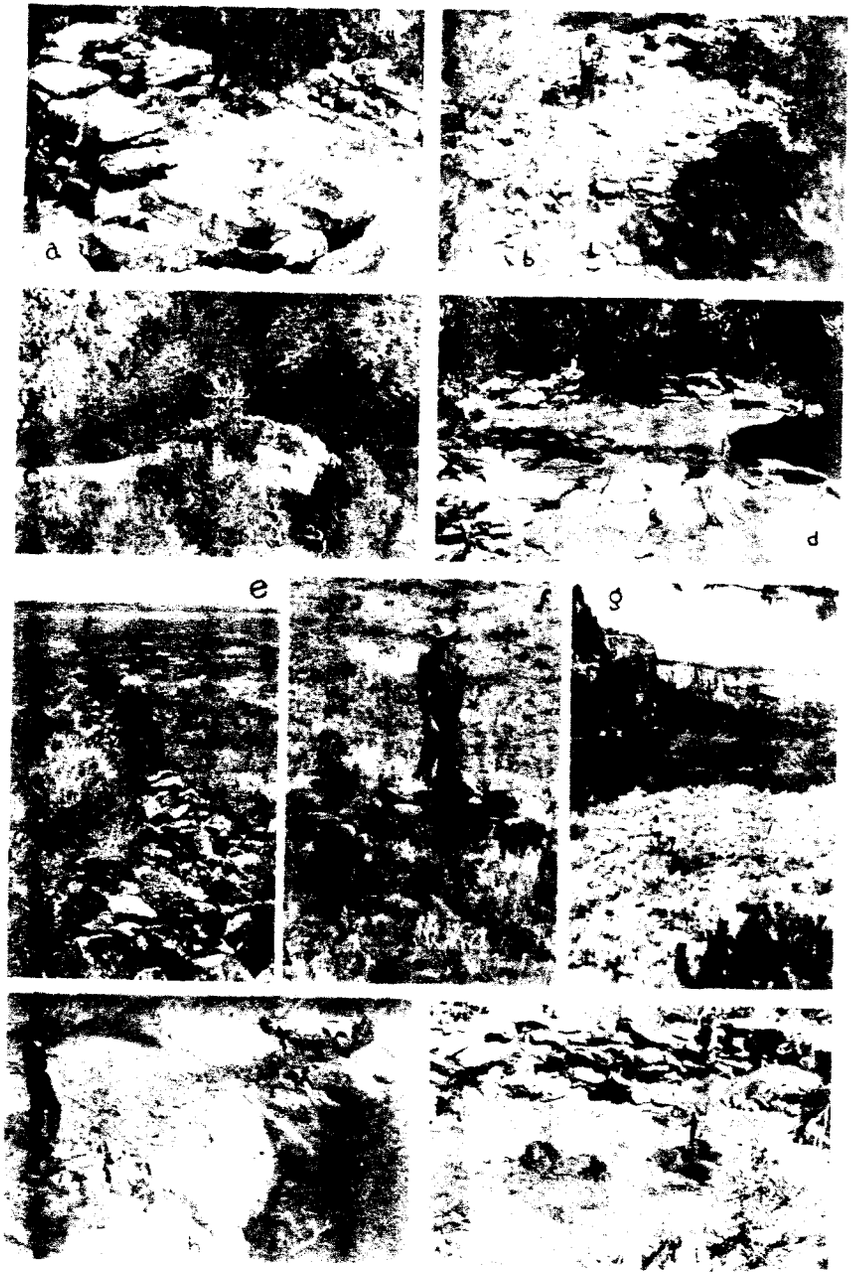


PLATE III

all four ruins as a type, the last interpretation most probably would be correct.

Straight walls are clearly visible in this ruin, but curved walls seem more common. Visible wall remains are of random-sized rimrock slabs, untrimmed, some of unusual (two-man) size. There is considerable soil in and around the ruin but this need not imply the presence of adobe mortar since the accumulation all may be windblown sand and dirt.

At the northeast corner of the ruin cluster is a house circle about 18 feet (5.5 m.) across, the walls very well preserved and undoubtedly of dry-laid masonry, the floor probably sunk below the mesa top. There is no way of telling without excavation whether this house ring is part of the main ruin, or whether it was built later. A similar hogan structure with squared-circle (subrectangular) outline is built on a projecting point of the mesa some thirty yards to the southeast of the main group. This building also is undoubtedly of dry-laid masonry, its walls are oriented to the cardinal points, and the floor is probably one to two feet below mesa level. The structure is noteworthy because it is the type location for what we are calling "cordwood masonry" (for lack of a better term). The canyon rim here is of a very hard ironstone-quartzite which joints out in long, club-shaped billets. These clubs have been laid up transversely to form the wall, just as one would stack kindling. The inner surface is kept fairly true, the outer surface is less even. The rounded corners are turned rather neatly by the use of irregular, wedge-shaped stones.

On a bench about one hundred feet below the mesa rim is another unit consisting of two circles, adjoining on an east-west axis, the west one about 20 feet in diameter, the east one about 14 feet (6.1 and 4.3 m.). In both rooms the masonry is certainly dry-laid, floor probably sunk, no doors visible. In all these hogan rooms the amount of stone indicates walls at least three feet high and probably never much more than four feet (.9 to 1.2 m.), but some stone may have been hauled away for building.

On a narrow westward projecting spur of this same bench, about fifteen hundred yards farther up stream, is another group of ruins consisting of the foundation courses of a series of separate rooms arranged single file along the crest of the spur. Four rooms (none adjoining) are recognizable, but additional remnants of wall mark the probable locations of still other rooms. Three of the rooms are oval, with long diameters of 15, 18, and 21 feet (4.5, 5.4, 6.4 m.) respectively, while another is nearly circular and about 15 feet in diameter.

At this latter location and at the larger site on the mesa rim artifacts are fairly numerous (though there is no true refuse mound); there are a few scraps of weathered black-on-white pottery, there are crude percussion-flaked implements, and (at the canyon rim site) numbers of deep, oval-bowl metates and one-hand manos. Most of the metates are broken squarely across the middle, one at least shows evidence of having been "killed" ceremonially by a blow in the center of the bottom. The pottery gives us a cross-date for both sites of somewhere around 1100 A. D. but that date does not necessarily apply to the two hogans on the bench.

So far as we have been able to discover, the described locations on the headwaters of the San Miguel are the only places in west-central Colorado where the enclosed compound is found, one a true fortress enclosure, the second less certainly a fortress, a third barely possible, and a fourth somewhat more probable, with two additional sites for which comparative information is lacking. To the west the nearest occurrence of such compound sites is on the north rim of the Grand Canyon, but this area is known only from surface descriptions (Judd, 1926). What is probably a closely related form was described above from Saguache County, and Renaud has listed numerous examples of the same thing from the Front Range and foothills

in the old Apache country of southeastern Colorado.*

The circular hogan structures found inside the first compound, and adjoining the last compound have, as we have seen, counterparts on other locations where they are not associated directly with the compound enclosures. These separate hogans are quite numerous throughout the San Miguel-Lower Dolores drainages where they were first described (Paradox Valley) ten years ago by the Woodburys (1932). We have located a number of sites, chiefly from cattlemen's and prospectors' descriptions, but most of the locations are so inaccessible that we have been unable to verify them personally. From the accounts the buildings all occur singly or in adjoining pairs, usually on projecting tips of mesas overlooking well-watered canyons. The low walls must be dry-laid because descriptions usually agree in the detail of the "loopholes" so arranged that the Indians could shoot (their bows and arrows, remember) through them.

The best preserved example of these curvilinear, dry-laid hogan houses which we have seen is located in southern Montrose County. The ruin (HRH) consists of a single oval room 7.5 by 14 feet (2.3 by 4.2 m.) perched on top a large talus boulder near the bottom of a well-watered canyon (Pl. III, fig. a; Pl. IV, fig. e). These walls, on their solid rock foundations, have not been disturbed by frost action; thus parts are still standing just as they were left hundreds of years ago. A barely traceable ring of stone adjoining the talus boulder to the east was probably another hogan with identical wall construction, but because of the steep slope it has almost completely slid down the hill. Original wall heights probably were never much over three feet.

The walls still standing were built of well-selected slabs so chosen that the thickness of the wall would fall between 12 and 16 inches (.3 and .4 m.). Apparently none of these slabs was trimmed to shape though they have been laid up rather carefully in courses, the joints broken with sufficient regularity to show that the builders well understood the principles of masonry. Since the untrimmed stones of this type of dry-laid masonry never quite fit together, the intervening cracks are chinked with smaller stones and splinters of rock (Pl. VII, fig. d). When such rock chinking loosens and falls out the resultant holes in the wall form the "fortress loopholes" which so intrigue the popular imagination.

There was a central hearth in the room on top of the rock and, less certainly, in the room adjoining the rock to the east. The door of the upper room certainly opened to the east, whether into the lower room or onto its roof is not clear. We regard this ruin as the probable type for the many others known in this and adjoining areas, even when soil creep has overthrown the rock walls so that masonry details cannot be determined directly. A characteristic of nearly all these ruins is that when possible a rock ledge or a large talus boulder was incorporated into one wall; even when built on a comparatively gentle slope, they usually were placed in the rockiest spot available, so that one or more low outcrops could serve as wall foundations, and large rocks very often were left sticking up in the floor. These are very constant traits.

To the north of the San Miguel Valley a continuity is certain because of a site (HJL) just under the rim of the Uncompahgre Plateau between the headwaters of the Escalante Creek and Tabeguache Creek drainages at the north margin of Montrose County. At this point the Uncompahgre Plateau is capped with a resistant layer of Dakota sandstone dipping very gently to the northeast, and underlain by weaker McElmo (Summerville-Morrison) sandstones and shales. As a result the cuesta rim to the southwest has broken away in a series of landslips leaving transverse, stairstep pockets along the face of the plateau. In the bottom of the very highest of

*Distribution of structural forms is discussed under a separate heading.

a series of little pockets the hogan builders erected a group of their characteristic houses. The site is hidden from view in all directions and is protected from the wind on all sides except the southeast, a direction from which storms never come. Once the houses were found by an enemy, however, they would have proved indefensible because all are commanded by higher ground a few feet away. Growing near the site are Engelmann spruce (**Picea engelmannii**), Alpine fir (**Abies lasiocarpa**), quaking aspen (**Populus tremuloides**), and alder (**Alnus tenuifolia**). The elevation is just under 10,000 feet and Mr. Frank Rice, a veteran cattleman of the region, estimated that at this point there would be from eight to ten feet of snow on the level during an ordinary winter.

At least five and possibly seven of the hogan rings were visible in this camp, two very well preserved, the others almost completely overthrown. All were built directly above the shear line of the old land slip where the ground consists almost entirely of loose slide rock with little or no mantle. Two examples were excavated.* One, the better preserved, (Pl. I, fig. i) had only a thin accumulation of soil in which some charcoal could be discerned, the other was one of the least distinct and had been destroyed almost completely by creep of the slope. By excavating the two extreme examples we hoped to show whether the two houses were of the same type, differing only in degree of preservation.

The partially destroyed hogan proved to have consisted of a basin-shaped pit, about 11 feet (3.3 m.) inside diameter, dug into the slope on the high side (southwest) to a depth of about two feet (.6 m.) below the estimated original surface. From the north (lower) edge to the center the floor was barely distinguishable, being represented only by scattered charcoal fragments at depths of 6-10 inches. In the south half of the building we picked up a definite floor line of packed brown clayey-earth and small rock, with long flat sandstone slabs lying on the contact; above the floor and the slabs the soil was darker and more loose. There was no identifiable hearth area other than a doubtful concentration of charcoal fragments slightly north of center. One fragment of charred log indicated a stick of Alpine fir about 4 inches (10.2 cm.) in diameter. There was considerable bark charcoal (apparently Engelmann spruce) along the floor line, probably more than would be accounted for by the burning of roof poles, so we must grant the definite possibility of a roof of bark slabs over the fir rafter poles.

