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# The Texas Archeological and Paleontological Society

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# Foreword



## *History*

All authorities agree that, prior to a few years ago, Texas constituted a vast unknown archeological territory whose borders touched known areas where interesting civilizations flourished on the south, east and west.

Archeological investigation of the Abilene region was started in 1927 as a week-end and after-office hour hobby of the editor, and continued for several years in association with the first secretary of the Society.

In October, 1928, the two called a meeting of a few interested business and professional men including college and university professors for the purpose of forming a society to study findings and publish reports. This meeting resulted in the organization of the Texas Archeological and Paleontological Society.

A year later (1929) the first volume of the Society's Bulletin was issued in September. This has been published annually since then.

## *Editorial Principles*

The Society receives financial support from neither corporation, school, college, university nor private individual except the \$3.00 payment of annual dues by members and the sales of Bulletins to libraries of universities and museums throughout America.

Only 300 copies are published each year and this necessarily limits books sent for review to a very few.

None of the officers of the Society receive, nor have ever received, any pay for their work in editing, nor have contributors been paid for their manuscripts or photographs. The Society neither has solicited nor accepted advertising from anyone. The Society has maintained, and hopes to continue the publication above commercialism of any kind on the high plane of pure scientific research.

Our publication is independent and is either great or small who has really found and accurate in his descriptions. We have thesis which we no pet dogma, theory or thesis which we hope to maintain against all comers. We feel free to present any aspect of a subject.

## *Objects of the Society*

The Society was organized and chartered in pursuit of a literary and scientific undertaking; for the study of the history, prehistory and the major and minor artifacts of man and the fossils representing the past floras and faunas of Texas; for the encouragement of the proper collection and preservation of such artifacts and fossils in museums and their study and classification and the publication of the results of the researches incident thereto.

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## THE IMPORTANCE OF TEXAS AS AN ARCHEOLOGICAL FIELD

BY DR. WARREN KING MOOREHEAD

PHOTOGRAPHS BY FLOYD V. STUDER

The writer is very glad to offer a few suggestions concerning archeological work in the State of Texas.

We are all aware that the Texas area has been more or less neglected, archeologically speaking, until Professor J. E. Pearce of the University of Texas began his researches many years ago. It is true that we have a creditable amount of ethnological material concerning the Comanches, Apaches and other tribes. Texas for the most part, remains terra incognita as far as archeology is concerned. Many years ago a school teacher, Mr. T. L. Eyerly, head of the Academy at Canadian, published two brief papers in the Academy Bulletin of 1907. A small collection of specimens from the ruins on 'golf Creek, tributary of the Canadian, and located in Ochiltree County, Texas Panhandle, induced the writer to visit the region and make some preliminary observations. Following this we made more careful study and Dr. J. Alden Mason of the University of Pennsylvania Museum also engaged in a brief examination. The results of the two surveys conducted by the writer are set forth in "Archeology of the Arkansas River Valley," published in 1931. Following these preliminary researches more thorough and extended examination of the region was undertaken by Mr. Floyd V. Studer of Amarillo and Dr. W. C. Holden of the Texas Archeological and Paleontological Society. Since the Bulletin has published several articles in which detailed exploration is set forth, it is not necessary for the writer, in the brief space allotted him, to do other than make a few general observations.

It would seem to him that the following fact is of primary importance—that we have in the Panhandle of Texas a very interesting and primitive culture not precisely that of the Plains, and equally true not as yet connected with Pueblo Cliff-dwellers Culture. Beginning in western Oklahoma, there appears to be a definite and consistent improvement

in culture as one proceeds up the Canadian. The writer came to this conclusion after three inspections and careful reading of the field notes made available by this Society and Mr. Studer. It is further to be noted, and this is significant, that save on the upper river fragments of Pueblo pottery are not much in evidence. On the contrary the great majority of fragments discovered are not to be identified with Pueblo. Pueblo pottery seems to be intrusive. It should be clearly understood by this statement the writer means small quantities (fragments) of standard Pueblo ceramic designs. There is sufficient of this pottery in collections of the Texas Archeological and Paleontological Society and members, also in Mr. Studer's collection, to enable some student of ceramic art to prepare a small monograph. I would suggest this. What relation the pottery bears to prevailing forms found throughout Kansas and Oklahoma the writer does not know. It is rather crude and seems inferior to the fine art of the mid-Mississippi region.

Taking as our standard the remains of the Handley Ranch, Wolf Creek (Ochiltree County), here we have, it would seem, the beginning of the famous Pueblo Cliff-dweller culture. That is, as pointed out in the Arkansas Valley volume, there is a definite departure from house construction of the Plains tribes. Large stone slabs are set vertically not laid horizontally. The ruins might come under the general term of "Slab-house People," as applied by our observers in the Utah-New Mexico fields.

Proceeding westward, or up river, one encounters larger groups of ruins and there is a distinct improvement in architecture. Finally, in the upper Mora Valley, no great distance east of famous Pecos pueblo, we find typical Pueblo architecture, stones laid flat although the buildings are rather small. This in brief is the record as the writer reads it. To be perfectly fair, there are certain of our friends, distinguished in Southwestern archaeology who do not believe in Great Plains origin of our

Pueblo folk. They say that the Pueblo culture worked eastward, gradually disappearing or merging into that of the Plains, all of which may be true, but the writer does not accept that version for this reason the dominant or prevailing characteristic of the Pueblo is their superior ceramic art. It has been very carefully studied and classified by Dr. Kidder, as everyone knows. It is inconceivable that a primitive people would lose a fixed and established art upon migrating a scant 300 miles. The finding of numbers of fragments of pottery of unquestioned Pueblo origin here and there in the Panhandle has been explained by Mr. Studer, who has done considerable excavating, as intrusive. The writer is inclined to believe he is correct.

Dr. F. W. Hodge has commented upon migration of Pueblo Indians into the Buffalo Country, that they located in Meade County, Kansas, and there remained for some time. The University of Kansas, years ago, made an inspection of this site. The writer has visited the remains in Meade County and also a similar but smaller group some miles distant. After reading these reports, one concludes that the ancient Spanish record of the migration refers to the Meade County site. It should be noted that these remains are not quite the same in character as those of the Panhandle country. The Meade County settlement was not of long duration, is not prehistoric setting.

Leaving out eastern, southern and western Texas, concerning which the writer knows practically nothing, and accepting Professor Pearce's valuable researches with reference to central and southwestern Texas, the writer believes that one of the most intriguing archeological problems in this country lies along the Canadian. If it is not



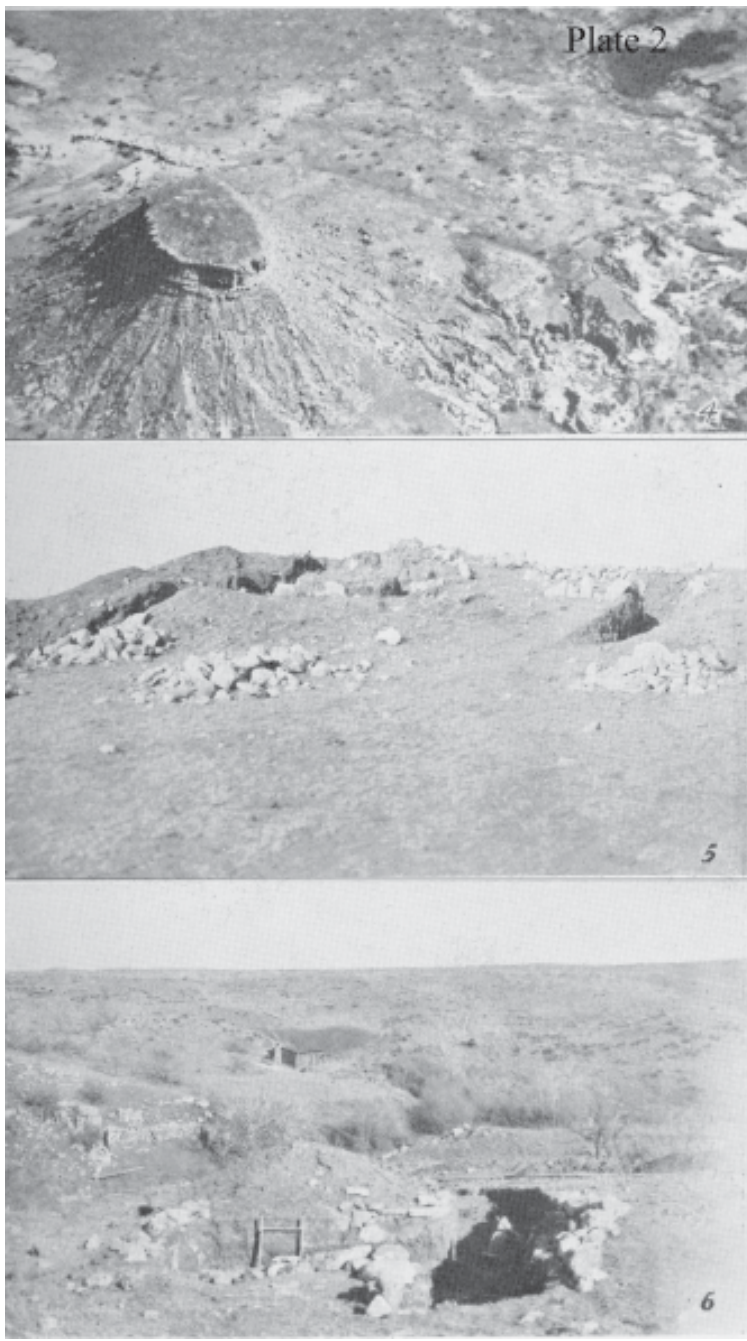
PLATE 1

No. 1 Saddleback :Mountain near Old Tascosa on the Canadian. No. 2. Site on the Canadian River in the Matador Ranch.

No. 3. Site 13 on Antelope Creek, a tributary of the Canadian River.

presumptuous, one may suggest that a well equipped expedition be organized and put into this field for several seasons. It is quite probable that such work would result in definitely establishing the presence





## PLATE 2

- No. 4. Airplane view of site on Landergrin Mesa.  
The entire top of this mesa is a solid mass of ruins.
- No. 5. A Trench in the main ruins of Alibates Creek, a tributary of the Canadian River.
- No. 6. Another view of the ruins on Alibates Creek where Mr. Studer has worked for many years.

Maker and pre-Basket Maker cultures. Their differences, or affinities, have been rather positively assigned in the New Mexican field. Until the Panhandle region shall have been carefully examined, we can not speak with assurance as to presence of these various cultures or sub divisions of them.

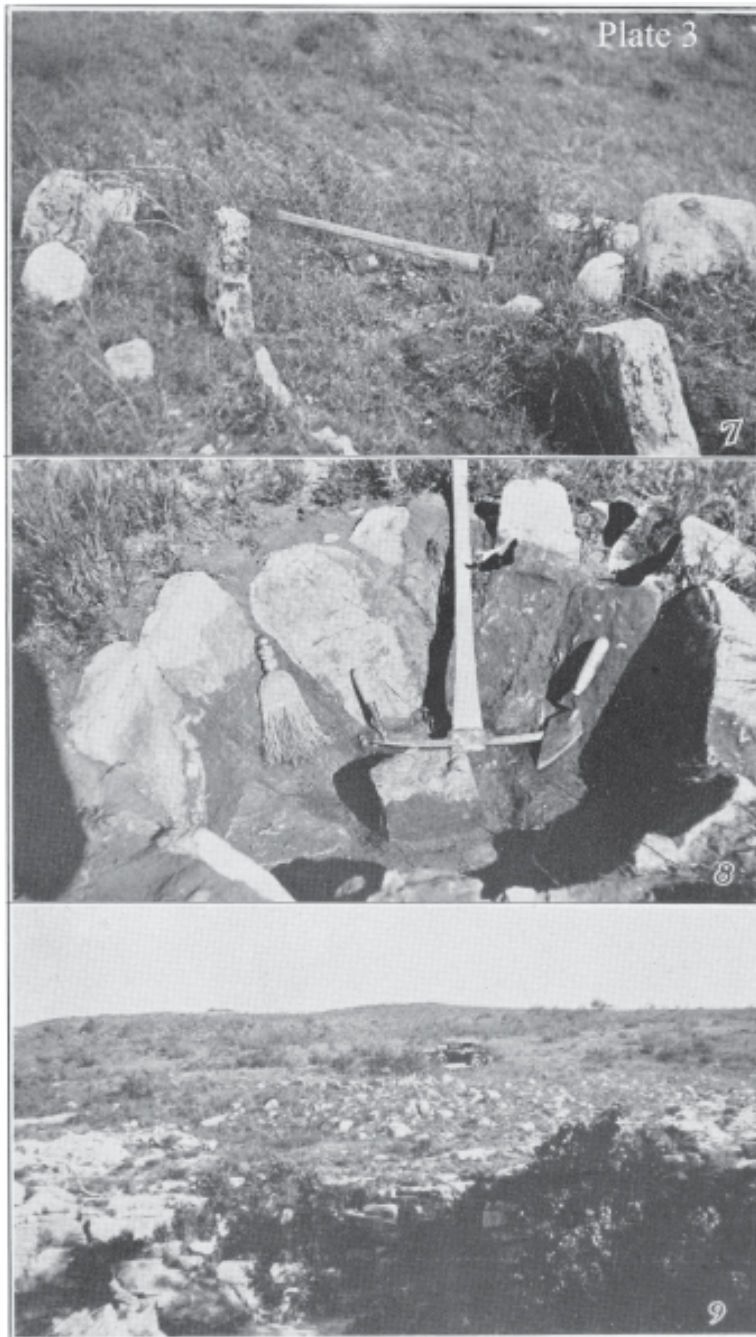
Another important phase of northwest Texas archaeology is the number and extent of flint quarries and deposits of materials suitable for the manufacture of implements. There has been discussion with reference to the origin of the Folsom, New Mexico, points. The stone from which they are made is not uncommon along the Canadian. Mr. Studer discovered a number of these quarry or chipping sites. It is recommended that they all be recorded upon large scale maps, further that specimens be selected from each site and these should include not merely finished and unfinished artifacts but also some of the raw material.

The question of caverns or rock shelters arises. Already there has been considerable research in this direction farther west, although the results have not been published. One might suggest that there should be careful inspection of natural rock shelters or caverns, particularly those facing south, southwest or east. In certain canyons and along "rim rock" outcrops there are many livable places formed by nature in which primitive man might have resided for a greater or less length of time.

The writer's observations, for the most part, have dealt with artifacts and their distribution. He considers this a very important subject. After five years studs and investigation of stone cutting tools

of a Basket Maker tribe and the true relationship of the so-called "Slab-house People" to the Pueblo culture. We hear somewhat concerning Basket

of North America, and tabulation of about 50,000 such objects, in museums and large collections between northeast Canada and the Mexican



## PLATE 3

- No. 7. A doorway in one of the typical Panhandle Culture Ruins on Antelope Creek
- No. 8. An outside stone hearth found in the yard away from the main buildings on Coetas Creek.
- No. 9. A picture of the ruins on Coetas Creek.

frontier, he has come to the conclusion that tribes of prehistoric times may be identified by such means. Artifacts must be handled in very large groups. All our present classifications have been based upon linguistics. Obviously we do not know the language of a prehistoric tribe and must therefore depend upon archeological research.

Before long the writer hopes to visit Texas, confining his observation to a study and classification of artifacts and their distribution rather than exploration. This should be left to local institutions and trained individuals. It was the consensus of opinion manifest during the meeting held at Birmingham, Alabama, last December that the states or local institutions should be encouraged to carry on their own archaeological work. One may be pardoned if he mentioned that the gentlemen present represented fifteen states and with the exception of New York, Massachusetts, Michigan and Illinois, these were of the South. It is believed that they will carry on the work.

In conclusion the writer thanks President Ray for affording him opportunity to express appreciation of the extent and importance of the Texas field for pure research.

Finally, one might suggest the possibility of discovering human remains, or artifacts, associated with extinct mammals. If such find is made, may one urge that the place and find be guarded day and night until the "experts in both geologic and archaeologic science" assemble.

Phillips Academy  
Andover, Massachusetts.

## MULTIPLE BURIALS IN STONE CIST MOUNDS OF THE ABILENE REGION

BY DR. CYRUS N. RAY

### *Roberts Covered Mound, 1*

A type of stone slab cist containing a single long-headed, flexed burial, or at most two of such, has been described by the writer in all of the four preceding volumes of the Society's Bulletin. However, not until late in September of 1932 had any local investigator found multiple cist burials in this region. There is indeed a tale extant to the effect that long ago some strangers (probably treasure hunters) excavated seven skulls on the summit of a high hill overlooking Elm Creek about eight miles north of the site the writer will describe.

In volume four, 1932, of the Society's Bulletin on page 66, under the following subtitle, "Rock Mound Cremated Burial," is the writer's account of the excavation of a cremated burial in a stone slab Gist mound. After describing the mound and the excavated portion, the account ended with this statement: "All of the mound has not yet been excavated and it is possible that other parts may contain more cremated cist burials."

After the above was written, the writer returned to the site and with the assistance of Mr. Russell Stephens and Mr. Hollis Roberts, the latter being a son of the owner of the land, excavated the west end of the mound from the northeast portion of which a cremated burial had previously been taken. After the usual number of tightly wedged, three feet long, vertically set limestone slabs had been taken out, a very large, flat, nearly square stone was found to be lying horizontally in the bottom at a depth from the surface of over three feet. On removing this stone, a badly crushed, long, narrow, low forehead skull was found near its south edge, but not under it. The skull lay on its side facing the east. Under the stone lay the flexed skeleton lying on its right side. These bones were removed, and the following day another flexed, long-headed skeleton was found directly below the first one with the bones of the two almost in contact. The second skeleton excavated had been put into the hole first and it lay

on its left side with its skull also facing the east. It is evident that both were buried at the same time and that the body of the one with its skull to the south rested on top of the body of the one with the skull to the north. The same heavy rock covered the bodies of both. The skulls of neither of the skeletons had been under the stone but were left projecting at the ends of it.

The north skull had not been crushed and was gotten out almost whole with all of its upper and lower teeth intact. It is one of five good skulls sent in February of this year to Dr. E. A. Hooton of Harvard University for a report.<sup>1</sup> At the time this article is being written, the June following, no report has been made.<sup>2</sup> In the absence of this report I will give the few measurements made before the skull was shipped. Its length from the center of the glabella to the posterior end of the skull was  $7\frac{3}{4}$  inches; the skull width near the top over the mastoids was  $4\frac{3}{4}$  inches; the width at the mastoids was 5 inches; the length from the posterior end of the skull to the middle, of the upper incisors was 9 inches; the width of the skull at its narrowest place just back of the supraorbitals was  $3\frac{5}{8}$  inches. The forehead was very narrow and also very low and receding. The eyebrow ridges were unusually prominent and the face projected very far forward with heavy jaws and teeth. The femora were, markedly curved from front to back, the tibiae very flattened from side to side, and the other racial peculiarities and curvatures previously described as typical of the stone slab Gist men were present. No artifacts of any kind were found with these two skeletons, however here and there were small fragments of shells which may have been remnants of something. There was no evidence of the action of fire on these bones; and the caliche formation, in the top of which they lay, had preserved them in fairly good condition.

At a later date the writer, assisted by Mr. Mack Machen, excavated the southeast portion of the

mound and under a similar stone structure found a small skeleton, presumably that of a woman, and beside it the skeleton of a very young child. The heads of both lay to the north and that of the infant was facing east and the woman's skull lay upright, facing south. The flexed bodies of both were covered with another large, roughly square, flat rock laid nearly horizontally but higher near the heads, which lay outside of the rock covering. These skulls were crushed, but, evidently, were of the same long-headed type. Near or against the long bones where they were doubled against the chest were five large mussel shells. The shells had not been altered in any manner. Just below the head and about the region

of the left shoulder was a cache of objects which must have been in a bag or container of some kind as they were in a compact bundle. It is probable that the handle of the sack or other container may have been placed in the left hand as it lay beside the left side of the face. In these flexed burials the hand bones are nearly always found on either side of the face. In the bundle were the proximal ends of three deer horns of about three inches in length which had been trimmed down from their intact swollen bases to about the size of a large man's little finger. These objects had blunt distal ends and probably were pressure flakers used in making flint tools. Unfortunately these disappeared while excavation was in progress. In addition a bone awl, the articular ends of three animal bones, one quartzite abrading stone,\* one thin patinated flint point probably a drill point, and a crude patinated side chipped scraper were found.

The bone awl was identified by F. B. Howard of the University of Pennsylvania as "Part of the proximal end of a metapodial of a deer or an antelope". The three other bones were identified as the proximal ends of the ulnae of deer or of antelope. In reference to the above and other identifications of bones sent to him and mentioned below, Mr. Howard wrote: "This may not be much help to you, but let me add that it is not possible to tell from fragments of leg bones whether the animal is recent or earlier, that is, Pleistocene. For a bone like the bison bone (mentioned later) shows such little difference if any between the recent and extinct forms that it is impossible to tell which it is."

The animal bones found in the different Roberts mounds are quite hard and firm and the bison bone is rather heavy, indicating, in the writer's opinion, a slight mineralization. All were found in the top of the caliche



PLATE 4

No. 10. Four Stone Cist Grave curved femora.  
From left to right R. Dl. 1 S., A. M. 1 S. 3,  
R. M. 3 S., Bever S.

formation which probably explains their unusually good state of preservation.

*Roberts Covered Mound, 2.*

The region of the Roberts mounds had been closely settled for over sixty years and the small village of Nugent has existed for a long time a half mile away and residents had walked over the sites of the four mounds for that period of time without suspecting that there was anything unusual about the sites. The reason for this was that the stone structures were almost completely buried, leaving very little evidence on the surface. It is very probable that soil accretion has buried them completely in the past and that recent erosion has yet only exposed slight portions of the top edges of some of the stones.

After assisting the writer with the first mound, Mr. Hollis Roberts rapidly became very proficient in locating such mounds. While the writer finished mound number one, he located another underground structure about a hundred feet lower down the hill towards the Brazos River. There were hardly any surface signs, but he began digging and uncovered the same type of structure there and finally came to another large horizontally-laid stone buried three feet deep. He then stopped and permitted the writer to finish the excavation. Under this stone was a small, flexed skeleton, probably that of a woman, and, also, one of a child. The child's bones were thin and mostly decayed but those of the woman were in fair condition and the skull and all of the teeth were intact. This was a long, narrow skull, but not so long nor so narrow as the two male skulls in the mound above. The heads of both skeletons lay outside of and to the west of the large, flat, horizontally-laid stone which lay over the flexed skeletons. The woman's skull lay upright and faced the north.

In excavating around the skull, portions of two very thin, incised bird bones were found in the neck region, but all of the fragments could not be located when the excavation was finished. The skull was taken out in a block of dirt and when this was later carefully removed in the laboratory, a third nearly complete, thin, incised bird bone tube 3 7-16 inches

long and one-half inch in diameter was found lying directly under the lower jawbone and in contact with it. Evidently three of these tubes were strung around the neck. Mr. E. B. Howard wrote about the tube as follows: "The bird bone offers a problem, too. It apparently has been rubbed down before it was incised. I showed it to the ornithologist at the Academy of Natural Sciences as well as to Dr. Farr at Princeton. It probably is the shaft of a humerus of a turkey. It certainly is a fine piece." It seems from Mr. Howard's comments that he was somewhat uncertain as to the kind of bird from which it came. It evidently was one of some very large species. The tube has five encircling incisions beginning 5-8 inch from one end and between these and the end are criss-crossed lines producing diamond-shaped decorations as they cross each other. At the other end are three rings and the same criss-cross decorations. The central portion contains smaller criss-crosses on one side and larger ones on the other. The few fragments of the other two tubes which the writer was able to retain show the same type of decoration. No other artifacts were found in this mound.

