

THE ANCIENT PUEBLO CULTURE OF NORTHERN MEXICO

by

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PREFACE

The object of the following work is to bring forth archaeological facts that will help to solve the problem of the prehistory of the inhabitants in northern Mexico and to locate them in a cultural pattern. There has been little investigation done in this region up to the present time and this thesis will show that many phases of the Mexican cultures will need more study to determine their origin and distribution. The author does not attempt to place Chihuahuan and Sonoran cultures in a definite culture scheme because his knowledge of the regions is not sufficient to do so, but by investigating the material that has been published and recording facts of personal observation in the areas he has endeavored to build up a picture of northern Mexican prehistory that should enlighten the archaeologist and be of value to further investigation.

Printed material that concerns the prehistoric population of Chihuahua and Sonora is very limited. The reports of Sauer and Brand were valuable aids in working out the archaeology and geography of the regions. Other sources of material that were of great value are the books of Bandelier and Lumholtz, who were early travelers and investigators. The report of Amsden helped consider-

ably. Material of great value was obtained in Dr. Brand's dissertation on northwestern Chihuahua. Considerable material was obtained by field work in the area and by conversing with the inhabitants of the region. For the complete titles of the publications written by the individuals mentioned above, consult the bibliography.

The author wishes to express his thanks to Dr. Cummings of the University of Arizona for advice and guidance in producing this thesis. Also, he wishes to thank Mr. Getty, Assistant in the Arizona State Museum, for suggestions and photographic work, and Mr. Harritt, a student in the University of Arizona, who made many valuable hints and helped in photographic work. Mr. Welles, also a student in the University, deserves considerable credit, as it was through his interpretative ability that the field trip in 1934-35 was successful.

The illustrations of part of the stone implements, the ornaments, and the pottery are taken from specimens in the Arizona State Museum.

THE ANCIENT PUEBLO CULTURE OF NORTHERN MEXICO

INTRODUCTION

The title, "The Ancient Pueblo Culture of Northern Mexico" has been used to describe a geographical area approximately three hundred fifty miles wide from east to west and one hundred twenty-five miles long from north to south. This region includes the northwestern portion of Chihuahua and the northeastern part of Sonora. The culture areas considered in these two Mexican states are bordered on the north by Arizona, New Mexico, and a small part of western Texas. The southern limit of the cultures is unknown. The twenty-ninth degree parallel of north latitude has been used to approximate the extent of the prehistoric people in that direction. Progressing from east to west, the cultures are located between the one hundred sixth and one hundred twelfth degree meridians of west longitude.

In this large expanse of territory there are broad expanses of desert, large areas of steppe lands, and extensive mountain chains, which are drained by numerous river systems.

It was along these river banks that the prehistoric inhabitants built their homes and established agriculture which caused them to lead a sedentary life conducive to art

developments. The tremendous extent of these ancient cultures is present today in the form of ruins which are the archaeologists' key to the developments of a people of uncertain origin.

This area is a fertile field for those interested in the prehistory of the American Indian and offers splendid opportunity for extensive investigation. The author feels that many mysteries of Southwestern archaeology will be solved when northern Mexico is better understood.

PHYSICAL GEOGRAPHY

CHIHUAHUA

In northern Chihuahua geographical features vary considerably from the arid desert of the northeastern part to the moist timbered region of the Sierra Madre, which mountains separate the more inhabitable areas of Sonora and Chihuahua. In the very arid regions population was sparse and unstable due to the impossibility of extensive agriculture. On the plains and along river banks the prehistoric people developed large communities and lived a very sedentary life.

There are three northerly flowing river systems in Chihuahua that drain into interior lakes with no outlet to the sea. Progressing from east to west the first river is the Carmen, whose course is in an arid to semi-arid country except for the mountains where many tributary arroyos have their sources. This river empties into a small playa, Laguna de Patos.

The next river to the west is the Santa Maria, which also flows most of its length in a desert region until it empties into Laguna de Santa Maria. This lake is much larger than the previous one due to the fact that it receives water from a much larger area.

The Casas Grandes is the third and most important river system in northern Chihuahua. It is fed by several

rivers, the San Miguel, Piedras Verdes, Tinaja-Tapiecitas, San Pedro, and Carretas, which reach back into the timbered Sierra Madre and are well supplied with water.

There are several minor arroyos, of great archaeological importance that empty into the San Pedro and Carretas. The Arroyo del Cuervo and Arroyo las Varas both enter the San Pedro from the south and are well populated with ruins. The arroyos that empty into the Carretas are the Agua Jarca, Alisos, Varas, and Huerigos. The first two flow from the south, the third from the east and the last from the north. All of the arroyos flow across the grass covered Llanos de Carretas. They are intermittent streams which carry surface water only during very wet seasons.

The Casas Grandes empties into the largest inland basin in northern Chihuahua, Laguna Gugman. This lake used to be very much larger but agriculture in the populated valleys along the Casas Grandes has depleted the flow of water into Laguna Gugman to almost nothing.

There are two other minor river systems in this area but they are of little archaeological value. They are the Playas-Nogales system in the extreme northwestern part of Chihuahua and the Palomas-Mimbres system south of Deming, New Mexico. The Mimbres is very important in New Mexico as a culture center but not in Chihuahua. Both of these systems flow in an arid region that was unfavorable for pre-historic occupation.

MOUNTAINS

There are innumerable mountain ranges in Chihuahua which have a general northwest-southeast trend. They are separated by valleys and uplands which are of an arid to semi-arid nature. The ranges increase in height from east to west until the great Sierra Madre chain is reached. Except for the Sierra Madre and its ramifications, the mountains are of little archaeological importance.

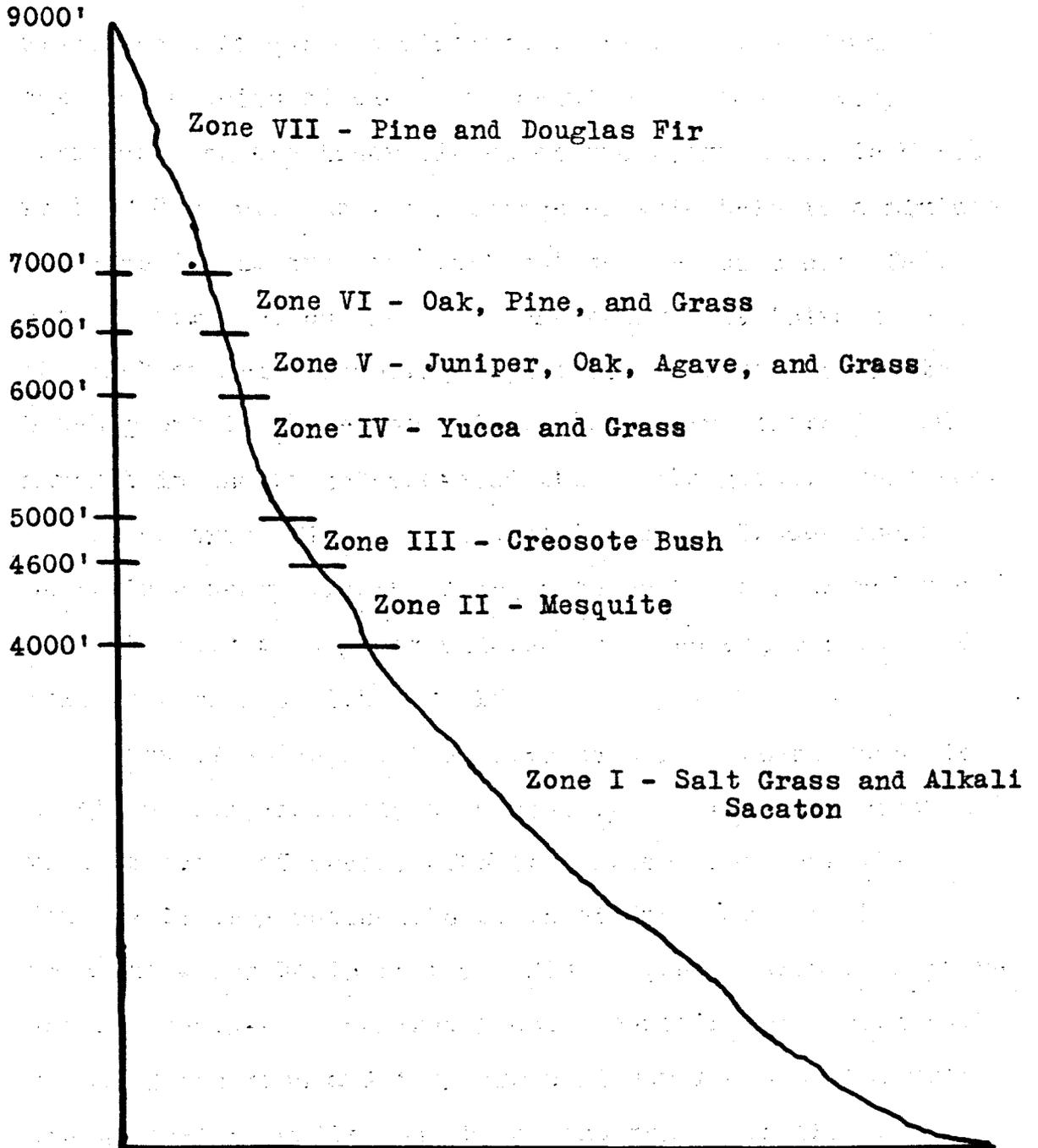
VEGETATION

The vegetation of northern Chihuahua seems to be restricted to certain belts which are determined by altitude. No absolutely rigid laws governing plant growth can be stated, but, in general, if a vertical cross section below four thousand to nine thousand feet were drawn, the following zones would be apparent:

Zone I - This zone includes the playas so common in arid northeastern Chihuahua at an elevation of slightly less than four thousand feet. These sink bottoms are characterized by a growth of salt grass and alkali sacaton, which is a short, tough stubble grass.