There was no definite wall line; as at the Saguache site the floor simply sloped up and became indistinguishable in the slide rock. However, sandstone slabs lying at an angle in the fill indicated a fairly well built masonry wall (rather than a random embankment); in some cases the slabs lay overlapping as though the wall had slid in gradually, retaining the relative positions of the slabs. The edges of some of these sandstone slabs were definitely reddened as if by fire.. In the loose fill above the old floor line were found fragments of an unusual circular slab metate, probably deliberately "killed"; this must have lain outside the building and slid in after the collapse of the wall.** There was no definite door evidence; the pit wall was doubtful in the southeast quadrant and there even might have been some sort of additional entryway there, or the wall simply may have caved.

The better preserved ring was built near the south side of a large boulder but in this case the wall was independent of the boulder (Pl. I, fig. i). Two rock slabs standing in natural position about 6 feet (1.8 m.) apart were utilized as jambes of a door opening to the southwest; both natural jambes and orientation are atypical since they were not noticed

*Under permits from the Department of Agriculture, 1940, 1941.

**The edge of this metate had been trimmed rather carefully to a radius of about 20 cm. from the intersection of the fracture lines. This circular stone resembles the stone cist lids or hatch covers of Basketmaker III houses.

elsewhere.* This hogan was laid out in a very true circle, about 12 feet (3.6 m.) in inside diameter, with massive walls about two feet thick laid up to (original) heights of about three feet. Though we believe the walls originally to have been very similar to those at the San Miguel County type site, the mansonry was not so regular. We found no evidence of mortar, but we should point out that the site is subject to very heavy precipitation and mortar would have washed out anyway.

This room did not seem to have been excavated much below the previous surface, probably the floor was simply levelled. The floor was quite readily traceable over several square feet, particularly at the center of the building and at the door opening. It seemed to have been formed of a thin layer of transported clayey-soil, more likely simply trampled into place than plastered on as adobe. Beneath this floor were the loose slide rocks with bottomless cavities between them. We had to remove all dirt by very carefully hand-tooling into a canvas and then carrying to be screened, otherwise the dirt simply sifted down into holes and was lost. This floor treatment may offer a clue to the original flooring of the Eagle County site previously described.

There was no definite hearth, and the somewhat thicker charcoal traces near the center would be just about sufficient to account for the burning of a very light pole roof. The thin fill above the floor rules out the possibility of an earth-covered roof; a few chips, charcoal fragments, and fine bedding lines seemed to be due to washing in from a hearth area on slightly higher ground just outside the door to the southwest, but this hearth was not located. All ruins at this site probably are substantially the same, with only minor variations in door and roof treatment.

In addition to the metate noted a short artifact series was recovered here, among which should be mentioned two corner-notched knives of chalcedony (Pl. V, fig. 2, g, i) and several small corner-notched points (Pl. V, fig. 1, k-l). One small lateral-notched point (Ute type) was found on the surface, and two manos, one burned, were found in cavities (possible caches) under the edge of the large boulder back of the hogan just described. One mano had been used as a pestle in breaking up colored rock, probably in the preparation of pigment for paints, though we must grant the possibility of the manufacture of colored sand to be used in sand painting. One battered end was stained with a red ochre, while the other end was stained with yellow.

Uncompahgre River Drainage

To the southeast of the region just discussed our explorations are limited, and we have not established the continuity of these sites across Cochetopa Pass to the Saguache area. That the distribution is continuous is probable from a report of three of these hogan ruins in a cluster on top a ridge near a pass between the Uncompahgre River and smaller tributaries of the Upper Gunnison River. We visited the indicated area and found the given landmarks to tally exactly but the country is so overgrown with brush that location of the ruin proved impossible. Since guides were not then available we were forced to leave without verifying the report personally. The altitude at the site would be about 9,500 feet, and winters very severe. The district mentioned would be about fifty miles airline from the Upper Rio Grande Valley sites described in the early surveys, and about one hundred miles airline from the Saguache area discussed in a previous section; actual road distances, however, are much greater.

*Keur (1941, p. 30) describes Navaho utilization of natural outcrops as door jambes.

Lower Gunnison River Drainage

Our most complete hogan records come from somewhat farther northwest in the corner of Mesa County, just across the line from the Montrose County site we have been describing. We have found no true "village" clusters nor compound enclosures in this region, but rather in the populated areas the hogans are set singly or in adjoining pairs on almost every little point of rock, or every alluvial cone thrusting out onto the canyon floors (Pl. III, fig. c). In no case were breastworks erected independent of the house walls. Because of the exposed nature of the sites very little material culture was salvageable. The six houses excavated were selected because their locations had favored deposition inside the rings rather than erosion, and there was more chance for the preservation of significant information.*

Basing our opinions on the hogan examples studied, we do not believe this area to represent any particular local specialization; in structural details and in material culture recovered the houses seem to be identical with those in the San Miguel-Lower Dolores drainage. In two cases the hogans were built behind large boulders where they would have been almost completely invisible except at close range or from the cliffs above; most of the other houses were built in very conspicuous places and could have been seen easily from as much as a mile up- or down-canyon.

Our first hogan in this district was excavated in the fall of 1940. The site (HH) consisted of a single ring of jumbled stone about seventeen feet (5.5 m.) in east-west diameter under the overhanging north (downwind) side of a large talus boulder (a wind-eroded "mushroom"), the boulder forming a section of the back wall (Pl. IV, fig b). A pinon tree growing in and through the wall was estimated to be at least 150 years old. The floor of this hogan had been dug into the hill about one foot on the high side (north), but had never truly been levelled, and after abandonment all the debris and ash inside the walls had washed down to the lower side of the room (Pl. III, fig. d). Over much of the north half of the building the floor line proved impossible to trace, but in the south half the floor showed thin laminations of the natural red clay of the hill with darker ash-filled soil, as if the floor had been exposed to the weather at intervals. The laminations were hardly thick enough to represent intentional renewing of the floor by carrying in clean clay. In almost the exact center of this room an unlined, basin-shaped hearth about 3 feet (.9 m.) in diameter had been excavated to a total depth of 7.9 inches (20 cm.). It was partially filled with brick-sized burned stones, in no discernible arrangement. Hand-tooling revealed the segments of arcs of other hearths adjoining, suggesting the periodic re-digging of hearths in approximately the same position. At this site, at least, there is some slight verification of what we have suspected elsewhere: that certain sites may not have been occupied the year round. Under the overhang of the boulder backwall several ash-filled depressions were tooled out, but there was nothing to indicate that these had been either hearths or sub-floor cist-caches. Probably such floor depressions are simply the burrowings of coyotes, skunks or badgers—even the Indians' own dogs—after the abandonment of the house; the accumulated ash-dirt floor would quickly wash into the pits. When we find a dozen such pits there is certainly no sense in regarding them all as "hearths" and trying to account for the resulting unusual "floor plan."

Stones removed from the interior of the room were piled separately and their cubic content estimated: the wall probably had been originally as much as 3 feet (.9 m.) but certainly no more than 4 feet (1.2 m.) high. The masonry was of fairly well selected sandstone slabs laid in courses with

*These explorations were conducted under permit from the Department of the Interior, 1940, 1941, and permit from the Department of Agriculture, 1940, 1941.

some attention paid to breaking joints. In one place three courses were still in position. Lack of any trace of adobe mortar in the interstices of the rocks showed the wall to have been dry-laid.

Direct roof evidence was lacking. Fragments of small-diameter charcoal on the south half of the floor could have come from the central hearth or could be traces of a burned roof, possibly a light pole frame covered either with brush or bark, or with skins. Several large flat slabs noted leaning against the outside of the wall seemed too wide to have been part of the wall; they could have been used in the anchoring of the pole superstructure to the wall. The position of the house against the talus boulder makes it probable that the rafter ends were leaned against the boulder and that the complete roof formed a segment of a cone.

Outside the doorway and down the slight slope to the east and south a thin line of black soil was the only midden trace. Sufficient household debris was recovered here to rule out the possibility of the building having been a sudatory, or sweat house (Pl. V, fig. 1, h; fig. 2, c).

Nearby, in another branch of the same canyon system, four other hogan rings were excavated, two in 1940, two more in 1941 (HMF -1, -2, -3, -4): there are probably other houses at this site but if so soil creep has overthrown all walls and the locations would be hard to find. Three small dry gulches enter an east-west canyon from the south, cutting an old alluvial cone, and the houses were built on the truncated end of the alluvial cone between the dry gulches. In wet years the canyon carries water all year around, and even during the dryest season "raises" of water may be found nearby in the creek bed. To avoid repetition, all houses in this group will be considered in the same class as the one described in the preceding paragraphs and only noteworthy departures will be cited.

All the buildings located had bedrock foundations for at least part of the circles and sections of the dry-laid walls were correspondingly well-preserved. Two of these houses (-1, -2, Pl. II, fig. b) (diameters about 12½ and 11½ feet; 3.8 and 3.4 m.) were built adjoining on a north-south axis with a short section of wall apparently in common. A third hogan (-3, Pl. IV, fig. a) (diameter 18 feet, 5.5 m.) a quarter of a mile away was hidden behind a large talus boulder, the boulder forming about one-fourth of the wall. A fourth house (-4) (diameter 10½ feet, 3.2 m.) nearby was smaller, and yielded little information.

The door of -1 was to the east, a simple gap in the wall, width undetermined; the three other ruins apparently had no doors and possibly they were entered by stepping over the wall through a hole in the roof. If so the entry would most conveniently have been made from the south (high) side, a possible linking of this site with the one on top of the pass at the crest of the Uncompahgre Plateau. Of this group all floors were dug into the hill from one to two feet on the high side; floors were fairly well levelled in -1 and -3, were more nearly basin-shaped in -2 and -4; in all four floors large boulders were left sticking up.

At -1 there was clear evidence that after the floor had been levelled it had been improved further by an additional layer of disintegrated red shale (Chinlee-Lower Dolores) which can be dug nearby; this had not been spread wet, as adobe. At hogans -1, -2, and -3, thin layers of clay alternating with charcoal-ash layers may imply a periodic abandonment of the buildings; the clay layers did not seem to have been carried in but are rather of washed-in soil, possibly from soil banked around the houses.

Three separate well-packed floor surfaces could be peeled near the center of -1. In the center of -1 and -2 there were shallow basin-shaped hearths (the -1 hearth traceable to the second of three floors); evidence at -3 and -4 was not convincing.