*Roberts Covered Mound, 3.*

Heavy floods on the Brazos and its branches prevented a return to the mound site for some weeks. During this period Mr. Hollis Roberts and two other farmers engaged in a jack rabbit hunt with a pack of dogs. The dogs ran about a dozen of the rabbits into a large hole which went down between some rocks located higher up on top of the same ridge about two hundred yards south of the first two mounds. Here the dogs began to dig industriously and soon brought several bones to the surface. This interested the hunters who had watched us open the first two mounds, and they obtained tools and dug out three flexed skeletons from stone slab cists buried four feet deep. Mr. Roberts then stopped them, and, when the writer returned, informed him of the occurrence. Examination showed that there probably was a large buried cist mound on the site. The farmers had opened the northwest portion, so excavation was started at the southeast edge and the mound was trenched through to their excavation. This

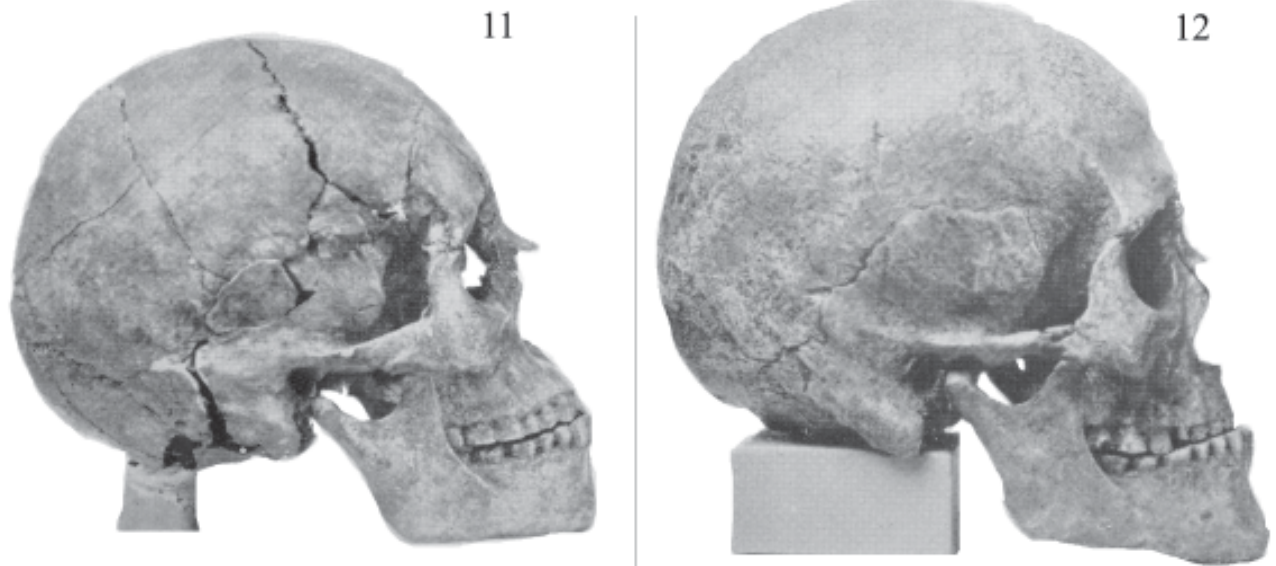


PLATE 5

No. 11. R. M 8 S. 10 One of the two Roberts Mound skulls described by Mr. R A. Hooton in "Five Texas Crania."

No. 12. R M 2 S 1. The Roberts Mound skull which had three incised bird bone tubes around the neck.

excavation was done by Mr. Hollis Roberts, Mr. Mack Machen and the writer. An unusual feature found in no other stone cist mound was encountered in this mound. At a depth of about a foot parts of a poorly preserved skull and a bundle of bone fragments were found under the top layer of stones. There was too little remaining of this skull to determine its shape. Close by and at a depth of about fifteen inches from the surface lay another skull and bundle of bones. This skull was of medium size and fairly well preserved and of a type never before found in a stone slab grave. Its form was of the modern type, short head with nearly vertical forehead instead of the nearly flat bestial type usually found. Resting in the center of its rib bones lay a beautiful barbed, slender, sharp, blue, unpatinated flint arrow-head.

Below the two shallow-buried skulls lay three feet of tightly wedged slabs set on end and below these and each under a separate horizontal slab and each in its own cist lay five more skeletons at depths of about four feet or more below the soil surface. These five skulls and the three excavated by the farmers had the typical low foreheads, long skulls, curved femora and flat tibiae always found -in the

stone slab cist burials. No other artifacts were found with any of the burials except a bone awl found with one of the long heads at a depth of four feet. Mr. E. B. Howard identified it as follows: "Part of distal end of metapodial of deer or antelope." A hard, heavy animal bone found by the farmers with the deeply buried skeletons was identified by Mr. Howard as the "coossified cuboid-navicular hone of bison." He could not determine the species.

Considering the shape of the round-headed skull, the unpatinated condition of the flint arrow head found with it and its top stratum level type, and the shallowness of the burial, it is the writer's opinion that some fairly recent Indian tribe raised up some of the stones near the surface of this old mound and thrust two later bundle burials into the mound's top and probably never knew that several feet deeper lay the remains of an older type of man. The same place would have been more likely to have been used again as the burial site contains the only rocks on the summit of a hill otherwise composed of loose, sandy loam soil and it is evident that all of the slabs had been carried to the top of the hill to line the cists.

Another peculiarity of this mound not previously encountered was that five of the ten skeletons showed absolutely no trace of a single tooth or fragment of the lower jaws. All of these skulls but three had been badly- crushed by the four feet of stone and soil above them, but practically all of the skull-bone fragments and those of the rest of the skeletons, including all of the upper jaws and teeth, were found.

The eight long-headed skeletons lay in the top of the caliche and nodules of it had formed inside and against the skulls and this probably accounts for the good state of preservation of the bones.

It is evident that for some strange reason the lower jaws of five skeletons had been removed before burial. Had this been done by some enemy after a battle in conformity to some gruesome custom comparable to the later Indian's scalping practice?

#### *Roberts Covered Mound, 4.*

While the writer was working on Roberts Mound number 3, Mr. Roberts located signs of a smaller one about a hundred feet northeast of that one. This fourth mound consisted of only one buried slab cist containing one skeleton. The skeleton in this one was the shallowest long-headed flexed Gist burial found in the Roberts sites. It was only two feet deep, and, while all the bones were in place, they were poorly preserved and fragile when attempts were made to remove them. Lying closely against and on the outside of the two right forearm bones at the place where a wrist watch is commonly worn were two artifacts lying flat on the bones and touching each other. One of the artifacts is of some white substance which I think is stone but may be either fossil ivory or shell. This artifact measures 2 1-8 inches across and has a hole drilled through its center and dot decorations in one edge. It is concave on the inner side and formed so as to fit one's wrist perfectly. The outer surface is gently curving and polished. If the object is shell, no laminations can be detected in it. The other object is 1 3-4 inches long and 1 5-16 inches wide; it is slightly over 3-8 inch thick at the larger end and runs to a dull edge 1-8 inch thick at the other. The

surface lying against the wrist was flat and the other surface was rounded and sloping from the thicker end to the thinner end. It appeared to have been broken off of the end of a longer stone. The stone was fine-grained and gray-colored, and had been ground down to its present shape. No other artifacts were found in this grave.

#### *Myatt Covered Mound, 1.*

Mr. John Zip had found signs of a stone structure on the place of Mr. Charles Myatt on the banks of Dead Man Creek located five miles southeast of the Roberts structures. This was excavated with the assistance of Mr. Roberts and Mr. Zip. The construction near the surface was similar to those of the Roberts mounds, but after a depth of about a foot was excavated on the western end of the mound a horizontally laid stone was removed and a few skull fragments were found in the soil under it. The soil was free from stones under the horizontal slab's center, but its edges lay on the ends of some large, three-foot-long slabs which lined the outside of a nearly square box-like area. The dirt was removed from this down to the caliche bottom where some foot and leg bones lay, but nothing else was found. The purpose of this new and unusual form of construction could not be determined until shown by later excavations in another place. The bottom of the stone-walled box was four feet from the soil surface. On digging into the east end of the same covered mound a stone slab structure like those found in the Roberts mounds was found and in its bottom at a depth of four feet a flexed skeleton rested on its side on the caliche formation. No artifacts were found in this mound.

#### *Alexander Covered Mound, 1.*

Many years ago a group of farmers dug into a stone structure at night hoping to find buried treasure, and when portions of a skull were found instead, the party hastily filled the hole and left. The location of this place is five miles north of the Roberts sites and on the ranch of Dr. J. M. Alexander. Through the assistance of Mr. Roberts, the writer and Colonel M. L. Crimmins of San Antonio were directed to the place. This covered mound is located on a high gravel hill about a third of a mile west of

the Brazos River. Nearer the river an old camp site is eroding out of a cotton field.

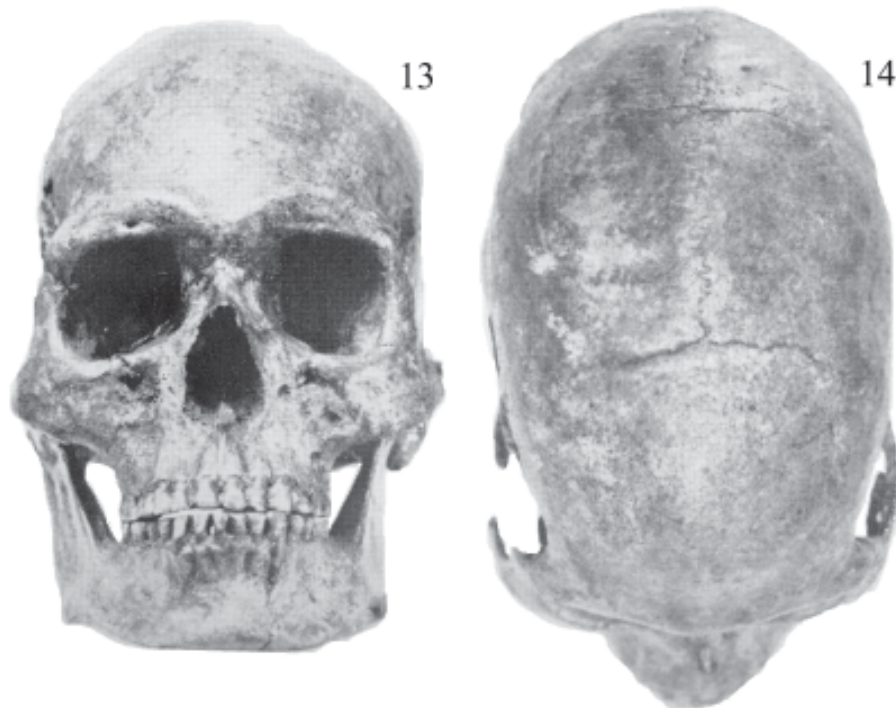
On digging into the mound the center showed previously disturbed soil and the fragments of a skull and long bones. The north portion had not been disturbed and here was encountered another stone box with its lid a foot or more beneath vertically set stones. Here again were a few small skull fragments in the soil near the top of the box and a few foot bones at the bottom which was four feet below the top soil surface. The west end of the mound also seemed not to have been disturbed, so this was gone into from the disturbed central portion. Below the usual edge set stones at a depth of about eighteen inches a nearly perfect skull, lower jaw and other portions of a skeleton was found. The long bones indicated that this one had been buried in the flexed position lying on the side. When this excavation was completed some edges of limestone slabs set endwise were seen to be in the bottom of the hole. As it was getting late, the excavation was stopped and the skull was given to

Col. Crimmins for the White Memorial Museum.

Some weeks later the writer returned to the site and resumed digging in the bottom of the hole below where the skull was found and soon unearthed a horizontally laid slab which was setting on top of the ends of some three feet long slabs which were set endwise in box form. Directly below the slab was a long-headed skull facing west. It was in excellent condition except that the lower jaw was missing and no trace of any part of it was found. Almost all of the rest of the skeleton was in place in good condition and the bones were all still arranged in sitting position facing west with the knees drawn up on the chest and flexed and the arms flexed so that the hands rested on each side of the skull. The foot bones in the bottom of the box-like compartment were a little more than four feet below the soil surface. The bones have the same peculiarities noted in other stone slab skeletons. The femora were curved from front to back and the tibiae flattened from side to side (platycnemia). The femur measures 18 1-4 inches in length and the

humerus 12 inches in length. When the femur is laid on a table top so that the posterior surfaces of its articular ends rest on the table, the middle of the shaft bows upward so that the distance from the table top to the upper or anterior surface of the shaft measures 2 7-8 inches. The fact that the upper jaw and teeth and other bones were found in good condition and no trace was found of the lower jaw or teeth indicates that here we have another instance of the strange custom first noted in one of the Roberts mounds.

One additional stone slab structure containing one burial has since been excavated at a site thirty miles west of Abilene in Nolan County. This contains




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PLATE 6

No. 13. Front view R. M. 1 S. 2. The first dolichocephalic skull described in "Five Texas Crania"

No. 14. Top view of R. D4. 1 S. 2. Same skull as the one shown to left.

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no features not previous described. It was found in the top of a small, flat-topped, natural mound around which was the scattered debris of a small camp site. The site is beside a small creek branch which is usually dry. On the eroded gravel margin of the hillside close by and above the site was found part of a Texas coast conch shell around which a groove had been cut for the purpose of suspension. It is hard and heavy, and probably partially mineralized.

The covered stone slab Gist burial mounds offer many problems to the archeologist. Probably the term mound is a misnomer in the sense of anything of much consequence showing on the present soil surface. However, it is the writer's opinion that in the long time ago when these structures were built that they then were small mounds which accretion later covered completely with soil for some undetermined period. Now, only a few inches of the edges of a few of the stones are eroding from usually flat surfaces. But when one excavates these lie finds symmetrically built, usually round structures going down into the ground from three to four or more feet. The presence in Roberts mound number one of a cist containing one cremated burial in such oval symmetrical form as to suggest it originally rested in a bag and in the same mound other slab cists of the same type containing four flexed long-headed burials with a bundle of deer or antelope bone and horn artifacts of similar type to those identified as Basket Maker elsewhere would suggest to the writer some relation or similarity to features of the Basket Maker culture complex. It is certain that the vicinity of the main sites shows many evidences of formerly occupied ground levels buried under horizontal stratification in river banks at depths of four, five, six and eight feet below the present soil surfaces. At other places not far away exist other camp site levels twenty-four and twenty-eight feet below the soil surfaces. Sixty miles from these sites Mr. E. B. Sayles showed the writer seven negative hand prints made by holding the hand against a cave shelter wall and throwing red powder against the wall. Here also Mr. Sayles called my attention to the typical square-shouldered, Basket-Maker man's picture on the same wall.

Eight miles south of the principal burial site Mr. Buckner Osborn showed me eight pictographs made of red hematite paint on a similar ledge. Mr. Osborn stated that another set of red pictographs existed forty miles away from the principal burial sites in an opposite direction from those shown to the writer by Mr. Sayles. It is probable that we may here see represented some of the first crude American beginnings of stone-built structures which may have evolved into a generalized basket-maker prototype or an early widespread basket-maker culture which later constituted the foundation on which all of the various phases of pueblo civilization rested?

P. O. Box 894  
Abilene, Texas.

1. R. M. (1) S. 2.
2. Reported since, in "Five Texas Crania".

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\*Deeply grooved and worn abrading stones of hard quartzite have been found to occur commonly in certain types of prehistoric camp sites throughout the Abilene district and their presence occasioned much speculation since only one bone artifact had been found in the region previously and the shell artifacts were so scantily represented and were usually of such coastal materials as to lead one to believe that they were manufactured elsewhere. As a result of many years search of hundreds of camp sites the writer's collection contains only the following in worked shell: three small beads, one conch shell pendant, one mussel shell with a hole drilled in the edge, and one abalone shell pendant. In addition one sea shell tinkler and a large tubular bead were found in one early burial and a worked mussel shell in another. In worked bone, prior to this series of excavations, only one object—a carved petrified horse bone (species undetermined) had been found. Nearly all of the objects enumerated above owe their preservation to varying degrees of mineralization and it may be true that the region once supported an industry in bone and shell of which time's vicissitudes and an unfavorable soil and climate have destroyed all except vestigial remains.

**NOTES ON FIVE TEXAS CRANIA**

BY DR. ERNEST A. HOOTON

*Introductory Note*

The crania sent to the Peabody Museum by Dr. Cyrus N. Ray had been carefully mended, but suffered a good deal of secondary breakage in shipment. A new and more complete restoration of the specimens would have been possible at the cost of a great deal of time and labor. The writer had no time for this work of restoration, nor were there available sufficiently skilled assistants to carry out the work independently.

In the following pages there are recorded the principal measurements, indices, and morphological observations made by the writer\*. These represent merely the routine data taken on all crania. In the case of the morphological observations, it should be explained that each cranial feature is classified in one of five grades—very small, small or submedium, medium, large, very large. The standard of comparison is the observer's judgment as to average development in the adult male Northwestern European skull. Although the employment of such an ideal and subjective standard is sure to yield varying results in the case of different observers, it represents, at any rate, the attempt to grade and to classify with some precision features which are not measurable.

## CRANIUM RM-1-S2

*Condition*

This cranium is extremely fragile and the bones are very friable. The basilar region is fragmentary and the right zygomatic arch is broken away. In mending, the facial portion has been so attached to the cranio-facial base as to increase the facial length and prevent proper articulation of the mandible. Although carefully mended, the specimen has suffered badly in shipment. The cranial capacity cannot be measured.

*Sex and Age*

The cranium is of moderate weight and the muscular attachments are medium in their development. The sex criteria are well defined and clearly show that the skull is that of a male. On the basis of sutural occlusion and eruption and wear of the teeth the individual at death was of middle age (35-54 years).

*Metric and Indicial Features*

The measurements which could be taken, and the indices derived from them are listed in the accompanying table. The most notable feature of the skull is its extremely narrow vault, the maximum width of which is only 119 mm. Since the length of the skull is considerable the cranial index is one of the lowest ever observed by the author in American Indians (60.71). There is no suggestion of any pathological deformation, such as scaphocephaly. The vault is symmetrically formed. This cranium is also chamaecephalic and acrocephalic. The facial indices approach the leptoprosopic or narrow-faced condition. The nasal index is moderate, but the palate is rather narrow and long.

*Morphological Description*

The skull is free from artificial or pathological deformation. In the *norma verticalis* it is ellipsoid in shape. The frontal region is rather primitive in conformation. The brow ridges are large and continuous across the orbits; the glabella is prominent. The height and breadth of the frontal region are submedium and its slope or recession is pronounced. There is a well marked median external frontal crest; the frontal bosses are feebly developed; there is no trace of metopism. Postorbital constriction is pronounced.

The parietal region is remarkable for its exiguous breadth and for its great median sagittal elevation. The postcoronal depression is scarcely

discernible and the parietal bosses are indistinguishable. There are two small parietal foramina.

The temporal region shows no fullness whatsoever. It has a slight sphenoid depression. Temporal crests are medium and supramastoid crests small. The mastoid processes are of medium size.

The occipital region is protuberant with a slightly developed crestlike torus resulting from a marked development of the superior curved lines. The highest and inferior curved lines are medium in prominence. The external occipital protuberance is submedium in size. There is no lambdoid flattening and no traces of a transverse occipital suture are visible.

The serration of the coronal suture is extremely simple and both sagittal and lambdoid sutures are of submedium intricacy. The skull has been thickly coated with shellac so that sutural occlusion cannot be observed precisely. However, a medium degree of external obliteration has taken place in the sagittal, coronal, and lambdoid sutures. If there are any Wormian bones they are concealed by the shellac coating. The form of the ptergia is not discernible.

Many of the features of the skull base are unobservable on account of its fragmentary condition. There is a slight median occipital fossa; the condyles and the basion region are of moderate elevation. The styloids are of medium size. The pharyngeal tubercle is small. The glenoid fossae are of medium depth with moderate postglenoid tubercles and tympanic plates of average thickness. The shape of the auditory meatus is oval. The petrous parts of the temporal bone seem to have been depressed but slightly below the level of the basilar process when the skull is viewed in the norms basalis. No pterygo basal foramina are present. The external pterygoid plates are strongly developed; the internal plates of medium size; the pterygoid fossae are deep.

The orbits are rhomboidal and show a medium inclination downward and outward. The lachrymoethmoidal and infra-orbital sutures cannot be

distinguished. Suborbital fossae are of average depth. The malars are large and display marked anterior and lateral projection. Zygomata, however, are of medium thickness and size.

The nasion depression is medium. The nasal root is narrow and of medium height. The bridge is high and narrow and shows a concavo-convex profile. Height and breadth of the nasal aperture are medium, as is also the development of the nasal spine. There are no subnasal grooves. Midfacial prognathism is absent but alveolar prognathism is pronounced, so that a moderate degree of total facial prognathism may be observed.

The alveolar borders are well preserved and show no absorption. The palate is a large U-shaped type with high roof and no torus. The transverse palatine sutures are directed posteriorly and the posterior nasal spine is of medium development.

The mandible is of medium size, with a median mental prominence which shows only slight anterior projection. Alveolar prognathism is marked. The genial tubercles and mylo-hyoid ridges are of average development. The pterygoid attachments are well marked and the gonial angles are strongly everted.

The teeth are completely erupted with the exception of the lower third molars, which are probably suppressed. No teeth have been lost in life, unless the third molars were extracted—a point on which I am not certain, but incline to a negative opinion. Although the wear on the teeth is marked, only one carious tooth was observed (the lower right first molar). In general the quality of the teeth is excellent and there are no traces of alveolar abscesses or pyorrhea. Shovel incisors are absent. There is slight crowding of the teeth. The upper molar cusp formula is 4-4-3, and the lower 5-5-?.

RM-3-S10

*Condition*

This is a fragmentary cranium with the facial portion detached and parts of the parietals missing.




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 PLATE 7
 

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No. 15. Side view of R. M\_ 1 S. 2. Same skull as the one shown twice on plate 6.

No. 16. A. M. 1 S. 3. This skeleton found sitting up in a stone slab box found below another flexed skeleton which lay on its side. No trace of a lower jaw was found with this skeleton.

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#### *Age and Sex*

The cranium is of moderate weight and with fairly marked muscular attachments. The sex criteria are well defined and indicate a male. The beginning of sutural occlusion and the condition of the teeth point to early middle age at death.

#### *Metric and Indicial Features*

The specimen is markedly dolichocephalic, and is also hypsicephalic and acrocephalic. It is much broader and higher relative to its vault length than Cranium RM-1-S2.

#### *Morphological Description*

The skull is undeformed and is ellipsoid in contour when viewed from above. The brow ridges are of the divided type and are sub-medium in size, as is also the glabella eminence. The frontal region is broad and of medium height and slope. The bosses are poorly defined; there is no median crest or elevation. No traces of a metopic suture are visible. The degree of postorbital constriction is less than average.

The parietal region is of medium breadth and presents a marked sagittal elevation. The post-coronal depression is slight. The bosses are

medium. Parietal foramina are indistinguishable on account of the shellac coating.

The temporal regions are of medium fullness, but the temporal crests are poorly defined. The supra-mastoid crests show an average development; the mastoids are large. The sphenoid depression is slight.

The occipital region is protuberant with poor development of the highest and superior curved lines and medium prominence of the inferior curved lines. There is no torus. Theinion region shows no prominence and lambdoid flattening is absent. The coronal suture is very simple in serration, the sagittal suture submedium, and the lambdoid medium. The two former show the beginnings of external obliteration, but the lambdoid and temporo-occipital sutures cannot be observed for this feature on account of the thick layer of shellac which overlies them. There are a few medium sized Wormian bones in the lambdoid suture. The form of the pterion on the left side is K; on the right side it cannot be observed.

The skull base shows a slightly developed median occipital fossa. The condyles are well elevated, as is also the basion point. The foramina of the base are not observable. The styloids are of

medium size. There is a moderate pharyngeal tubercle, but no pharyngeal fossa. The glenoid fossae are of medium depth, the postglenoid processes of average size, and the tympanic plate of ordinary thickness. The auditory meatus are round. The petrous portions of the temporal bones show submedium depression below the basilar level.

The orbits are rhomboidal and of medium lateral inclination. The lachrymal-ethmoidal suture is of the size ordinarily found in male Europeans. Infra-orbital sutures are unobservable. The malars are large, and pronounced in both lateral and anterior projection. Marginal processes are medium. The zygomata are massive.

There is no nasion depression. The nasal root is of medium height and breadth. The bridge is high and of average breadth. It is concavo-convex. The upper part of the nasal aperture is fragmentary. It has a submedium development of the lower borders, but a moderately developed spine. There are very slight subnasal grooves. Pronounced alveolar prognathism is present, but midfacial and total facial prognathism cannot be observed on account of the detached and fragmentary face.

The palate is a large U-shaped affair with a high roof and no torus. Its posterior portion is missing.

The mandible is large with a bilateral mental process. The anterior projection of the chin region is submedium. A medium development of alveolar prognathism of the mandible is present; the genial tubercles are small. Mylo-hyoid ridges, pterygoid attachments, and eversion of the gonial angles are all average.