Zone II - In Zone II there is a great overlapping of the grass in Zone I and mesquite of Zone II. The Ascencion basin, for instance, is approximately forty five hundred feet in elevation but the grass covered playas bordered by the mesquite fringe is still existant. However, the belt of mesquite growth does not extend higher than forty six

SECTIONAL CHART OF VEGETATION ZONES



hundred feet as a general rule.

Zone III - From forty-six hundred feet to five thousand, there is quite a distinct belt of creosote bush, numerous species of cacti and ocatillo, which is very noticeable on the lower slopes of the Sierra Flor de Marzo west of Guzman. The lower fringe of this belt is a mixture of mesquite and creosote bush but the mesquite soon fades out. A very noticeable fact concerning this third zone is the lack of grass covering especially where the creosote brush grows in close formation. Seemingly there is some mineral in the brush "creosote" that kills grass. This fact can be observed fifteen miles southeast of Tucson where there is a heavy growth of creosote bush and a scarcity or complete lack of a grass undercover. The upper border of this zone merges with Zone IV.

Zone IV - Roughly from five to six thousand feet lies a belt of comparatively open country covered with grass and various forms of yucca. The transition from Zone III to Zone IV is very noticeable south of Janos as one climbs from the Janos basin over a definite pass, which is approximately forty-nine hundred feet. Mountains rise upon both sides of the pass and they are well covered with the yucca-grass complex, while just below the summit of the draw there is a heavy stand of tall creosote brush which gives way to a dense mesquite growth in the Rio de San Pedro bottom lands.

Zone V - This zone is characterized by a mixture of juniper, oak, pine, agave, and grass vegetation, with considerable overlapping of the yucca in the lower margin of this belt. It ranges from between six thousand to six thousand five hundred feet in altitude. An excellent location to observe this zone is on the eastern slopes of the Sierra de la Brena, west of Colonia Juarez. As one gains altitude, from this Mormon settlement, over the piedmont slopes of the Sierra, the heavy grass-yucca complex merges into the scrub tree-grass-agave belt. Along the lower fringes of this belt a scattered growth occurs which becomes more and more dense as the Sierras are approached.

Zone VI - Between six thousand and seven thousand feet there is a belt of oak and pine, which Brand has termed a transitional zone. It is an area where hardwood and softwood trees are intermixed.

Zone VII - Above seven thousand feet the primary growth is pine forest. It is composed of western yellow pine, Arizona pine, and some Douglas fir. The author has never seen a more beautiful stand of pine timber in any part of the United States of North America. The ground covering underneath the trees is mainly of grass which gives a striking park-like aspect. The reason there is a lack of heavy underbrush, which so often is associated with our forests is that ground fires have burnt off most of the low growth. These fires do not harm the adult trees to any

great extent.

VEGETATION ALONG RIVER BANKS

It seems necessary to mention river bank vegetation as a special topic due to the fact that the impression may have been given that in the low basin and arid lands only a grass-mesquite-creosote bush complex is existant. This is true except for the borders of rivers and arroyos. Cottonwoods, willows, walnuts, and hackberries grow in gallery forest formation. In arroyos that are dry most of the year, there is an abundance of arrow-weed.

SONORA

In Sonora there is a different form of drainage existing than in Chihuahua. These rivers flow in a general westerly direction across the coastal plain into the Gulf of California. No interior sinks form a termination point of Sonoran rivers.

There are three main river systems, the Yaqui, Sonora, and Magdalena, and two minor systems, the Santa Cruz and San Pedro, that are of importance in this thesis.

The Yaqui drains a tremendous area and is partially fed by the Aros- and Bavispe-San Bernardino systems. These tributaries are all of considerable archaeological importance. Along the Aros, which rises in Chihuahua, there are cliff dwellings which correspond to the Chihuahuan type. The Bavispe-San Bernardino drainage contains many ruins that

seem to be peripheral Chihuahuan in type.

The Rio de Sonora flows west of the Bavispe in a north-south structural trough. In this trough and on the many side arroyos, there is considerable evidence of a prehistoric culture that is typically Sonoran.

The Magdalena which rises near Nogales drains a large area of northern Sonora. It has many tributary arroyos, the Boquillos, Altar, and Seco, that were extensively populated.

The Santa Cruz river drains a small steppe area of northern Sonora, but its main course is in Arizona.

The San Pedro drainage is similar to that of the Santa Cruz in that it flows in a steppe region.

MOUNTAINS

The mountainous section of the state lies in the eastern part where numerous Sierras gradually build up into the Sierra Madre. They present a similar vegetational aspect as was characteristic of Chihuahua.

Fringing the mountain regions there is a steppe country characterized by a grass covering. This area merges into a desert covered by a heavy growth of mesquite and creosote bush, with considerable Palo Verde and pitaya.

VALLEYS

The valleys of Sonora lack the silt filling that is so common in Chihuahua. They present a chain-like aspect along the river borders. In general these valleys are not

so broad as those characteristic of Chihuahua and they do not have as much arable land in their confines.

THE STATE OF COAHUILA

The state of Coahuila is situated in the northern part of Mexico, bounded on the north by the United States, on the east by the state of Tamaulipas, on the south by the state of Durango, and on the west by the state of Chihuahua. It is one of the largest states in Mexico, covering an area of approximately 150,000 square kilometers. The population is estimated to be around 4 million. The state is rich in natural resources, including minerals, timber, and agricultural products. The climate is generally semi-arid, with hot summers and mild winters. The state is known for its production of sugar, wheat, and other crops. It also has a significant mining industry, particularly in the production of silver and copper. The state is a member of the North American Free Trade Agreement (NAFTA).

THE STATE OF DURANGO

The state of Durango is located in the northern part of Mexico, bordered by the state of Coahuila to the west, the state of Chihuahua to the north, and the state of Zacatecas to the east. It is one of the smaller states in Mexico, with an area of about 120,000 square kilometers. The population is approximately 2 million. The state is known for its production of sugar, wheat, and other crops. It also has a significant mining industry, particularly in the production of silver and copper. The state is a member of the North American Free Trade Agreement (NAFTA). The climate is generally semi-arid, with hot summers and mild winters. The state is rich in natural resources, including minerals, timber, and agricultural products. The state is known for its production of sugar, wheat, and other crops. It also has a significant mining industry, particularly in the production of silver and copper. The state is a member of the North American Free Trade Agreement (NAFTA).

WILD LIFE

CHIHUAHUA AND SONORA

It seems rather appropriate to mention some of the forms of wild life that are found in northern Chihuahua as various birds and animals helped the prehistoric inhabitants to supplement their diet of corn, beans, and squash with fresh game. It is evident that various species of animals and birds were killed and prepared for food because on the mounds that have been carelessly pot-hunted, there are fragments of turkey, probably quail, deer, and other types of bones.

ANIMALS

Bear, mule and white-tail deer, mountain sheep, rabbits, squirrels, lions, jaguar, wildcats, skunk, racoon, fox, wolf, coyote, wild pigs, and antelope make up a part of the list of animals living in this area, from which the prehistoric peoples used the more edible forms for food. At present mountain sheep, antelope, and wild pigs are not very numerous. It was reported that in the early days, after the period of the Apache wars, antelope roamed over the plains regions in large numbers. Cattlemen with their large herds of stock, and hunters have practically exterminated this fleet-footed animal in northern Chihuahua.

BIRDS

A few of the more common species of feathered life in this area would be included in a list such as follows: woodpeckers, macaw, pigeons, ducks, geese, ibis, killdeer, cranes, snipe, curlew, hawks, eagles, owls, buzzards, quail, wild turkeys, roadrunners, kingfishers, flickers, meadow-larks, orioles, wrens, mockingbirds, jays, swallows, and thrashers. From these species of birds, the pigeons, ducks, geese, quail, and wild turkey were probably used extensively for food. While in the Carretas region in December, 1934, the author saw a number of geese, mallard, widgeon, and scaup ducks on the numerous reservoirs that furnish water for the stock in the area. Macaw head motifs on Casas Grandes polychrome pottery shows the importance of this bird. Also, it is not unreasonable to suppose its brilliant plumage was used in decorating ceremonial paraphernalia.

GENERAL GEOLOGY

CHIHUAHUA AND SONORA

The historical geology of the area considered in this thesis has not been very thoroughly investigated at the present time. Some sections, especially in the mining districts of both Chihuahua and Sonora, have been studied but the value of such work to this dissertation is not sufficient to warrant any detailed discussion. However, some general basic points concerning the geology of northern Mexico is of interest, due to the fact that various upheavals and lava flows in past ages had a direct bearing on the culture of the prehistoric inhabitants. Were it not for the extensive folding and alteration of the Sierra Madre, cliff dwellings that exist today would not be present, and had not tremendous volcanism taken place, prehistoric stone culture would have been affected. Therefore, it is evident that geology has a basic connection with cultural developments that were started many years after various disturbances changed the earth's crust.