Both -1 and -2 must have burned at the time of abandonment, to judge by the reddened inside edges of wall rocks and a layer of fragmented char-

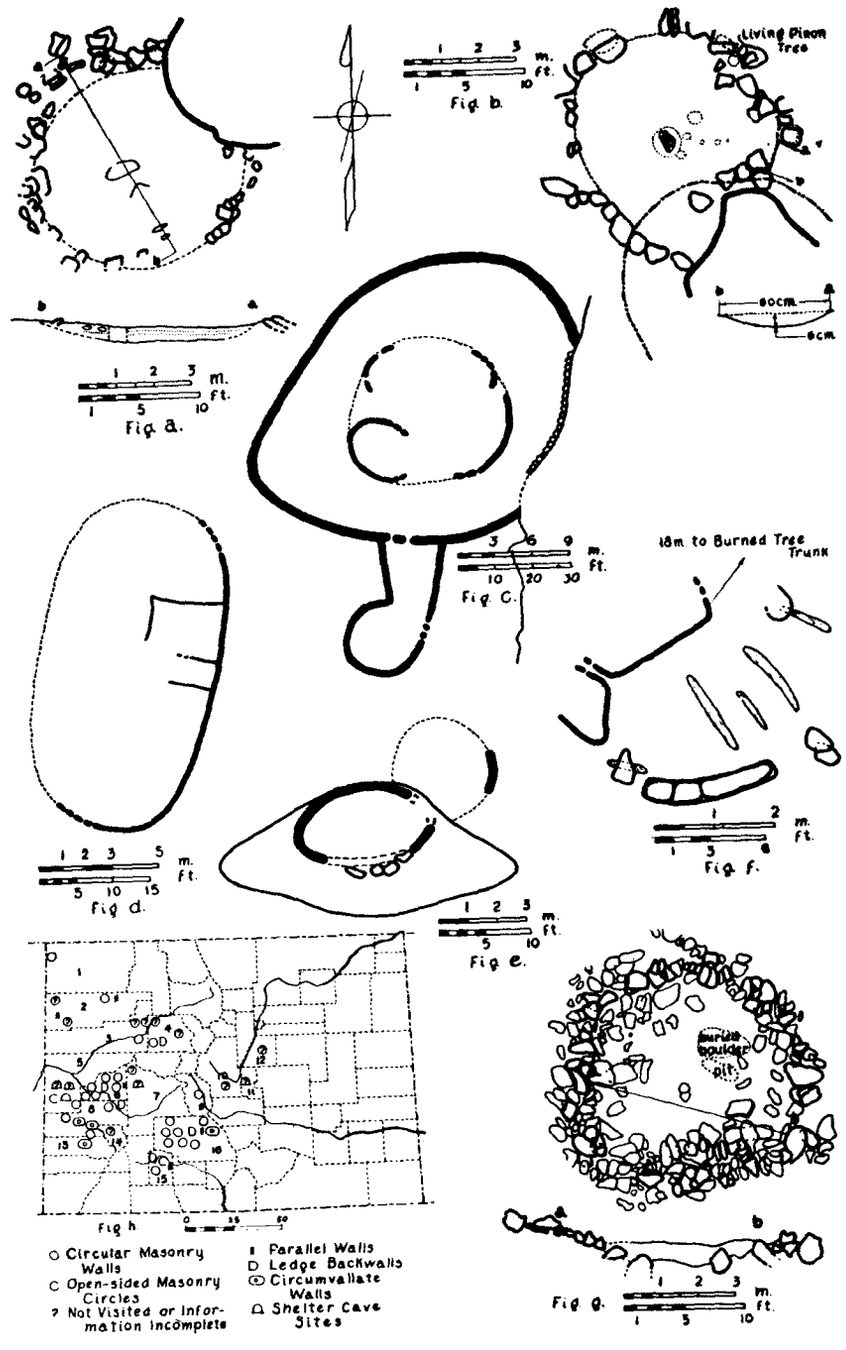


PLATE IV

coal at the upper contact of the highest floor. The fragments were all of small diameter juniper sticks (possibly some pinon), and they were worn into peculiar round and egg-shaped balls, most likely from being whirled around within the circular walls by eddies of the wind. We believe the evidence to point to the probable use of light pole roof frames covered possibly with brush, or at least something which would burn almost completely and with quite a hot fire.

Just inside of the door of -1 the walls were very red where there had been a pile of something which burned with intense heat and burned up completely. There was nothing in the remaining ash to identify the material, but dry corn on the cob or kindling wood in a pile might have caused such results, especially if a breeze had been blowing. We do not know the prevalence of the trait of storing piles of kindling wood, but have found such piles around Ute camps, never within the wikiups, however.

Of this group, the third hogan proved the most important, not for any information gained from the building itself—for the fill proved almost barren, the floor barely traceable—but because just to the east of the large talus boulder which formed part of the east wall of the hogan, a small wash filled with dump refuse was discovered (Pl. V, fig. 1, a-g; fig. 2, h; fig. 3, b-g; fig. 4, a, c-d, f-j; Pl. VI, figs. a-f, h). This material seemed all to have washed down from a small level place immediately south of the hogan, where doubtless many of the household activities were carried on. In the material recovered here was our best single series of bone implements, including pieces of four specially constructed tools of deer shoulder blade, several one-hand manos and small hammerstones, and one of our best series of potsherds (all of known Puebloan types dating to about 1100 A. D. plus or minus 50 years). Several small, rather shapeless lumps of dried clay and one small rod of fired clay suggest the possibility of clay figurines at this site, but no pieces were large enough for positive identification. Several small fragments of charred corncob were found here.

There is a still larger concentration of these hogans in another tributary canyon a few miles north of the sites just described. The first of these (HSP), a low, rock-strewn mound, had been visited in 1939 and a small series of Pueblo sherds picked up. Since this was the first occurrence of Pueblo sherds in association with building remains to come to our attention in the Uncompahgre Plateau region, we reported the site as a small Pueblo ruin (American Antiquity, Vol. V, No. 4, p. 345). However, after finding similar Pueblo sherds with the hogan dwellings in the next two years, we decided to clear this ruin as a check, and it was found to differ in no essential respect from the other hogan ruins. The mound is largely natural, and only a single room is built upon its top. Somewhat more dirt had drifted around this ruin than elsewhere, which contributed to the impression of adobe-laid walls (Pl. III, fig. g).

In excavating this ruin a trench one meter wide first was started at the extreme eastern edge of the debris-strewn area and brought to the edge of the house and across to the other side; all material removed was passed through ¼ inch mesh. At a distance of about 39 feet (12 meters) east of the house, still in very shallow fill, an alignment of three postholes was found, the size of the holes indicating posts not over four inches in diameter. In two of the postholes wedge-shaped rocks had been stuck down beside the posts to steady them. We are not certain as to the prevalence of the use of rock wedges in postholes, but it is our impression that at most Southwestern sites the soil is simply tamped around the posts.* Additional meters were cleared on either side of the main trench but no additional postholes were noted nor did we pick up any clearly defined floor.

East of the house and about one meter from the wall was an area covered with slabs lying flat, but these seem to have fallen from the wall after the abandonment of the house, for beneath them was a black midden line and a small basin-shaped hearth. An additional trench was started north of the ruin to meet the first trench at the east wall. In this north trench two black midden lines were picked up, the top layer grading to the surface around the house at the time it was occupied while the lower ran under the wall. The floor inside was dug into the hill about a foot and a half on the south side and elsewhere was dug down slightly below the base course of masonry. The floor, which was comparatively level, coincided almost exactly with the midden line which continued under the wall. These two floor levels, then, offer no evidence for any considerable lapse in time between the two occupations.

Within the house the only new features were two sub-floor storage pits or cists, a large one just east of the center, a smaller "pocket" cist, just west of the center. The larger cist was narrow-necked and oval in cross section rather than globular, and would have held about one bushel. It had been covered by a roughly trimmed sandstone slab lid. There was a basin-shaped hearth in the center, with margins so irregular that it may have been dug more than once, and near the hearth occasional traces of more than one floor surface were noted (Pl. III, fig. i).

There was no roof evidence and no definable door. At the south edge a rock outcrop which remained in the floor would have made climbing out easy; however, the hearth outside at the east suggests an east entrance. The walls of this ruin still stand as much as 2½ feet (.8 m.) high, but masonry details are very hard to make out. This wall seems to have been thicker than those elsewhere, possibly as much at 2½ to 3 feet (.8 to .9 m.) altogether, but neither face is clearly defined. We found no clear evidence of adobe mortar, since such dirt as remained between the rocks seemed simply loose wind-blown sand. We think the wall probably had been of dry-laid masonry, but there are the possibilities that it was either a wall of true masonry with a mortar of sandy mud which had disintegrated, or simply a ring of piled rock.

A total of 18 points were found here, all corner-notched (one with two notches on one side), scrapers, blade fragments, an object which seems to be a blank roughed out for making a stone awl or drill, and a single small scrap of charred corncob (Pl. V, fig. 1, n-o; fig. 2, c). A number of Pueblo sherds were found in and around this house, all of known Pueblo types dating to about 1100 A. D. plus or minus 50 years.

It seems probable that many other hogan ruins formerly existed in this canyon within a distance of about four miles up and down stream, but most of them are so far gone that they may be identified with the greatest difficulty (ten are known with some degree of certainty). This high mortality was caused by the choice of building sites: the little hogans usually were built on the very tips of steep-sided residual cones of shale (Chinlee-Lower Dolores red shale) with no solid foundation whatsoever. As a result in almost every case the stones have slid down the slopes leaving only an occasional rock in place to mark the foundations. A few flint artifacts and an occasional mano or deep bowl metate still may be found on the sides of the cones.

*Spier (1928) has noted the use of dry sand by the Havasupai in setting posts. Hill and Metcalf (1941, pp. 171, 178-179) mention the use of buffalo leg bones driven into postholes to wedge posts at a Dismal River site in Nebraska, and Strong (1940, p. 372) cites the same trait for the Cheyenne earth lodge in North Dakota. Mulloy (1942, p. 6) describes a similar use of bison bones at a prehistoric house site on the Lower Yellowstone in Montana; the ruin is identified as an earth lodge, but the described post size would suggest to us some lighter construction, more like the beehive houses of the southern Wichita. Renaud (1942, p. 18) describes what is probably the use of stone wedges around the upright monoliths of the Apishapa Canyon, in southeastern Colorado, in the former range of the Cuartelejo and San Carlos (Carlanas) bands of Apache. Keur (1941, p. 32) mentions two small holes "carefully lined with stone, which may have been loomholes" at a Navaho hogan site on Big Bead Mesa.

One ruin (HMH) about two miles from the preceding site still has over one-third of the house ring showing, and additional rocks indicate that there may have been another ring adjoining (Pl. III, fig. c). In levelling the foundation course of this building a short stub of very pitchy pinon had been laid down lengthwise under the stone, and by a freak this log had remained quite sound; it may help in the construction of an accurate tree-ring chronology for the district. A small remnant of midden was found on the slope of this knoll, and from this midden was recovered a perfect corner-tang knife (Pl. V, fig. 2, a); as has been pointed out elsewhere this type of knife may prove to have been a part of the artifact complex of the hogan builders. Numbers of hammerstones and percussion-flaked scrapers and a single Pueblo utility potsherd were found here (Pl. V, fig. 3, a). About one hundred yards east of this hogan a small cache walled with dry-laid slabs was found beneath an overhanging boulder; it contained a rat nest which had burned; among the ashes were charred remnants of corncobs.

During the 1941 field season Mr. Frank Darnell, one of our field assistants, located a shelter cave (HBL) halfway up the sheer north face of this same canyon, just above several knolls which seem once to have had hogans, though now they are practically bare. The shelter cave is only a few hundred yards from one of the oldest ranch houses in the region, but apparently its location was unknown to, or forgotten by, any of the people living in the neighborhood today. From the canyon floor only a slight overhang is visible, but by climbing along the ledges to the cave it was found to have a semicircular floor more than a hundred feet long, and in one place more than fifteen feet in depth. This shelter is exposed to the wind and there is little accumulation of any kind on the floor except at the west end, where remnants of a dry-laid stone wall outline two sides of a room (Pl. III, fig. h); windblown sand against this wall proved to be sterile.

At the west end of the room, however, a large cache was discovered completely filled by a rat nest which had been built at the time the cave was occupied, or soon after. This cache took advantage of a cavity between two large boulders, and was covered by a huge monolithic sandstone slab, all that three persons could move. The cache contained a number of corncobs scattered through the rat nest, most of the cobs indicating that the corn had been eaten green. Several slender shoots of service berry (**Amelanchier**), gathered green, may have been intended for use in coil basketry or they might have been selected for arrowshafts. The latter use is the less likely, however, because a short section of the base of a reed (**Phragmites communis**) arrowshaft was found.* This arrow was unpainted, had three feathers seized with sinew, and the butt had been strengthened for cutting the notch by the insertion of a small wooden plug held in by a tight seizing of sinew. Two additional examples of the shoulder blade tool turned up in this cache, one nearly complete, the other a small fragment (Pl. VI, fig. g).

Farther down the Uncompahgre Plateau near the Gunnison River there is a circular stone hogan inside a shelter cave. The description was given us by a reliable person who was familiar with the appearance of these ruins. The region is almost completely waterless and in order to do any exploration at all a three day packtrip would be required. Near this spot is a shelter made by laying logs across a gap between two large boulders; this, however, is said to have been made by recent Utes. A number of other ruins are known in the region where Mesa, Delta, and Montrose Counties come together, but they simply repeat previous descriptions. Two sites

*Plant materials were identified by staff members of the Wildlife Research Laboratory, Department of the Interior, Denver, Colorado. "**Amelanchier** made up almost all of the woody material and since much of it had been split we presume it was in preparation for making baskets. Such use probably was going to be made of the yucca." Letter, C. C. Sperry to A. M. Bailey, June 3, 1942.

consist chiefly of small D-shaped houses without doors, built against low rock ledges, and containing thin sandstone slabs which have fallen in from low flat roofs. In two cases a row of small stones laid along the ledge indicate a skin roof weighted at the sides with rocks. In one case juniper rafter sticks are still lying inside.