The lower third molars are probably suppressed. The wear on the teeth is pronounced, but the quality is excellent. There are no signs of caries, alveolar abscesses or pyorrhea.

Four of the incisor teeth are shovel-shaped—a feature common in American Indians. The incisors are markedly crowded. The molar cusp formulae are as follows: upper 4-4-3; lower 5-5-?. The bite is edge-to-edge.

## COLORADO, TEXAS

### *Condition*

This cranium is poorly preserved. The face is detached and the skull base is fragmentary.

### *Sex and Age*

The muscular attachments are of medium development; the skull is moderately heavy. Sex criteria show an average definition and indicate the male sex.

### *Metric and Indicial Features.*

The skull is hyperdolichocephalic, its length breadth index being only 64.65. The height measurements are not obtainable.

### *Morphological Description.*

The specimen shows no cranial deformation. The vault is ellipsoid when viewed in the *norma verticalis*. The brow ridges are of the divided type and are small. The glabella region is feebly developed. The frontal region is low, narrow, and of medium slope. The bosses are slightly developed and there is a submedium median crest. The post-orbital constriction is marked.

The parietal region is narrow with a very marked median sagittal elevation. There is only a trace of a post-coronal depression. The bosses are of medium size. Parietal foramina are absent.

The temporal region is of a submedium fullness, with poorly marked temporal crests, but large supra-mastoid crests. The mastoids are of moderate size and there is a slight sphenoid depression.

The occipital region is remarkably protuberant, but exhibits only a feeble development of the inion, the superior and inferior curved lines. The highest curved lines are of average definition. There is no torus. A slight lambdoid flattening is present.

The serration of the coronal and sagittal sutures is unobservable on account of obliteration. The lambdoid suture shows a medium intricacy. External obliteration is far advanced in the sagittal suture and somewhat less so in the coronal suture.

On account of the shellac the degree of external obliteration and the presence or absence of Wormian bones cannot be observed. The pterion is H-form on both sides.

The skull base is fragmentary. There is a trace of a median occipital fossa. The styloids are of medium size, the glenoid fossae of medium depth with moderate postglenoid tubercles and thin tympanic plates. The auditory meatus are elliptical in shape.

The orbits are rhomboidal and moderately inclined laterally. Infra-orbital sutures are complete on both sides, and on both orbital and facial aspects. The suborbital fossae are deep. The malars are of medium size and marked anterior projection. Their fragmentary character prevents observation of their lateral jut. Small marginal processes are present.

The nasal bones are missing. The nasal aperture is low and narrow with a medium development of the sills and a small spine. There are no subnasal grooves. A moderate amount of alveolar prognathism is present; facial prognathism is not observable.

The alveolar borders are poorly preserved and have undergone marked absorption. The palate is hyperbolic in shape. Further observations are lacking because of its defective state.

The mandible is of medium size with a median mental process which projects anteriorly to an average degree. There is a trace of alveolar prognathism. The genial tubercles, mylo-hyoid ridges, and pterygoid attachments are medium, but the gonial angles are markedly everted.

The eruption of the teeth is complete. Four teeth were lost before death and six have fallen out subsequently. The wear is very pronounced and the quality poor. Several carious teeth are present, but the decay is due to wearing down of the crowns, exposure of the pulp cavities, and consequent death of the teeth. Five medium alveolar abscesses are present and there are indications of pyorrhea. Incisor form and cusp formulae cannot be observed. The bite was edge-to-edge.

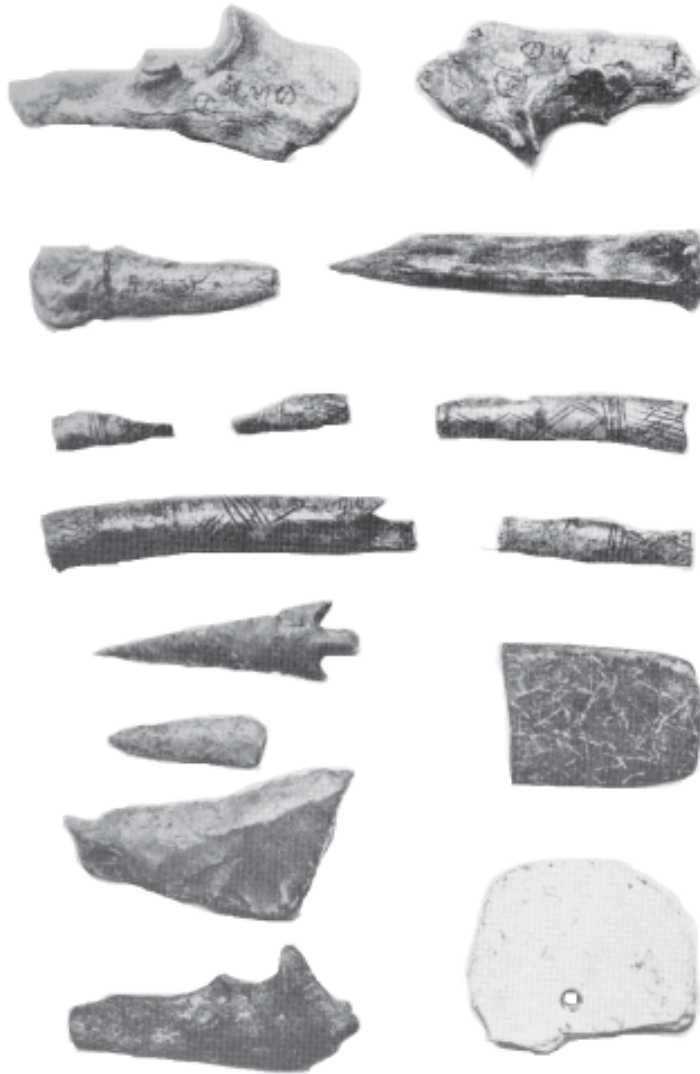


PLATE 8

No. 17. Roberts Mound artifacts. Top shows 2 deer or antelope bone awls and 2 ends of same. Next below are an incised bird bone tube and fragments of others. The sharp pointed barbed arrow point found in an intrusive burial in top of R. M. 3. The two patinated flints below were found in R. M. 1. Below this another end of a bone awl. On right bottom is a white stone ornament found on wrist of skeleton in R. M. 4. Above the right ornament is a chisel shaped stone found on wrist bones beside it.

## HEFFANER

*Condition*

This specimen is a calvaria and a mandible. The face is missing.

*Sex and Age*

The sex criteria are poorly defined, but the feebly developed muscular attachments, light weight, small brow ridges and mastoids, and other features indicate a female. The cranial vault sutures are all open and the third molars are erupted but unworn. The skull seems to have been that of a sub-adult individual about 18 years of age.

*Metric and Indicial Features*

Indicially the skull is mesocephalic, orthocephalic, and metriocephalic.

*Morphological Description*

The calvaria is undeformed and presents an ovoid shape when viewed in the *norma verticalis*. The brow ridges are of the median type and very small. The glabella eminence is very poorly developed. The frontal region is low, narrow and of submedium slope. The bosses are moderately developed. There is no median frontal crest; metopism does not exist; the post-orbital constriction is pronounced.

The parietal region is of medium breadth and a moderate sagittal elevation is present. The post-coronal depression is slight. Bosses are medium, and parietal foramina cannot be observed.

The temporal region is of medium fullness. The temporal crests are very poorly developed and the supra-mastoid crests submedium. The mastoids are very small. Sphenoid depressions cannot be observed on account of missing parts.

The occipital region shows a moderate convexity. The lines of attachment of the nuchal muscles are very poorly developed. There is a trace of lambdoid flattening.

The coronal and sagittal sutures are very simple in pattern; the lambdoid is of submedium complexity. All of the sutures are open. Wormian bones cannot be observed with certainty. The right pterion is of the K-shape.

The skull base shows a trace of a median occipital fossa. The condyles are markedly elevated, but the basion point only moderately. There are no postcondyloid foramina. The other foramina of the skull base are of moderate size and present no unusual features. The styloids are very small. Neither pharyngeal tubercle nor pharyngeal fossa is present. The glenoid fossae are shallow and there are no postglenoid tubercles. The tympanic plate is very thin on each side. The depression of the petrous portions of the temporal bones is submedium.

The face is missing. The mandible is small with a median mental prominence of feeble anterior projection. The genial tubercles are very small and the mylo-hyoid ridges and pterygoid muscle attachments are submedium. The gonial angles are not everted.

The teeth are completely erupted, but the third molars are unworn. The other teeth present marked wear and are of good quality. Probably the subject was free from all dental disease.

## BEYER

*Condition*

The specimen is a fragmentary calvaria accompanied by its mandible.

*Sex and Age*

The sex criteria are somewhat dubious, but suggest, in general, a female. The amount of sutural obliteration and the wear of the teeth indicate a young adult.

*Metric and Indicial Features*

The skull is exaggeratedly dolichocephalic, with a very narrow forehead.

*Morphological Description*

The skull is undeformed and ellipsoid in shape. It is light, with feebly developed muscular attachments. Viewed from above the vault is ellipsoid. The brow ridges are of the divided type and present considerable thickening of their lateral portions. They are of medium size. The glabella eminence is moderately developed. The frontal bone is low, narrow, and of medium slope. The bosses are poorly developed. There is a moderate median crest and the metopic suture is absent. Postorbital constriction is marked.

The parietal region is narrow with a pronounced sagittal elevation. The post-coronal depression is slight; the bosses are medium; there are no parietal foramina.

The temporal region is submedium in fullness. The temporal and supra-mastoid crests are moderately developed. The mastoid processes are small and the sphenoid depressions slight.

The occipital region is very protuberant. The highest curved lines show medium development, but the middle and inferior lines are poorly defined. There is, nevertheless, a slight torus. The external occipital protuberance is undeveloped. Very slight lambdoid flattening may be observed.

All of the vault sutures are submedium in their serration. External obliteration is beginning in the sagittal sutures. The other sutures are open. There is one medium sized Wormian bone in the lambdoid suture.

Most of the features of the skull base are unobservable. The styloids are small; the glenoid fossae of medium depth with traces only of postglenoid tubercles and thin tympanic plates. The auditory meatus arc oval in shape. The depression of the petrous parts is submedium.

The face is missing.

The mandible is small with a median mental prominence of moderate anterior projection. There is very slight alveolar prognathism. Genial tubercles and mylo-hyoid ridges are of medium development. The pterygoid attachments are small and the gonial angles are not everted.

The teeth are completely erupted, markedly worn, and of fair quality. The lower left first molar shows a secondary caries, consequent upon wear and death of the tooth. There is here a moderate alveolar abscess. Pyorrhea seems to have been present. The bite is edge-to-edge.

## TEXAS SKULLS

*Discussion*

In order to work out to his satisfaction the racial affinities of skulls, the physical anthropologist really requires a substantial series—twenty or more. The full range of a group variation cannot be determined from the study of a very few specimens, and the observer is likely to be misled by purely individual variations and by differences which are due to chance. This difficulty probably accounts to some extent for the seemingly great heterogeneity of fossil man. It is quite apparent, for example, from the new finds in Palestine and in Java, that Neanderthal man was much more varied in his physical characteristics than has been generally assumed heretofore.

In recent times human races have been thoroughly mixed and this condition gives rise to a multiplicity of intermediate and sometimes individual types which are likely to suggest to the observer erroneous conclusions as to racial affinities, if he attempts to decide on the basis of a few specimens only. On the other side inbreeding is wont to produce peculiar familial types. Hence the student possessing only two or three crania from some isolated area may mistake for racial features those which have merely a local or familial significance.

The five incomplete crania sent to the writer by Dr. Cyrus N. Ray are remarkable principally in one respect. They are excessively dolichocephalic, with the exception of the sub-adult Heffaner skull, which is mesocephalic. The other four are very unusual in their exiguous breadths and the relation of that dimension to their large lengths. Indeed RM-1-S2 is perhaps the most dolichocephalic American skull I have seen which is entirely free from scaphocephaly or suggestion of any sort of



deformation. Otherwise the crania are in no particular unusual. The pronounced lateral and anterior jut of the malars in the specimens suggest a Mongoloid feature, which is further substantiated by the presence in one of the specimens of shovel-shaped incisors.

There can be no question that these crania represent a Neanthropic or morphologically modern type of man. They are not Neanderthaloid, nor do they resemble in significant details any other type of great geological antiquity. On the other hand, it must be remembered that Neanthropic or physically modern types of men were in existence in the Old World before the end of the glacial period and that the lack of anthropid and archaic physical characters does not necessarily imply a recent date. The geological antiquity of any human skeleton must be determined by the definition of the stratum in which it is found, rather than by its morphological and metric features. Associated archaeological and palaeontological finds are important in determining age, but like morphological features, are frequently inconclusive.

The Texas crania under discussion seem to exemplify a very primitive type of American Indian, showing perhaps fewer evidences of admixture of brachycephalic elements than are usually observable in long-headed Indians. The skulls are

not very close to what seems to be the central type of the Basket-Maker, being narrower, longer, and lower. Parallels could be adduced from the series of crania from the caves of Coahuila and from the Santa Catalina Islands, but to the present writer the Texas skulls recall more clearly some of the Eastern dolichocephalic Indians, although the former are somewhat more primitive in their very narrow skull breadths. The tentative conclusion would be that Dr. Ray's crania represent very pure examples of one of the earlier strata of the American population, since it is probable that dolichocephalic groups preceded the round-heads in their migrations to the New World. However, it should be recalled that certain features suggest the presence in this stock of a Mongoloid element, which probably was strongest in the later brachycephals, but may have existed in a small degree among the early dolichocephals. It must be reiterated, moreover, that there is a definite possibility that the extreme dolichocephaly of these skulls is merely a local or familial variation.

Peabody Museum

Harvard University  
Cambridge, Massachusetts.

\*Measurements and Indices on page 38

TEXAS CRANIA  
MEASUREMENTS AND INDICES

SEX	RM-1-S2	RM-3-S-10	Col.-Texas-2	Heffaner	Beyer
	Male	Male	Male	female(?)	female(?)
CRANIAL VAULT- Age	(middle aged)	(middle aged)	(old)	(sub-adult)	(young adult)
a. Glabello-occipital	196	191	198	170	185
b. Maximum width	119	(136)	128	133	125
b/a. <u>Cranial Index</u>	<u>60.71</u>	<u>(71.20)</u>	<u>64.65</u>	<u>78.24</u>	<u>67.57</u>
c. Basion-bregma	134	(145)	?	(123)	?
c/a. <u>Height-length index</u>	<u>68.37</u>	<u>(75.92)</u>	?	<u>(72.35)</u>	?
c/b. <u>Height-breadth index</u>	<u>112.61</u>	<u>(106.62)</u>	?	<u>(92.48)</u>	?
c'. Auricular height	(118)	?	?	?	?
c'/a. <u>Aur. height-length ind.</u>	<u>(60.20)</u>	?	?	?	?
d. Thickness left parietal*	5	4.3	4.6	3.6	4.3
e. Minimum frontal	88	103	(93)	82	82
e/b. <u>Fronto-parietal index</u>	<u>73.95</u>	<u>(75.74)</u>	<u>(72.66)</u>	<u>61.65</u>	<u>65.60</u>
(a+b+c) /3 Cranial module	149.67	(157.33)	?	(142)	?
Maximum circumference**	518	528	(525)	?	(500)
Arc.-Nasion-opisthion	388	?	(375)	(342)	?
Arc-Transverse	301	318	(305)	(287)	283
CRANIO-FACIAL BASE					
i. Basion-nasion	?	(107)	?	?	?
FACE-					
f. Maximum bi-zygomatic	(131)	?	?	?	?
g. Menton-nasion	(116)	?	?	?	?
g/f. <u>Facial Index</u>	<u>(88.55)</u>	?	?	?	?
h. Prosthion-nasion	(70)	?	?	?	?
h/f. <u>Upper facial index</u>	<u>(53.44)</u>	?	?	?	?
f/b'. <u>Cranio-facial index</u>	<u>(110.08)</u>	?	?	?	?
k. Nasal height	49	?	?	?	?
l. Nasal breadth	24	?	?	?	?
l/k. <u>Nasal Index</u>	<u>48.98</u>	?	?	?	?
ORBITS-					
m. Height, right	34	?	?	?	?
n. Breadth, right	40	?	?	?	?
m/n. <u>Orbital index, right</u>	<u>85.00</u>	?	?	?	?
m'. Height, left	34	?	?	?	?
n'. Breadth, left	(39)	?	?	?	?
m'/n'. <u>Orbital index, left</u>	<u>(87.18)</u>	?	?	?	?
r. Interorbital breadth	(23)	?	?	?	?
s. Bi-orbital breadth	98	?	?	?	?
r/s. <u>Interorbital index</u>	<u>(23.47)</u>	?	?	?	?
t. Palate, external length	57	60	?	?	?
u. Palate, external width	63	68	70	?	?
u/t. <u>External palatal index</u>	<u>110.53</u>	<u>113.33</u>	?	?	?
MANDIBLE-					
v. Condyllo-symphysial length	(105)	102	(114)	?	?
w. Bi-condylar width	(112)	125	?	?	?
v/w. <u>Mandibular index</u>	<u>(93.75)</u>	<u>81.60</u>	?	?	?
x. Height of symphysis	35	39	37	?	85
y. Bigonial diameter	99	100	109	?	87
y/f. <u>Zygo-gonial Index</u>	<u>(75.57)</u>	?	?	?	?
Height of ascending ramus	58	57	(59)	?	49
Min. breadth ascending ramus	32	33	35	31	30
Mean Angle	121°	122°	123°	?	124°

\*Mean of three measurements taken about 10mm. above the squamous suture.

\*\*Above the level of the brow ridges.

**EXCAVATION OF SADDLE-BACK RUIN**

BY DR. W. C. HOLDEN

At previous meetings of the Texas Archeological and Paleontological Society I have read papers dealing with the nature and problems of the archaeology of the Canadian Valley of the Panhandle of Texas. These papers have been published in Volumes I, 11, III, and IV of the Bulletin of the Society. In a paper read at the last annual meeting I pointed out that Texas Technological College had adopted a definite program relative to attempting to establish the identity of the Panhandle culture. The program consisted, in brief, of excavating several typical slab-stone ruins up the Canadian Valley for the purpose of seeing how the Canadian culture "tied in" with the known early Pueblo culture of the Pecos drainage in New Mexico.

In accordance with this plan we selected for the summer's work of 1932 a ruin on Saddle-Back mesa located a mile and a half south of the Canadian River at old Tascosa which is forty miles northwest of Amarillo and approximately sixty miles west of the Antelope Creek ruin. We worked Saddle-Back ruin under the auspices of the Panhandle-Plains Historical Society and through the courtesy of Mr. Floyd V. Studer. Mr. Studer has in the past secured the scientific rights for this and practically all other sites along the Canadian River. This last spring (1932) he turned these scientific leases over to the Panhandle-Plains Historical Society at Canyon. The Society created a Department of Archaeology and Paleontology and made Mr. Studer director of the Department. Any individual or institution now wishing to do work in the Canadian vicinity must now do so under the auspice of the Society and under the direction of Mr. Studer. The Panhandle group is to be commended for taking these timely steps to forestall "pot-hunting" and vandalism and to preserve scientific materials in the Canadian Valley.

From some distance Saddle-Back mesa resembles a saddle with the "horn" or "pommel,"

pointing towards the southeast. The mesa at its top is 950 feet from the southeast to the northwest, and it rises approximately 225 feet from the surrounding country. Parker Creek rises several miles to the southwest and flows a few hundred feet west of the mesa into the Canadian. The creek is dry most of the time, but water can be obtained during drouthy periods by digging a few feet below the level of its bed. A quarter of a mile southeast of the mesa is a spring, no doubt the chief source of water for the inhabitants of the ruin.

The "horn" of Saddle-Back mesa is a cap of soft, yellowish-grey sandstone. The east, and south sides of the horn are precipitous, the cliffs rising some forty feet. On the other side the "horn" slopes towards the northwest with a cone-like rotundity. It was here the ruin was located. It "stair-stepped," or was terraced, from the base of the "horn" to its summit, with two rooms on top. It is unusual for a ruin to face the northwest, but as one stands on the summit of the "horn" he can understand why the builders of the house selected this site. A more beautiful vista probably could not be found in the Texas Panhandle. One could see from twenty to thirty miles up and down the Canadian Valley to the northwest and northeast. To the south and west a watchman could see only from five to eight miles because of a range of red hills. The founders had other reasons for selecting this spot. It afforded protection; it was close to water; and along Parker Creek and the Canadian River were spots of subirrigated land where corn and melons could be raised.

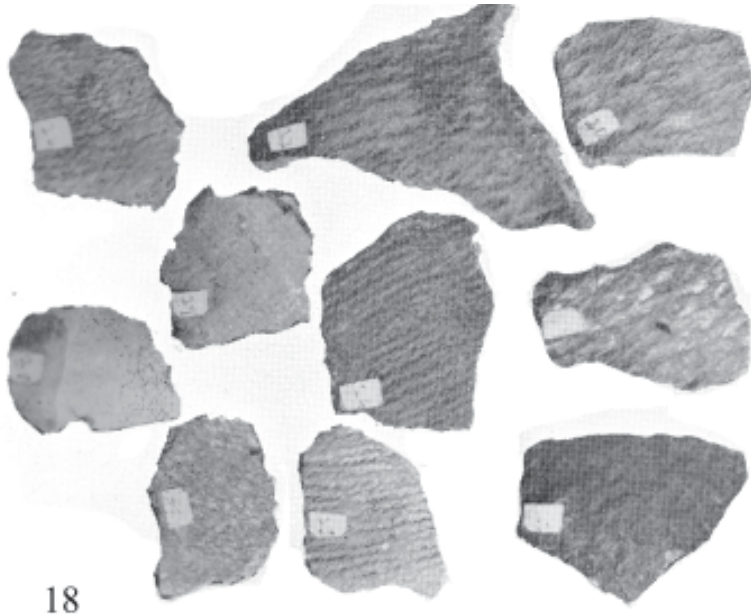
On June 8, 1932, fifteen students from Texas Technological College pitched camp on the south bank of the Canadian River, a mile and a half from the mesa on which the B. T. K. ruin is located. Four of the students had been on archaeological expeditions before, but the others were without field experience. All were anxious to get started. The next morning when we climbed the mesa with

our tools and saw the ruins, several of them were disappointed. They had expected something quite different, particularly more visible evidence above the ground. Nature sometimes has a way of carefully concealing her secrets, and it was true in this case for Saddle-Back ruin was so completely covered that a casual observer would not have connected the loose stones lying about with the remains of a human habitation.

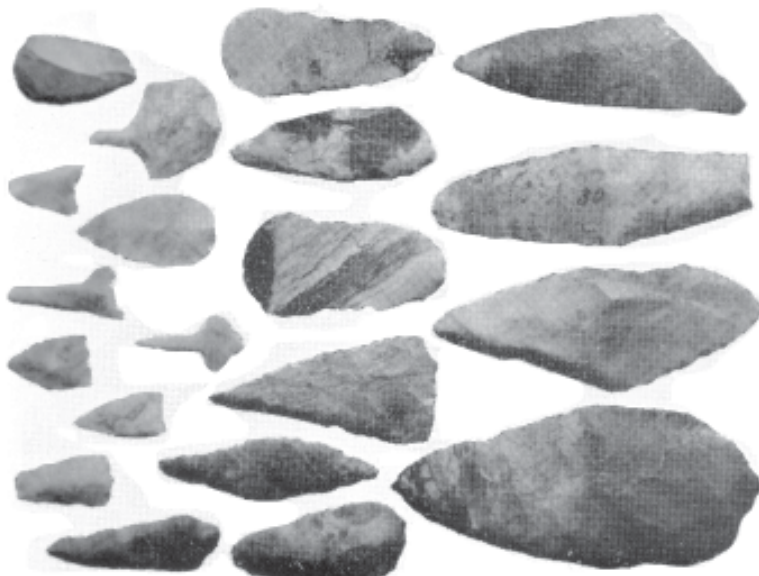
A student engineer surveyed the site and laid off seven trial trenches starting at the bottom of the debris and converging to a point at the summit of the incline. Each trench was four feet wide and laid off in sections five feet long. After listening to a lengthy lecture on the technique of excavation, two students were assigned to each trial trench. We had no money to hire labor and the students soon found that archaeology meant work-manual work.