The northern portion of Mexico, that we are considering, falls into three provinces which have had a slightly different geological history. Progressing from east to west these provinces are "the Anahuac Desert Plateau, the Sierra

Madre Occidental, and the Sonoran Desert."¹

THE ANAHUAC DESERT PLATEAU

This province includes practically the entire state of Chihuahua and "is a degraded area of scattered black mountains and intervening 'bolson' desert."² The desert plains of the Anahuac Desert Plateau are both degraded and constructional. Degradation is caused by erosion, which, in turn, is due extensively to wind action that seems to be rather a constant factor in this region. Denudation of the higher areas associated with a plains regions bears directly on the resulting topographical formations. As erosion of higher sections progresses, the material washed or blown away is transported to some other region and deposited, which deposition forms a constructional plain. This sort of thing is very common in northern Chihuahua.

It seems that this province was begun in late Cretaceous times when land masses were raised out of the Gulf of Mexico, thereby causing a marked retreat of the water. As this lifting took place a tremendous amount of deformation occurred, which resulted in a general north-south orientation of the higher portions of the land. Following the late Cretaceous uprising, another land lifting period came, probably in late Eocene times. Following this last period a general peneplanation progressed and tremendous

1. Thayer, W. N., The Physiography of Mexico, p. 62.

2. Ibid, p. 70.

orogenic movement caused the structural trend to change from the north-south trend to a northwest-southeast orientation. The extensive volcanic action that is characteristic of this time altered the land forms considerably. Extrusive and intrusive volcanic action was general over the area with the result that many sandstone and lava capped hills occur.¹

The lava mantle, which covered this area, seems to be thinner in the eastern section of the Chihuahua Culture Area around Villa Ahumada, southward to Encillas.² The railroad from Mexico to El Paso is constructed along this general north-south line.

THE SIERRA MADRE OCCIDENTAL

The beautiful Sierra Madre Occidental which extend from an undetermined point on the north, southward to where the coastline of Mexico makes a decided bend to the east (in the states of Michoacan and Guerrero), form the "backbone" of this very interesting country. This range of mountains averages about one hundred miles in width and increases in altitude as the more southern portions are reached. It is composed of longitudinal ridges and valleys which have a general northwest-southeast trend. A view of the skyline in northern Mexico gives the observer an impression of levelness, which is due to volcanic action that was not char-

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1. Thayer, W. N., The Physiography of Mexico, pp. 74-5.
 2. Brand, D. D., The Historical Geography of Northwestern Chihuahua, pp. 5-6.

acterized by the formation of cones.^{1.}

The roughness of its appearance is due to a wearing down rather than the upheaval. The sides of the mountain valleys are really canyon walls and not mountain slopes.²

The first great uplift of the Sierra Madre occurred in Cretaceous times. Sedimentary lands were raised to a considerable altitude and at the same time great deformation, in the form of folds and overthrusts, resulted. After this upheaval a wearing down or a process of peneplanation existed until near the end of the Miocene period when uplift and extensive volcanism occurred. The result of this volcanic action was the deposition of quantities of lava, tuff, rhyolite, andesite, etc., to tremendous depths, several thousand feet in places.

Erosion has not worked its tremendous forces in the Sierra Madre nearly so much as in the eastern and western bordering regions. This is largely due to the presence of a heavy growth of vegetation in these mountains. However, along the Piedras Verdes river, which has cut a gorge of several hundred feet in depth, there are evidences of extensive erosion present. Stratified layers of volcanic material are visible along the canyon walls.

THE SONORAN DESERT PROVINCE

In the portion of southern Sonora included in this

1. Thayer, W. N., The Physiography of Mexico, pp. 66.

2. Ibid, p. 67.

thesis, there is a destructional coastal plain and a foothill region in the western margin of the Sierra Madre. The former is characterized by flatness, many arroyos, and a mesquite-creosote bush vegetational complex. The latter is more rolling in topography, fewer but deeper arroyos, and a scrub-tree complex.

There seems to be some controversy over whether or not glacial action caused certain topographic alterations in northern Sonora, south of the San Bernardino mountains. Mr. Merrill thinks there is evidence of some in action (cirques and morains) but Mr. W. J. McGee thinks these apparent signs of postulated inaction are due to sheet flood erosion.¹

"The foothill section would be characterized by folded sedimentaries upon the beveled edges of which sheets of volcanic material are spread and into which dikes, sills, laccoliths, and other igneous bodies have been intruded."²

The geological history of this province is quite similar to the Anahuac Desert Plateau. After the deposition of Mesozoic sediments, great upheaval took place and close folding occurred. Then in early Tertiary times erosion took place which smoothed the edges of the folded strata and resulted in a peneplain. After this base-leveling process a period of volcanism occurred and covered the sedimentary material. After this another period of uplift

1. Thayer, W. N., The Physiography of Mexico, p. 78.

2. Ibid, p. 81.

took place, which uplift cause the streams coming out of the mountains to flow more rapidly and erode extensively.

As a result of another more recent uplifting great degradation and filling have occurred. A noticeable fact, that has been the result of uplift, is the cutting of the streams through the lava mantle down into the sedimentary material. Once a stream has broken through the igneous covering, it tends to erode very rapidly.

This concludes a brief survey of the general geology in the region we are considering. It seems strange that more intensive surveys have not been made in this north Mexican region because it would be an extremely interesting section in which to test one's knowledge of geology. The many stratified beds, that can be seen in cross-section where erosion has been intense, reveal an interesting story to the investigator.

HISTORICAL NOTES OF CHIHUAHUA

The history of Chihuahua and Sonora is strikingly similar from the early date of 1536 up to modern times. However, let us first consider the developments of the more eastern state of the two mentioned.

In 1536 Cabeza de Vaca passed across northern Chihuahua through the area of what is now Janos, and pushed westward over the Sierra Madre mountains into Sonora along the Bavispe River.

In 1567 Ybarra journeyed from Zacatecas up through eastern Sonora and over into Chihuahua following much the same route as that Cabeza de Vaca had made in his trip westward. Ybarra went to the Janos region, then southward through Casas Grandes, and finally turned west, back over the Sierra Madre into the middle Yaqui river valley. He was scouting for prospective ranch lands and mineral resources.

In 1581 Fray Rodriguez passed up through eastern Chihuahua into New Mexico, accompanied by Chamuscado, with the purpose of preaching and converting the Indians. He was killed in New Mexico shortly after reaching the region.¹

In 1582-3 Fray Beltran and Espejo set out in search

1. Bolton, H. E., Spanish Exploration in the Southwest, p. 158.

of members of the Rodriguez party. After reaching New Mexico, Espejo and several soldiers left the other members of the group and explored various portions of New Mexico and Arizona. They followed the route taken by Rodriguez northward through Chihuahua.¹

In 1596 the Onate expedition marched northward across Chihuahua some miles west of the previous two routes. He was in search of the supposed wealth reported to be abundant in the north.

Between the years 1604-1660 the Franciscan and Jesuit padres made their way northward, establishing missions and making conversions as they went along. The Jesuits were more restricted to the mountainous regions among the Tarahumara, whereas the Franciscans maintained their northward progress in the lower valley and plains regions.

Many missions had been well established, and comparative peace reigned over the area under consideration, but with the year 1680 a great revolt of various Indian tribes (Janos, Sumas, Jocomes, Conchos, etc.,) broke out. These groups banded together and destroyed, in a short time, many missions that had taken years to establish and develop. The revolt period lasted approximately sixteen years or until 1696.

Even though a revolt was in progress, the patient

1. Bolton, H. E., Spanish Exploration in the Southwest, p. 164.

padres attempted to carry on their work and between 1691 to 1703 succeeded in establishing a few missions.

From about the middle of the seventeenth century the warlike Apaches had been slowly filtering into northern Chihuahua and Sonora. They gradually gained in strength until about 1725 when they became a true menace to civilization established in the river valleys and on the plains. Their ruthless plundering and destroying of habitations, missions, and stock caused many of the settlers to abandon their homes and seek safety farther south where population was a little more dense.

Attempts were made to check the Apache invasion by populating presidios (Janos, Casas Grandes, etc.) which had been established during the latter part of the seventeenth century. The man power drafted for this dangerous frontier protection was of a very low class, that is, criminals, ruffians, paupers, and the like, who had no definite aim in life other than preying on more prosperous, fortunate people. Plundering, killing, and destroying continued in various portions of northern Chihuahua until about 1810 when an attempt at peace was made, which was successful to some extent. Settlers moved back into habitations and areas that had been abandoned for years. Stock raising, agriculture, and other occupations took on a new vigor and to outward appearances, it seemed that the country was ready for extensive settlement even though reports of Apache

degradations were not completely extinct. However, plans for northern Chihuahua development were brought to an abrupt close in 1832 when the Apaches again went on the war path. For some fifty years these marauders dealt out death and destruction to civilization in their path. The population was reduced to almost nothing. Homes, livestock, and farms were wiped out. Travel and communication were at a standstill as it was almost sure death to venture out on the plains any distance from the presidios.

With the deaths of Geronimo and Victorio, two Apache leaders, about 1885, the period of bloodshed gradually died down except for minor upheavals from time to time.

From this time on settlement again took place rapidly. The great grass-covered plains, for instance, the Llano de Carretas, became dotted with livestock, principally cattle and horses.