A large area farther northeast, in Delta County north of the Gunnison River, is known to us chiefly through reports, but we have been able to verify a few of the sites personally. Although our information as yet is very scanty, this region may prove to be one of the most important because of the high percentage of off-type potsherds which turn up here. The presence of the stone hogans is certain, but we have very few details. One site just north of Delta consisted of several circular houses (probably at least five) of piled basalt "niggerhead" boulders on the very top of a conical hill of Mancos shale and a higher hill nearby with three additional circles. These seem to have agreed in every respect with the lava boulder rings of the Saguache sites, but unfortunately the story has arisen that the rock piles are "Indian graves" and curio hunters have completely destroyed the site, one enthusiast using dynamite as an aid to excavation. Northeast of Delta we found a single small rectangular house of piled lava boulders, door opening to the south, the walls quite well laid up and still standing to about 2½ feet (.8 m.). It is completely hidden in a little pocket in the side of a high mesa and like some Saguache houses is built in the very bottom of a slight wash. Higher in the hills, well up on the sides of Grand Mesa, there are said to be other examples of these lava boulder sites, one described as a round tower built on top a large boulder, but these would be inaccessible without packtrain trips.

We heard of one valley where coarse black pottery with fingernail decorations could be found just for the looking and the proposition sounded too good to turn down: contrary to the usual results of such excursions the pottery actually was there. The site proved to be a surface camp along the edges and near the tip of a promontory overlooking the junction of a small side creek with a large canyon. The camp level is being exposed by wind erosion which has uncovered numerous basin-shaped hearths and the potsherds are found near the hearths. We were fortunate in salvaging enough sherds of one pot to make possible a complete restoration (Pl. VII, fig. a). Stone hogans are reported along the rim of this same creek not far away but weather at the time of our investigation prevented our visiting the ruins. The relationship of the surface camps with the hogan sites is not clear but we believe there is some connection. This site checks in almost every detail with another surface site in Mesa County where parts of (possibly) four pots were recovered, and the list of pottery traits is very similar. We urge all collectors who find such pottery concentrations to save every sherd because in many cases the sherds are parts of one pot or at most a few pots, and with a little care complete reconstructions are possible.

Near the Black Canyon of the Gunnison River several sites along mesa rimrock (Dakota sandstone) show signs of crude masonry. At one place where a huge block of the sandstone rim had jointed free and tipped down the slope the resulting cavity had been utilized as some sort of house. The openings had been at least partially blocked with dry masonry and several very wide, thin slabs inside probably indicated the use of slabs on the roof.

Two shelter caves in this region may prove to have a bearing on the problem of the hogan builders. One cave is in a dry gulch in a very rough region in eastern Delta County, and is reported to have "stone corrals" inside where the Indians (Utes) corralled tame bighorn sheep (**Ovis canadensis**). We have no evidence whatsoever that the Utes in pre-reservation days raised sheep, much less that they had accomplished the feat of domes-

ticating the bighorn.* However, it is by no means incredible that sheep, whether domestic sheep or wild bighorn, should have sought shelter in a cave containing stone hogans such as we have been describing. Farther east, in the corner of Gunnison County, in an almost inaccessible canyon, there is a shelter cave with quaking aspen poles set vertically in the floor. Of course this may be simply the work of white men, but we have noted in the literature several instances of the use of quaking aspen poles in shelter caves in the Northern Periphery. We may find the use of aspen to be a significant difference from the classical Basketmaker-Pueblo culture, since the latter places emphasis on pinon and juniper. Two sites on mountain passes leading out of the basin of the North Fork of the Gunnison have "stone piles" which, of course, are identified as "Indian graves." When investigated these may prove to be hogan sites as so many other "grave sites" have turned out.

II. CULTURE MATERIAL RECOVERED

Artifacts of Stone

Arrowpoints associated with hogan types of ruins are remarkable for typological homogeneity, or to put that in plain English, they are all the same (Pl. V, fig. 1). They are usually small,** and out of a series of 97 points, 92 were corner-notched (that is, they had expanding stems with various degrees of barb development, the Sc types of the Strong (1935) classification). Two surface examples, certainly intrusive in the sites, show the Shoshonean lateral notching. Two examples have a true stem, two examples have an additional third notch higher on one side (Pl. V, fig. 1, y),*** and one decidedly atypical piece has no notches, has a wavy edge, and shows the grinding of the basal edges which occurs on Yuma and Folsom points. Any or all of these latter points might be intrusive in the culture.

At the excavation near Saguache only very small points were found (two complete points weighed .65 and .73 grams or 10.1 and 11.3 grains, respectively). This camp is near the Saguache Creek marshes and only about seven miles from the Russell Springs marshes (the ponds of San Luis of the de Anza journal). Since this region is famous for plentiful wild fowl, the small points noted may be regarded as bird points, even though they do not show the blunt "bunt" tip of some bird point types. A large scattered camp high on a yellow pine mesa nearby yielded only short, very wide, points with small corner nicks (Pl. V, fig. 1, 9-5). Though the two sites and the two point types are certainly related there may be a time difference involved which would account for the change in point form, or we may have a functional difference. This latter camp is built in what must have been good deer or antelope country and such game would justify the slightly heavier point.

Nearly all arrowheads retained enough of the outline to determine that they had been made from small, rounded-base blanks by notching diagonally, thus the stems in a great majority of the complete examples were left convex. During early Pueblo times this particular type of point was used almost to the exclusion of any other in southwestern Colorado, but at

*There are several references to herds of goats owned by the Utes in the reservation period. Goat raising was not necessarily introduced by the Indian agents, however, as the Utes were intimately acquainted with New Mexico tribes and could have learned goat raising at an earlier period.

**Average weights of 10 points: .91 grams or 14.1 grains. Average dimensions of 81 measurable points: length, 23.7 mm.; breadth, 14.2 mm.; thickness, 3.1 mm. Kidder, 1938, pp. 156-7 discusses weights of Southwestern arrowpoints.

***According to Spier's (1928, p. 151) information from the Havasupai, if an arrowhead loosened from the hafting (in spite of the maker's prayers) an extra nick was made higher on the blade and additional seizing was bound around.

earlier sites and at the later Pueblo sites in New Mexico a wider variety of forms is present. The diagonal notches and the convex base sharply distinguish these arrowheads from the arrowheads of the modern Utes which have proved to be, at all sites investigated by us, triangular and with straight base, and with side notches or side and base notches (V. Steward, 1936, fig. 11, 2).

Blades and Knives

Blades and blade fragments formed a considerable class in all areas, and the total number examined, 93, is large enough to justify some generalization. Many of the cruder pieces may be broken or unfinished blanks though smoothed or chipped wear edges are sometimes apparent. Of these coarser pieces, possibly blanks, 9 bases were rounded to two squared off; in the definitely finished pieces the ratio was reversed with five squared bases to two rounded. Thus we would regard the squared-base blade as characteristic (Pl. V, fig. 2, b, d, e). In the better specimens the shaping of blades was accomplished by a process which took off wide, flat flakes; we should suspect indirect percussion with punches. The edge retouch, however, was accomplished by a method which produced an irregular chipping rather than a flaking.*

Of five blades finished for hafting (not included in the above totals), four were corner-notched (Pl. V, fig. 2, f, h, i). A single corner-tanged example was found in the dump of one ruin; it agrees exactly with surface finds of corner-tanged knives known from west-central Colorado (Pl. V, fig. 2, a). All are of materials known locally. A very good corner-tanged knife comes from the neighborhood of the San Miguel County fortress, but it cannot be regarded as a direct association. Moorehead (1931) has reported the occurrence of these distinctive knives at camp sites in the vicinity of stone circles, but the actual relationship of the sites has not been demonstrated. However, it is becoming increasingly probable that the corner-tanged knife is a part of the material culture complex of the hogan builders.

The order of flaking which produces alternately bevelled cutting edges was observed for five knife blades. Four of these were too fragmentary to permit recording all characteristics, the complete piece was pointed oval (Strong's type NAB1) in outline. The four-sided (diamond outline) alternately bevelled blade has not turned up at hogan sites, though it is present in western Colorado. The diamond-shaped knife with four edges alternately bevelled and leaf-shaped knife with the pointed end alternately bevelled are traits of the Dismal River culture of the Platte River (Hill and Metcalf, 1941, p. 190, Pl. VIII, 2). Leaf-shaped blades with the same outline as those illustrated for the Dismal River sites are abundant in the Great Salt Lake area (Reagan, 1935, p. 72, n. 9, fig. 3).

Scrapers

We are setting up as a separate classification "tabular scrapers," simply flat flakes with crudely retouched edges. Steward (1937) regarded similar scrapers, made from slate, as characteristic of his Promontory culture and the type does occur consistently in the Columbia River regions; ten scrapers out of a series of 86 fell in this class so it seemed distinct enough to justify carrying under a separate heading. In our sites they were formed from small tabular masses of quartz or natural (frost) spalls of quartzite, by

*This is not a distinction without a difference. Long regular flakes may be produced consistently with a pointed bone tool by a gradually increasing pressure applied at an angle approaching the plane of the finished tool; when the pressure is applied at greater angles, approaching a right angle to the finished tool, the haphazard rounded chips will be produced. In the present instance this probably means that the chipping resulted when flaking and work were held freehand, in contrast to holding the work in a fixed position on a dampening buckskin. At all events the finished product reflects a specific flaking method.

simply knocking a few flakes off one side or end or both.

The method of using such scrapers is problematical, but back-hafting between split twigs or split green bones is a logical suggestion. They would, then, be comparable to the back-hafted skinning knife (Eskimo "ulo") on the one hand, and the Plains and Plateau "drawknife" scraper on the other. That the back-hafted scraper reached the Pueblo Southwest is indicated by published examples in earlier reports, but it is not always established that such atypical artifacts may not have been intruded from surface camps of recent nomads.

In the more orthodox classifications two negative traits showed up (based on absence from the series of 86): there is no true keel scraper (rostro-carinate) and there is no true end scraper with the exception of two small "snub-noses." These two snub-noses differ from the recognized type in that the flaking is toward the plano-convex surface rather than away from it; that is, the flat side of the flake is the back of the tool instead of the face (Pl. V, fig. 2, j).

Forty-one core scrapers were found, about evenly divided between the true turtle-back core shape and the discoidal. An intriguing fact turned up in the examination of these scrapers, the probable presence in 8 implements out of 41 of the **tci-tho** flaking technique described for the Northern Athapaskans.* The identifying characteristic is a slightly crumbled or crushed working edge, entirely distinct from the usual scraper edge. The manufacturing process leaves a peculiarly regular profile, quite in contrast to the scalloped edge of flaked tools. The tool may easily be confused with a discoidal hammer-stone which has been used for, let us say, cracking bones. This **tci-tho** classification may be greatly lengthened if we include all hammerstones which have been used as scrapers, since 21 (out of a total of 74) hammerstones have smoothed, worn edges showing their utilization as scrapers, and there is no doubt that the two implement types converge. What is probably this same tool occurs at many sites in the Columbia River region and in the Southwest, sometimes listed as crude scrapers made from split stream pebbles, sometimes as scrapers formed by battering the edge of a flake. Published examples agree entirely with the **tci-tho** description and far from being crude or random types, the scrapers probably are highly standardized; certainly they are worth watching for. However, the full significance of the various occurrences will only appear when comparable numerical lists are available.

Among flake scrapers also type limits were not sharply defined. An approximation of a keel scraper occurs (rare) formed from a very thick flake by a slight (batering?) retouch of the edge (Pl. V, fig. 3, d, e,). A discoidal flake scraper, retouched all around the margin is most common, closely followed by side scrapers and combination side and end scrapers, these latter clearly betray a relationship to the tabular type (Pl. V, fig. 3, f, g). The discoidal flake scrapers are the most completely finished tools.