The dirt was taken out in six inch layers and screened by hand before being hauled down the hill in a wheel barrow. But students forgot about the back-breaking part of excavating in expectancy of what the next spadefull will reveal. George Langford was "first finder". Within ten minutes he had unearthed a beautiful flint knife five inches long. In a few minutes some one in Trench II uncovered a large pot shard. Trench IV reported an arrow head, and Trench I a flake of obsidian. This was important for there are no obsidian deposits in the Texas Panhandle, and this piece had doubtless been brought from a point two or three hundred miles to the west in New Mexico.

That afternoon Trench III uncovered a pot shard distinctly different from the typical Panhandle pottery. It was a "black-on-white" and undoubtedly of Pueblo origin. Here was something which might "tie-up" with Pueblo chronology. The next day a find in Trench I completely upset our previous theories about the date of the Panhandle culture. The find consisted of a small pot shard of glaze ware, suspiciously like Rio Grande glaze. If this should turn out to be a piece of Pueblo trade ware, it would mean that our Panhandle Indians were contemporary with a late Pueblo period and that our ruins were a thousand years younger than we first believed.



18



19

## PLATE 9.

No. 18. Typical Canadian River Culture pottery type.

No. 19 Typical Canadian River Culture flint artifacts.

Panhandle weather is variable even in June and July. A part of the time the weather was ideal. A few days were so hot, however, that some of the students got their backs blistered through their shirts. Two days the wind blew from the south filling our eyes, ears, and noses with dust. Frequent storms, mostly at night, threatened to carry our camp away. One evening after supper we heard a roaring to the west. Soon someone discovered the cause. About a mile up the river a head-rise was coming down. A wall of water several feet high was churning, rolling, and foaming down stream. At intervals of a half mile were other rises. In fifteen minutes the Canadian was changed from a quiet stream fifty feet wide to a heaving torrent a quarter of a mile wide. The Panhandle Indians who occupied our ruin centuries before had experienced similar climatic changes and conditions, and we were learning more what their lives must have been like.

After a few days we decided we could accomplish more by getting up at 5:00 o'clock and going immediately to work and having the cooks bring breakfast to the diggings. This enabled us to get a lot of digging done in the cool of early morning.

It took three weeks to get the trenches to the top of the hill. The farther up they extended the thicker the dump heap became. In one place it reached a thickness of twelve feet. Numerous foundations of walls were encountered in the upper parts of the trenches. When we reached the summit we knew where all the cross walls were. Then we started following these walls out and cleaning out the rooms. In all there were thirty-two rooms, irregular in shape and varying in size from four to twenty feet across. This ruin is of peculiar interest in that it, being "stair-stepped" up the side of the hill, gave the appearance when occupied of being an eight story, terraced building of the Pueblo type. The appearance was deceptive, however, for at no place was the house over one story high.

Room 1, located on the southwest corner of the ruin, had only the north wall intact. This wall was approximately three feet thick and two and a half feet high. The room was approximately five feet

wide and nine feet long. It yielded some flint, obsidian, pot shards, and an abundance of bone. Four distinct floor levels were found. Near the center of the room on the bottom level was a hearth with a considerable amount of bone around it. Near the north wall on the fourth level was found a piece of roofing material of light red, puddled clay. In it were indentations of twigs and small poles in the roof.

Room 2 had only one layer of debris. It contained shards, flint, obsidian chips, and bone.

Rooms 3, 4, 5 and 6 contained no debris. The fact that the cross walls between Rooms 13 and 14, 14 and 15, and 15 and 16, stopped abruptly without closing, together with the fact the south walls of Rooms 1 and 2 line with the south walls of Rooms 7, 8, 9, and 10 indicate the south walls of Rooms 3, 4, 5, and 6 existed and were in line with the south walls of Rooms 12, 7, 8, 9, and 10.

Room 7 can hardly be called a room, as it measured only three by three and one-half feet. The walls were intact the north, east, and west ones being one foot thick, and the south wall one and one-half feet thick. Little material was found in it.

Room 8 measured three by eight feet. The walls were all standing to a height of one foot and they were about one and one-half feet thick. Comparatively little material was found in the room. It contained a definite floor level. The floor was composed of a clay base covered with a thin layer of hard-packed, reddish dirt. On this was a deposit of charcoal and ashes.

Room 9 was rather small, measuring two and a half by five feet. The south and east walls were one foot, the west wall, two feet, and the north wall, two and one-half feet thick.

Room 10 was the top-most room in the ruin. The south and east walls were outside walls approximately one and a half feet thick. The north wall was two and one-half feet thick, and the west wall varied from one to two feet in thickness. Aside from a distinct floor level at a depth of eight inches to one foot, the room contained in the southwest corner a cist embedded in the hard sandstone. It

measured twenty inches in diameter and thirteen inches deep and was plastered to a thickness of three-fourths of an inch with red clay. A course of flat stones about the size of ordinary bricks were placed flat-wise around it. On the north side corner of this room was a hearth.

Room 11, directly north of Room 1, was six by seven feet with the walls intact to a height of approximately three feet. The north and east walls were two and a half feet thick. The south wall was curved and measured three feet in thickness. The debris on the west side of the west wall was not entirely removed, and its thickness was not recorded. This room contains four distinct floor levels. The first level, thirty inches from the surface, was made of a layer of red clay one-third of an inch thick.

The second level, six inches above the first, was the best made floor in the ruin. It consisted of a layer of well packed, greyish clay one and a half inches thick covered by a layer of red clay one-half inch thick. The third layer is ten inches higher at the base of a course of slab-stones in the north wall. This was the level used at the time the present slab wall on the north side was built. The fourth level is at the top of the course of slab-stones. The first and second levels extend back under the north wall, indicating that the present walls were built on the site of an older building. Mr. Floyd V. Studer had previously done some excavating in this room.

Rooms 12 and 13 appeared at first to be one large room, but there was considerable evidence that there had been a dividing wall between them. Both rooms are irregular in shape and are approximately ten by twelve feet. The south walls of both rooms were unusually thick, averaging from three to four feet. The north wall of Room 12 and the north and east walls of Room 13 were very heavy, but badly fallen. A definite floor level was found in Room 13. On it was a great amount of charcoal, but no hearth was found.

Room 14, triangular in shape, measured approximately five feet on each side and seven feet at the base. The walls were about one foot high and one and one-half feet thick. The south wall

had fallen or had been destroyed by workers in excavating. The floor of this room had been leveled with packed earth to offset the incline.

The walls of Room 15 were practically destroyed. The room was approximately eight feet north and south, four feet wide on the south end, and three feet wide on the north end. The debris in this room was from eight to twelve inches deep.

Room 16 measured three by five feet. Part of its south wall had been destroyed. The remaining part was one foot wide; the west wall, one and a half feet wide; the north wall three to four feet wide; and the east wall, one to two feet wide. This room contained two floor levels. The first level was made of rocks with clay packed in between to make it level. The second level, three inches higher, was not so distinct, and was indicated by a thin layer of charcoal and ashes.

Room 17, measuring eight by nine feet, was on a steep incline and its floor was considerably higher on one side than on the other. The walls varied in thickness from one to two and a half feet. This room also had two floor levels similar respectively to the levels in Room 16.

Room 18 was four and a half by five feet. All its walls are of about the same thickness, averaging one and a half feet, and are comparatively good shape. The height of the walls varied from one to two feet.

Room 19 was six feet long and varied in width from two to four feet. The south wall was two and a half feet wide and a foot and a half high. The west and north walls varied from one foot to a foot and a half in thickness and were one and a half feet high. The east wall was two and one-half feet thick and two feet high. The debris of this small room was rich in artifacts. A hearth was located in the east end. A definite floor level of red clay covered with charcoal and ashes was found one foot below the surface.

Room 20, one of the large oval rooms, measured sixteen feet in an east and west direction and nine feet in a north and south direction. The walls were of slab-stone construction and two feet wide and

well constructed, varying in height from two to three feet. The floor was inclined to the southeast, being a foot higher on that side.

Room 21, located almost at the center of the ruin, has the shape of an L and may have been two rooms at one time. There was a great mass of stones piled promiscuously throughout the ruin, but as to whether they were in a division wall, we were unable to tell. The longest dimension of the room

was twenty feet with an average width of seven feet. The walls were of irregular thickness and height varying in thickness from two to four feet and in height from one to two and a half feet high. A fire pit a foot wide and several inches deep was found in the southeast corner.

Room 22 was very small and triangular in shape pointing towards the north. It measured six feet north and south and four feet across the base. All the walls were standing to a height of one to two feet, and they varied in thickness from one foot on the east side to two feet on the west side. The floor level, just above the sandstone, was covered with charcoal and ashes.

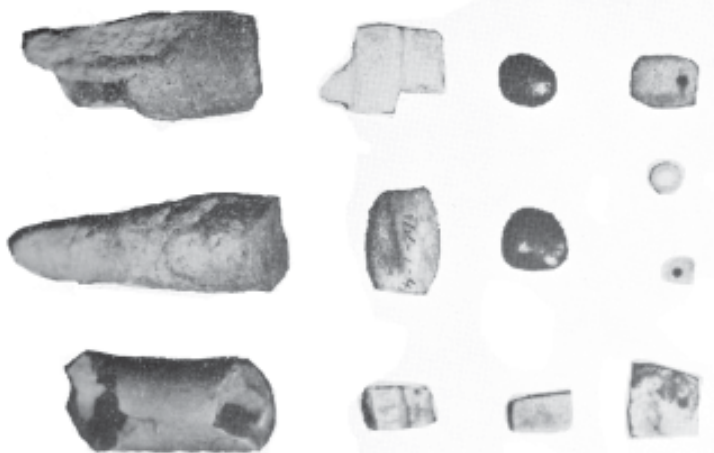
Room 23, rectangular in shape, is eleven feet long and five feet wide. All of the walls were intact to a height of two feet on the east to four feet on the north to four feet on the south. The east wall had a uniform thickness of two feet; the north wall, four feet; and the west and south walls, one foot.

Room 24, located on the east side of the ruin, is also rectangular in shape, measuring sixteen feet north and south and four feet east and west. The east wall was of good horizontal masonry about two and a half feet thick. In height it varied from two to three feet. The south wall was three feet thick and two feet high. The west and north walls were two feet thick and about the same height. A fireplace containing several inches of ashes was in the south end.

Room 25 was perhaps the most interesting room in the ruin. It is on the north side of a sandstone cliff and measures seven by ten feet. The debris is nine feet thick at the cliff and four and a half feet thick at the north wall. The east wall of this room is an interesting study of stratification. There are four distinct floor levels. The first level is on the sandstone. It contains two



20



21

## PLATE 10.

No. 20. Canadian River Culture bone artifacts.

No. 21. Beads and Ornaments from the Panhandle Ruins situated on the Canadian River.

fire pits, one near the east wall twenty-four inches in diameter and another on the west side eight inches in diameter. On this floor level in the southeast corner of the room was the skeleton of a buffalo badly deteriorated. Other floor levels were found at fifteen, thirty-six, and fifty-two inches respectively from the bottom. On the north side is a hearth four feet long and eighteen inches wide built at the time the second floor level was being used. It was made by placing a course of flat stones on edge in such a way that the wall formed the back side. This hearth was filled with ashes to a depth of six inches.

Room 26 was nine feet east and west and five feet north and south. The walls were intact and varied from two to two and a half feet. They were all built of heavy slab-stones set in adobe mortar. The debris was eighteen inches deep on the north side and six inches deep on the south side.

Room 27 measured approximately six by seven feet. All of its walls were intact and made of slab-stones. The north wall was one to two feet thick and three feet high. The east wall was two feet thick and three feet high. The south wall was one and a half feet thick and four feet high, and the west wall was two feet thick and two feet high.

Room 28 is sixteen feet east and west and seven feet north and south. The four walls were standing, the west one three to four feet thick and one foot high, the north one two to three feet thick and one foot high, the east one three feet thick and one foot high, and the south one two feet thick and three feet high. The room contained a definite floor level and a fire pit seventeen inches in diameter and eight inches deep in the northeast corner.

Room 29 measured eight by twelve feet. A part of the north wall was down. The rest of the walls varied from a foot and a half to two feet in thickness and from a foot to two and a half feet in height.

Room 30 is four by thirteen feet. The east, south and west walls were very heavy, varying from two to two and a half feet thick and averaged a foot and a half in height. The north wall varied from one to two feet in thickness and was about two feet high. The room had a well-defined floor level.

Room 31 was irregular in shape and measured nine feet in one direction and twelve feet in the other. Parts of the southeast and northwest walls were destroyed by workers in excavation. The walls corresponded in thickness and height to those of the adjoining rooms. A definite floor level covered with a thin layer of ashes was found two feet below the surface.

Room 32, located in the northeast corner of the ruin, was large. It measured ten feet north and south and seventeen feet east and west. The walls, all intact, averaged one and a half feet thick and two feet high. The floor level was very distinct and was made of several inches of hard packed earth covered with a thin layer of red clay. There were three holes in the floor which may have been cists or fire pits.

Room 33 was of the rounded type, measuring ten feet in one direction and fourteen feet in another direction. The walls were approximately one foot thick and two feet high. There was a hearth or fire pit, fifteen inches in diameter and four inches deep in the center of the room. In the southeast corner was a bench or shelf made of stones. The shelf was approximately one foot high and three feet long. In the south wall of the room was a stone with four grooves in it, probably caused by sharpening bone objects in them. This room may have been a crude kiva, but positive evidence is lacking.

Several of the rooms in this ruin are too small to have been occupied. No doubt these were used for storage purposes. The floors of some were inclined so steeply that their use as rooms would have been most uncomfortable. These likewise were probably used for storage. No doors were found in any of the rooms, and it is probable that entrance into the rooms was through hatch-ways in the roofs.

The masonry in Saddle-Back ruin is of three types, slab-stones, horizontal, and a combination of slab-stone and horizontal. The slab-stone type is made by setting on edge two courses of slabrocks, the courses being two to four feet apart. The space between the courses is filled in with adobe and rubble. On top of the fill-in and offsetting inside



the two rock courses are placed two other rows of slab-stones which are filled in between. In this way the wall is built four or five courses high. The average slab-stone outside wall is from three to four feet thick at the bottom and “pyramids” into a thickness of six inches at the top. The horizontal masonry is usually crude with stones of irregular size placed in thick adobe mortar. The east, outside wall of Saddle-Back ruin, is of horizontal masonry and is of good workmanship, showing that the original Panhandle masons could do good work on occasion. The stones are sized and evenly placed. Often the inside partition walls are composed of a first course of heavy slab-stone upon which crude horizontal masonry is super-imposed.

In regard to the kind of roof that once covered this ruin we have but one small piece of evidence; however, it tells a great deal. In one of the rooms was found a lump of hard, reddish adobe with the indentions of twigs and small poles on one side. A number of finger prints of the woman that puddled the clay are clearly visible. This piece of roofing material is similar to roofing material found more abundantly in other Panhandle ruins. We infer, therefore, that the ruin had a flat roof made by placing brush on poles and then a layer of adobe on top of the brush.

The flint-work of the Panhandle Indians was superb. Their source of material was the Alibates flint mine north of Amarillo. They made small, exquisitely fashioned arrow points which contrast vividly with the larger, cruder points of later Plains Indians. The Panhandle Indians made many double-beveled knives with four edges, shaped something like an aeroplane propeller. These knives varied in length from three to five inches. These people had numerous hide scrapers of Alibates flint varying in size and shape. The dominant type differs from the snub-nose scraper of the Plains Indians in that it is thin and finished with a fine process.

Artifacts of bone are plentiful, the most dominant type being bone awls. These were made mostly from the shin bones of antelope, the leg bones of turkeys, and the rib bones of larger animals. A considerable number of decorated bones with grooves cut cross-wise have been found.

Several stag-horn pressure flakers with which they fashioned their flint were excavated. They made spades from buffalo femurs to use in the cultivation of their own corn patches.

The Panhandle Indians used distinctly Plains methods in their pottery construction. All their pots were made of a grey material and carried textile impressions. In some cases an orange color was gotten as a result of the firing process. In rarer instances a red color was obtained by the use of a red wash. But whether grey, orange, or red, every piece had fabric impressions. The pottery was tempered with quartz and mica, and an analysis shows it to be harder than Pueblo pottery.

In all 4901 shards were found in the ruin. Of these 3034 were grey; 1215 were orange and red, and 652 so blackened by fire that their original color could not be ascertained. Put into percentages, 61.77% of the total were grey, 24.7% orange (and red) and 15.67% black. It is to be remembered, however, that the black shards were originally grey or orange. A stratification study of the shards was made by six inch layers, and it seems that the proportion of grey and orange shards seems to hold about the same throughout the debris. Approximately two dozen shards of intrusive shards from the Southwest were found. Of these we will speak later.

The Panhandle Indians smoked pipes of both soap stones and pottery construction. In both cases, however, pipes were, no doubt, trade articles procured at a considerable distance. These Indians were fastidious about their ornaments. They must have turquoise pendants, necklaces, and inlaid turquoise objects from the Cerrillos mines south of Santa Fe and certain kinds of shell beads from the Pacific Coast. They also made use, however, of objects of decorated bone, rattles made by placing small, polished, black pebbles in terrapin shells, and necklaces of bone beads.

The chief source of food was doubtless buffalo meat. The vast amount of broken bones evenly distributed through the dump heaps indicate that the stone house inhabitants were great meat eaters. In addition to buffalo, they had deer, antelope, bear,

turkey, and small wild game. A rather important secondary source of food was agriculture. On little subirrigated areas along the creeks and the Canadian River they raised corn which they ground on metates and cooked over open fire places.

At the close of the season all of the materials were taken to the Laboratory of Anthropology at Santa Fe, where we studied them in consultation with the Laboratory staff. Director Jesse Nusbaum and Dr. H. P. Mera were extremely interested in our problem, and exceedingly helpful to us in dating our ruin and in identifying pieces of trade ware. The most important thing we did at the Laboratory was to date the Panhandle culture. Among the materials were about two dozen Glaze 1 and Biscuit A pot shards. They differed so distinctly from the dominant type of pottery that they are doubtless fragments of trade ware. Glaze I and Biscuit A were made only by the Pueblo Indians of the Rio Grande drainage. By the tree-ring science, it has been ascertained that these wares were first made about 1350 A. D. Pottery is a fragile thing and ordinarily does not last long when in use. It is highly probable, therefore, that the Panhandle Indians were contemporary with the Glaze 1 period of Pueblo history. In as much as the Panhandle houses were in such a state of ruin by 1540 that the Spaniards passing through the region at that time made no mention of them, it is probable that the houses had been deserted for a considerable length of time. We may deduce, therefore, that the sedentary Panhandle culture flourished in Texas approximately from 1850 to 1450 A. D. This discovery was a great surprise to most of us who have been working in the Panhandle, and it completely upset our previous theories.

Some of us had formerly thought that the Canadian culture was an eastern expansion of an early Pueblo people

shortly after the Christian era. The discovery, however, that they are contemporary with a late Pueblo period puts them in an entirely different light. Their distinctive type of pottery indicates they are non-Pueblo. It is highly probable that they were a people of Plains or Eastern origin. Incidentally, their pottery has a marked resemblance to the prehistoric pottery of Tennessee and North Carolina. They wandered into the Canadian Valley, and found conditions there conducive to sedentary life. The broken country and the fresh water creeks



PLATE 11.

No. 22 Map of Saddleback ruin

of the Canadian Valley made the vicinity ideal for buffalo at all seasons of the year. With a permanent meat supply, the newcomers could settle down. They either brought knowledge of corn culture with them or borrowed it from the Pueblos to the west. With corn to cultivate there was all the more reason why they should stay in one place as they had to constantly guard their corn fields from buffalo, antelope, and deer from the time the corn was planted until it was harvested.

They began to think of permanent homes. A sedentary life is essential to an accumulative culture. Once they settled down, they began to make rapid strides towards civilized life. A brisk trade sprang up with the civilized peoples to the west. Buffalo hides were traded for turquoise and pottery. Among other things the Panhandle Indians were cruder artisans, but they were learning fast during the relatively short period they were here. A ruin with almost 800 rooms within fourteen miles of the B. T. K. ruin indicates the progress they were making.

It is highly probable that the Panhandle Indians borrowed social institutions from the Pueblos. Several hundred people living in a communal house could not have gotten along very well without rather high governmental and economic systems. As community life became more and more complicated it was natural for the people to turn to the existing systems to the west for models. No doubt before they left the Canadian Valley the Panhandle Indians were becoming "Puebloized."

The word "Pueblo" has a cultural significance, as is evidenced by the fact that the Pueblos today are descendants of four distinct linguistic groups. Two adjacent Pueblo peoples may not be able to talk to each other except through the common medium of Spanish.

The question still remains as to what became of the Panhandle Indians. After they evolved such a civilization what caused them to completely disappear? In time we may be able to answer that, but at the present we can only guess. There are two probable causes-drouths and hostile pressure. The cyclic, erratic nature of Texas weather may have caused them to starve out and to start wandering again. With the return to nomadic life they left behind the inventions they had accumulated, and no longer had need of the recently acquired social institutions. On the other hand, pressure from more warlike neighbors may have caused the Panhandle Indians to leave the Canadian Valley. They may have retreated westward and become amalgamated with the Pueblos of the Rio Grande area, or they may have been forced in some other direction, and once out of the region where they could obtain a livelihood in a sedentary manner, they may have lost those traits which had made them distinctive. Years of careful work may be necessary to determine what became of the people, and again we may never know.

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## FLINT: ITS OCCURRENCE, COMPOSITION AND PATINA

BY HENRY E. ELROD

Flint is an amorphous, silicious substance, occurring in the top of the upper series of the "Chalk" in England, and in about the middle of the Lower Cretaceous, in Texas. It dates from Secondary Geologic times, and is thought to be a product of the life cycle of certain silica-secreting organisms, such as sponges, radiolarins, diatoms, etc., some of which (the animal foraminifera) form the "Chalk." These foraminifera secrete silica in the calcareous ooze on the sea floor, where it gathers in nodular concretions and hardens, with the chalk, into what we know as flint. Its composition consists of almost pure silica, having only traces of lime, iron and alumina. Many limestones, also, contain similar silicious matter which, when concentrated as in the chalk, becomes not flint but chert.

Occasionally, flint nodules are found with nuclei of fossil shells, usually *Requienia*. Mr. Albert Nowatny, of New Braunfels, Texas, has a flint nodule the nucleus of which is a complete and practically perfect crinoid head. A specimen of flint recently found in the Frio Canyon has a nucleus of beautiful pectens. Many specimens of English flints have nuclei of *Requienia*, and are "shot" thru with sponge spicules.

Dr. Robert T. Hill, in the Twenty-first Annual Report of the United States Geological Survey, said: "Accompanying these chalks and chalky limestones (referring to the Edward's Limestones) are well defined layers of flint nodules occupying apparently persistent horizons. The flint nodules are flat, oval, cylindrical, or kidney shaped, ranging in size from that of a walnut to about one foot in diameter. Exteriorly they are chalky white, resembling in general character the flint nodules of the English chalk cliffs. Interiorly, they are various shades from light opalescent to black, sometimes showing a banded structure. These flint nodules are beautifully displayed in situ in the Deep Eddy Canyon of the Colorado River above Austin,

where they can be seen occupying three distinct belts in the white, chalky limestones."

Referring further to these flints, Dr. Hill said that, in so far as he knows, these are the only flint horizons in the Cretaceous in the United States, and that it was from these flints that the ancient and modern Indians made their implements. He said, also, that the ease of their lithologic identification will be of value to the anthropologist in tracing the extent of the intercourse and depredations of former Indian tribes inhabiting this region. In other regions of the United States, what implements the Indians made of stone, were made of other material than flint. In the Eastern portion, chalcedony was rather generally used; in the central northwest, agate; in the West, obsidian; in what is now southern Arkansas and Oklahoma, and along the western reaches of the Rio Grande, novaculite. When true, flint implements are found outside of the Texas limestone areas, it is practically certain that flint of which the implement was made was brought from Texas.

Patina, on flint, is the result of chemical and molecular changes on the surface of the flint, due to the decomposition or oxidation of the silica through long exposure to the atmosphere.

The patina of flint, as it occurs in its native matrix, is always white. If the inherent impurities occurred in flint in sufficient quantities to impart color to the patina, then the patina would not always be white as stated, but would sometimes be colored, and the color would vary in intensity in proportion to the quantity and character of the impurities causing the color. It is only after the flint has been freed from its native matrix that its patina acquires color -such color, sometimes, as no inherent impurity of the flint could have caused. Then, too, flints have been found that bore patina of one color on one face, and another color on another face. This would seem to indicate that the color of the patina

was acquired from without, due to either climate, exposure or chemical environment.