The lumber business in the Sierra Madre mountains took great strides, principally due to investment of American and Canadian capital. Two huge mills were constructed, one at Pearson, and the other at Madero, to handle the tremendous amount of timber that was cut in the mountains a few miles to the west. At the present day Pearson looks like a "ghost town." Many large wooden structures are empty and falling to decay. What few inhabited buildings there are now are Mexican adobe houses. The abandonment of the lumbering interests was caused by revolutions in the early

part of the twentieth century.

The development of mines and associated industries progressed in a marked degree. This industry was primarily centered in eastern Chihuahua in the regions of Santa Eulalia, Sabinal, etc. Silver, lead, and zinc were the chief metals extracted. The first element mentioned had been discovered at Santa Eulalia in the early seventeen hundreds and since that time sporadic developments were carried on. However, with the evacuation of the large Apache bands, the mining industry, commerce, and trade were renewed.

Trouble during the late eighteen hundreds was not restricted to the area under consideration here because groups of agricultural peoples, Mormons, were having considerable strife with various United States officials regarding a phase of their social organization, namely, the practice of polygamy. Pressure was brought to bear upon them so heavily that between the years 1884 and 1898 several hundred Mormons migrated southward from Arizona and Utah and established their colonies both in the Sierra Madre and along the lower Piedras Verdes and Casas Grandes rivers.

Three colonies, in order of their date of settlement, were founded in the mountains along stream borders. These were Chuhuichupa in 1884, Pacheco in 1885, and Garcia in 1898. As the people in these towns were hemmed in closely by forest-covered ridges of the Sierra, they, by necessity, had to practice small plot, intensive agriculture with grain

and potatoes as the major products. In addition to agriculture, and of great importance to these mountain Mormons, were lumbering and dairy farming. Dr. Donald D. Brand, on his reconnaissance trip in northern Chihuahua in 1930, found the population of these settlements to be as follows: Chu-huichupa - 190, Pacheco - 94, and Garcia - 149. These populations were much larger before the Villa raids.

Colonies were also established in the lower country along or near the rivers. These, in order of their date of settlement, are: Colonia Juarez in 1885, Colonia Diaz in 1886, and Colonia Dublan in 1889. The populations of Juarez, and Dublan were obtained late in 1934 by the author from a Mormon bishop living in Dublan. He estimated Juarez as having a Mormon population of 400 and Dublan 363. These two figures are slightly higher than those reported by Dr. Brand in 1930, at which time he found both Juarez and Dublan had a population of approximately 350. The third colony (Colonia Diaz) has practically been evacuated by the Mormon settlers due to the revolutions in the early part of the present century.

The great difference in the geographical character of the two groups of settlements (i.e. mountain and valley) caused considerable difference in the methods of livelihood of the two areas. It has been mentioned that small plot agriculture with lumbering and dairying were important in the mountains. In the valleys agriculture is carried on

very extensively with large acreages under cultivation. This is especially marked at Dublan which is located near the Casas Grandes river on a flat silt-filled basin of some fifteen miles in length and eight miles in width. Grains, vegetables, and fruits are raised.

When one thinks of Mexico today, he usually has the thought of various political difficulties that have rocked this great country. An attempt will not be made to give a history of such troubles but the mention of a few periods of peace or turmoil will help to show why industries, commerce, and trade have been held back from time to time.

Between the years 1876 and 1911 the Diaz regime held sway over Mexico. It was a period of comparative peace, except on the northern frontier, and laws were respected.

In 1911 the Madero regime came into power and caused great turmoil in northern Chihuahua. The army had to be fed and the area we are considering afforded excellent opportunity to plunder the farms and raid the stock owners' herds. Many of the Mormon and other American settlers had to leave everything they possessed behind and flee for their lives.

Madero's power came to an end in 1913 but the work he had started was carried on by Castillo, one of the Madero generals. For over a year this general, with other officers and men, continued the incessant pillaging started in 1911.

Then in 1914 Castillo was replaced by the notorious Villa, whose fame as a bandit and leader has spread over this continent. Villa was the dominating factor in northern Chihuahua until 1920. When one travels in Mexico now over the routes made by Villa, he hears many stories of the bravery, daring, and bloodthirstiness of this one time controller of the largest state in Mexico. No doubt, these tales have been colored by age and imagination, but probably the basic principles are true.

The brief outline of historical development in northern Chihuahua given in the previous paragraphs gives, in general, various periods of advancement and struggle which this area passed through. It can readily be seen that one big reason why there is not a larger, more prosperous population in the region is that the sounds of revolutionary gunfire have scarcely died away.

HISTORICAL NOTES OF SONORA

Sonora, which borders Chihuahua on the west, passed through periods of rather striking similarity to those of Chihuahua, which fact is not surprising due to the proximity of the two, even though a mountainous region presents rather a formidable barrier between the more densely inhabited portions of the two states.

In 1536 Cabeza de Vaca entered the region along the Bavispe river on his trek southward to Culiacan.

In 1540 Coronado pushed northward into Sonora from Campostela. His route led him across the Yaqui river to Ures on the Rio Sonora, from which location he passed through the vicinity of Arizpe, thence across the International Border near where Nogales is now situated, and thence on up to Zuni, New Mexico.

In 1567 Ybarra, who also has been mentioned, progressed northward from Zacatecas up across the middle Yaqui river to Bavispe and on east into Chihuahua across the Llanos de Carretas into the vicinity of Janos. Further movements of Ybarra in Chihuahua have already been mentioned. He reentered Sonora south of the confluence of the Aros river with the Yaqui.

From 1613 to 1711 the Jesuit padres carried on their work of founding missions and converting the natives. Much of the success of the padres is due to Father Kino, who carried on his ceaseless labors from 1687 to 1711, the year of his death.

In 1690 a presidio was established at Fronteras due to ¹degradations of Apache Indians. It will be noted that about this same time presidios were being constructed in the state of Chihuahua (Janos, Casas Grandes, etc.) for frontier protection against these marauding Indians.

As the padres carried on their work, the Pimas of

1. Ober, F. A., Travels in Mexico, p. 634.

northern Sonora were slowly growing to dislike the treatment to which they were being subjected, which ill-feeling broke out in rebellion around 1750. The rebellion was put down by Captain Urrea at Arivaca in 1751 but not until after the Pimas had destroyed many missions, ranches, and considerable stock. A direct result of this uprising was the establishment of a presidio at Altar in 1754.

The padres having lost much of their influence with the natives were expelled from America. However, northern Sonora did not lack in religious guidance any great length of time for in 1768 the Franciscans made their appearance in Sonora. They soon established missions throughout the region.

While the Franciscans were carrying on their work of preaching and converting, the Apaches were causing much turmoil on the frontier. By 1852 their power had become extremely great and their ruthless plundering so destructive that the rural population of northern Sonora had been almost wiped out.

Two important factors had a direct bearing on the depopulation of Sonora during this period.

The first was the discovery of gold in California in 1848. Large numbers of people, entire families and many able-bodied men, rushed westward to seek their luck in the gold fields. The loss of so many inhabitants, particularly those capable of bearing arms, weakened the resisting force

of Sonora tremendously.

The second factor which caused so much destruction and loss of life in frontier Sonora was the combining of power of the Chihuahuans and the Comanches in 1851-2 in an effort to repel the Apaches on the Chihuahua frontier. Thus, the power of these two allied groups tended to cause the Apaches to move westward and attack the comparatively weaker Sonoran settlements.

Also during the years from 1850-4 the French made attempts to enter Sonora with the special purpose of gaining control over the silver interests. They came from California but had very little success in establishing colonies due primarily to activities of de Raousset, a French count. In 1852 Raousset landed at Guaymas and proceeded northward to Saric on the Altar river. His intention was to work the silver mines which had been discovered in 1736.¹ However, before the Spanish government would grant him the privilege of working them, he had to assure the Spanish officials that he would bring a large group of colonists who would help ward off the Apache invasion. In case Raousset did bring a sizeable body of French people, the Spanish government agreed to pay him a fixed sum of money and to grant the privilege of working in various silver mines. Raousset never did carry out the Spanish stipulation so that by 1854

1. Lockwood, F. C., Spanish Missions of the Middle Southwest, p. 57.

colonization by the French was given up.

In the meantime the Apaches were a constant dread in northern Sonora. A bounty of one hundred dollars for an Apache buck scalp and half that amount for a squaw, which had been made official by the *Proyecta de Guerra* in 1837, was raised by a similar *Proyecta* around 1880, to two hundred fifty dollars for a buck scalp.¹ Naturally a bounty of this sort could not be successful due to the fact that scalps of questionable Apache character were brought in to obtain the reward.

With the year 1882 the Apaches made a final, great raid over northern Sonora, dealing out death and destruction wherever they went.² This wanton pillaging lasted about a year at which time General Crook and a number of soldiers set out to vanquish this warlike, nomadic tribe that had terrorized the region for so many years. The success of his campaign was quite notable. The Apaches that were not killed or taken as prisoners fled into the wild fastness of the Sierra Madre where, it is rumored from time to time, there are still wandering groups of these one time bloodthirsty marauders.

During the later years of Apache dominion in northern Sonora, the Mormons from Arizona were interested in forming settlements in the region. In 1873-4 exploration of the

1. Ober, F. A., *Travels in Mexico*, p. 627.
2. *Ibid*, p. 634.

Bavispe and Yaqui rivers was undertaken by Brigham Young Jr. and several other Mormons. No colonies were established at this time but in 1896 these people acquired a tract of 110,000 acres on the Bavispe and founded Colonia Oaxaca. This large tract of land was primarily used for grazing as it was not suitable for cultivation except along the river borders and flood terraces.