We should note here that any kind of scraper is rare at the Saguache County hogan clusters but that they do occur in numbers, both flake and core types, with the little individual houses in the hills and with the scattered mesa-top sites. This hardly argues a lack of connection between the two types of sites, but rather that in the larger assemblages such activities as required use of these tools were carried on at some nearby spot, possibly at the foot of the hill, where they would certainly be covered by alluvium.

*Rainey, (1940, p. 310, n. 403): "(The **tci-tho**) is the most common implement in all Athapaskan sites excavated. An oval or semi-lunar flake is struck from a water worn boulder and battered against a stone until crudely retouched." Mr. Haldon Chase, assistant, demonstrated for us the rapidity with which such implements can be made by striking an anvil stone while slowly rotating the implement and at the same time rocking the hand slightly at each blow. Very regular chips will thus be struck from alternate faces of the implement.

Spokeshaves

Spokeshaves occur in two sizes, one type with a small diameter curve for arrowshafts or basket-splints, another with a longer, flatter curve (19 mm. long, 6 mm. deep) which could have been used in dressing down bow-sticks. The arrow-size spokeshave occurs in combination on the edge of tabular and discoidal flake scrapers.

Hammerstones

Hand hammerstones or pecking stones form a very numerous classification (Pl. V, fig. 3, a-c). Our series should show a much higher percentage of these implements from surface sites but after establishing their high frequency we paid less attention to them other than to secure representative specimens. A notable fact is the almost complete absence of hammerstones from the large sites in the Saguache area. This cannot be due to the sites having been picked over, since hammerstones are comparatively ignored by collectors, and one extensive site examined is unknown locally. A possible explanation may be found by supposing the various activities for which hammerstones were used to have taken place customarily at some distance from the houses. Several were found around the individual houses in the hills.

We have noted previously that a high percent (21 out of 74 examined) of these hammerstones showed by their smoothed edges that they have been used as scrapers, and that undoubtedly the true hammerstone and the true discoidal scraper meet in the **tci-tho** type of scraper. An examination of hammerstones to determine the method of manufacture disclosed most of them to have been adapted from camp refuse, thus 30 out of 74 were simply utilized cores. In 9 cases the hammerstone probably originally had been a flake scraper, but the scraper edge was battered beyond recognition. Sixteen examples could have been choppers or hand-axes originally, which is interesting since only six hand-axes turned up. It would seem that a worn-out hand-axe which does not lend itself to resharpening automatically becomes a hammerstone; thus, the frequency of hand-axes probably should be 22 rather than 6.

Manos and Metates

We are recognizing two types of manos, both the one-hand variety: the skin-dressing mano or rubbing stone, distinguished by its polished wear surfaces; and the food-grinding mano with its ground but unpolished surface. The most common mano is made from a selected stream-bed cobble of resistant quartzite, the surface usually somewhat altered by pecking and subsequent grinding; other manos were selected scraps of sandstone, some shaped, others unaltered. An unusually high percentage were used on one face only (13 out of 41), though they were clearly the one-hand type of mano. There are a few small fragments ground on one side, some of which may be parts of larger manos; however, some writers set up a separate classification of these small forms as pot rubbers or seed hullers, and the distinction may be justified.

By far the most of the metates are of the oval, deep-bowl type, this trait particularly noticeable at the Uncompahgre Plateau sites and at two San Miguel sites. Shallow slab metates, often bifacial, were common on the Uncompahgre Plateau and a single example was found during the Saguache excavations. At one Uncompahgre Plateau excavation was found a fragment of a true trough metate and made from a local granite rather than the usual sandstone; such a metate, however, certainly is not characteristic.

Miscellaneous

A total of five drills or stone awls were recovered, none with T-base. One piece had a definitely triangular base, while three others had less regular, unfinished bases which might or might not have been intended as tri-

angular. One unfinished piece of unusual proportions is almost certainly a blank roughed out for an awl, but not worked down. A total of six crude choppers were recovered, and 4 pieces in a slightly better finished class which we are calling axes or celts, though their actual use is unknown. Two may have been intended for hafting, but they show no certain wear polish resulting from hafting. Another, doubtfully identified flake implement, is carefully chipped around the edges on three sides, the bulb edge being left unfinished. There is a clear suggestion of hafting in the intentional thinning of the two sides about midway from the end, certainly suggesting a small hatchet and more probably a weapon than a utility implement; however, for lack of precedent in this area we are classifying it along with flake scrapers. No ground or polished axes, celts or mauls were found. Two trimmed sandstone disks which were probably pot lids were found at Uncompahgre Plateau sites.*

Bone Tools

The hogans we excavated showed a considerable emphasis on artifacts made of bone, and we suspect that much the same numerical percentages would hold true for the other ruins though, of course, no bone is recoverable on the surface. The large number of arrowheads and the use of bone would be expected of a hunting culture which had not yet been oriented, or at least was poorly oriented, toward the southwestern agricultural pattern.

Bone awls of artiodactyl** leg bones are quite numerous and may be divided roughly into two sizes, one rather long and thin (Pl. V, fig. 4, c-e), the other short and broad (fig. 4, f, g); 11 out of a series of 14 were of the thin type. Of 7 fairly complete examples, 5 were of bone splinters trimmed to shape while 2 were formed of leg bones with the joint left on as a handle. Both the examples with joints were from ruins which yielded Puebloan potsherds, and a particularly fine trimmed example came from a ruin without potsherds. However, our series is too short to show any convincing differences, since both types are common in the Southwest. Two small bone needles were found, both from ruins with Puebloan potsherds.

Short fragments of leg bones trimmed to a point (8 in all, all with joints left on) were used as flakers in the finishing off of the edges of stone implements and weapon points (Pl. VI, fig. a, b, i). The short awl forms with ground points are sometimes considered to be flakers, but in the present study we regarded a slight splintering or chipping at the end as a criterion and none of the awl forms showed this sign of use as a flaker. We found nothing indicating the hafted bone or antler pressure flaker, such as has been found in some Basketmaker and Pueblo sites, so probably these short forms held in the hand were used exclusively. Several examples of a bone tool with a spatulate end were found (HMF, HSP) (Pl. V, fig. 4, a, b); such tools have been called "marrow spoons" or scrapers, but the actual use is unknown. None of the bone tools had been shaped by the classical Basketmaker-Pueblo method of cutting notches with stone saws, then breaking off. However, several tools had been roughed out by chopping the green bone. If this chopping was done with the hand axe, considerable dexterity in the use of that tool is implied.

Three carefully made cylindrical tools, two of bone, one (badly decayed) possibly of antler, offer another clue to flint-working methods (Pl. VI, fig. c, d). Because of their battered ends we identify them as punches or "pitching tools" used in the flaking of stone implements by the indirect percussion method.*

*Stone disk lids for storage pots and as plugs for canteens are common in southwestern sites and continued in use down into the historical period; however, their presence does not predicate use of pottery. A container for seeds was sometimes made by cutting a hole in the side of a squash after which the squash was dried; such a container would be closed by a stone lid and the contents sealed in with mud.

Deer **(Odocoileus hemionus), mountain sheep **(Ovis canadensis)**, antelope **(Antilocapra americana)** have been identified.

An unexpected departure is a type of specialized tool made from the shoulder blades of deer **(Odocoileus hemionus)** and of mountain sheep **(Ovis canadensis)** (Pl. XI, e-h). These tools were found at two sites in Mesa County, one hogan and one cave site. In making this tool the web of the shoulder blade was hacked off so as purposely to leave a jagged edge and this edge was used as some kind of scraping or beating tool. Part of the spine of the scapula was trimmed away and the acromion was cut from the shoulder joint to make a sort of handle. On one complete example this handle end shows a high polish from long use (fig. h). The jagged blade edge is always very much worn and polished; in one example the edge shows very even wear facets indicating that the tool always was used at a precise angle. In a single instance a sandstone whetstone had been used in grinding the wear edge to a well sharpened concave curve; this piece may have been different in function from the others, but not necessarily (fig. f).

This scapula tool is not represented at the earlier classical San Juan Basketmaker or Pueblo sites and is not listed for the Fremont River (Utah) or Promontory Cave (Utah) sites. However, Dr. Hurst (1942, p. 15, Pl. III, Fig. 10; probably also 1941, p. 17, Pl. IV, Fig. 11) found this type of scraper in his investigations of the Tabeguache Basketmaker Cave. A single occurrence might be regarded as intrusive, except that Mr. Earl Morris has announced its presence in considerable numbers at a Basketmaker II site near Durango, Colorado, which agrees in many essential respects with the classical Basketmaker sites but differs in that the houses are dug into a hillside (Morris, 1941, p. 282). One published record of this tool is from Lovelock Cave (Nevada) but the level is not stated and it may be in age from Basketmaker to Paiute of the immediate prehistoric (Loud, Harrington, 1929). A more clear cut occurrence is recorded by E. R. Smith (1941, p. 35, Pls. VII, 14; VIII, 1) from Deadman Cave, Utah, where the scapula tool and a similar tool of rib (deer or antelope) were found in levels 2, 3, and 4; possibly representing a time range of 2000 B. C. to 1000 A. D. Similar tools are found in shellmounds of the San Francisco Bay region where a considerable antiquity is shown.**

A wide range of uses is shown or postulated in the various references, but the most convincing descriptions come from the Fraser River drainage of British Columbia, and from the Canadian Athapaskans, where similar tools were used up to recent years as "drawknife" hide scrapers. (Smith, 1900, p. 147, Fig. 66; 1900a, p. 420, Fig. 356; Jenness, 1937, p. 35, Pl. VIII.) The scraping technique used with these bone scrapers is basically different from that used with stone scrapers, since with the drawknife scraper the hide must be laid over a log and moved around as the scraping progresses, while with the stone scraper the hide is tied in a frame or spread or stretched out flat on the ground and the operator moves around over the work.*** The Fraser River drawknife scrapers have wrappings of string or skin as handles and the working edge may be ground sharp (archaeological exmple).

Other uses which have been suggested for these scapula tools are as a

*Methods of flaking stone have been described in many publications, notably by Holmes in the old **American Anthropologist**, 1891. An excellent popular presentation will be found in a recent article by Harrington (1941). The Apaches are cited as characteristically using indirect percussion.

**Schenck, 1936, p. 219. "It must have been an implement in common use throughout the history of the mound since a piece was found as deep as 29 feet in Trench 1." The materials mentioned are deer and elk scapulae, and the teeth more carefully cut angular serrations. California mounds may have been building for several thousand years. Other occurrences are cited, in New York and among the Eskimo. Hurst, 1942, also lists additional occurrences.

***The very complete study by Mason (1891) is the standard authority on Indian skin dressing methods; Navaho skin dressing techniques are described and illustrated in detail.

scraper used to dress the inside of cased hides (a rather vague description), a scraper used in smoothing greasewood arrowshafts (a doubtful use, and certainly not widely applicable), or a shredder used in the preparation of plant fibers for twisting into string. It has occurred to us that the tools might have functioned as seed beaters used with a tray basket in the collection of grass seeds much as the Paiute gathered grass seeds within the historical period; with such a function the shoulder blade tools might be identical with the mountain sheep horn "sickles" of the Basketmakers and Paiutes. On the other hand the so-called sickles may actually be drawknife scrapers. Considering the great emphasis on hunting at the sites we investigated we should be inclined to identify our examples as hide-scrapers.*

Ornaments

Beads are known from eleven examples found scattered through two sites (HMF, HSP). Nine beads are flat discs made of stone and are very carefully ground and polished; the material has been identified as soapstone, source unknown.** The beads had been perforated from one or both sides by a pointed drill, leaving conical and biconical holes. Diameters ranged from 3.5 mm. to 5 mm. (outside), thicknesses from .5 mm. to 2 mm. These beads are not distinguishable from stone beads made by the Pueblo; the present examples may have been made locally or they could have been traded in.