Mr. Reginald A. Smith, B. A., F. S. A., Deputy Keeper of the Department of the British and Medieval Antiquities of the British Museum, says "Paleolithic flints-have their edges softened, the surface more or less lustrous, and the original black or brown of the flint discolored. These chemical or molecular changes often produce pleasing color effects known as "patina," an indication of great antiquity and probably of prolonged exposure to the elements. This alteration of the surface is not necessarily due to the contact with the deposit in which the implement is found, otherwise all found in one bed of gravel would be similarly stained. Such is no doubt the case with plateau gravel in Kent, where the ochreous patina is general, but it is clear from such deposits as Warren Hill, Suffolk, that the worked flints had acquired their present varied patinations under different atmospheric conditions before being finally buried in the gravel. On the other hand, worked flints in a chalky soil usually have a white surface-that is to say, decomposition has reached a certain depth, leaving only a black core; and it is possible that contact with chalk accelerates this change in the nature of the stone. A number of implements have been removed from clay and brick-earth with their surfaces unaltered in any way, and it is only their undoubted discovery in certain positions that such specimens can be distinguished from modern productions".

Mr. Smith describes a specimen from Kempson, which he says is remarkable as showing two distinct periods of flaking in paleolithic times. "The crust of the original pebble is seen toward the butt-end, and the surface of the implement, as first chipped, at B; subsequent contact, probably with iron in some form, has stained this surface, which contrasts strongly with the flaking done at some later date; and the extent to which the flint has been thus effected is shown by the different color of a

recent fracture at the tip of the specimen. These and other indications go to prove that the patination was effected before the implement was enclosed in the gravel by long exposure on the surface; the unequal discoloration of the two faces sometimes indicates exactly how the flint lay for an indefinite period, the patination being more thorough on the upper face, though a heavy ferruginous deposit is often concentrated on the lower face".

Flint and its patina are integral masses, and cannot be separated, one from the other, along any definite cleavage plane. A crust of ferruginous deposit, such as is mentioned above, might so be separated.

In a previous paragraph, Mr. Smith is quoted as saying that patina is an indication of "great antiquity". Generally speaking this is true. Patina may not be relied upon, however, as an indication of great antiquity, except when the conditions of previous environment are known. An alkaline soil will hasten patination; much moisture, in the presence of alkali, will produce a thick, soft patina; this patina will harden under long exposure to the atmosphere and sunshine. Flints found in ancient shell heaps are usually much more heavily patinated than flints of the same age found in the same locality, but outside of shell heaps, and the patina will be soft and "limey". Also, it is believed that flints exposed to the action of sea water (brine) acquired patination more readily than do flints in most other environments.

Undoubtedly, the patination of flint is a natural process requiring long periods of time for accomplishment. It is probable that any flint implement that has acquired an observable degree of patination under normal conditions was made by human hands five thousand or more years ago.

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## SANDALS OF THE BIG BEND CULTURE WITH ADDITIONAL NOTES CONCERNING BASKET-MAKER EVIDENCE

BY VICTOR J. SMITH

It is the purpose of the main body of this paper to call attention to the various types of sandals found among the evidences of former Indian occupation in the Big Bend of Texas. It is not assumed, of course, that the list is at all complete or that a revision of the grouping indicated may not be required as further studies develop. It is believed, however, that the descriptions included in the following paragraphs will be helpful to those interested in the problems related to Texas and the Southwest.

The several types of sandals which have come to light in my own investigations have been grouped as follows:

Type I: Two Opposing Warps.

- a. Fish-tail.
- b. Round toe.
- c. Diagonal weave.
- d. Twisted string.
- e. Broad leaf.

Type II: Multiple Warp of more than two.

- a. With sewed reinforcements.
  1. Diagonal overcast reinforcements.
  2. Longitudinal sewed reinforcement.
- b. Six or seven warp.
- c. Checker weave.

Type III: Plaited.

It will be observed, of course, that the basis for the above classification is the warp rather than the materials used in the construction of the sandal.

### *The Fish-tail Sandal (I-a)*

The most numerous type of sandal found in the Big Bend has been the fish-tail type, (P. 13 No. 30). A narrow leaf yucca provides the material for two opposing warps built up into small bundles either held in place at the ends by the nature of the

wickerwork or tied. The general shape of the sandal thus formed is suggested by the name applied. Yucca leaves are woven over and under the warp base in such a way as to form a suitable rest for either foot and also to provide reinforcements for the sole of the sandal as the start and end of each weft element is turned down. Two braiding techniques are noticeable. One type of braiding turns the strand over as each element is turned and the other keeps each element flat. The turning process seems to give a more compact form to the sandals made from coarser leaves. It has been my experience that the fish-tail sandal is more common in the shallow deposits than in the deeper excavations. The exceptions to this rule, however, are frequent enough to make definite conclusions unreliable.

Stratification in the sense of a definite determination of time sequence is yet to be found with respect to the Big Bend culture but it is hoped that the Douglas true ring chronology may eventually be worked out so that sandals and other objects at various levels may be definitely dated. Frank H. Roberts has called attention to certain similarities between the fish-tail sandal and similar weaves in the southwestern area.<sup>1</sup>

### *The Round-Toed Sandal (I-b)*

Sandals with distinct and characteristic roundness of the toe (P 12, No. 25, P. 13, No. 30) are also built upon two opposing warps of single heavy yucca leaves with the ends woven back into the toe as reinforcement. The wickerwork body of smaller leaves is also reinforced by longitudinal elements. The wear resisting qualities of the sole is increased by turning down all ends which appear to have been shredded into a pad.

### *Diagonally Woven Sandals (I-c)*

This type (P. 13, No. 27) is somewhat different in shape and structure from the usual run of two

warp sandals. The weft elements run at an angle and are made from some unidentified soft material which is thinner than the usual yucca leaf.

#### *Fibre String Warp Sandal (I-d)*

For this type, a single specimen, the warp consists of opposing elements of single small two-strand string produced from desert fibres. The shredded fibre wool was assembled in such a way as to produce a soft cushion quite comfortable to the foot but rather unsuited to the type of use required in the rough country surrounding the cave in which it was found. The size is such as to suggest use by a woman and the sole shows little wear. The cord ties range from 3-64" to 3-32" in diameter and the arrangement of ties show quite plainly in an illustration of this sandal contained in the 1932 issue of this Bulletin, Plate 13, No. 32. Edwin F. Coffin reports a similar sandal from the same neighborhood.<sup>2</sup>

#### *Broad Leaf Sandals (I-e)*

This is an adult sandal made from the heavier leaves of the yucca. The flat warp from opposing elements for a rather coarse type of braiding in which the ends of the warp continue as woof elements. Coffin also reports this type as Fig. 10, c, of the report previously referred to.

#### *Multiple Warp with Sewed Reinforcements (II-a-1 and 2)*

Sandals with sewed reinforcements are usually composed of four warp strands (single wide leaves) with similar smaller leaves utilized for weft elements so that a substantial base for the sandal is formed. In addition to the wickerwork base, however, two types of sewed reinforcements have been observed. The first of these we have called Diagonal Overcast (II-a-1) as such diagonal reinforcements are sewed or woven into the base adding thickness and strength to the structure. The reinforcements referred to are difficult to trace without destroying the specimen. Overcast stitches are used, piercing the central portion of the sandal and going around the side. These reinforcements are sewed in a rather hit or miss fashion and are

often diagonal with the braiding of the base elements. (P. 13, No. 27).

The longitudinally reinforced type, on the other hand, are reinforced with sewed elements running with the long axis of the sandal (II-a-2) the base of which is formed as described above. The distinguishing feature of this type lies in the type of reinforcement mentioned which forms practically the entire wearing surface of the sole by the pad thus secured. (P. 12, No. 26)

#### *"Seven Warp" Yucca (II-b)*

I have found this type of sandal only in the larger of the adult sizes. It consists of six or seven warps of medium width yucca leaves with the woof leaves slightly smaller in size and neatly assembled so that because of the regularity of weaving, a checker effect is secured. This type of sandal lacks the thickness and body weight of most of the sandals previously described. They evidently depend upon the compactness of the weave for wearing qualities rather than reinforcements or shredded elements in the sole. The illustration of this larger type (P. 13, No. 28) is somewhat misleading as to width since the particular sandal illustrated represents the only attached "half sole" which has come under my observation. Examination indicates that this sandal has been repaired by means of a second layer of similar weave to the first being fastened to the original structure on the under side. The resulting wear and consequent spread makes an unnatural width for the specimen.

#### *Checker Weave Sandal (II-c)*

This type is also identified by a single specimen which was illustrated in the 1932 issue of this *Bulletin*, Plate 13, No. 30. It is woven in flat checker technique and is quite similar in appearance to the matting found in the area. Unfortunately this sandal was partly burned so that the length and toe shape is not available. Its light weight, however, suggests another form of the "house shoe" type as it is evident that its use would be only temporary in rough mountain country but that it would be quite comfortable on the relatively soft floor of a habitation cave.

*Plaited Sandals (III)*

This type of sandal (P. 13, No. 29), is composed of several strands of yucca fibre braided together so as to form a compact flat pad for the foot, the toe ends being frayed or worn beyond recognition

as to typical toe shape in the several specimens located to date. Plaiting is irregular and the soles, as usual, are reinforced with shredded ends of woven elements.

*Sizes of Sandals*

The smallest sandal found (fish-tail type) was located in a dry shelter after this paper was practically complete, being 2 9-16" long, 1 7-16" wide. The illustration, therefore, of the "smallest" sandal in (P. 13, No. 28) is correct and illustrates the fact which should be kept in mind with respect to all reports from the Big Bend, that accumulating evidence may at any time invalidate the materials of an earlier report. The small sandal illustrated is one of a number of similar objects evidently used by quite small children and showing actual wear on the soles. The largest of the sandals found are 4" x 12 1/4" and 5" by 10 3/4" respectively. Both are classified as six or seven warp (II-b) and the 5" width (P. 13, No. 28) carries size width because of the "half sole" mentioned in a previous paragraph. The sandal 12 3/4" long may have turned up at the heel when used, therefore, it shows an exaggerated length when flattened as found.

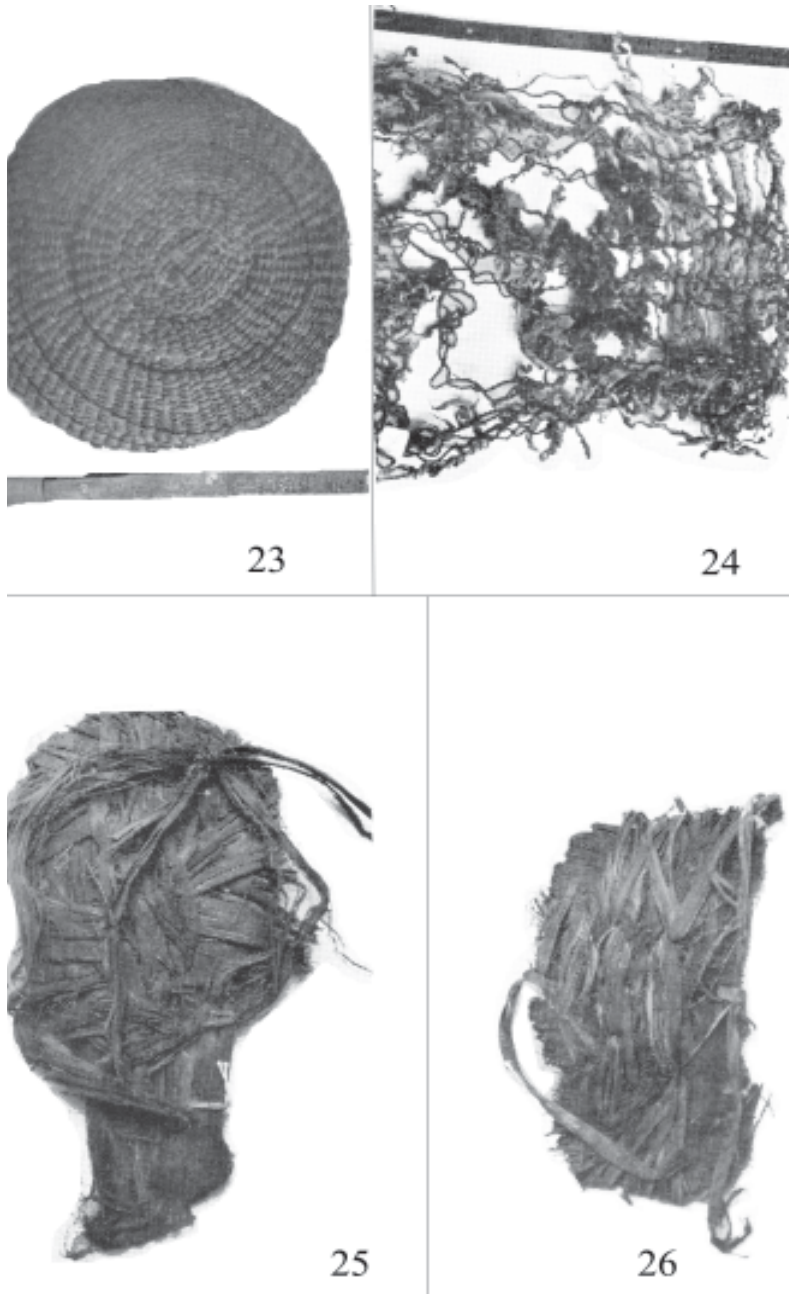


PLATE 12.

No. 23. A twined basket. Decorations are of dyed twisted cord.

No. 24. Fur cloth mat.

No. 25. Round toed sandal of the Big Bend. (I 5).

No. 26. Longitudinal reinforced sewing (II a-2).

*Sandal Tie-Strings*

While most tie-strings are missing or damaged, it appears that the common method of fastening the sandal to the foot is with yucca strings (not twisted) passing between the warp elements. In only type I-d was finished string used and no hair ties whatever have been located to date. The attachment cord generally takes the form of a figure eight at the front, probably passing over the second and third toes, crossing and passing back



to a point a little beyond midway, attaching to the warp and then passing over the foot. Heel ties are found in a number of specimens but tying methods are difficult to trace because of damage. They should receive further study as well as more accurate determination of the desert plants used. I am inclined to think that we often say "yucca" when it may be that several different yucca species such as the Spanish dagger, bear grass, etc., may have been used.

#### *Age of Sandal Types*

Accredited observers to the Big Bend generally agree that many of the artifacts representing the culture are probably of ancient origin and that there are strikingly analogous points of evidence with the Basketmaker of the Southwest. With respect to sandals, however, no distinct relationship can be claimed. Typical twined woven or square toed sandals of the Basketmaker are absent; Roberts found in the El Paso area, however, sandals comparable with those reported by Kidder and Guernsey in Arizona (Am. Eth. No. 65). A number of sandals and other artifacts reported by Roberts are almost identical with those of the Big Bend Culture.

A study of the depths at which the several types of sandals are found may shed some light on the problem of age, at least in a relative way. The following tabulation represents information available in the Museum at Alpine:

Because of the larger number of better preserved specimens and the depth record above, it seems reasonable to conclude that the more recent of the cave dwellers used the fish-tail type of sandal. We have not, however, included four specimens found 3' 4" deep at Bat Cave as the slope at the point found might have accumulated unusual depth because of material dumped from above. It may be further pointed out that the broad leaf and six-warp types represent the deeper culture levels while the limited depth range of the plaited type places it under the bulk of fish-tail specimens. With longitudinally reinforced sandals occupying intermediate levels we may roughly indicate the following age distribution of sandals in dry rock shelters for which records are at hand: fish-tail, plaited, longitudinal, round-toe., broad leaf, and six-warp.

#### *Supplementary Basketmaker Notes*

In Volume IV of this *Bulletin*<sup>3</sup> an attempt was made to show the relationship between the Big Bend Culture and the Basketmaker to the Southwest. More than a year has elapsed since the article referred to was written during which time three dry rock shelters have been completely excavated and a group of three are being excavated at the time of this writing. It is to be expected that such added records, plus correspondence with several scientists interested and experienced in the field under discussion (Setzler, Cosgrove, and

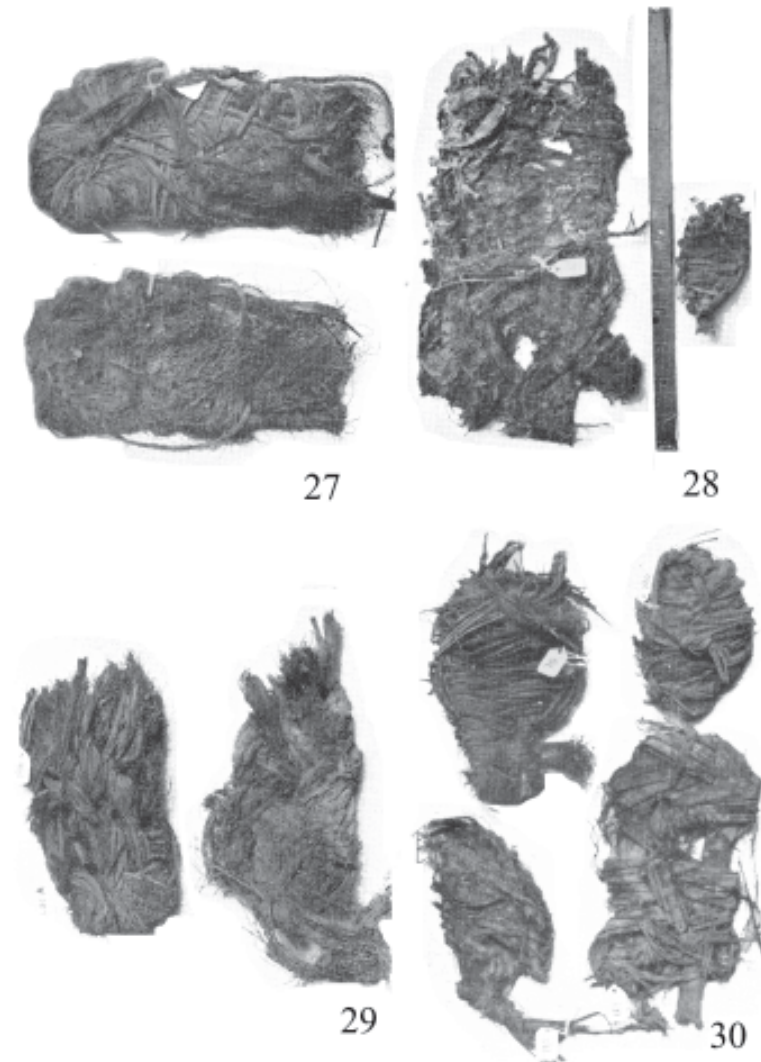
Type	Depth Range	Av. Depth	Remarks:
I-a Fish-tail	1" to 20"	8.0"	Two specimens only exceed 10"
I-b round-toe	6" to 18"	13.6"	These are 19" and 20" deep
I-c diagonal weave*	8" to 23"	10.6"	Two only less than 15" deep
I-d string warp*	8"		One Specimen
I-e broad leaf	18" to 22"	21.0"	
II-a-1 diag. overcast*	6.5" to 30"	16.6"	
II-a-2 longitudinal	13.5" to 18"	15.7"	
II-b six-warp	18" to 23"	21.0"	
II-c checker	18"		One Specimen
III plaited	9" to 10"	9.1"	

\*No deductions can be made for these types until a larger number of recorded specimens are available.

others) should result in some revisions and additions with respect to the materials previously submitted. For example, the statement that the throwing member of the atlatl had not been found no longer hold good as F. M. Setzler, U. S. National Museum, has located and definitely identified that part of the atlatl equipment in Big Bend deposits as reported to the last meeting of the A.A.A.S. Setzler also found bits of twined weaving an atlatl blunt point, and additional rabbit clubs, all of which

strengthen the theory of relationship referred to. My own excavation work during the past year has added two rabbit stick fragments, proof of agriculture (corn), a small but well shaped atlatl fragment (cupped proximal end), and other evidence similar to that included in my previous report. Individuals interested in the atlatl foreshaft described in Volume Four may turn to page 61 and insert a definite length of 4 ½" for the atlatl part described on that page. The proximal end mentioned above has the typical

shallow cup at the end into which the spur of the throwing member would fit. Other Big Bend evidence of similar nature to those mentioned in the several reports by Kifder and Guernsey are: game balls; two and three-strand twisted cord from 1/32" to 1/4" in diameter; three-strand braided cord; bone awls; pendants; use of sinew; a small "duck head" stone suggesting the spear-thrower weight; hammer stones; manos; unmodified metates; fragments of skin bags; the rejected tongue part of a foreshaft;




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PLATE 13

- No. 27. Overcase sewed reinforced type (II a-1).  
 No. 28. Extremes in sandal size. The smaller measures 2 inches by 3 ¼ inches and the larger 5 inches by 11 ¼ inches.  
 No. 29. Plaited Sandals  
 No. 30. Fish tail type sandals of Big Bend from Carved Rock Shelter near Alpine, Texas.
- 

Two more important parallels with Basketmaker culture are worthy of mention. One of these lies in the presence of twined woven materials in both matting and basketry. Two small baskets are woven in this manner. One has some attempt at ornament in that several rings of dyed twisted string are woven into the basket at intervals (P. 12, No. 23). A second parallel culture trait lies in the evidence pointing to the use of fur cloth by the Big Bend Indian. Several sites have yielded bits of string wound with hide which suggest the remains of fur cloth material. Two of the better specimens indicate a strong resemblance to the type of fur cloth made by twisting heavier pieces of hide without the string core. We have previously indicated a lack of loom evidence in the Big Bend. The fur cloth referred to is formed more as a mat with fibre twisted string twined at intervals of from 1 ½ to 2 inches. The

resulting "blanket" was evidently a soft and compact article.

It should be said in conclusion, however, that the Big Bend Culture continues to maintain distinct characteristics of its own. This is evidenced primarily in the sandal types, coiled basketry, (no panniers), and burial customs. Dr. Cyrus N. Ray has previously reported the finding of cremated burials in the Abilene area. This practice was also used in the Big Bend since we have evidence of three burials with bones wrapped in twilled matting mortuary bags, folded once and decorated (two bags) with lines of black and red pigment. The twilling runs diagonally with the bags and is composed of from seven to nine elements to the inch. One of the decorated bags contains the bones of an infant (not cremated). The other two command attention because of the fact that the evident human remains have been cremated and placed in the bag so as to form a neat and compact bundle. The size of the mortuary bags range from 10-1/2" to 16" wide and from 17" to 21" long before folding. Sewing is done with small fiber cord. Readers will recognize that this practice differs radically from Basketmaker burial customs save as to the decoration of bags with colors. Cremation,

of course, was practiced among the Indians of southern Arizona and elsewhere.

As to the cephalic index of the Big Bend Indian, Setzler reported a measurement of 70.3 for one of his specimens. An average of eight skulls recently measured in the Museum at Alpine indicated 70.7, all long headed types. It is probable that the survey now being conducted in Old Mexico by E. B. Sayles will yield valuable contributions to the problems of the Big Bend in Texas.

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2. Roberts, F. H., Recent Archeological Developments in the Vicinity of El Paso, Publication 3009, Smithsonian Institution.
3. Coffin, Edwin F., Archaeological Exploration of a Rock Shelter in Brewster County, Texas, *Indian Notes*, No. 48, Heye Foundation

## A METATE FACTORY IN NEW MEXICO

BY EILEEN E. ALVES

It is a lonely country—that land lying west of Mt. Riley, and just north of the Mexican border. Black shadows lie across it like shadows cast by great clouds. But the sky is cloudless, and the shadows are flows of lava from some of the long dead craters that are in the nearby ranges of hills. Great drifts of yellow sand are encroaching on the lava, Sunshine, sand and lava, mesquite, creosote and yucca, all make a fierce hot beauty in a lonely land.

The ranches lie very far apart on the American side of the border, and on the Mexican side to the south a waterless desert makes travel almost impossible for man or beast, still more impossible for the needs of home and family.

But at one time this was not so. There seem to have been many settlements in this drainage country of Mt. Riley and the Potrillo Mountains. Pottery sherds of many different cultures, beads arrow points, turquoise pendants, carved frogs, and copper bells have been found here and in sufficient quantities to prove that many people must have lived and hunted on the plains and nearby hills. The question of the water supply must have been as acute then as now. Today, the rancher scans the sky and questions the gathering clouds the answer means life or death to his valuable white faced herd. Perhaps the same answer to men of a different period meant finally the deserted home, and the wandering of the tribe to some kinder land where living conditions were not so difficult. The mystery of water may hide the mystery of the deserted village more often than disease or lurking foe.