In 1899 the Mormons acquired another tract of some 25,000 acres twenty-five miles south of Colonia Oaxaca along the river. Here they established the colony of Morelos. As the terrain, in the vicinity of Colonia Morelos, was much more suitable for agriculture, the Mormons cultivated the land extensively and allowed their stock to graze along the fringes of their fields.¹

Shortly after 1905 a third colony, San Jose, was established along the river and agriculture begun.

Comparative peace reigned over these colonies until 1911 when Isidoro Escabosa arrived in Colonia Morelos with a large band of men. Federal officers were in pursuit of this outlaw and needed supplies, etc., for the army so between the two groups of men, the Mormons lost much of their property. In 1912 many left everything they had and fled to the United States. The few colonists that remained were in constant danger and continued to be oppressed by the Mexicans.

1. McClintock, J. H., Mormon settlement in Arizona, p. 268.

From 1914 to 1920 northern Sonora, as well as Chihuahua, was in a state of turmoil due to the actions of federal troops and rebels. In 1920 the country was restored to comparative peace and many refugee Mormons have gone back to their colonies.

PREHISTORIC POPULATION

CHIHUAHUA

There is no question but that the prehistoric population of Chihuahua was very large. This fact is very evident in the hundreds of ruins, both large and small, that dot the river banks, rise up out of the grassy plains, protect important corridors of trade routes, and that are found in the mountains as ridge top sites, mounds, or cave dwellings.

Large areas that were heavily populated during prehistoric times are now very sparsely settled. The Llanos de Carretas is an excellent example of this fact. In this region many huge mounds, that must have sheltered from one thousand to fifteen hundred people, are now covered with grass which is the chief means of sustenance of the many cattle that graze on the plains. There is a very scanty population there now, hundreds of times less than during the peak of the pueblo occupation.

The average density of population in this northern Chihuahua region certainly would not exceed three inhabitants per square miles, whereas, it does not seem unreasonable to say that in the same area the prehistoric average density would be at least five. This estimate is based on the theory that the valley people were forced into the

PLATE I



Valley Ruin Eight Miles Northwest of Colonia
Dublan, Chihuahua



Remains of a Corner at the
Casas Grandes Ruin,
Chihuahua

PLATE II



Wall Remains at Casas Grandes Ruin,
Chihuahua



Rock Fortress Wall near "Cerro de Montezuma"
Chihuahua

Sierra Madre at the end of the great pueblo period in which the development of arts had reached a peak. If the valley and mountain cultures were contemporaneous, it would raise the postulated density to approximately six inhabitants per square mile, or twice the number of people that are living in the region at present.

When and where the prehistoric Chihuahua culture started is a difficult question to answer at the present time. The small amount of excavation that has been done is not sufficient to make any definite statements regarding the origin of the Casas Grandes people. It will be necessary to carry on scientific work along all of the peripheral areas and to seek out possible early house types before much of the mystery of Chihuahua culture will be solved.

Another item to be considered is the use of tree rings to obtain ruin dates. Naturally, such a study would necessitate the procuring of hundreds of tree ring specimens to be used in cross-dating and very likely chronology building. Dr. Douglass is doing wonderful work in this field in this country, and some one doubtlessly will tackle the Chihuahua problem very soon. If such a chronology could be constructed for the Casas Grandes people, and beam specimens obtained from the cliff dwellings and valley pueblos, then the theory of a difference in time of the two areas could be certified and a better estimate of the population advanced.

In the light of what is known at present it seems that the pueblo culture came into existence in the early part of the Late Pueblo period (Pueblo II), rose to great heights during the middle part of the period (Pueblo III), and died out in the latter part of the period. (Pueblo IV). The middle part of the Late Pueblo period was characterized by expansion, excellent ceramic development, trade, etc. Then for some unknown reason the population decreased and the people became more concentrated in certain areas (Casas Grandes, Carretas, etc.). After this concentration period, which probably was in the Late Pueblo period, the people may have gone into the Sierra Madre mountains and continued their culture. The Tarahumari Indians in these mountains might be the remnants of the Chihuahuans.

The author does not doubt the fact that earlier types of ruins and pottery will be found in the future which will help to solve the problem of the prehistoric population. It does not seem reasonable to suppose that these people came into the area from the south as late as the early part of the Late Pueblo period. Some southern Mexican influence is manifest in the Chihuahua culture but there is also a very strong southwestern influence that entered from more northern regions. If we accept the theory that the Mimbres people died out around 1200 A.D., and that they went into Chihuahua, then it is not entirely impossible that they were assimilated by the Chihuahuans, who probably were very

powerful and widely distributed at this time.

SONORA

The prehistoric population of Sonora was less than that of Chihuahua, and the present population is less per square mile than the bordering state. Densely populated centers such as those in the Casas Grandes valley, Janos-Ascencion region, and the Llanos de Carretas were not present in Sonora. If they were we would discover more extensive ruins.

The author advances the hypothesis that the people who developed the Sonoran culture entered the region as an archaic group that developed along with the Gila peoples. As the pithouse period advanced the Gila population rapidly outnumbered the Sonoran settlers and had considerable influence in the Mexican state. But the Sonorans had enough people so that they developed a pottery type which was distinctly different from the Red-on-Buff of the northern area.

About the time of the Surface Pueblo period the Chihuahuans were becoming powerful and increased in population until in the middle of this period they had spread widely over northern Chihuahua and probably influenced Sonoran culture, particularly in the eastern part.

The hearth of this area seems to be in the Altar valley. This statement is based on sherd collections made by Sauer and Brand in 1931. This region is in the eastern part of the cultural area considered in this thesis. Based

SITES

CHIHUAHUA

In Chihuahua there are hundreds of pueblo sites located along the river drainages, on the plains, and in the mountains. These ruins vary a great deal in size and form, from very small few room houses to the great ruin of Casas Grandes which had several hundred rooms and was four or five stories in height. Sites on the plains and in the valley basins were usually non-defensive, strictly agricultural settlements. Ruins along trade routes and corridors were often fortified. The hearth of the Chihuahua culture seemed to be in the Casas Grandes valley as it is in this region that the largest number of ruins were seen. They were not so large as in the Carretas nor the Janos-Ascencion regions but were more numerous. However, these two areas mentioned certainly were secondary hearths.

In the Carmen Basin sites are sparse with Loma de Montezuma the best ruin. This mound is located southwest of Villa Ahumada. Brand records a local Red-on-Gray ware as well as about an even distribution of El Paso and Chihuahua wares. Apparently there were two groups of people in the Middle Carmen. First, there was a people who were associated with Carmen ware and Mimbres, El Paso, and Three Rivers trade ware. Secondly, there was a people of quite

pure Chihuahua type. Stone and adobe were used by the first group and adobe by the second. These two sites were about five miles apart.

In the Santa Maria drainage there was a more dense population than in the Carmen. In some of the valleys (San Buenaventura and lower Santa Maria) there was evidence of a sizable population in prehistoric times.

It has been mentioned before that many ruins exist along the Casas Grandes and its tributaries. Ruins increase in number from the upper San Miguel down the river to San Diego. South of Pearson there are small ruins. In the mountainous portions of this area there must be cliff dwellings.

The Piedras Verdes is well known for cave sites (Olla Cave). This region was extensively inhabited in prehistoric times. In the Strawberry Valley there is a large cliff ruin, well protected and difficult to reach.

The Arroyos of Tinaja and Tapiecitas were well populated. Brand mentions a ruin at Hacienda Tapiecitas that is next to Casas Grandes in size in Chihuahua, with only pure Chihuahua wares present. This area was on the corridor between the upper San Pedro and Casas Grandes valleys so fortified sites were well represented.

Below the confluence of the Arroyos of Tinaja and Tapiecitas with the Piedras Verdes, there are numerous mounds on the west side of the river. These sites vary in

size but are not large. Numerous pothunters' holes exposed walls that were of adobe and small pebbles.

Along the Casas Grandes from the union of the San Miguel and Piedras Verdes to the Ascencion Valley, there were many ruins of adobe. Agriculture must have been extensive in this region as innumerable broken metates and manos are scattered on the ground.

The San Pedro is well lined with sites. Near Janos is a large ruin of adobe that yielded Chihuahua wares, Mimbres Black-on-White, El Paso ware, Chupadero Black-on-White, and Gila polychrome. West from this site in the rolling plains land, there are a few ruins. From Los Ojitos southward numerous sites of small size line both banks of the San Pedro. Pronounced cimiento development and fortifications exist along the river in this region.

On the Arroyo el Cuervo, a southern tributary of the San Pedro, near the mountains there is a huge ruin, "El Cuervo." It is located on the east bank of the arroyo and extends three hundred fifty yards north and south and about fifty yards east and west. The height of this ruin was approximately sixteen feet and must have been at least three stories high. A strange feature at this site was the presence of three rectangular stone outcroppings with a definite circle of stones in the center. One of these was approximately twenty feet square with a nine and one-half foot circle in the center. It was covered with sherds of plain

PLATE III



Circular Rock Construction Inside of a Rect-
angular Cimiento Wall Plan on the Arroyo
el Cuervo, Chihuahua



Cimientos on East Bank of San
Pedro Three Miles South of
Ojitos, Chihuahua

ware and a few pieces of polychrome. On the main ruin Chihuahua wares and a small number of trade sherds were found (Gila polychrome, Mimbres Black-on-White, El Paso polychrome, and seemingly a Sonoran raked red ware.)