One bone bead was made by cutting a section 8 mm. long from the leg bone of a bird; another larger bead or ornament (26 mm. long by 22 mm. in diameter) was made from a section of leg bone, probably deer (Pl. V, fig. 4, j, k). The latter ornament was polished and had been burned—it was not of a shape to justify regarding it as a bone pipe bowl.

Petroglyphs

Only one petroglyph design has been found reasonably near a hogan site. On the south side of the boulder against which one hogan (HH) was built there is a single, deeply pecked, design consisting of four concentric round-cornered squares with a dot in the center. The figure appears to be quite old to judge from the amount of weathering and the case-hardening of the rock. Bear-track petroglyphs are numerous on the Uncompahgre Plateau but no associations with the hogan ruins have been found so far.

Pottery Types

A total of 166 sherds was recovered from hogan ruins on the Uncompahgre Plateau and from the surface around the San Miguel mesa rim site (HHR). With a single exception, all were of known Puebloan types. This collection was submitted to the Laboratory of Anthropology for examination, and Dr. H. P. Mera very kindly identified the pottery types represented and commented on the distributions and possible dates.

Of these sherds, 106 were of Puebloan utility types, about evenly divided between the neck-banded and neck-coiled types dating to the Pueblo I-Pueblo II transition. The actual date of this transition is generally conceded to have been somewhat later on the Northern Periphery than in regions farther south. Seven sherds, possibly parts of one pot, of (affinis) Bluff Black-on-white were found (at HMF, HHR), another type for which Dr. Mera suggests dates of around 1100 A. D.*** Two sherds of a finely

*Mr. Earl Morris (letter, 4/15/42) calling our attention to other published records, comments, "It would seem probable that they were used in different ways by different groups, considering their wide distribution in space and time."

**Identification by Mr. Harvey Markman, Curator, Department of Geology, Colorado Museum of Natural History.

***Mera (letter, 10/14/41): "This division (Mancos Black-on-white) contains such a heterogeneous mixture of styles it is difficult to be specific . . . Mr. Stallings has obtained dates from 1051 to 1145 for this stage of development here and this same stage in your region should not vary greatly from this."

indented utility ware (found at HMF) seem out of place with the other material from the same site.* Possibly the over-worked doctrine of peripheral lag should be invoked here: hogan-building squaws who were just mastering the early Pueblo pottery types, may have traded a few buckskins for finer pots from the south. At all events, the evidence indicates dates of around 1100 A. D., plus or minus possibly a hundred years, for such hogan buildings on the Uncompahgre Plateau as have yielded pottery.

Had true Puebloans actually colonized in a valley ε hundred miles from home it is hardly possible that they would suddenly have abandoned all they had learned of housebuilding and adopted the ridiculous little circular piles of stone on top of bald knobs with the wind whistling through the cracks. The same objection applies to a "Pueblo hunting camp" theory sometimes advanced. Actually, the "extension" of Pueblo culture in this area consists of little more than a partially assimilated ceramic technique; there is no evidence that the kiva cult ever reached the Gunnison River, if, indeed, it reached the San Miguel. Similar pottery assortments were noted in surface collections from the Eagle River Valley in West Central Colorado, but we know of no associations with the masonry ruins there.

In the San Luis Valley the general pottery relationships seem plain enough, but no one type lends itself to exact dating. One type found at a San Luis Valley hogan site (HTH) and at the Upper Rio Grande Valley ridge site (HWW) is highly micaceous, usually quite thin, and has smooth, well-compacted surfaces inside and out, but is not truly polished.** Mera (letter, 10/14/41) comments: "These sherds are not Puebloan. They closely resemble thin micaceous material found on open sites from eastern New Mexico, north to the vicinity of Pueblo, Colorado. Any relationship (between) yours and the plains type is problematical. Late glaze-paint pueblo sherds have been occasionally found on these open sites." A closely related, if not identical, thin micaceous pottery had turned up as scattered sherds from a number of surface sites in Western Colorado, all in the Gunnison drainage.*** In two instances the extreme thinness and curve of the sherds show that tubular pipes had been fashioned from this paste. We have not found this pottery in actual association with hogan ruins on the Western Slope.

Another grey-black pottery type is present in both the San Luis Valley and in the Lower Gunnison drainage; it has less mica than the above, has fine sand or rock temper, and is usually thicker and rougher than the preceding type. The interior and core will range from a dark grey to black, with a somewhat lighter grey to buff exterior; it usually is tooled inside (even pebble polished) and has an irregular exterior which sometimes shows apparently intentional scratchings or striae. The only attempt at decoration which we have ever noticed for this type is the occasional use of vertical fingernail incisions in a horizontal line on neck sherds. The mica in this paste may be inadvertent, whereas the clays for the preceding type

*Mera (letter, 10/14/41): the technique "tends to place it not earlier than a well-developed Pueblo II stage. None of your black on white material appears to go with it."

**Very hard, range from very thin to thin (3-5 mm.), core usually very dark grey to black, exterior surface may be mottled grey to buff (one sample showed color range from Maerz and Paul "traprock", 15-A-2, to "olivewood", 15-E-10). Both exterior and interior are well smoothed, but the interior may show some tooling striae. Under 30-power the HTH sample shows no visible sand grains; the HWW sample shows angular and rounded sand grains, mostly quartz, but with a consistent admixture of unidentified, minute, bright green particles.

***Sherd samples from a surface camp northeast of Delta; thin (5 mm., very constant), hard, temper under 30-power apparently finely ground quartz, but mica is present in sufficient quantity to make interior surface glittery. Exterior has been "puddled" to bring a self slip to the surface, no surface scoring. Interior dark grey, core black, exterior grey to buff. One sherd shows slightly thicker, slightly everted rim; one sherd indicates rather abrupt curve at neck. The pot or pots were large because body sherds show very slight curvature.

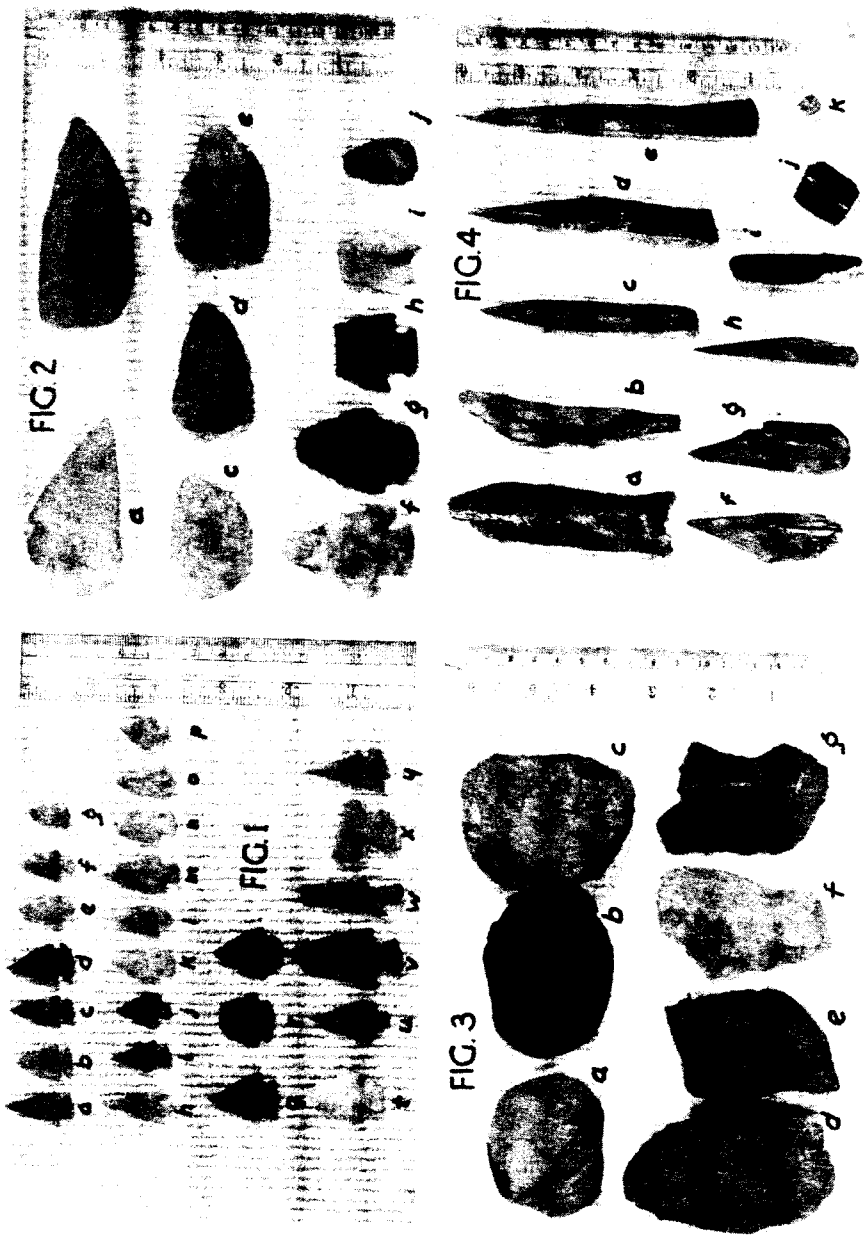


PLATE V

certainly were selected for mica content.

This pottery type is probably that represented at the site we investigated on top the lava promontory near Saguache and is certainly the most common type in surface collections from the San Luis Valley. Four complete or partially complete pots are known from the San Luis Valley or environs, all of generalized sub-conical to round-bottomed olla shapes, definite necks, plain, slightly everted rims. One example (Pl. VII, Fig. b), supposedly from beneath a rock overhang about a mile from the Upper Rio Grande Valley ridge site (HWW) may be taken as a fair representative for all those pots.*

This pottery type is certainly related to modern Ute-Paiute pottery on the one hand and to modern Navajo and Jicarilla pottery on the other.** However, pottery of this same general tradition has been made continuously in and around the Rocky Mountain massif for the past thousand years, or even longer, with no startling modifications. Thus a very similar pottery was incorporated into the Puebloid Fremont River culture, if not all the northeastern Utah Puebloid cultures, and it seems to have been present in some strength in the Piedra Puebloan sites reported by Jeancon (1922; V. also Mera, 1935). Its integral position in the pit-house and tower-house building culture of the Largo and Gallina drainages is well-reported and unequivocal, while the near identity of the later types with the utility pottery of the neighboring (but truly Puebloan) Rio Grande Valley villages is always cited in discussions of the introduction of "Woodland" traits into the Southwest. The extent to which these grey-black sandy clay utility wares eventually may be differentiated depends directly on the amount of work which can be devoted to them.*** Certainly the detailed analysis required for exact identifications never will be justified for the random surface finds.

With so many similar occurrences in the Southwest it is a little hard to excuse the recent tendency to copy and recopy without qualification Amsden's (1934, p. 125) early remark that Navaho pottery seemed "utterly un-Southwestern" in character. Tilting at windmills is no favored pastime of ours, but we must cite the opposite as an equal possibility—that these coarse, crude, generalized wares actually may constitute the basic Southwestern pottery type. Following up a suggestion of Gladwin's (1937, p. 40), it is not impossible that the somewhat similar Basketmaker pottery originally entered the Southwest from the north, and that these other manifestations belong to a later branch of the same pottery stem.

What is far the most important group of sherds (because it promises more exact identifications) is similar to the foregoing in shapes, pastes, temper and firing, but has the exterior surface manipulated in any of a dozen different ways. This pottery is found most commonly (though it is anything but abundant) in the lower Gunnison River drainage, and is represented to some extent in San Luis Valley collections. Our best collections come from two surface camp sites on mesa rims with no masonry showing and no surviving wood, one site on the north slope of the Uncompahgre Plateau, the other on the south slope of Grand Mesa. These two finds were important because of the number of pottery traits found in apparent asso-

*Jack Nelson collection. Bi-conical olla, definitely pointed base, cracks on coil lines at intervals of 4.5-5.5 cm.; surface dark grey through drab to buff, apparently scraped but never smoothed; interior dark grey, smooth, showing horizontal striations but no anvil pitting. Neither surface scales, no evidence of pitching. Coarse gritty paste, presumably sand tempered, no large pebbles visible either face. Short self neck and rim, rim slightly thinner, slightly everted. Thickness 5 mm. average; mouth diam. 17 mm., greatest diam. 28 cm.; overall height, 24.5 cm.