In a saddle of land lying between two low hills, there is a collection of metates,

manos, mortars, a collection like nothing we have seen before. These stone objects lie on the surface,

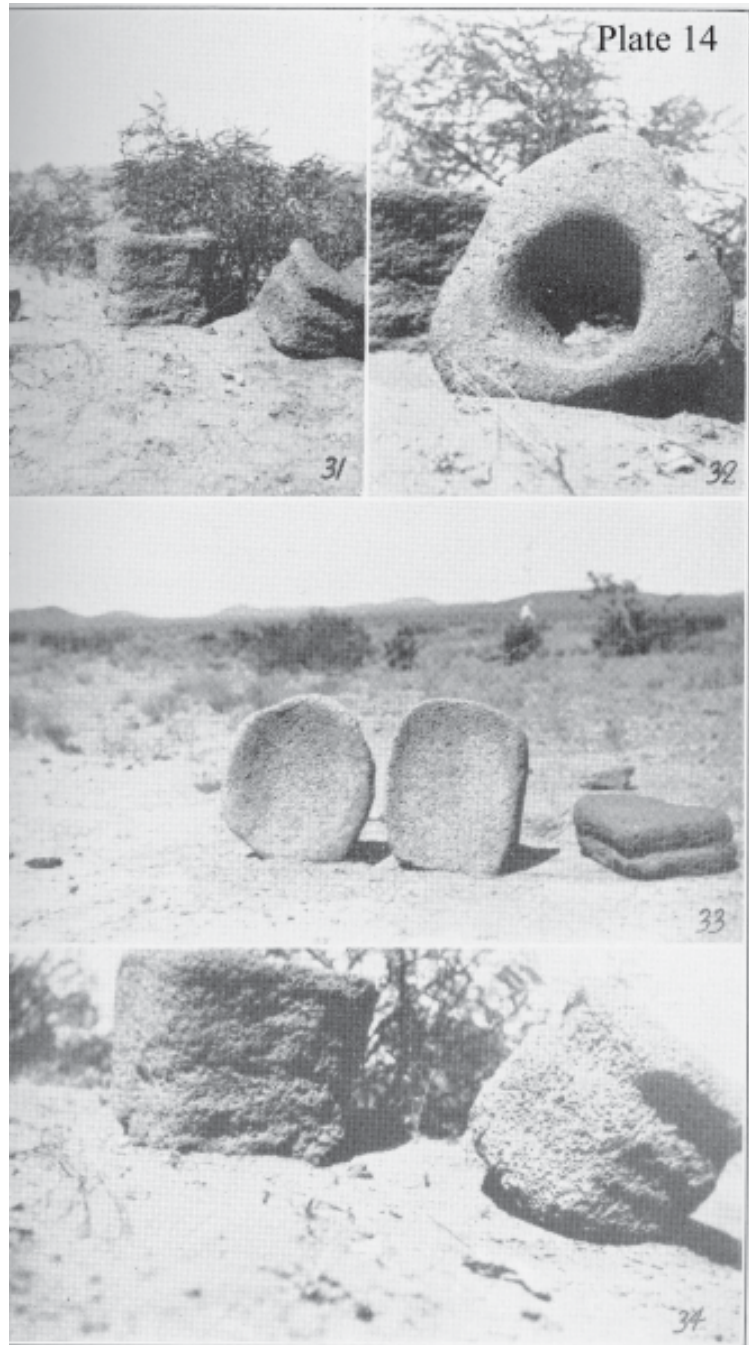


PLATE 14

Nos. 31, 32, 38 and 34 show different types found in a New Mexican Metate factory.

or half buried in the sand, and no one knows how many are completely covered from sight. From their number, so many more than would be needed in so small a village, and from the unworn condition of the stones it would seem as if they were made here perhaps for distribution to the many settlements in the general vicinity. Can this possibly be a metate factory? There is evidence in favor of such a conclusion. On the hill north of the saddle of land containing the metates there is a lava flow on the top, that in falling over the side, cooled and split in great blocks of a convenient size and shape, the slope of the hill making an easy path for the heavy blocks to travel from the source of supply to the workers in the camp below, while a lake bed, now long dry, may at that time have provided them with water if needed in the grinding.

Right below the lava supply there are groups of finished and unfinished stone artifacts, stone blocks and fragments of broken stone. In a distance of one hundred and seventy feet there are seven such groups, and in each group from five to seven pieces of worked stone. Scattered about are the evidences of the workers in sherds and beads.

There are large and small metates and mortars such as are usually found in this part of the country. In addition are large mortars standing about two feet high, and different in both size and shape. Two large blocks in the shape of manos are over fourteen inches long and more than six inches in both width and depth.

The metates we generally find show signs of decided wear, some worn thin others entirely broken through, but not so these. They are as if ready for use, shaped and the holes well formed, but otherwise unworn.

Another curious thing is the deep groove around some of them. Perhaps it is the private mark of some individual worker. This groove shows plainly on one of the high mortars, also round a block of stone not otherwise worked, and on one of the large mano like stones. This last has split right on the line of the grooving.

In the Sauer-Brand report "Pre-historic Settlements of Sonora" University of California Publication-1931, there is mention made on page 89 of a place called "Mesa de los Metates" on a hill south of Nogales, Mexico. The report says, as well as entire metates, there were found a great number worn and broken by constant use, and all must have been transported there from some earlier habitation. To the contrary on this hill of the metates in New Mexico, the source of supply of the material, the work shop, the finished product and the points of distribution are all in convenient distance of each other.

Mr. Donald D. Brand also brought from the Chihuahua country two large lava blocks similar in material, though slightly smaller, to the two found here. This may indicate the same Mexican influences as already shown by the Chihuahua pottery sherds and the copper bells. But the peculiar grooving and the same lava material would prove that the blocks were made here, even if the pottery and bells came from the south.

Many of the villages as well as this place of the metates are on the well known ranch of Mr. Ed P. Cox and he is doing his best to save them from the onslaught of pot hunters and other vandals. With the exception of some that were carried away by a gang of Mexican laborers for use in their camp on the railroad, the metates and mortars lie as left by the hands of the long dead Indian workers. So far, this page of New Mexican prehistory is almost intact, but this state of Utopia can not last long. Some way will be found to carry these unique artifacts away and scatter them all over the country, making worthless parts of what is now a perfect whole.

But at present they lie under the blazing New Mexican sun, just as they did many hundreds of years ago. The lake bed below is dry and filled with silt, but otherwise I doubt if there has been much change, since they were made.

1120 Arizona Street  
El Paso, Texas

## INDIAN PIPES OF EAST TEXAS

By A. T. JACKSON

The aboriginal inhabitants of the timbered region of East Texas made pipes of earthenware and stone. The pipes are found in burials and midden deposits in the ancient village sites along the streams. While not numerous, they are in sufficient numbers, and distributed over such a wide area, as to represent a cultural trait of the region.

The material in this article is gleaned from my field notes covering three seasons' work; and from a careful study of 81 pipes in the collection of the Anthropology Department of the University of Texas. The three seasons—1930 to 1932 inclusive—embraced approximately 20 months of intensive field work. Returns for 1933 are not included.

A large strip of East Texas, extending from Sabine County to Jefferson County, has not been explored by the University of Texas at the time of this writing (March, 1933.) Hence no data are available for that region.

Sixty per cent of the pipes were in graves, where they were buried along with other mortuary offerings. On an average, one grave in ten contained a pipe. Thirty-five per cent were imbedded in kitchen midden deposits. The remaining five per cent came from the surface of camp sites. Most of those accompanying burials were whole. Many of the pipes in midden deposits and on the surface were broken.

### *Scarcity of Stone Pipes.*

Only five stone pipes have been secured from this region. Four came from along Red River, in Lamar and Bowie counties; the other from near Sulphur River, Morris County. Twenty percent of the pipes from Red River are of stone; six percent of those from Sulphur River; and none from the Sabine and Neches

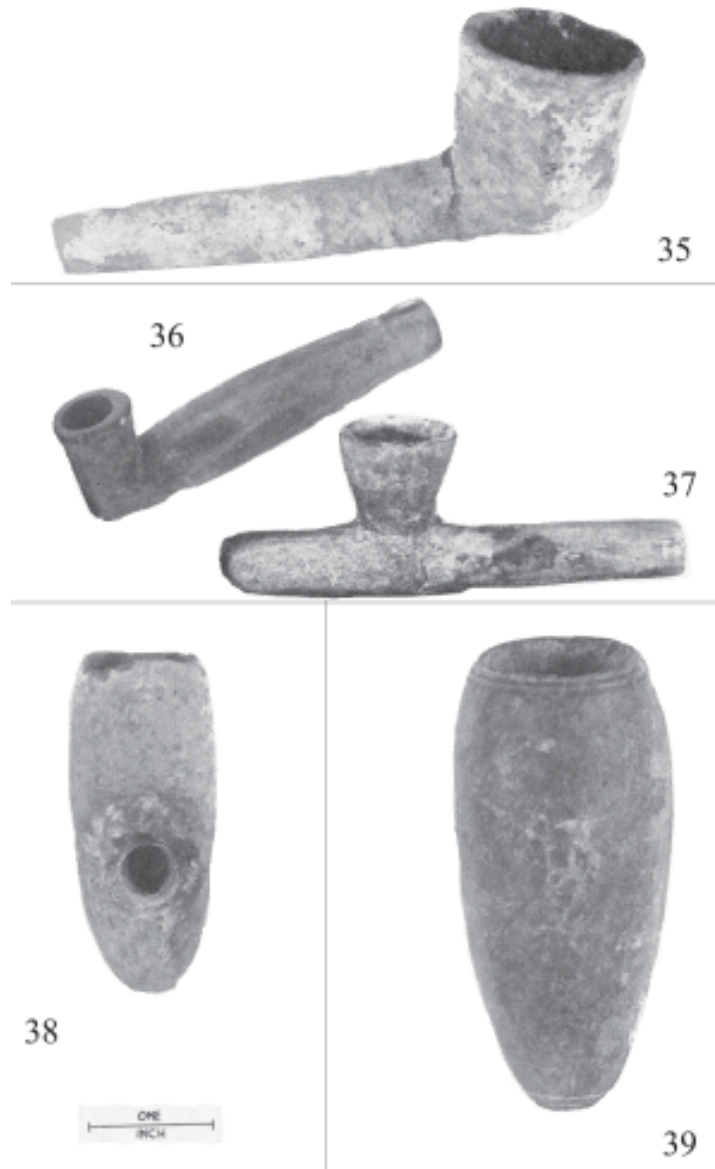


PLATE 15.

- No. 35. Long stemmed clay pipe from burial, T. M. Sanders farm, Lamar County.
- No. 36. Small stone pipe with long stem, from a burial on T. M. Sanders farm, Lamar County.
- No. 37. Long stemmed earthenware pipe, unusual in East Texas from J. C. McGinnis farm, Wood County.
- No. 38. Earthenware pipe of stemless type, Andrew Peurifay, Cass County.
- No. 39. Stone tubular pipe, Mitchell place, Bowie County.

River areas. In this connection, it is interesting to note that more polished stone celts are found in the Sabine River area than elsewhere.

#### *Pipes With Flat Bases*

A flat bottom—that enables the pipe to remain upright when laid on any surface—is a feature appearing among some specimens from several different types. The percentage of stems with flat bottoms is greater among pipes of the conical-bowl type than others. An average of one pipe in six has either a flat-bottomed stem or flat bowl-base. Occasionally the bottom of a stem is flat only a portion of its length; another may be flat the entire length. There are several variants of flat-bottomed pipe bowls. One is in the form of a round bottom; another has a semi-circular knob at the base of the bowl.

#### *Distribution by River Basins*

Different types of pipes are present in the various subculture areas. The same is true of earthenware vessels in general. The subculture areas follow the principal river valleys. The region is thus divided into four areas: the Red, Sulphur, Sabine and Neches river valleys.

The number of pipes from the respective areas do not vary widely. The greatest difference is between the Sulphur and Sabine River subcultures. The distribution of pipes is a fairly accurate index to the numbers of earthenware vessels secured from these areas. The Sabine River Valley holds first place in each case.

The following tabulation shows the types of pipes and the numbers of each in the respective areas. The type names are applied because of certain distinctive features. The classification is tentative and no doubt will be revised as additional specimens are secured for study and comparison.

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#### *Distribution of Types of Pipes by River Basins.*

Type	Number Specimens by Areas				Total
	Red	Sulphur	Sabine	Neches	
Conical bowl	-	1	-	14	15
Elbow (large)	3	4	2	-	9
Elbow (small)	-	1	3	-	4
Curved stem	-	4	4	-	8
Long-stemmed	5	-	1	-	6
Pointed-end stem	2	-	3	-	5
V-shaped	1	-	-	4	5
Effigy	-	1	3	1	5
Thong-hole	1	-	2	1	4
Handle	1	1	2	-	4
Semi-platform	-	1	2	-	3
Tubular	2	-	-	1	3
Diminutive	3	-	-	-	3
Short-stemmed	-	-	2	-	2
Stemless	-	2	-	-	2
Semi-tubular	1	1	-	-	2
Triangular bowl	1	-	-	-	1
Totals	20	16	24	21	81

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*Sizes of Bowl and Stem Openings*

The tendency in East Texas Pipes seems to be toward a certain uniformity in the relative sizes of bowl and stem openings. The facts are presented as follows:

<i>Relative Sizes of Bowl and Stem Openings by Types.</i>		
Type of Pipe	Average Inside Diameter-Inch	
	Bowl	Stem
Conical bowl	1.51	.53
Elbow (large)	1.58	.63
Elbow (small)	.69	.59
Curved stem1	.08	.52
Long-stemmed	.82	.29
Pointed-end stem	1.13	.51
V-shaped	.78	.46
Effigy	.86	.51
Thong-hole	.97	.50
Handle	1.22	.56
Semi-platform	1.08	.69
Tubular	.69	.48
Diminutive	.67	.27
Short-stemmed	.72	.47
Stemless	.63	.34
Semi-tubular	.91	.44
Triangular bowl	.75	.25

*Pipe With Two Handles*

A highly interesting variant of the conical-bowl type of pipe came from the DeRossett farm, 3½ miles northeast of Frankston, Henderson County. The specimen, made of red clay, is 3 1-8 inches long, 1 3-4 inches high, with a bowl diameter of 2 inches; stem diameter outside, 7-8 inch, inside 1-2 inch. It bears several unusual features. The outstanding one is the presence, near the rim of the bowl; of what appears to be the remains of two small handles. They are located on opposite sides of the bowl. The points of breakage: shows them to have been 1-4 inch in diameter and about 1-2 inch in length.

This is not the only pipe with two handles. One from a mound on the coast of Georgia bore two handles immediately beneath the flaring rim of its bowl.<sup>1</sup>

Another interesting feature of the double-handle Texas pipe is the remains of double thong-holes at the base of the bowl. It is the only conical-bowl pipe bearing thong-holes. Aside from these two variations, the specimen is typical-in size, shape and decoration of the conical-bowl type of that region. The pipe might be classed in either three distinct types-handle, thong-hole or conical-bowl. It is included in the latter type.

*Thong-Hole Pipes.*

Of particular interest are the pipes bearing small holes that appear to have been for attaching strings. In two cases the edges of the holes seem to show some wear; but holes in the other specimens reveal no evidence of use. All the thong-holes but one are located at the bases of the bowls. The exception is that of a stone pipe, with the thong-hole in a knob on top of the stem at the outer end. The holes vary in diameter from 1-16 to 3-16 inch.

In writing about a stone pipe from Sterling, Conn., McGuire<sup>2</sup> says: "There is a hole bored through the base of this specimen from side to side, evidently intended to receive a string, which would be attached to the stem. It appears to the writer that pipes with holes for attaching bowl and stem, or for whatever purpose the hole was intended, are much more common in the North than in the South, which may be because of the greater liability to loss in the snow than in the grass or among leaves."

*Effigy Pipes.*

Real effigy pipes are rarely encountered in East Texas. The pipes placed in this class possess some unusual shapes or appendages that suggest the likeness of a horned owl, a bird's outspread wings, a moccasin and a few highly conventionalized creatures. Unfortunately, less than half the bowl of an interesting effigy pipe was recovered from a midden deposit on the Neches River in Anderson County. It is not included in the number of pipes.





PLATE 16.

- No.40. Earthenware pipe of handle type, from a burial on J. M. Riley farm, Upshur County.
- No. 41. Diminutive stone pipe from a burial, T. M. Sanders farm, Lamar County.
- No. 42. Small earthenware pipe of the handle type, painted red. From J. H. Reese farm, Wood County.
- No. 48. Huge earthenware pipe weighing 6½ ounces from Mrs., H. L. Culpepper farm, Hopkins County.
- No. 44. V-shaped or angular earthenware pipe, from A. C. Sanders farm, Anderson County.

The fragment is the back portion of the bowl, apparently representing the rounded beak of some, bird. Enough of the specimen remains to indicate that the bowl opening represented the mouth of the duck-like fowl. The back of the bowl bears two vertical rows of incised triangles.

A very unusual pipe-from Harrison County-is the effigy of a bird with wings spread, as if in flight. One wing seems to have been missing when deposited in the grave. It has been reconstructed.

#### *Separate Stems*

Practically all the pipes, except a few of the long-stemmed type, seem to have been for use with separate stems. But no auxiliary stems have been found in place in any of the pipes. This would seem to suggest that they were of wood, reed or other perishable material.

What may have been a fowl bone stem was found in a midden deposit with a fragment of a clay pipe nearby. The bone was four inches long, 1-4 inch diameter, cut at each end and well polished. It came from a small earth mound on the Earl Jones farm, four miles northeast of Quitman, Wood County. There is a possibility that it may have been a long bead, or other artifact, instead of a pipe stem.

No evidence has been found to indicate the use of gum or resin for holding in place the separate stems.

#### *Decoration on Pipes*

Sixty-nine per cent of the pipes are decorated in some form. Forty-four of them are incised, 10 have raised lines or ridges, and two bear an excess amount of shell tempering. Twenty-five are undecorated. Of those incised, 10 are decorated on the bowl; 17 on the stem; and 17 on both bowl and stem.

Shetrone,<sup>3</sup> writing of pipes from mounds in Ohio, says: "Tobacco pipes, in common with most artifacts of the Mound-Builders, present both utility and aesthetic aspects. The aesthetic interest, however, both artistic and ceremonial, greatly exceeds the utility."

The class of pipes most ornately decorated is the conical-bowl type. Of the 15 pipes of that type, all but one are decorated. The distribution of the decoration is as follows: On stem, 9; bowl, 3; stem and bowl, 2.

The decoration of most pipes from the Neches River area is decidedly different from that appearing on those from the Sabine, Sulphur and Red River areas. The distinctive designs in the Neches area are punctate and incised lines-found separately and together. Two specimens are decorated with incised triangles -seeming to form sun symbols, similar to those on certain earthenware vessels.

The two most frequently recurring forms of incised decoration on pipes from the Sabine River area are triangles and so-called "ladder" designs. Next in frequency is the combed or scratched surface. The triangular designs are strikingly like those from Red River and Neches areas. The ladder designs, consisting of parallel lines with connecting lines or "rungs," resemble designs on some earthenware vessels.

Very few pipes from the Sulphur River area are decorated. No one form of decoration seems to predominate. There is one specimen bearing incised triangles and another with a ladder design. The triangular pattern is about the same as those from the other three areas.

The percentage of decorated pipes from Red River is smaller than from the Sabine area. There is no outstanding form of decoration on pipes from Red River. The incised lines include cross-hatch, crude concentric circle and triangles. One specimen bears a punctate design slightly resembling those from the Neches area. The triangular designs are identical with those on bowls from the same site.

Coloring matter is present on three pipes-one each from Lee Ellis, J. H. Reese and L. E. Gait

farms, the former in the Neches and the others from Sabine area. In the first specimen the incised lines and gouged depressions are filled with white pigment. The effect is pleasing to the eye. The second also has white pigment in its lines; but bears less incised work and correspondingly smaller quantity of paint.

The third specimen, of the handle type and bearing a red slip, is one of the most unusual pipes in the collection. The entire outer surface is covered with the "slip" or paint. After applying the slip, triangular designs were carved through-thus causing them to stand out by contrast. Four triangles, attached to a band-line, form a semi-circle around the end of the stem; and three triangles similarly arranged, are on each side of the bowl.

An added type of decoration, very unusual in East Texas, is found on this specimen. Carved through the slip on the upper part of the handle, facing the smoker, is a curiously formed head. The eyes and mouth pierce the paint, and present a grotesque appearance. The head is strikingly like those on a redware tripod-bottle from T. M. Sanders; and the banded triangles like those on a broker pipe from H. E. Womack farm, both along Red River, Lamar County.

A rare form of decoration-for such it appears to be-is by means of an excessive amount of crushed shell tempering material. A large pipe of the elbow type from the T. M Sanders farm, Lamar County, is so heavily tempered with small flakes of shell as to present countless white specks on the surface. This type of decoration was occasionally employed in bowls and other small vessels.

Due to smaller surfaces involved, decorations on the pipes are necessarily less extensive and complicated than some of those on bottles bowls and jars. But the motivation frequently seems to be the same. Several of the pipe designs are identical with those adorning certain vessels.

#### *Conditions Under Which Pipes Found*

To give a general idea of field conditions as applied to pipes a few finds in each region are discussed in detail.

*Neches River Area*

A clay pipe with a conical bowl, typical of the region, was in what appeared to be a child's grave on Pierce Freeman farm, 8 miles south of Frankston, Anderson County. The skeletal material, at a depth of 17 inches, was almost completely disintegrated, there remaining only a fragment of a small femur and a trace of skull. The pipe rested against a tiny pot and seems originally to have been on the chest. This is an unusual find in that a pipe rarely accompanies the remains of a child.

The pipe bowl bears no decoration. The stem is decorated with four deeply incised lines encircling it at the end; three punctuated lines on each side, running horizontally, each consisting of six small gouged depressions or dots; and three incised lines passing around the rear end, connecting the punctate lines on the sides.

In addition to the pipe, there were four pots, two bowls and two jars accompanying the burial. No arrowpoints or other stone artifacts.

Another pipe with conical bowl accompanied a burial, at a depth of 27 inches, on J. M. Cook farm, 1 1-2, miles south of Frankston, Anderson County. It was the grave of an adult male. The body was on its back extended, the skeletal material badly disintegrated. Quoting from my field notes: "The pipe occupied a somewhat unusual position, being between the legs, very close to the knees, and 41 inches from the skull. Length of pipe, 3 inches; height, 1 3-4 inches; diameter of bowl at top, 1 3-4 inches. Stem decorated with three rows of impressed dots."

The grave also contained 5 vessels, 2 flint knives, and 31 chert arrowpoints. The latter were distributed as follows: One on each side of the skull, with points down; 17 beneath the right knee, all pointing toward the west; 12 inside the pipe bowl, some with points down and others on top crosswise. The arrow points in the pipe bowl ranged from 5/8 to 1 1/4 inch in length and 3/8 to 11/16 inch in extreme width; one was triangular, the others had short tang and barbs. This is the only case so far found by us where arrowpoints were in a pipe.

On November 11, 1931, a grave showing European contact was exhumed on Mrs. Emma Owens farm, 2 miles southeast of Frankston, Anderson County. The grave depth ranged from 18 inches at the feet to 32 1/2 inches at the head. Accompanying the burial were an earthenware pipe, small pot, flint awl, red paint, mussel shell, potsherd and a badly rusted metal knife blade. The pipe was just outside the left humerus slightly above the elbow. It had a conical bowl and save for a shorter stem-was much the same as the pipes found in prehistoric graves in the vicinity. There was much carbon inside the stem. Well made, but crudely decorated, on bowl and stem, with deeply incised lines. This is the only pipe found, to date, by us in a grave containing evidence of contact with white men.

Two mounds very close together on A. C. Saunders farm, 2 1/2 miles east of Frankston, 1 mile west of Neches River, Anderson County, were trenched in October, 1931. The smaller one, about 50 feet in diameter and 31 inches high, is an accumulation of midden material. It contains countless animal and fowl bones, fresh water mussel shells, deer antler, and potsherds, intermixed with earth and ashes. "One of the unusual features of the midden." read my notes, "is the presence of numbers of broken pipes. Most of these are decorated with deeply impressed dots, usually in rows, that give an artistic appearance. There is also a tendency to have either two or three deeply incised or trailed lines running around the stem end, and sometimes the bowl end, of the pipe. The bowls are little larger than the stems; and are unlike the flaring-mouth or conical-bowl pipes from the Lee Ellis and Pierce Freeman farms, less than 10 miles away."