The Carretas and its tributaries contain a great many sites except in the lower plains region. Two large ruins, Metate Ruin, west of the Arroyo de los Alisos, and Ruina de la Tortuga both yielded Chihuahua wares, Mimbres Black-on-White, Little Colorado ware, Chupadero Black-on-White, Gila polychrome, El Paso polychrome, and Sonora raked ware. These ruins are large mounds covered with grass and some fifteen feet in height along the central axis.

In the valley of La Ascencion numerous sites give evidence of a large population along the Casas Grandes. This basin is covered with grass and mesquite with cottonwoods along the river. The ruins, El Esparceno and de la Cruz, are located in this valley. The former is about ten miles west of La Ascencion and the latter near the town. These are large mounds and were densely covered with sherds. Chihuahua wares, El Paso polychrome, Chupadero Black-on-White, Mimbres Black-on-White, and Gila polychrome were all present in this area. These sites are non-defensive.

Between La Ascencion and Laguna Guzman sites are small and show a strong trade influence from the northern and eastern cultures. This stretch of country is arid and not suitable to agriculture. No doubt the extension of people

into this area occurred in the period of great expansion and development of the arts.

Sites in the Palomas-Mimbres drainage are small and show a heavy percentage of Mimbres wares. North of the International Border the sites are practically pure Mimbres. It is evident that the strictly Chihuahuan sites in this region were small and lacked the fine development of the hearth regions.

Sites in the Playas-Nogales basin are similar to those in the Palomas-Mimbres region. They are small ruins in an arid region. The Arroyo Nogales site located on the upper Nogales is a large mound covered with desert vegetation. Gila polychrome and Little Colorado wares entered Chihuahua through this area so are well represented at this ruin. Also El Paso polychrome is present.

In the Arroyo de las Varas which was a corridor into Sonora through the Sierra Pulpito, there were a few sites. Most of these are fortified so are characterized by an abundance of rock.

On the southern periphery in the Babicora region there are numerous ruins that are composed chiefly of stone and adobe. The southern extent of Chihuahuan culture in this district is unknown. It would be of value to make an intensive reconnaissance for ruins south of Temosachic to see if any connection with the Chihuahuan culture and the cultures of more southern Mexico exists. The author believes

PLATE IV



View of the Llanos de Carretas Northward with
the Sierra Enmedio in the distance, Chihuahua



Ruina de la Tortuga on the Llanos de Carretas,
Chihuahua

that the area between Babicora in Chihuahua and Chalchuites in Zacatecas will reveal archaeological sites unknown at the present time.

It is evident that a very great area was covered by archaeological sites in Chihuahua, but in addition there are numerous sites in southeastern Arizona¹ and in Sonora along the eastern border westward to the Fronteras region.

SONORA

Pueblo sites in Sonora are restricted almost exclusively to river valleys. They do not appear as extensive mounds that are so common in Chihuahua, but are rather insignificant, usually rock outlined, locations of prehistoric habitations. Sauer and Brand visited or were aware of approximately thirty-five sites and Amsden recorded approximately twenty-two. Bandelier and Lumholtz mention prehistoric ruins in eastern Sonora but many of these must be the same as the ones reported by Amsden due to the fact that he followed parts of the routes taken by the two earlier workers. At the present time little work has been done in Sonora so that very much valuable material is not obtainable.

It can be stated that sites in the Altar district are practically pure Sonoran in pottery type. This is also true for most of the Magdalena drainage, that is the lower portions south of Imuris. From Imuris eastward the sites

1. Sauer, C. and Brand, D., Pueblo Sites in Southeastern Arizona, pp. 422 et. seq.

become more mixed, with Sonora and Chihuahua wares present. From Imuris northward the sites reveal that Sonoran and Gila Red-on-Buff people were in contact with each other.

A very interesting field of investigation awaits the archaeologist who will attempt to define the Sonoran cultural area on the south and west. Also of great interest and value would be the excavation of sites in the Altar district, the Sonora River valley, the lower Bavispe country, and the upper Santa Cruz section.

PUEBLO TYPES

VALLEY TYPE IN CHIHUAHUA

The term valley, as used in this discussion, does not necessarily mean that the ruins were located in a valley. It is used to designate ruins whose material make-up was adobe and pebbles from houses that were composed of rock with adobe mortar. Such a distinction is made between the ruins, for instance, near Phoenix (Pueblo Grande) and the ruins in the Fort Apache region (Kinishba). Both ruins mentioned are located in a valley but the former is composed of adobe and pebbles whereas, the latter was made of rock set in clay mortar, which puts it in the Mesa Type ruin classification. In general, the topography and structure type correlate very well but exceptions are not lacking.

From a study of twenty ruins situated in different parts of the area, the author was able to get a good idea of the construction of these mounds. The facts are based on investigation in excavations made by pothunters, and Lumholtz's work in the lower Piedras Verdes river valley. The ruins of Casas Grandes are not mentioned due to the fact that these buildings are of exceptional construction as regards size, wall thickness, and wall formation, and a detailed account would be much too lengthy to be included

in this paper.

All of these twenty ruins were the Surface Pueblo Type and ranged from rambling to compact in ground plan. They varied from small ten-room, one-story structures to "apartments" of over one hundred rooms and at least three stories in height in sections.

Wall measurements were made wherever possible. They ranged from ten to eighteen inches thick and were composed of adobe with small pebbles as a "tempering material." In the region of Colonia Juarez rocks of a larger size (small stones) were used in the adobe. The average wall height was five feet but careful excavation will be necessary to determine this point. Many walls were covered with a coating of plaster which was three-eighths of an inch in thickness in one ruin on the upper Agua Zarca.

Room dimensions varied in size from two small ones, in a ruin on the Arroyo Cuervo, that were approximately $4\frac{1}{2}'$ x $6'$ to larger rooms in the ruins near La Ascencion that were $10'$ x $12'$. The average size room was $7'$ x $9'$.

Doorways were seen at two sites and they were $2'8''$ high x $2'2''$ wide and $2'$ above the floor level. At one site, on the slopes of the Sierra de la Brena, two Mexicans were pothunting a ruin which had a T-shaped door very similar to the T-shaped doors of the Piedras Verdes cliff ruins in Chihuahua and the Tonto Cliff ruins in Arizona. No lintels or sills were observed in place but evidence that they were

employed was found at a site in the Casas Grandes valley near Frederico. Here a large, flat rock, although broken, measured two and one-half feet long by one foot wide by two inches thick.

A fireplace in the center of each room seemed to be the common practice. This was usually a small circular pit. Another type of fireplace was noticed by Carey¹ in that the pit was rectangular and built against one of the walls.

A fact that is noticeable as regards these rooms is that there is not much wood in portions large enough to attempt tree ring dating. We certainly hope if any scientific excavation is done in the future that extreme care will be taken not to destroy the possibility of finding fallen beams, which must have been used as a basis for roof construction.

It is impossible to record a standard ground plan due to the many sizes of the ruins and methods of adding rooms. However, a general northwest-southeast orientation of the longitudinal axis was noticeable in over half the twenty ruins visited. The remainder were either orientated north and south or northeast-southwest. The highest portions of the mounds were along this general north-south axis and rooms of from one to two stories were built on the east and west sides at right angles to the main body of the ruin.

1. Carey, H. A., *An Analysis of Northwestern Chihuahua Culture*, p. 363, Plate 19b.

These additional rooms often formed what must have been courts that faced both east and west and were bordered on two or three sides by rooms.

Three sites visited showed signs of cimientos or lines of rocks on the surface that outlined rooms. These were apparently in the top of the wall.

The sites that showed this trait were in the northeastern portion of Chihuahua. Brand records many ruins with this characteristic and there is an apparent increase of cimiento development over the Sierra Madre into Sonora.

CLIFF TYPE

Cliff pueblos are those located in a cave or under an overhanging bluff in a mountainous region. Excellent cliff pueblos are located in Cave Valley along the Piedras Verdes river in the caves that have been formed in an agglomerate formation. Also in the Strawberry Valley approximately eight miles south of Cave Valley contains a very well preserved cliff ruin.

As an example of the cliff type pueblo, the author has chosen Olla Cave, which is situated about one-quarter of a mile north of the Piedras Verdes river in Cave Valley. This cave is about eighty feet wide at the mouth and one hundred feet from front to back. The roof slopes down from about twenty-five feet high at the mouth to almost nothing in the back. It has a southeastern exposure and commands a good view of the Piedras Verdes Valley.

In the front of the cave there is a large olla-shaped storage bin composed of ropes of twisted grass, coiled like a piece of pottery and plastered over with clay. The wall thickness averaged eight inches. It was twelve feet high and eleven feet in diameter in the widest part. At the top there was a hole three feet in diameter which was probably used when the olla was filled with agricultural products. There is a hole of similar dimensions near the bottom and two pairs of smaller (six to eight inches in diameter) holes at intervals on the sides. These smaller holes were probably used for beam supports which enabled the people to go down inside the structure and take out a supply of food. The hole at the bottom must have been closed at times when the granary was partially filled to prevent the products from spilling out onto the floor of the cave and also to prevent rodents from getting into the supply of stored food. Lumholtz¹ mentions several other granaries of smaller dimensions and two of which were sunken into the cave floor.