**At some indefinite period in the past the Navaho and Jicarilla took over Pueblo scraping techniques in place of the older, or at least more widely distributed, paddle and anvil thinning methods. Until details of this transition are cleared up the exact relationship must remain doubtful.

***We have made the attempt in the case of pottery of supposed Ute origin (Huscher and Huscher, 1940).

ciation. Pointed, thickened bottoms are certain on the basis of a partially restorable pot from the Uncompahgre Plateau and a completely restored pot (Pl. VIII, fig. a) from Grand Mesa.*

The temper of this type of pottery is somewhat variable. Usually it is fine sand, sometimes rather finely ground quartz; but it seems to grade to the types using the large coarse sand or selected quartz pebbles (for which the Promontory pottery of northwestern Utah may be taken as the type). Because our finds are from surface camps it has not been possible for us to establish whether the temper variants actually are temporally associated or whether there is a transition from one to the other, but a relationship is evident. The various surface manipulations are common to both. Fingernail impressions, usually in regular rows, are probably the commonest single surface treatment; sometimes these impressions are incised by pressing the nail straight into the wet clay; at other times there is a deliberate thumbnail scuffing, pushing clay ahead of the nail to form regular ridges. When the impressions in adjacent rows are carefully spaced an even grooving is produced which may run vertically or diagonally downward. As a final treatment on some examples the scuffed surface may be rubbed until the crest of the ridges are partially obliterated, leaving a peculiarly dimpled surface. A similar dimpled surface was produced, without thumb-marks, and without rubbing, on the surface of one very coarse, porous textured pot, but we have been unable to figure out the process used. This one pot differed in color from others in the association, in that it had been burned to a reddish buff, whether by firing in an oxidizing flame or accidental re-burning, we cannot say. Other surface variants were produced by the imprinting of the side of a small round dowel to form regular, cuneiform markings.

The surface manipulations we have noted are by no means without precedent; in fact, they are so common and so widely spread as to add weight to the argument for a common origin for many pottery types ordinarily thought of as local developments. We have not found them in direct association with the hogan ruins; however, we believe them to be in some way, part and parcel of the hogan problem. Our reasons are based on the probable elimination of the two other logical candidates, the Basketmakers and the Utes; and on the association of the traits at other sites where clear parallels with the hogan-building culture may be traced. The wide-mouthed, conical-bottomed, black pot with fingernail impressions over the surface, which we have figured, must be closely equivalent to pottery of the modern Paiute of southwestern Utah and southwestern Nevada, where such pottery was still being made down to the end of the last century (Harrington, 1927, p. 271; Baldwin, 1942, p. 16). Whether this kind of pot ever was made by the Utes of the Rocky Mountain region is uncertain, since the type we believe them to have been using at the opening of the historical period much more closely resembles Navaho pottery (Huscher and Huscher, 1940). However, a coarse, sand or pebble tempered, grey to black, surface manipulated pottery was already very widely spread at a much earlier period when the Utes were still chasing lizards in the Navada deserts.

Several variations of the fingernail or dowel impressions have been listed by Steward (1936; 1937, p. 46 ff. fig. 19 a, d, o, p) for the Great Salt Lake region, and Morss (1931, p. 45) lists a surface manipulated type from the Fremont River which he calls "pitted ware"; he does not make clear

*Technical description of illustrated example: wide-mouthed conical pot, grey-black core, slightly micaceous, tempered with fine sand and slightly larger ground quartz (about .5 mm. max.) visible both faces; fracture lines indicate coil building; there is a tendency for surface to scale. Surface fingernail-decorated overall in horizontal rows, impressions spaced so as to produce rows running diagonally downward to right. Grey-black interior and exterior, interior not polished but shows slight horizontal scratchings. Thickness 6-8 mm., average nearer 8; no neck, plain rim slightly everted, slightly thinner, not smoothed. Diameter, 29.0 cm., height, 28.0 cm.

whether this is the standard Puebloan obliterated corrugated, or some variant of the rubbed, thumb-scuffed wares.* Jeancon (1922, p. 8) mentions corncob striated sherds, and an example with "oblique grooves running from the top or the rim to the bottom of the pot." Strong (1935, p. 216) describes a pottery type from the Dismal River sites of Nebraska which has the surface marked by crisscross ridges partially eliminated by rubbing. This certainly would not be the Puebloan obliterated, but sounds very much like one of the "dimpled" variants. Renaud (1931, pp. 89, 92, fig.) illustrates these surface manipulated sherds, distinct from the ordinary cord-marked types, from the Plains of Colorado, and again lists examples of "Plains pottery of which two are grooved, two incised, and two finger-rubbed," from a stone enclosure site in the old Jicarilla Apache region of northeastern New Mexico (Renaud, 1942, p. 31).

As described by Sauer and Brand (1931) the utility ware associated with the wide variety of Trincheras structures along the Mexican border, is characterized by incised or gouged decoration, and a black core burned to a red on the exterior.** From the cited trans-montane similarities it would seem this group of traits had a wide distribution in time and space across the entire northern borders of Pueblo land, and this distribution suggests an ultimate northern or northeastern origin for the whole group of traits.

Another tie-up with the regions farther north and east may be seen in the cord-marked pottery found at the extensive mesa top site (HAH) west of Saguache. The paste and general texture of this ware at first glance strongly remind us of early Navaho sand-tempered utility pottery, but the presence of cord-wrapped paddle markings distinguishes the types.*** This cord-marked ware is very well known from sites farther south and east. Thus, it has been described and figured from hogan-like sites near the Canadian River (Moorehead, 1931, pp. 115-116, fig. 50); from the plains of eastern Colorado (Renaud, 1931, p. 89, fig.); and is mentioned from caves on the Purgatoire by Wedel (1939, p. 284). Sherds recovered from surface layers of a deep, stratified site near Denver fall in this class (Huscher and Huscher, 1942a).

From its distributions and associations this cord-marked pottery probably is to be identified with Apacheans of the late prehistoric or early historic, specifically the northeastern Jicarillan bands; with our present information, however, more definite statements cannot be made. Wedel (loc. cit.) suggests an eastern origin for the type, but it seems to us more likely that it derived from prototypes farther north on the Plains since some of the early material from the Upper Missouri seems comparable. We have not encountered it west of the Continental Divide, but we should expect eventually to find some trace of the type there also.

There our present information on pottery of the hogan builders must rest—scraps of information, some of it of doubtful value, but all pointing toward the conclusion that for about a thousand years there has been this rather continuous body of black-cored, surface manipulated pottery on the north opposing the more even distribution of the grey to black, plain or

*Regular pitting could not result from the rubbing of such corrugated pottery as Morss illustrates (p. 45, Pl. 24). What is probably the Fremont "lap-streak corrugated" is known from Grand Junction, Colorado, with a definitely pointed bottom.

**From the descriptions and comments it does not seem that this ware is locally derived; parallels in building types, moreover, suggest the possibility of eventual tie-ups with northern pottery, the oxidized exterior being the only obvious innovation. Hoover (1941, p. 238) mentions pottery cross dates as early as 800 A .D.; we do not know that the Trincheras utility ware appeared so early.

***Thin (4-6 mm.), hard, has considerable admixture of fine sand, some visible mica (but this clay was not selected for mica content). External surface textured with paddle wrapped with 2-strand string, paddle not regularly applied. Interior and core drab to dark grey. Exterior surface burned to buff (Maerz and Paul "laurel oak," 7-J-10, to "Army brown," 6-A-10). No shapes known.

corrugated, utility ware of the Basketmaker-Pueblo series farther south. No fine distinctions can be drawn, but in instances where associations can be shown, it was the hogan-building, hunting peoples who used this black surface-manipulated pottery, while the appearance of Puebloan pottery types goes with an increasing use of adobe and a dependence on vegetal food. However, there must have been quite a bit of overlapping all along the line. Thus the round bottoms and generally Puebloan shapes used by the Promontory and Fremont cave-dwellers may reflect considerable Southwestern influence on the material culture of hunting peoples. On the other hand, it is not shown that there were not two non-Puebloan pottery stems represented among these hunting peoples, one with conical and sub-conical shapes, the other with globular shapes, both styles sharing paste, modelling, and firing traits.

But we cannot leave the discussion here. Simply pointing out a few scattered similarities, as we have done, is worse than useless, since such comparisons inevitably leave implications completely unjustified by the original evidence. For example, we might say that Ute pottery shows close relationships with pottery from the Lower Colorado River region—which is perfectly true, but the bare, unqualified statement leaves the implication that Ute pottery may have been derived from Lower Colorado River pottery, which is almost certainly untrue. A more exact wording should specify that Ute pottery shows enough traits in common with pottery from the Lower Colorado River to justify belief in their ultimate common origin. Thus we turn attention from the obvious present relationships to the identification of a proto-type, as yet hypothetical, which shows the necessary traits and which could fulfill the requirements of time and place.*

In our present problem it is not enough to point out the resemblances to Basketmaker pottery, to Puebloan pottery, to Yuman Pottery, even to "Woodland" pottery—though all these resemblances exist. Since we ignore the time element, the implication left is of a hopeless hodgepodge of hybrid types, an implication exactly one hundred percent untrue. Rather, we should ask ourselves, what combination of tribal movements with what combination of trait diffusions could have produced the present distribution of related traits—and so asking, we relegate each individual problem to its proper place in a larger, primary problem: the probable ultimate source or sources of these traits. The period of 1000-1100 A. D. is a convenient one to adopt as a test period since those dates, plus or minus a possible additional 100 years, should apply alike to peripheral Puebloid sites scattered in a continuous arc from Texas to the Great Salt Lake region.

In previous paragraphs we said that the known distribution of the pottery traits listed points to a northern or northeastern origin for the whole group. That statement was made advisedly; however, as is the case with many generalizations, it is difficult to document the statement with concrete illustrations. One difficulty lies in the lack of reliable cross dates since (except for the few sites on the borders of Pueblo-land dated by pottery finds) we seldom can be sure of our time horizons. The exact chronologies of Southwestern archaeology as yet have no counterparts in the north and east, where our best estimates still must be based on probable length of cultural evolution, rate of accumulation of debris, and rate of disintegration of remains.** This lack of reliable time indicators still balks efforts to prove archaeologically the direction in which specific population movements or trait diffusions took place, and, in certain other instances, to distinguish between developmental and decadent stages of the evolution of material culture traits. The best general discussion of the eastern situation is found in a recent paper by Setzler (1940, pp. 256, 257, Table 1),

*This statement corrects an early comment of ours on the pottery relationships. Huscher & Huscher, 1940, p. 141.

**Geological factors must be considered at certain of the older sites.

where that authority points out that the various archaeological patterns seem to have differentiated from a generalized "Agpo" base within the last 1000 years.

It is not our intent to attempt a review of the voluminous literature on eastern pottery types. For our purpose it should be sufficient to call attention to a report on a single archaeological site in Canada which may have some bearing on this problem of pottery origins. About twenty years ago Mr. W. J. Wintemberg excavated a site, the Uren Village site, in Oxford County, Ontario, where pottery and other material culture traits indicated a very early camp of Iroquoian peoples, probably of the tribes known as the Neutrals in historical times (Wintemberg, 1928, pp. 48, 50). The particular interest, to us, of this site lies in the generalized nature of the pottery, since the complicated incised designs, and the elaborate, built-up, cornice rims of later Iroquoian ceramics were only suggested here.

The Uren pottery complex as described by Wintemberg cross-checks very closely throughout the entire trait list, in paste, form, decoration, and firing techniques, with the western surface-manipulated types we have been discussing. Thus, cord-marked surfaces, fingernail impressions, stick impressions, cuneiform and round punctations, lap-weld rims, some surfaces rubbed partially smooth before firing, are common to both areas. The Uren pots seem to have been round-bottomed, but were tall in shape rather than globular. The trait of thickened bottoms definitely was present.