No other site explored by the University of Texas has yielded so many fragmentary pipes. A midden mound on L. L. Winterbauer's farm, 1 1/2 miles west of Quitman, Wood County, was completely excavated in July, 1930. It was about the same size as the midden mound on A. C. Saunders farm; and in many respects was remarkably similar in contents. But there was one notable difference. The Winterbauer mound yielded only one broken pipe.



PLATE 17.

- No. 45. Earthenware pipe in grave that showed European contact. Mrs. Emma Owens farm, Anderson County.
- No. 46. Clay pipe of the pointed stem type, from J. H. Reese farm, Wood County.
- No. 47. Conical bowl pipe of earthenware, showing evidence of handles near rim and remains of double thong holes at base of bowl De Rossett farm, Henderson County.
- No. 48. Thong hole pipe of earthenware, with white paint in inclosed lines. From a burial on J. A. Galt farm, Franklin County.
- No. 49. Earthenware pipe of the elbow type. From T U. Shirey farm, Wood County

A trench in the larger mound on the A. C. Saunders farm revealed no burials, no fragments of pipes and less than a dozen pot-sherds and fragments of animal bones. The mound was built on a natural knoll about 2 feet high. Just above that was a deposit, 3½ feet deep at the center and gradually decreasing in thickness toward the edge, of hard-packed ashes. Above the ash was a layer of some 18 inches of sandy loam. The diameter of the mound was 125 feet.

In describing the habits and customs of the Asinai, or Tejas, Indians, Fray Juan Agustin DeMorfi, in a report written in 1778, states that they “offer their adoration to fire. For this they have a house or temple where they perpetually keep a fire. In front of the bed in the fire temple.” Father DeMorfi continues, “there is located a little square stool. On this stool it was customary to have tobacco, pipe and some feathers; little pots of clay, which seemed to serve as incense burners, where they burned tobacco and grease.” “They exercise great care in taking out of the temple the ashes of the sacred fire which they keep to make large mounds.”<sup>4</sup>

#### *Sabine River Area*

A pipe of the handle type accompanied a burial on J. M. Riley farm, 7 miles east of Lafayette, Upshur County. The pipe rested immediately back (east) of the skull. In the grave were also 13 vessels, 1 polished stone celt and 22 small triangular arrowpoints. The handle, about two inches in length, tapers gradually as it rises crescent-like from the base of the bowl and connects again to the rim. It is an upturned extension of the stem.

Another burial at the Riley site contained a curved-stem pipe that appeared to be a modification of the handle type-or perhaps the form from which the handle pipe developed. This pipe lay with 13 arrowpoints nearby, at the right foot. The grave also contained 15 vessels, 10 additional arrowpoints, 4 celts, 2 flint knives and 1 flint scraper.

At the H. R. Taylor farm, 5 miles northwest of Harleton, Harrison County-where a crew of 7 men worked for 5 weeks in the summer of 1931, only four pipes were found in the 64 burials uncovered. Oddly enough, 3 of them came from one grave. The 3 pipes, together with several small vessels, were in a row just to the northeast of the skull. Two were of the curved-stem type. The other was of the pointed-end-stem type. While the average for the cemetery was 8 vessels per grave, there were in this one 26 vessels, 23 arrowpoints, 9 used lumps of paint, 5 smooth pebbles and the 3 pipes.

A long-stemmed earthenware pipe, with parts of stem and bowl missing, came from the surface of a small earth mound on J. C. McGinnis farm, 5 miles south of Yantis, Wood County. This type of pipe, with the stem projecting beyond the bowl, is rarely encountered in East Texas. It is the same type as found by Harrington<sup>5</sup> at Mineral Springs and Washington sites in Arkansas. The Texas specimen, in its present condition, measures 3 13/16 inches in length.

The most massive pipe in the collection came from a burial on Mrs. H. L. Culpepper farm, 5 miles south of Saltillo, Hopkins County. It weighs 6 1/2 ounces, is 3 7/16 inches long, 2 inches high, has a bowl diameter of 2 1/2 inches and stem diameter of 1 1/2 inches. The thickness of the walls ranges from 1/8 to 1/2 inch. It bears incised designs including triangles connected by band lines.

#### *Sulphur River Area.*

On R. L. Cason farm, 8 miles northwest of Daingerfield, Morris County, accompanying a burial, at a depth of 38 inches, was a pipe of the curved-stem type. It was two feet back (east) of the skull and 4 inches deeper than the balance of the grave floor. Among the 10 vessels with the burial

was a huge cooking pot-about 5-gallon capacity-in almost perfect condition. Also 2 polished stone celts and 31 sharp-pointed, triangular arrowpoints.

With a burial, at a depth of 30 inches, on Joe Justiss farm, 6 miles north of Cason, Morris County, were two large, crude earthenware pipes of the elbow type. One was immediately southeast of the fragmentary skull; the other between the legs just above the knees. Other mortuary offerings in the grave included 9 vessels, 1 polished stone Celt and 6 arrowpoints. The burial was in red clay-instead of the usual sandy soil-with the skeletal material badly disintegrated.

A cemetery on Clements Brothers farm, excavated June 16 to July 9, 1932, is located 2 1/2 miles west of Atlanta, Cass County. The two pipes secured came from graves previously dug into by "pot-hunters." At the east end of one burial, from which we obtained a perfect pipe, a pot-hunter had sunk a hole 22 inches deep; the west end he dug to a depth of 51 inches-looking for "buried treasure." The badly mixed skeletal material, together with many potsherds, had been thrown back by him in filling the hole. He no doubt cast back the pipe and 5 conch shell beads along with the dirt. Had it not been for his carelessness and haphazard methods, our work in that grave would have been in vain. As it was, we got nothing but the specimens-valuable information having been destroyed by one who had no interest in science.

The pipe is of the conical-bowl type; yet it is a distinct variant from those in the Neches River area. Another earthenware pipe, unusual in that it is of the semi-tubular type, also came from a disturbed grave at this site.

A crude, massive clay pipe of the elbow type came from a burial at a depth of 19 inches, in a cemetery on Goode Hunt (negro) farm, 8 miles west of Atlanta, Cass County. It rested at the right shoulder, with its bowl opening toward the chin and the stem pointing outward. A bottle was between the legs, immediately below the knees. The point of a spearhead was near the right foot.

*Red River Area.*

Eight earthenware and two stone pipes were found in a burial mound on T. M. Sanders farm, located on Bois d' Are Creek 1/2 mile from its junction with Red River, 1 mile west of Direct, Lamar County. We worked at the site from July 23 to August 28, 1931 and uncovered 21 graves containing 60 skeletons, many of which were in an excellent state of preservation. In one burial was a stone pipe with an unusually small bowl and a long stem. It was only 8 inches below the surface and 7 inches above the right shoulder. The bowl was 1 inch high and 5-8 inch in diameter; the stem 3 1/4 inches long and 7/16 inch in diameter. On top of the stem was carved an "X" or cross; and on the edge of the bowl were 10 tiny notches. The pipe was made from a fine grained sandstone and bears a polish.

In another burial, at a depth of 27 inches, located 30 inches east (back) of the skull and with the stem to the east, was an earthenware pipe. It was well polished; no decoration. Other artifacts in the grave included a large broken bottle; a gorget, carved from conch shell in the form of an equal-armed cross enclosed in a circle: a tiny arrowpoint; broken shell pendant; and 668 shell beads around and over the skull, around the wrist and legs and loose in the soil.

From the surface of an extensive campsite and cemetery at H. E. Womack farm, 1 mile west of Garrett Bluff, on Red River, Lamar County, came a pipe of Catlinite or red pipestone. The type is strikingly like Siouan pipes.<sup>6</sup> On top of the stem, at the end, is a knob bearing 3 notches and a thong-hole.

Glass beads, metal spearhead, flint for a flint-lock rifle, lead balls and other articles of European manufacture were found on the surface in association with the Catlinite pipe. A burial nearby contained glass beads and Indian pots, but no pipe.

It seems probable that the Catlinite pipe reached Red River through trade. In this connection Moorehead says:<sup>7</sup> "Pipes, from their very nature, were probably more prized among our aborigines than any other articles. It is quite likely that pipes

were more generally exchanged among tribes than other artifacts. Aboriginal barter or trade in pipes was extensive."

In discussing the probable age of Catlinite pipes, the same writer says<sup>8</sup> "They were found in great numbers in modern graves, in village-sites where tribes have lived in the historic period. This in itself is significant."

A shell-tempered earthenware pipe was also found on the surface at the Womack site. Stem and bowl are approximately the same size-a little less than 1 inch. The end of the stem is somewhat enlarged and there is a pointed projection at the rear in line with the stem. Its general shape is remarkably like a Catlinite pipe in the University of Texas collection from a historic burial on John Fleming farm, 10 miles southeast of Santa Anna, Coleman County, Texas.

A low earth mound, in Red River bottom on E. H. Moore's plantation, 10 1/2 miles northwest of Texarkana, Bowie County, was excavated August 12 to September 2, 1932. Five earthenware pipes were recovered-at depths ranging from 11 to 35 inches from the midden deposit in the mound. They were of the tubular, semi-tubular, triangular, massive elbow and handle types. The tubular pipe was much the same as one secured from a midden mound on A. C. Saunders farm, Anderson County.

The semi-tubular specimen bears no close resemblance to any others yet found by us in East Texas. It carries a slight suggestion of the shape of the hunting or powder horn. This may be a mere coincidence; or intentional copying-since lead bullets were found in the mound. It is comparable in shape to an Atlantic coast pipe from Monroe County, Tenn.<sup>9</sup>

The triangular bowl pipe is unique. The large elbow pipe is an almost exact duplicate of one from the Goode Hunt farm, Cass County. The handle pipe is very similar to one from a burial on J. M. Riley farm, Upshur County, and of the same type as one from J. H. Reese farm, Wood County.

The elbow pipe-which came from a depth of 28 inches-had its large bowl about 3/4 full of charred

material. A sample of the vegetal matter was sent to Dr. Melvin R. Gilmore, a specialist in ethno-botany. He reported<sup>10</sup> the “botanical source indeterminable.”

On the surface of a campsite at the Mitchell place, 9 miles west of Texarkana, Bowie County, was found a tubular stone pipe, or so-called “cloud-blower.” The specimen is 3 3/4 inches long. It is made of a fine sandstone. The only decoration consists of three incised lines encircling each end. This is the only tubular stone pipe so far found in Northeast Texas, although two of earthenware have been unearthed. Tubular stone pipes have been found in Central and South Texas.

Wissler says:<sup>11</sup> “The tubular stone pipe is found in the western part of the United States and is the exclusive form in the highland region from British Columbia to the Rio Grande; it is even occasionally met with in the Mississippi Valley.”

Concerning the probable age of tubular pipes, McGuire<sup>12</sup> says: “The use of the tubular pipe in certain aboriginal ceremonies at the most solemn junctures would suggest its greater antiquity over other forms, especially when we find great veneration paid to the tube which is not given to other types of pipe.”

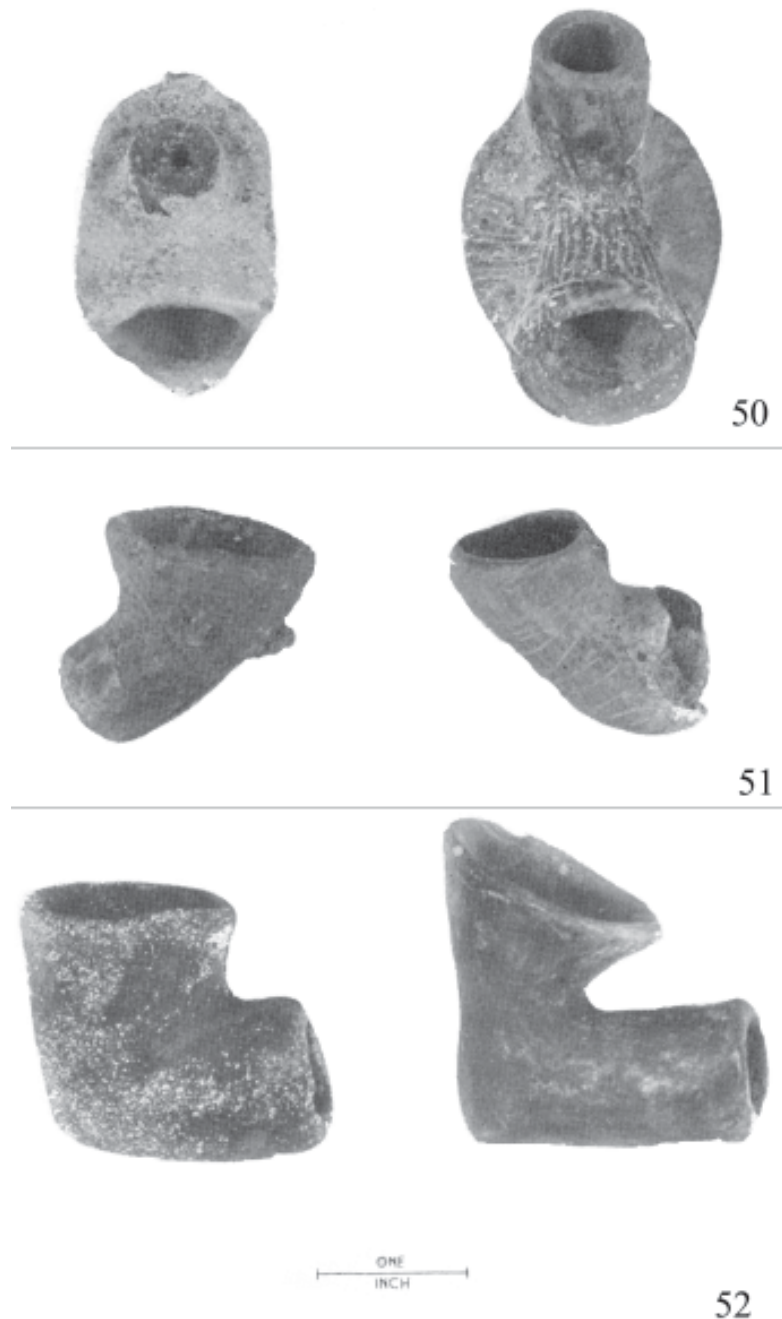


PLATE 18.

- No. 50. Left: Triangular pipe of clay, E. H Moore's plantation, Bowie County. Right: Effigy pipe of clay, H. R. Taylor farm, Harrison County.
- No. 51. Earthenware pipes of unusual shapes. Left: Semi-tubular pipe from Midden deposit, E. H. Moore's plantation, Bowie County. Right: semi-tubular pipe from burial, Clements Brothers' farm, Cass County.
- No. 52. Earthenware Pipes Left: Elbow type of pipe, showing excessive shell tempering; T. M. Sanders farm, Lamar County. Right: A variant of the conical-bowl type, Clements Brothers' farm, Cass County.

Not enough tubular pipes have been found in East Texas to justify a conclusion as to their relative age as a type. But those excavated seem to be contemporaneous with other types from the sites involved.

#### *Positions of Pipes in Graves*

Twenty-eight of the pipes were in graves, with sufficient skeletal material remaining to determine their positions with reference to various parts of the body. The number of pipes from the different positions follows: East and southeast of skull, near, 6; east of skull, 2 to 8 feet, 6; near chin, 6; between legs, 3; near shoulders, 2; on chest, 1; outside of right femur, 1; beside right humerus, 1; outside left humerus, 1; and at right foot, 1. Twelve of the pipes-43% of those for which data are available-were located east or slightly southeast of the skulls, at distances varying from 3 to 36 inches. Since the bodies were interred with the heads approximately to the east, it means that 48% of those pipes were buried back of the head. Only 21% of them were located near the chin.

#### *Comparisons with Pipes from Other States*

There are a number of pipes from East Texas that bear unmistakable resemblances to some from Arkansas and Louisiana. Harrington<sup>13</sup> pictures on one plate 4 pipes, from Southwest Arkansas, which he describes as "Pipes of earthenware, short-stemmed type. All are unusual variants." They are very much like certain specimens from Northeast Texas. Specimen "a", above mentioned plate-from Site 5 Ozan, Ark.— corresponds closely with our curved-stem type. The Arkansas specimen is nearly identical with one from Russell Brothers farm, Titus County, Texas. Specimen "b"-a crude pipe of the elbow type-from site 1, Ozan, Ark., is almost a duplicate of one from T. M. Sanders farm, Lamar County, Texas. Specimen "c" of the pointed-stem type-from Site 5, Hot Springs, Ark., bears considerable resemblance to ones from H. E. Womack and J. H. Reese farms, Lamar and Wood Counties, Texas. Specimen "d"-of the cockscomb-effigy type-from the Washington site, Ark., is much like one, with a notched projection around the base

of the bowl, from Russell Brothers farm, Titus County, Texas.

Moore<sup>14</sup> pictures the bowl of a pipe, "with a curious loop attachment," from Kent Place Ouachita County, Arkansas. The "loop attachment" is the same as that on East Texas pipes of the handle type. The shape and manner of attachment of the loop or handle on the Arkansas specimen is identical with that on a pipe from E. H. Moore's plantation, Bowie County, Texas. On the Arkansas pipe, at the base of the bowl, facing the smoker, are the outlines of eyes and nose. This feature calls to mind the carved head on the handle of the redware pipe from J. H. Reese farm, Wood County, Texas.

One pipe pictured by Moore<sup>15</sup> is that with a flat base from Keno Place, Morehouse Parish, Louisiana. It has much the same general shape as a round, flat-base specimen from H. R. Taylor farm, Harrison County, Texas.

Another of Moore's<sup>16</sup> pipe finds-from a burial in an earth mound at the Pritchard Landing, Catahoula Parish, Louisiana-bears an incised vertical design on the bowl that is much like the design on a pipe from Forest Hill, Wood County, Texas.

#### *Summary*

From the facts herein recorded it would seem that:

1-The Indians of East Texas smoked pipes from the time of their first occupancy of the region on into historic times.

2-The types of pipes, their decorations and numbers varied somewhat in the four subareas, or main river valleys.

3-The variations in the pipes from the respective areas is in line with differences in earthenware vessels from those regions.

4-Certain pipes from East Texas bear a resemblance to some from Arkansas and Louisiana.

University of Texas  
Austin, Texas.



1. Joseph D. McGuire, Pipes and Smoking Customs of the American Aborigines Based on Material in the United States National Museum, Annual Report U. S. National Museum 1897, Washington D. C., 1899, Part I, fig. 226, p. 616.
2. Ibid. p. 429.
3. H. C. Shetrone, *The Mound-Builders*, D. Appleton & Co., New York, 1930, p. 152.
4. Fredrick C. Chabot, Excerpts from the Memorias for the History of the Province of Texas, (Translated and annotated), Naylor Printing Co., San Antonio, 1932, pp. 23-24.
5. M. R. Harrington, *Certain Caddo Sites in Arkansas*, Museum of the American Indian, Heye Foundation, New York, 1920, Pl. CII.
6. Joseph D. McGuire, Pipes and Smoking Customs of the Aborigines, Based on Material in the United States National Museum; Annual Report U. S. National Museum 1897. Washington, D. C. 1899, Part 1, figs. 179 and 180, pp. 579-580.
7. W. K. Moorehead, *The Stone Age in North America*, Houghton Mifflin Co., New York, 1910, Vol. II, p. 80.
8. Ibid. p. 51
9. Joseph D. McGuire, Pipes and Smoking Customs of the American Aborigines, Based on Material in the United States National Museum, Annual Report U. S. National Museum 1897, Washington, D. C., 1899, Part I, fig. 213, p. 609 and fig. 151, p. 535.
10. University of Michigan Museum of Anthropology, Ethnobotanical Laboratory, Ann Arbor, Report No. 57, Pt. 3, February 17, 1933.
11. Clark Wissler, *the American Indian*, Oxford University Press, New York, 1922, p. 125.
12. Joseph D. McGuire, Pipes and Smoking Customs of the American Aborigines Based on Material in the United States National Museum, Annual Report U. S. National Museum 1897, Washington, D. C., 1899, Part I, p. 626
13. M. R. Harrington, *Certain Caddo Sites in Arkansas*, Museum of the American Indian, Heye Foundation, New York, 1920, Plate CIV.
14. Clarence B. Moore, *Antiquities of the Ouachita Valley*, Reprint from the Journal of the Academy of Natural Sciences of Philadelphia, Philadelphia, 1909, Vol. XIV, fig. 99, p. 97.
15. Ibid., fig. 124, p. 127
16. Ibid., fig. 2, p. 19

**SOME ARCHAEOLOGICAL FIELDS NEAR THE CITY OF MEXICO**

BY COL. M. L. CRIMMINS

(Illustrations furnished through the courtesy of Dr. George C. Valliant of the American Museum of National History)

In order to study some of the sources of the culture of our American Indians, we made a trip to the City of Mexico last August. In telling the story of the American Indian, Dr. Paul Radin of the University of California says that our North American Indians owed the fundamental and basic traits of their civilization to the direct or indirect influence of the Mayas. Our Indians undoubtedly developed their agriculture, pyramidal mounds, ceramic art, and other evidences of culture through the influence of the Mayas. Radin believes the Mayas or a people completely transformed by Mayan culture, actually invaded the lower Mississippi Valley and laid the foundation of the Mound-Builders. The Mound-Builders in turn doubtlessly influenced the culture of all the tribes east of the Mississippi to a very great extent, and some of their culture evidently spread to Eastern Texas as shown by recent finds of the University of Texas. The Mayan influence gradually deteriorated as it spread northward. The

Zapotecans, with their high civilization, records their first contact to the north; and then came the Toltecs. From the Toltecs the pre-Aztecs and Aztecs owe their culture. The effect of the northern spread of Mayan influence to our Southwest was affected by a whole series of invasions from Mexico starting in the pre-Toltec time and continuing to the post-Toltec period. The Aztec tradition that they came from the North may be true, but when they did, the most active people were returning towards the place their peregrination had started from, and those left behind were the least affected. There seems to be a gradual deterioration from the culture of the Mayas to the simple tribes of northern Canada. The lack of a concentrated food supply would have that effect.

Archaeological knowledge cannot go back of the material objects that have survived destruction. We have, therefore, only the imperishable artifacts such as pottery, clay figurines, engravings, gorgets, and delicate flint knives to study. The similarity of the above-mentioned artifacts of the Mound-Builders and those of the ancient Mexicans is so



PLATE 19

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No. 53. Pyramid of the Sun, San Juan Teotihuacan, Mexico. Photograph by La Rochester, Mexico.

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striking that it can only be assumed that the Mound-Builders had contact with the Mexicans in prehistoric times. Why was the contact broken? Was the urge that prompted their peregrination northward exhausted? We do not know, but we do know that those left behind in the north belong to the same race as those that started on the peregrination from the south. The Mexican and American Indian are of the same race.

This wave of influence from Mexico was spent before the discovery of the New World-but it left in the cornfields of Ohio beautiful works of art, whose intimate inspiration was Mayan. Therefore no history of the North American Indian can any longer be considered without recognizing the background of Mexican influence.

To tell our story by the means available we must first understand the methods used. We do so by the study of Archaeology. Archaeology in the sense which I will use it is the study of the art, architecture, customs, and beliefs of some of the ancient people of Mexico as shown by their monuments, implements, inscriptions, relics, etc.

Archaeology begins where man ceases to speak and has to be spoken for. The earliest culture in America probably started in the region near Vera Cruz, Mexico, more than six thousand years ago. This culture was called Archaic, and was about as advanced as that of the Eskimo before being influenced by white men. We have little evidence of the Archaic culture outside of their ceramic objects. The pottery of that period was heavy and simple, and their decoration was in relief. When paint was used, only the simplest geometric designs were shown. They did some stone work, in fact the stone figurine preceded the ceramic, and they made stone implements, ornaments, and crude figurines of men and animals. The most interesting of these early attempts at art were the pottery human figurines. They were quite distinctive, and the heads were flattened in the gingerbread-design. Details of the headdress and clothing were added as well as the tattooing on their bodies. The sitting postures of both men and women are shown by these figurines. These clay figures are found throughout Southern Mexico, in ancient mounds and burials

deep beneath the debris of following civilizations. Many have been found beneath lava that flowed from volcanoes from three to seven thousand years ago. It is believed that the female figurines were placed in the fields as votive offerings or prayers to increase the fertility of the crops. The little clay heads may have been likenesses of some loved one or popular hero as so many of them are similar in design.