In back of the large olla in Olla Cave there were remains of rooms. The walls were constructed of the clay-like material of the cave with the use of small rocks as reinforcements. They were about eight inches thick and, in general, were very hard and smoothly covered with plaster.

1. Lumholtz, C., Unknown Mexico, pp. 65 et. seq.

The rooms varied much in size but six by seven feet seems a good average. The height was difficult to determine but based on this cave and two others visited, they seemed to be between five and five and one-half feet.

Evidence of two, or perhaps three, stories was exposed by the presence of definite wall marks on the roof in the front portion of the cave.

Doorways were constructed in rectangular and T-shaped forms. The rectangular type averaged two feet wide by about two feet four inches high. Door heights were difficult to obtain as the upper parts of the dwellings have caved in considerably. The T-shaped door was present in two forms. The most common form was the regular narrow bottom, wide top shape which is common in the cliff dwellings of the Southwest. The second type was constructed with one side vertical and the other side with two or three small step-like projections which caused the doorway to be narrow at the bottom and wider at the top. This type of door was usually higher than the others.

These doorways were made about one foot above the floor level so it was necessary to step up slightly when one wished to enter a room.

The roof construction in these dwellings must have been similar to the cliff dwellings in the Southwest. Rows of beam holes were in evidence and they were approximately three inches in diameter. Very little of the roof material

remains but it is safe to assume that smaller poles and a covering of adobe were employed.

In one cave, a mile south of Olla Cave, which was given the name, Goblin Cave, due to the presence of a nearby spire of rock that resembled a goblin, there was a large rectangular room built against the southeast wall. This measured approximately fifteen by five by five and one-half feet. It had one rectangular doorway of small dimensions which was about eighteen inches above the floor level. It is hard to say what the purpose of the room was but it seems that it was used for storage.

Another feature of this cave and one in Strawberry Valley was the presence of "concrete seats or blocks."¹ The author is inclined to believe this was a type of fireplace which was quite similar in form to Type No. 2 pictured by Carey in the Babicora district.² This type of fireplace was rectangular with sides built up at right angles to the wall and the front left open.

OTHER FORMS OF ARCHITECTURE

Agricultural Terraces or Trincheras

Across many of the intermittent side-streams in the mountains of Chihuahua and Sonora stone dams have been built for the purpose of catching and holding what silt may be washed down from the higher regions. These dams vary in

1. Lumholtz, C., Unknown Mexico, p. 67.
2. Carey, H. A., p. 363, plate 19b.

width and height , but twenty by five feet would be a good average. As sediment was carried down the slopes, it was deposited behind these rock dams in a rather level stratification. When sufficient dirt had been filled in, the small area was cultivated intensively. The reason for such constructions must have been that there was a lack of cultivatable soil along the river margins at times, and to raise any crops some artificial "fields" had to be developed. These trincheras were not built so that there would be tillable soil in times of danger because oftentimes they are not so close to a ruin as the main stream borderland. In some arroyos several terraces exist; one slightly farther upstream than the preceding. An excellent picture of an agricultural trinchera is shown in Lumholtz.¹

Fortifications

Fortifications were located in regions where natural passes and corridors existed. The upper San Pedro was used extensively for a travel route from the Carretas plains over the Sierra del Rio San Pedro into the Tinaja drainage and San Diego - Casas Grandes valleys. Also a pass that was used for a trade route connecting Chihuahua and Sonora leads from the Llanos de Carretas via Arroyos de las Varas and Pulpito into the Bavispe drainage of Sonora near the town of Oaxaca.

1. Lumholtz, C., Unknown Mexico, p. 73.

The typical fortified site is composed of rock-walled rooms protected by a wall of stones. The rooms may be built against the protecting wall.

One site reported above, the Arroyo de las Varas, near the point of its emergence onto the plain, was constructed almost entirely of cyclopean masonry, with some adobe mortar. The rooms of this site were six feet deep and the walls a foot and a half thick.

The best example of a fortified site in Chihuahua is the Cerro de Montezuma. This is located six miles southwest of the ruins of Casas Grandes.¹ This is a ridge-top ruin, but is situated near the pass between the Casas Grandes and San Diego-Juarez valleys. It is constructed of volcanic stone blocks laid up to form massive walls. Rooms were constructed inside the protecting wall and in one portion there was a stone parapet or lookout. Blakiston attaches a good deal of religious feeling to this ruin but the author is inclined to believe it was a refuge site constructed when heavy pressure was brought to bear on the agricultural people of the valleys.

Cerros de Trincheras

The use of the word "trincheras" may be confusing as used here in a different sense than was used as regards the agricultural terraces. However, the word cerro (hill)

1. Blakiston, A. H., The Ruins of Cerro de Montezuma, pp. 256-61.

PLATE V



Stone Dwelling on the "Cerro de Trincheras"
Trincheras, Sonora



Rock Terrace on the "Cerro
de Trincheras"
Trincheras, Sonora

definitely distinguishes this type of construction from the one previously mentioned.

A cerro de trincheras is a terraced hill which was not used for agriculture but was a place of dwelling and probably protection. Usually a hill which rose as an isolated island from the surrounding terrain was selected for this form of terrace architecture.

The best example of a cerro de trincheras is located in Sonora just south of the town Las Trincheras. It is a hill of circumdenudation which rises from the plains 1900 feet in elevation to 2500 feet on the highest point. The slopes of the entire hill are covered with terraces which vary from two to ten feet in height. The length also varies considerably but the longest one seen at this location measured over three hundred yards. The width was usually about eight feet. On the surface of these terraces there was a very thin thickness of dirt in places which could not have supported any agricultural crops. They were constructed of igneous boulders piled up with care so that a smooth face and level surface resulted.

Several rock rooms were noticed on the terraces which proves they were used for habitation. In addition, fragments of pottery, shell, and broken manos were scattered from the summit to the plains below. One room measured twelve and a half feet long by eight feet wide by five feet high. Much of the wall section had fallen down so

this height measurement is less than at the time the room was occupied.

Cerros de trincheras were reported in western Chihuahua but they are not so abundant as in Sonora where almost every hill in the region of Las Trincheras is terraced.

It seems that the agricultural trincheras were Chihuahuan in origin and the cerros de trincheras Sonoran, but there is an overlapping of these two architectural forms which would indicate that one was earlier than the other. The author believes the Sonoran cerros de trincheras preceded the agricultural type and that the Chihuahuans applied the terrace fundamentals for agriculture.

SONORAN PUEBLO TYPE

Before any final statements can be made regarding the architectural form of the Sonoran habitations, excavation must be made at sites located in different sections of the area. Amsden makes the following statement concerning ruins in the Rio de Sonora drainage: "Surface indications of this show a double line of stones laid together to form a foundation a foot or slightly more, in width. Since they are level with the surface of the surrounding ground, the houses that men erected over them must have been made of brush or poles. Rooms are always rectangular, eight by ten, or ten by twelve feet in size, and, so far as I could tell, were not placed in any very definite order. Mounds of adobe at three of the Sonoran type ruins I investigated

indicate that the use of that material for house building was practiced.¹

The author feels that habitations of brush and poles were not the usual type in this area, but that they were composed of adobe from above the ground level. The stones were probably used as a foundation which often went beneath the ground surface to form a rectangular pit. The presence of small mud mounds in connection with these rock outlines indicates a wall construction of adobe. The roof was probably made of poles and had a mud covering. Sauer and Brand found stone outlines with mounds in the western section of this area, in the vicinity of Altar.

1. Amsden, C., *Archaeological Reconnaissance in Sonora*, pp. 46-7.

MATERIAL CULTURE

AGRICULTURE

There is no doubt but that agriculture was a very important factor in the lives of the prehistoric inhabitants of northern Mexico as it was in all of the other areas of the Southwest. Evidences are apparent throughout the entire region. Metates and manos, agricultural trincheras, granaries, corncobs, and cotton fabrics, all point to the fact that the pueblo culture was dependent on this pursuit. The use of wild game, fruits, nuts, and berries, probably was extensive but of secondary importance to the raising of crops.

The three vegetables used were corn, beans, and squash. This complex goes together throughout the Southwest.

Except at Casas Grandes, no canals or stone hoes used for pueblo agriculture were seen by the author. This seems very queer due to the fact that many sites were visited where a canal system would have been ideal. There is no doubt in my mind but that canals existed somewhere near these sites but were not apparent.

Agricultural practices in the region at the present time and the extensive grazing in the plains region have obliterated much archaeological material and many evidences

of the prehistoric people. No doubt many irrigation systems have thus been obscured. In addition, erosion has, without doubt, done its share in altering artificial surface configurations.

That the inhabitants were aware of the possibility of drought is evidenced by the fact that storage bins and granaries were erected. Also, the agricultural trincheras may have been a means for providing arable land in dry seasons as well as wet. The little arroyos would catch and hold water that might have dissipated into the soil before reaching the main stream.

STONE WORK

In Chihuahua and Sonora there was a marked similarity in the manufacture of stone implements. The people of both culture areas were very skillful in the art of chipping, pecking, and smoothing the many articles so necessary in the pueblo culture. Igneous rocks are spread over the entire region and were extensively employed to make the various types of weapons, tools, and ceremonial objects. In addition to igneous rocks there was also quartzite, sandstone, limestone, jasper, chalcedony, flint, and chert. The first three mentioned were used more extensively in the manufacture of grinding implements, whereas the last four were employed primarily for projectile points.