We cannot say that the Uren sites necessarily go so far back as the date (ca. 1000 A. D.) suggested by Setzler; however, from Wintemberg's comments (1928, p. 48) the Uren pottery must show a high proportion of those traits which belonged to this older time level but were obscured by later specializations.* The upshot of the argument is simply this: when we rule out the obvious later innovations and make our comparisons on this older time horizon of (ca.) 1000 A. D. (assuming the Setzler figure and Wintemberg's conclusions to be reasonably correct) a very high correlation can be shown between the utility wares of the Northern Periphery and at least one focus of the Great Lakes region. This distribution of related pottery traits points toward the Upper Mississippi Valley and the adjacent part of Canada as the most likely dispersal center for the complex as a whole. The present status of archaeological research and particularly of early pottery types in the region mentioned is presented in summary in recent papers by Strong (1940), and by Wintemberg (1942). Judging from these reports the requisite pottery proto-types do exist there, but as yet the associations are not well enough worked out to make possible accurate cross-checking at given time levels.

There remains one aspect of the problem to be considered: the possibility of a direct relationship between the surface-textured, black-cored pottery of both the east and the west, with the very similar pottery found in Alaska and Siberia. Several years ago McKern (1937) outlined a hypothesis of a connection between eastern "Woodland" pottery and the pottery of eastern Asia.** Long distance comparisons and far-fetched analogies are especially open to attack as idle theorizing, but in the case of the pottery a considerable body of evidence had been accumulating, all pointing toward

*Wintemberg 1928, p. 48. The Uren pottery differs from other Iroquoian pottery, in technique and in its greater simplicity. "The Iroquois evidently developed their distinctive ware after they arrived in the east, for none, or very little is found along any of the presumed routes by which they may have come from their former home. They must have used pottery during their migration, but we can safely assume that most of the decorative designs were not what we commonly call Iroquoian, since otherwise we surely would find them."
Fenton (1940, p. 165) remarks that "What we know as Iroquois culture developed its own peculiar patterns and institutions in the lower Great Lakes area during relatively recent protohistoric and historic times."

**We do not believe that "Woodland" pottery alone should be singled out in these comparisons, since it can be only one of several ceramic stems differentiated from an earlier generalized base.

an actual genetic relationship. The writers, citing parallels between the western pottery types and the eastern "Woodland" pottery have suggested the Athapaskans as probable primary agents in the dispersal (Huscher and Huscher, 1942, p. 87). There is nothing new about these ideas since the possibilities have been discussed privately for years; however, very few statements have appeared in print.

Jenness (1941, pp. 394, 395), in a recent summary, doubts the hypothesis of any Asiatic connection, because of the considerable gap in central Canada from which no pottery has been reported. In the same summary Jenness answers his own objection—and we shall let it be our own answer, too—when he mentions the Yuma finds of Central Canada and the Alaskan Yukon. The gap is almost identically the same in both instances: from the upper Yukon to the northern Great Plains in Canada. In both regions pottery and Yuma points were found within a few years after archaeological interest was aroused, and there is no reason to doubt that the Canadian gap ultimately will be bridged by actual finds of pottery as well as of Early Man artifacts.*

Food

The hogan builders were hunters, of that we are sure. Furthermore, they depended more largely on the hunting of deer, mountain sheep, and antelope than on the hunting or snaring of such small fry as rabbits or prairie dogs. Our only complete series of bones came from the Uncompahgre Plateau sites which show slight Pueblo influence, but the hunting pattern is still clearly predominant. A series of bone fragments from hogan ruins (chiefly HSP and HMF-3) were identified in the following frequencies: deer (all **Odocoileus hemionus**), 28; mountain sheep (**Ovis canadensis**), 7; pronghorn antelope (**Antilocapra americana**), 1; porcupine (**Erethizon**), 1; coyote ? Indian dog? (**Canis** Sp.?), 1. This series does not check with a short series from Ute wikiup sites, where the proportion of antelope bones was much higher. Antelope and mountain sheep are now extinct in the areas visited, but deer are still very numerous. No buffalo or elk bones were found.

The sites for which the use of corn is certain are limited to the Uncompahgre Plateau, but the San Miguel sites, too, are almost certainly those of corn-growing tribes. Manos and metate fragments found at other sites do not necessarily indicate the use of corn, because many wild seeds were used as food by Indian tribes and these were customarily ground. Ripe heads of grass were found in the shelter cave cache in Mesa County, but these may have been carried in by rats.** We have stated previously that corncobs were present at two hogan ruins, at a cache (burned) beneath a rock near a hogan, and at a shelter cave containing a dry masonry wall. These cobs were all small, some very small, and nearly all of them showed clear evidence that the corn had been used green. The wide variation in the number of rows, from 6 to 16 with 10-rowed predominating, showed that the corn variety had never been standardized by selection or else the seed strains had been badly mixed. One ear had been of "pod" corn, with each kernel separately sheathed, but this fact is of little significance since similar ears of "pod" corn are still borne occasionally on the tassels of highly selected domestic corn.

The evidence of corn at peripheral sites has been variously interpreted by earlier writers, some regarding the presence of corn as evidence of agri-

*A recent news release states that no human artifacts were uncovered along the whole length of the new Alaskan highway (Science, Vol. 97, No. 2505, Jan. 1, 1943, p. 10).

Canary grass (Phalaris arundinacea**) predominated, but wild rye (**Elymus**), bunch grass (**Poa**), wheat grass (**Agropyron pauciflorum**), and possibly **Muhlenbergia** were also present. Identifications were by the Wildlife Research Laboratory, Department of the Interior, Denver.

culture and hence of orientation toward the sedentary cultures of the Southwest, while others have seen only evidence of trade contact with more advanced areas. Actually the mere presence of a few corn cobs at a peripheral site is of very little significance one way or another. Hurst (1941) reported the finding of numerous corn cobs in the Tabeguache Basketmaker cave, the evidence pointing toward the use of corn in the milk stage. Corn cobs are comparatively much more rare at the Uncompahgre Plateau hogan sites, but here again most of the corn had been used green. Use of green corn clearly shows a lack of appreciation of the true value of the grain, which may be employed to best advantage as a stored food available during the lean winter months.

Probably the growing of corn in most of the Northern Periphery has been (with local exceptions) at about the stage shown by the Utes at the time of the earlier explorations. Thus Jackson (1876, p. 43) noted the growing of corn without irrigation by the (Weminuche) Utes in southeastern Utah in 1874 (also Hayden, 1877, p. 18). The corn was used green, since the renegade Ute band of the La Sal Mountain region entertained surveyors of the Hayden party with a feast of green corn. This fact is verified by Gifford (1940, p. 102) who found that the Southern Utes formerly used their corn green, retaining only two ears dry for seed purposes. In Ruxton's time (about 1840, Ruxton, 1924, p. 71) a band of Utes in South Park had dry corn, but this had been obtained in trading with the Navaho. Undoubtedly such trading (of products of the hunt for products of the farm) went on between hunting bands and sedentary peoples in the prehistoric, but the distance that corn could feasibly be transported in the pre-horse period must have been much less.

We wished to obtain some clear idea as to the probabilities of trade and transport in the prehistoric period as against the local raising of corn. Inquiry of the Department of Agronomy, Colorado State College of Agriculture, Experiment Station, Fort Collins, about corn-growing areas of Colorado brought the following information:*

> There are some native flint-like corns that can be grown in the San Luis valley at 8000 feet. They are very small corns and very low producers. . . . It is quite possible that before the coming of the white man some of these very short-season, flinty corns constituted a very definite part of food production for the Indians in some of these sections. . . . Even so, about 8000 feet is about the approximate upper limit of their growth. That is too high in some neighborhoods, but under favorable slopes and exposures, they might be grown just a little higher.

Translated in terms of our hogan problem, there are very few areas in the Colorado mountains which are more than fifty miles distant from places where corn-growing would have been possible on an aboriginal scale, more probably only as a seasonal adjunct to a hunting economy. The evidence so far noted points toward the growing of corn on a small scale in the Colorado foothills and mountains from the prehistoric period well into the historic, and it is this tradition of casual, ancillary, corn-growing which survived among certain Ute bands. The Pueblo origin or influence usually invoked is by no means necessarily true, since very similar corn-growing practices survived into the historic nearby to the northeast in the Platte River drainage. The nomadic Ute-Comanche-Shoshoni occupation of the Platte River-Green River divide (South Pass) in the early historical period should not obscure the fact that there were strong cultural cross-currents through that region (the kingdom of "Teguayo" of the early Spanish chroniclers) in the immediate prehistoric.** In this connection we should point out

*Letter, Alvin Kezer, Chief Agronomist, to B.H.H., 4/21/42.

**Thomas (1935, pp. 10-11) quotes the "Informe" of Posadas: the region of Teguayo (ou the Lagoon of Copala) was to the west, the region of Quivira

that the southwestern stone slab-lined storage cist and the slab-walled *mealing bin* both were absent from the hogan sites we investigated, but that the jug-shaped unlined pit, so characteristic of the Plains, was present.

III. ARCHAEOLOGICAL AND ETHNOLOGICAL BACKGROUND

Our survey activities have been devoted primarily to the location of sites with the testing of only a few selected examples to obtain representative artifacts. Naturally our information lays most emphasis on building traits since many of these can be determined without excavation. In the present section we shall examine first the distribution of related building types and then see what similarities there may be in other material culture traits. Negative traits, those traits which we might reasonably suspect to be present but which were not noted, are discussed along with the positive traits. More complete investigation may show many supposedly missing traits actually to be present.*

It is with proper trepidation that we embark upon this review since our own point of departure, the few sites we have studied in detail, hardly justifies assumption of an Olympian role. However, we believe that any such site is inexplicable in and of itself, and that it is only by comparison with similar sites elsewhere that anything like a sensible interpretation may emerge. To quote a distinguished contemporary, "What is wanted is not to theorize a local development which may have taken place, but to find that which has actually taken place, and this is not done by surrounding a culture with fences."** Let us, then, break down a few fences and see whether we can bring any order to the hodgepodge of "sacred shrines," "granaries," "lookouts," "forts," "fortified enclosures," "Pueblo hunting camps," and "mysterious ceremonial enclosures" with which the literature is cluttered.

We may say in advance, and flatly, that the house type we have been discussing, the stone hogan with variants, is old and widely distributed in the western part of the United States. We have found not the slightest justification for regarding the stone hogan as a recent imitation of Pueblo masonry. Even in the specialized and diagnostic forms we have listed the hogan is traceable over many western states and far beyond the known, limited distribution of Navaho archaeological sites. It follows, certainly, that the "Navaho" house is identifiable as Navaho only so long as it is associated with artifact or pottery traits definitive of Navaho culture.

Nearly every building trait we have cited is known from the present day Navaho or from archaeological or historical records of Navaho houses of the past. Traits which are present in Navaho building but which we have not noted here are the use of the cribbed roof, the use of a heavy timbered roof covered with earth, the building of a covered entryway, the use of two posts as door jambes, the use of four central supporting posts, and the use of adobe mortar.

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to the east; because buffalo were known to both regions it was concluded that they came together at a distance of fifty leagues to the north of Santa Fe. The description applies best to South Pass in Wyoming, by which communication could be had between the Platte drainage and the Colorado drainage, but the estimated distance is low. The distance would apply to Cochetopa Pass between the Gunnison drainage and the Rio Grande drainage which was a famous buffalo pass ("Cochetopa" means "Buffalo Pass"), but this region does not meet the other requirements as a pass between Quivira and Teguayo.

*In preparation of this section we have borrowed frequently from representative publications on surrounding archaeological areas. Because the references used will be unavailable to most of the readers of this series the relevant passages are quoted somewhat more fully than might otherwise be necessary. Our examination of the literature has by no means been exhaustive, but we have aimed at including sufficient pertinent facts to make the present paper an adequate statement of evidence now available.

**Birket-Smith, 1929, p. 45.