The most cultured people at the dawn of Mexican history were the Mayas. They probably developed in the Mexican highlands, the wild maize or teocentli; which concentrated food aided them in becoming a nation. They probably had their origin near Vera Cruz in Mexico and in the Uloa Valley of Honduras, but at the height of their culture the Mayas were settled in Yucatan. The culture of the Mayas affected the culture of the people of the valley of Mexico indirectly, for it was their sculptures and other products that ranked with the highest in the New World. What Greek art was to Europe, Mayan culture was to prehistoric America. The Mayans were deep students of astronomy, and they had a better calendar than the Europeans at the time of the discovery of Mexico. They based their calendar on careful astronomical observations. They built their cities of stone in a manner superior to any in the new world. They appeared on the threshold of American history, about twenty-five hundred years ago and then established their great cities of Tikal in northern Guatemala and Copan in western Honduras. Their most brilliant period was from three hundred to six hundred A. D. after which their ancient cities were abandoned, probably due to drought or pestilence or both. They then moved into northern Yucatan where the second period of their culture, lasting six hundred years, began. During the first period of the Mayan empire, what is now known as the Valley of Mexico, was inhabited by the Nahua people about whom little is known. There were many tribes of these people of whom the following were the best known the Olmecas, Totonacs, and the Zapotecs. Their language, Nahuatl, meant "clear speech". The Olmecas derived their name from the Nahuatl-for rubber-Olli, and they were known as the rubber people and were the first civilized people of the

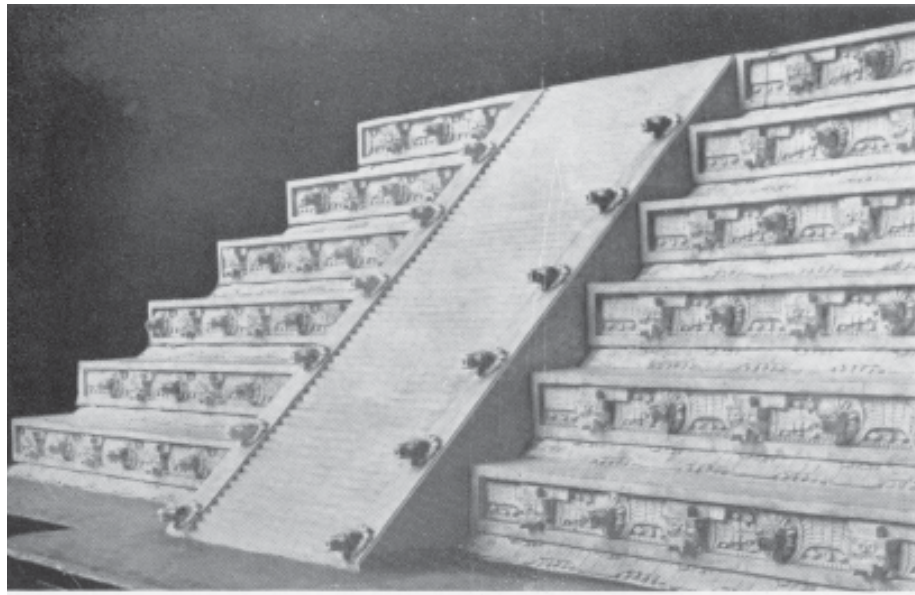


PLATE 20

No. 54. Model of the Temple of Quetzalcoatl. This is the most ornate building discovered at the Toltec ceremonial center of San Juan Teotihuacan. Note the alternating heads of Quetzalcoatl, the Feathered Serpent, and The Obsidian Butterfly, two of the chief divinities of these ancient people. Photographed by La Rochester, Mexico.

Highlands of Mexico. The Totonacs were from Central Vera Cruz and were probably connected with the Mayan tribes called Huastecas as they absorbed some of their culture, while outside the Valley of Mexico their culture strongly affected it. Their artistic figurines with smiling faces are quite characteristic, and are the finest examples of clay moulding in the New World. Their heavy stone yokes or collars, often beautifully carved, were said to have been placed on the necks of their human victims about to be sacrificed. They were of a smooth, hard, greenish stone nephrite and were usually polished, and weighed about twenty-five pounds.

South of the City of Mexico in the Oaxaca Valley we find the Zapotacos of the Middle Civilization. They are supposed to have absorbed the Mayan culture just as the Romans did that of the Greeks. Their art, hieroglyphic writing and calendar system show this. The recent finds at Mt. Alban, with their beautiful gold and jade ornaments, place them very high in the history of Mexican primitive art. It is believed that Oaxaca was their former capital, which was abandoned before the arrival of the Spaniards in 1519. The

famous temples of Mitla are among the best preserved in Mexico, and it was there that the Zapotecan kings were buried. They were expert potters, goldsmiths, and lapidaries.

About thirty-five miles northeast of Mexico City lie the ruins of San Juan Teotihuacan. In the magnitude of its remains and in the evidence the site furnishes of population and antiquity it stands easily at the head of the ancient cities of Mexico. Were the entire mass of the ruined structures of Chichen Itza, Uxmal, or Mitla, heaped in a single mound, it would hardly surpass the great Pyramid of the Sun, and the whole bulk of Teotihuacan is many times that of its chief pyramid. The site covers an area of about twenty-five hundred acres. Only about one-fifth of the area has been uncovered. There are two great pyramids, the Pyramid of the Sun is two-hundred and sixteen feet in height with a quadrilateral, base 721 feet by 761, and the pyramid of the Moon is 150 feet in height with a base 426 x 511 feet. The city was arranged around quadrangles with a floor of dark red polished stucco-cement. The buildings were decorated and also the sculptures with polychrome frescos.

Long before the advent of the Aztecs the glory of Teotihuacan had passed, and the place attracted as much wonder and speculation then as it does today. Until recently the place was covered with brush and debris although the outlines of the two great pyramids projected above the surrounding territory. There were great quantities of broken pottery and small Egyptian-like terra-cotta heads scattered all over the surface. As far back as 1874 attempts were made to explore these mounds, and the work was carried on by the National Department of Archaeology under the direction of Dr. Manuel Gamio. This work is still being continued, and in addition valuable work has been done there during the past six seasons by Dr. George C. Vaillant, the Curator of Mexican Archaeology of the American Museum of Natural History, New York City. It was due to the co-operation of Dr. Vaillant in furnishing me the

reprints of five of his valuable lectures, that has made this paper possible.

Teotihuacan is laid out symmetrically in squares on either side of a long avenue known as the Camino de los Muertos or the Pathway of the Dead. It gets its name from the long rows of tombs on either side. The arrangement is in accordance with the astronomical measurements made at the time they were erected. Every altar, temple, and pyramid was so placed that the sun's rays would strike a particular part on a certain day in a given season which shows the Toltecs' astronomical knowledge.

The Highway of the Dead runs from the north-northeast to south-southwest, and at the northern end is the Pyramid of the Moon set back in a large plaza. Around it are temples, dwellings, and shrines opening upon it. The most important of these buildings is the Temple of Agriculture which was



PLATE 21

No. 55. Cast of the National Stone. An Aztec sculpture which might be called a model since it probably represents the Calendar Stone set on a pyramid. The original is about a metre square and is richly adorned with carvings pertaining to worship of the Sun God.

so named on account of the decorations consisting of fresco-friezes of flowers, birds, animals, and vines with scenes of worshipers bringing the products of their fields and orchards to the flaming altars. Very little is left of their paintings, but a copy of some of them were made at the time of discovery and are now at the National Museum of the City of Mexico. The scrolls coming out of the mouths of their priests indicate speech. It is interesting to note that similar pictographs have been found at the Hueco Tanks, located thirty miles east of El Paso, Texas. Going up the "Pathway of the Dead" from the south towards the North, we find most of the visible buildings on the eastern side. The first is a large quadrangle known as the "Ciudadela" with a temple of Quetzalcoatl in the center. Here we find small pyramids and altars placed around the four sides of the square, according to their astronomical calculations. The Quetzalcoatl pyramid-temple can easily be identified by the great number of plumed serpents and obsidian butterflies alternating in the decorations. Next beyond is the Temple of Tlaloc, "the god of rain" which is so closely associated with the worship of these people. On the opposite side of the Highway the "Subterraneos" or undergrounds so-called because the other building was superimposed on an earlier structure, so that in order to see it one has to go underground. About half-way down the "Pathway of the Dead" on the eastern side and facing west and slightly south is the Pyramid of the Sun from the top of which an

excellent view of the Teotihuacan ruins can be obtained. The pyramid is a typical broad, truncated Mexican edifice and was used as a look-out temple and an astronomical observatory.

Near the entrance is a Museum containing terra cotta figures, pottery bowls, semi-precious stone carvings and artifacts as well as the products of the local people of today, such as crops and crafts.

Many classic Toltec faces are shown in the little clay figures found in such profusion in this vicinity. Most of them are of the same type and show the characteristic highly tapering forehead and pointed chin with widely separated eyes and raised eyebrows. The upper lip is long and the mouth curves into a smile. The face is more frequently that of a young man than of a young woman, and the headdress a turban with some geometrical design and circular earrings are worn. Sometimes the face of an old man with a tufted beard on the end of his chin is found with a peculiar semitic snicker on his wise old face. These miniature human faces were used to ornament ceremonial pottery just as the large stone sculptures ornamented the temples. While the faces vary much in minor details so as to create the impression that they are portraits of actual persons, the method of modelling is alike. It is the contagious laughing or smiling face which characterizes the clay human figurines in this vicinity.

Fort Sam Houston, Texas.

## FIELD NOTES AND REVIEWS

E. B. Sayles has been doing field work for The Medallion of Globe, Arizona, for the past two years and has been in northern Mexico most of the past season.

Dr. J. E. Pearce of the Anthropology Department of Texas University reports that he has a force of students under Mr. A. T. Jackson, Field Foreman, working in the kitchen middens and burial sites of the Texas coast which will remain active until the middle of September. He reports the discovery of some very old sites with no traces of pottery and other more recent sites in which pottery is abundant and accompanied by microliths and very fine flint chipping.

Mr. C. A. Howard of Dallas reports that the skeleton of a plesiosaur was found in good condition near Dallas during the past two years.

Mr. George C. Martin, President of Southwest Texas Archeological Society, and S. W. Woolford of Witte Memorial Museum of San Antonio have recently returned from a successful expedition to The Texas Big Bend where they have reported the finding of fifteen burials, many found in original costumes. They report finding basketry burials, beaver robes, buckskin shirts, rattlesnake vertebra pendants, painted pebbles, atlatls, and many other interesting types of artifacts. Specimens of a peculiar degenerated type of human jaw bone were also secured.

A list of the officers of the recently organized Southwest Texas Archeological Society of San Antonio just received are George C. Martin, President, Mrs. Emma Gutzeit, Secretary, Mrs. Dudley Jackson, Treasurer, Publications Committee, Sam Woolford and George C. Martin.

The Panhandle-Plains Historical Society was organized in 1921. The Society possesses many relics, papers, documents, and other literature relating to the Great Plains section of Texas, and also has many fossils and archeological remains in its museum.

The museum building which cost \$55,000.00, located at Canyon, Texas, is modern and fire proof. The museum was opened to the public on April 14, 1933. Since then 14,225 people have registered as visitors.

The Panhandle-Plains Historical Society also publishes annually a magazine, the Panhandle-Plains Historical Review.

The Society has a membership of about 860. Its membership is open to all interested people.

Mr. Floyd V. Studer has continued excavation on two large Panhandle Culture ruins close to Amarillo.

Both are large ruins and it will require many more months to complete this work.

Mr. Studer has been elected Director and Curator of the Departments of Archeology and Paleontology by the Panhandle-Plains Historical Society Museum at Canyon, Texas. Mr. Studer has been mapping and studying the Panhandle ruins during a period of twenty-six years.

Field activities of the West Texas Historical and Scientific Society, Alpine during the past year have been confined to detailed excavations of five dry rock shelters together with the preparation of written reports concerning each. Fuller Rock Shelter, near Santiago Peak, yielded over fifty millers, new types of sandals, and an unusual number of turtle back scrapers. Marked Rock Shelter, Sunny Glen, gave added evidence concerning agriculture, the use of cists, and unusual flint objects. The best specimens found at this place were two hafted flint blades in perfect condition. In Hord Cave, also in Sunny Glen, were found added sandal types of interest together with burials of minor importance. A group of three shelters on the Meriwether Ranch, North of Alpine, though closely grouped, showed distinguishing characteristics. The presence of numerous bone awls and perishable materials in one of these shelters is quite in contrast

with the variety and number of flint objects in the third cave of the group. All of the sites mentioned were completely excavated to rock bottom and accurate records kept so that the culture picture of the sites may be studied by visitors to the museum located in the Sul Ross State Teachers College at Alpine.

The general survey of the Big Bend has been continued and 600 stored specimens catalogued. Bulletin No. 4 has been published during the year.

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### THE BROWNWOOD SKULL

Late in 1932 a newspaper story appeared which stated that some human bones had been blasted out of a solid limestone boulder near Brownwood, Texas.

The tale seemed improbable but the editor undertook a trip to Brownwood (ninety miles distant) to find what basis there was for the story.

The facts were carefully gathered from the finders while the matter was fresh in their minds, the site was visited in their company the bones were examined and measurements of them were made.

At a later date others visited the site and a report was sent out in "Science Service" which the writer thinks omitted some significant facts.

It appears that a road construction company was engaged in blasting away the face of a Pennsylvanian formation limestone ledge and crushing it in a rock crusher near by.

When the work was started there were some large detached boulders standing a few feet below the face of the ledge. One of the boulders which appeared to be of solid limestone and of an approximate size of twelve feet square was shattered into small fragments by numerous heavy charges of explosive.

Shortly thereafter the truck drivers began to find bones amongst the limestone fragments as they were shoveled into the rock crusher. Many bone fragments were destroyed in this manner and a long bone was carried out to the road by a truck driver and hastily thrown out (where it was later covered by paving

operations) by the driver when a foreman stated that it was a human bone (probably a femur from the description). About this time a driver with a little more curiosity notified an official of the company, Mr. John O. Palmer, and he with Mr. J. H. Arledge walked over to the site and immediately picked up a complete lower jaw containing most of the teeth and a large part of the frontal bone with a very peculiar nasal bone attached. The finders appear to have thought the find of small importance at the time since they sent the bones to town by a truck driver who allowed them to jolt around in it so that some of the teeth were lost.

The bones were finally taken to a Dr. Snyder-a Brownwood dentist who had possession of them at the time of the writer's visit.

Despite one report that these bones were only slightly mineralized, the writer found them to be hard and heavy and to have a stony clink when knocked together similar to that of some fossil human skull bones from the Texas coast in the writer's possession. The edges of the fractured surfaces were sharp and of stony hardness. However, no portions of the limestone ledge adhered to them, although the color was the same as that of the limestone and the hardness seemed as great or greater.

Both Mr. Palmer and Mr. Arledge were positive - at that time that no observable opening existed in the boulder and that no earth or stained stones were found in the broken limestone fragments out of which they claimed they picked the bones. Mr. Palmer pointed to a small pile of freshly fractured limestone fragments of light grey color and stated that that was where he found the bones, although by that time nearly all of the debris of the boulder had been cleared away.

Opposite to the location of the boulder which contained the bones was a crack in the ledge about a foot wide which contained black earth and stained stones but this would not necessarily have had any connection with the widely detached boulder. A small creek containing water is immediately below the ledge and on the opposite bank not far away the writer found a burnt rock mound but this may have had no relation to the ledge site.

The writer pointed out to the finders the fact that scientists generally would not believe a story of human



bones being blasted out of solid Pennsylvanian limestone but both adhered firmly and steadfastly to their first statements. The writer then stated that the most reasonable explanation would be that a cave could have been filled with stalagmitic deposit which might have encased the bones.

If the latter explanation be true the bones had no signs of adherent stone matrix which also appears to make this theory not very reasonable.

If the bones did not carry in their state of petrification evidence of considerable age and in addition have the limestone color and hardness with at least one extraordinary anatomical feature and other primitive ones, one might let the matter rest here without further comment, but the bones deserve some description.

The ascending ramii of the lower jaw were quite wide, the distance across the top of one from coronoid to condyle was 2 1/16 inches. The distance from coronoid to coronoid was 4 13/16 inches. From the bottom of the sigmoid notch to the bottom of the ascending ramus was 2 1/4 inches. From the back edge of the third molar to the middle of the incisors was 2 5/16 inches. The architecture of the lower jaw is heavy resembling in that respect and in dental equipment some primitive jaws found near Abilene and elsewhere in Texas. The mylohyoid ridge is flattened like the fossil lower jaws found by George C. Martin on the coast of Texas and the lower jaw found by the writer near Colorado, Texas.

The teeth are much worn. In the left side all teeth are present except the two incisors and their jaw cavities indicate that they have been lost recently. On the right side the teeth are all in place except the first premolar recently lost, and the broken off canine.

The depth of the sigmoid notch is ten sixteenths of an inch.

The large portion of frontal bone has attached in place a remarkable nasal bone which is wide, flat, and spatulate shaped at the end. It also curves sharply upwards. It is 1 1/4 inches wide at the proximal or attachment end. When a rule is set with one end against the skull at its articulation with the frontal bone and extended to the distal end of the nasal bone the measurement straight across from end to end (not

following the marked curvature of the bone) is 1 3/4 inches. This long, flat, upturned nasal bone is like nothing the writer has seen before on a human skull.

Nasal bones have usually decayed before other parts of ancient skulls on account of their thinness and fragility and consequently are rarely found in good condition. This nasal bone from all accounts withstood the shock of the many charges of dynamite which shattered a hard limestone boulder and the rough handling afterward and when examined the edges were hard and sharp, and but slightly damaged.

We have reported all of the evidence as told to and observed by us without injecting any conclusions and we have none. The matter should be looked into more fully by experts.

#### *Other Field Trips*

Field trips were made to beyond Midland, 300 miles west, and to Fort McKavitt, 150 miles southwest. A trip was made with Dr. R. P. Glenn to a mastodon bone site 100 miles west. Many local field trips were made. An interesting site near Abilene visited by the writer and W. A. Riney contained teeth and skeletal remains of both large and small Permian Age animals. These have not been studied or identified at this time.

CYRUS N. RAY

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#### REVIEWS OF TEXAS PUBLICATIONS

Bulletin 44, West Texas Historical and Scientific Society, published quarterly at The Sul Ross State Teachers College, Alpine, Texas, December 1, 1932, (56 pages, 5 plates, 4 line drawings):

The space in this Bulletin is mainly devoted to articles on history, natural history, and various society and museum reports. However, its two articles on anthropology should prove of interest to our members. It contains a printed copy of a report read before the October 1931 annual meeting of The Texas Archeological and Paleontological Society by Roscoe P. Conkling describing his finding of human remains beneath those of pleistocene mammals in a cave near Bishop Cap, New Mexico. His report before the

Texas Society was illustrated with stereoptican slides, and it would have been better had the published report contained more than the one plate used. The thirteen-page article includes lists of the cave fauna.

The other article, "Perishable Artifacts of the Hueco Caves" by Eileen E. Alves contains four pages of text.

References in this Bulletin to articles in Texas Archeological Society refer to articles in Texas Archeological and Paleontological Society Bulletin. There is no society in Texas known as Texas Archeological Society.

Otto O. Watts.

Bulletins of the Southwest Texas Archeological Society of the Witte Memorial Museum, San Antonio, Texas:

Two Bulletins of this new Society have been issued recently. Issues are not dated and do not contain lists of the Society's officers and editor. Bulletin One (1) contains two pages of plates and fourteen pages of text devoted to one article by George C. Martin entitled "The Big Bend Basket Maker". Price, 50 cents.

Bulletin Two (2). The one article in this Bulletin by Major Fletcher Gardner and George C. Martin is entitled "A New Type of Atlatl from a Cave Shelter on the Rio Grande near Shumla" and contains one plate and four pages of text. Price, 25 cents.

References in the first issue of this Bulletin to Texas Archeological Society also refer to the Texas Archeological and Paleontological Society Bulletin.

Otto O. Watts.

**SECRETARY AND TREASURER REPORT OF THE TEXAS  
ARCHEOLOGICAL AND PALEONTOLOGICAL  
SOCIETY.**

Statement for the Period from September 15, 1932, to September 1, 1933.

**RECEIPTS:**

Balance on Sept. 16th, 1932 .....	\$212.34
Bulletin Sales to Institutions and Purchasing Agencies .....	132.00
61 Memberships at \$3.00 for 1933 .....	183.00
Back Dues .....	50.00
Collections .....	12.00
1934 Dues .....	<u>3.00</u>
	\$592.34

**DISBURSEMENTS:**

Stamps and Mailing Expense .....	29.13
Stationery and Supplies .....	18.62
Abilene Printing and Stationery Co. for 1932 Bulletin .....	191.59
Worth Engraving Co. for 1932 Bulletin .....	60.77
Drayage .....	5.50
Tax on checks .....	<u>.44</u>
	\$306.05

**ACCOUNTS PAYABLE**

300 Copies of 1933 Bulletin in Process of Printing .....	209.60
Engraving for 1933 Bulletin .....	<u>64.80</u>
	\$274.40

Bank Balance on September 12, 1933 .....	\$286.29
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The Texas Archeological and Paleontological Society owes no past debts, or any other obligations except the cost of this Bulletin, for which a cash balance is on hand.

## 1933 MEMBERSHIP LIST\*

## HONORARY MEMBERS

Harold J. Cook ..... Agate Neb.  
 Albert J. Ingalls ..... New York City

## ACTIVE MEMBERS

Dr. W. B. Adamson ..... Abilene, Texas  
 Dr. J. M. Alexander ..... Abilene, Texas  
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 Dr. K. H. Aynesworth ..... Waco, Texas  
 H. J. Bass ..... Abilene, Texas  
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 Major John B. Hawley ..... 411 Capps Bldg., Ft. Worth, Texas  
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 Percy Jones ..... Abilene, Texas  
 Roland Jones ..... Abilene, Texas  
 W. E. Kauffman ..... Abilene, Texas  
 W. R. Keeble ..... Abilene, Texas  
 Ed King ..... Abilene, Texas  
 Prof. E M. Landers ..... Simmons Univ., Abilene, Texas  
 R. E. Lawson ..... Lorena, Texas  
 W. J. Van London ..... Amarillo, Texas  
 George Martin ..... Terrell Wells, Texas

Dr. Charles H. Mayo .....	Rochester, Minn.
George L. Minter .....	Abilene, Texas
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J. F. Morrison .....	Abilene, Texas
Charles W. Motz .....	Abilene, Texas
Dr. Julius Olsen .....	Simmons Univ., Abilene, Texas
Bruce E. Oliver .....	Abilene, Texas
Frank C. Patton .....	Rosenberg library, Galveston, Texas
George L. Paxton, Jr. ....	Abilene, Texas
H. A. Pender .....	Abilene, Texas
J. M. Radford (deceased) .....	Abilene, Texas
Dr. Cyrus N. Ray .....	Abilene, Texas
W. A. Riney .....	Abilene, Texas
Dr. Ellis W. Shuler .....	So. Meth. Univ., Dallas, Texas
Dr. Grady Shytles .....	Abilene, Texas
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Floyd V. Studer .....	635 Amarillo Bldg., Amarillo, Texas
W. S. Strain .....	Marland Hotel, Borger, Texas
Dr. Maud Durlin Sullivan .....	Public Library, El Paso, Texas
Dr. Otto O. Watts .....	Simmons Univ., Abilene, Texas
C. W. Wilson .....	Abilene, Texas
H. O. Wooten .....	Abilene, Texas
Ernest W. Wilson .....	Abilene, Texas
Lester B. Wood .....	Breckenridge, Texas

\*This only lists members who have paid their 1933 dues in full.

The Texas Archeological and Paleontological Society has previously issued 4 annual Bulletins. Vol.1, 1929, size 6x9, contain: 6 articles, 76 pages text, 8 photographic plates, 2 page line drawings. Price \$3.00.

Vol. II, 1930, size 6x9, contains 11 articles, 99 pages text, 20 pages photographic plates, 8 page line drawings. Price \$3.00.

Vol. III. 1931, size 6x9, contains 10 articles, 96 pages text, 16 pages photographic plates, 9 line drawings. Price \$3.00.

Vol. IV, 1932, size 6x9, contains 9 articles, 84 pages text, 12 pages Photographic plates, 3 line drawings. Price \$3.00.

The Bulletins sell for \$3.00 per Volume cash, no discounts. The Bulletin is sent with membership in the Society, the dues of which are \$3 00 per year. The Society year begins after the annual meeting held on the last Saturday in October, in Abilene, Texas.