Metates, Manos, Mortars, and Pestles

Utensils for grinding corn, nuts, acorns, mesquite beans, etc., were of primary importance among the house-

hold articles made of stone. The metate and mano were used in much larger numbers than the mortar and pestle. Whole articles or fragments of them are scattered profusely over the many mounds.

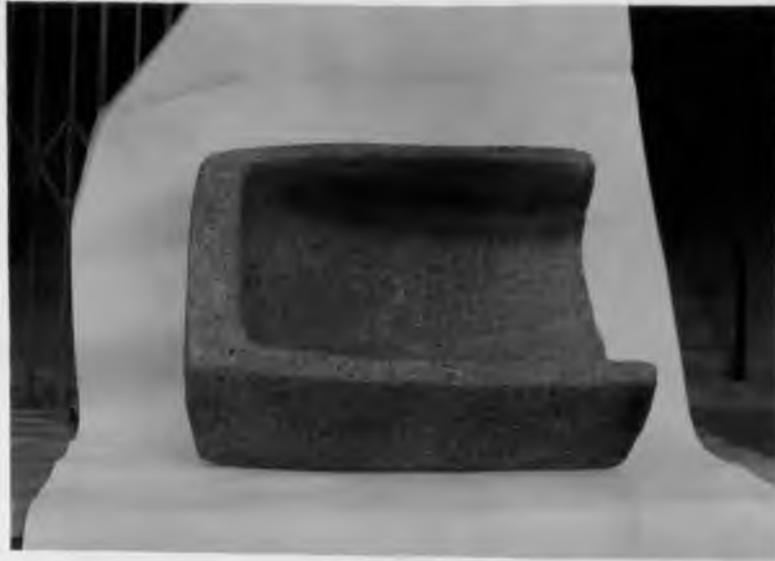
Metates

The metates of Chihuahua and Sonora are predominantly of one major shape, which is the scoop type and includes four-fifths of the metates in Chihuahua.¹ I am inclined to believe that this percentage would be less in Sonora due to the abundance of mortar holes in bedrock.

In appearance the scoop metate looks like a rectangular box with one end and the top removed and the interior sides and back curved inwardly to aid in grinding. These metates vary much in size, from a foot to two feet in length. The size depends on the form of the rock before working it into a metate. In the superior specimens, the exterior sides were carefully smoothed with the corners accurately squared. By far the most abundant material employed in metate manufacture was vesicular basalt. Some were made of quartzite and rhyolite. They are distributed throughout the area but seem more common and of better technique in areas of more advanced agricultural development. South of Las Trincheras, in Sonora, the scoop metate seems to fade out considerably and the mortar increases in number.

1. Brand, D. D., pp. 76 et. seq.

PLATE VI



Scoop Metate of Vesicular Basalt, Chihuahua



Pestles of Amphibolite Schist, Chihuahua

Manos

Based on the observation of several hundred manos, complete and broken, the most abundant shape is a thin, generally flat, rectangular article with a slightly curved face to fit the metate. Some of the other shapes that are found in fair numbers are roughly triangular, elliptical, and a rectangular shape which looks square in cross-section.

Vesicular basalt, quartzite, and sandstone were used to a great extent in mano manufacture.

A shape that appears in both Chihuahua and Sonora, in a minor degree, is the round, flat grinding stone, which must have developed by being used in a rotary motion.

Mortars

Mortars are far less numerous than metates in these two states and seem to be stronger in the peripheral regions. They are manufactured from a roughly cylindrical rock by constant wearing in the center of one and oftentimes both faces. As the stone is worn the hole becomes the shape of an inverted cone with a rounded apex.

Basalt and quartzite are the most common rocks employed. In the region south of Las Trincheras in the granite bedrock of the arroyos numerous mortar holes were observed. This particular trait is very common in southern California, both in stream beds and in the mountains where acorns are plentiful.

Pestles

Pestles are distributed over the same area as the mortars because these two articles make up a complex which could not exist if one or the other were removed. Most any stone of a roughly cylindrical shape could be used as a pestle. They vary much in size, diameter, and length, but generally are not over two inches in diameter by ten inches long.

Two specimens in the Arizona State Museum, that suggest a Mimbres influence¹ were found in a ruin near La Ascencion, Chihuahua. These were made of amphibolite schist and are seventeen and three-quarters and thirteen and three-quarters inches long. They are elliptical in cross section.

Paint Mortars

Paint mortars occur rather frequently in the more densely populated (during prehistoric times) regions of Chihuahua. These artifacts are similar in shape to a section of a cylinder whose diameter is about twice the thickness. In the flat upper surface a depression was worn out by grinding various paints. The exterior of these mortars is well smoothed and shows careful workmanship. Sandstone, quartzite, and rhyolite were used to make these articles.

The author heard reports of stone bowls in Sonora which must have been the same as the Chihuahuan paint mortars.

1. Cosgrove, H. S. & C. B., The Swartz Ruin, p. 34, and plate 30, pestle C.

PLATE VII



Paint Mortars and Pestles, Chihuahua



Axes from Chihuahua

Bowl Metate

This adjective "bowl" is used here to distinguish this article from the scoop metate and true mortar. It is a combination mortar and metate in shape and is found in the peripheral regions. The grinding surface of these implements is generally oblong in shape and may be two or three inches deep by six inches in width. The sides are left rather rough and do not show the skillful workmanship of the scoop metate.

Axes

The Chihuahua-Sonora axe type was very similar to that characteristic of the Gila culture. That is, the three quarters grooved form is most common although there were also full grooved axes. Most axes were made of diorite in both regions, but olivine was used in Sonora as well as diorite. Various other types, the double grooved, flanged, and double bitted, were manufactured. Brand mentions some specimens with animal heads on them but such a form is very rare.

Picks, Hammers, and Mauls

Although we do not know a great deal about the three articles here mentioned, it is evident that they were present in these regions. The picks were generally pointed cylindrical articles with a full groove. They were of well smoothed diorite. An example of a hammerstone and a piece of maul was found on the Arroyo, Cuervo by the author.

The former was a handstone of flat cylindrical shape, which had small depressions in each side to aid the user to grasp the stone. It was of quartzite. The latter article represented about one quarter of the head part of a maul which probably was about four inches in length. It could not be determined whether the article was full or three-quarters grooved. It was of vesicular basalt, and the shape must have been similar to two bells placed mouth to mouth.¹ This shape is also common in northern Arizona.

Projectile Points

Arrow points are of two general types in these areas. One is the small barbed pueblo form and the other a larger type with a flat butt. The former are found on and close to the mounds. The latter seem to be more restricted to the peripheral areas and seem related to a nomadic people. Without doubt many are of Apache manufacture but if the pueblo people were forced to concentrate into more densely populated centers by nomadic bands, many of these large arrow points could be of prehistoric origin.

Flint, chert, and obsidian were the three most common materials used, although some points of quartz crystal were found by the author in the Ascencion region.

Obsidian may have been traded into Sonora.² In this

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1. Note shape of maul "e", plate 40, H. S. & C. B. Cosgrove, The Swartz Ruin.
 2. Sauer and Brand, Prehistoric Settlements in Sonora, p.112.

connection it was reported by Bandelier¹ that the Cuesta del Jarato and the Plateau of Huipari in eastern Sonora, were covered with lava rock and considerable obsidian in nodule form. Obsidian nodules were ideal for making projectile points, spearheads, and knives, and if Bandelier is correct in his observations, it seems very likely that much of the obsidian in Sonora was not trade material.

Additional Stone Artifacts

Drills, arrow polishers, knives, scrapers, human and zoomorphic figures, phallic symbols, balls, "doughnuts", trays, slate palettes, ceremonial four-cornered stars, and pipes have been reported as found.

Stone balls and "doughnuts" (a stone article of unknown use shaped like a doughnut) were found by the author on the Llano de Carretas and were made of basalt. They point very strongly to a connection with the Gila and Mimbres areas where these articles have been excavated. None of them were reported in Sonora though Lumholtz pictures a ring of somewhat similar manufacture.²

A double-headed serpent of steatite was found in the Suaqui region.³

Figurines of an odd type such as this do not necessarily prove a difference in one stone culture from another.

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1. Bandelier, Final Report on Investigations in the Southwest, p. 515.
 2. Lumholtz, New Trails in Mexico, p. 42.
 3. Sauer & Brand, Prehistoric Settlements in Sonora, p. 113

It seems more likely an individual composition. Also in Chihuahua the use of the serpent as a decorative pottery motif was not uncommon so that the presence of the serpent complex in both areas seems to be a tying factor.

The "ceremonial four-cornered star" mentioned is pictured by Lumholtz.¹ The shape is identical to a number of obsidian stars possessed by a customs official in Columbus, New Mexico, that were obtained eighteen miles east of Columbus. The one pictured by Lumholtz is made of jasper and came from Maria.

No doubt many more examples of stone work will be excavated in the future. At the present time the stone artifacts from these areas point much more strongly to a northern rather than southern influence. Therefore, until evidence of southern Mexico influence in stone work is more pronounced, the author will claim a southwestern connection.

TEXTILES

Very little evidence of the textile art of northern Mexico has been brought to light at the present time, but we do know that spinning and weaving were practiced.

In the cliff dwellings of Cave Valley, Lumholtz found needles and awls of bone, basketry work covered with pinon pith, mats, and girdles, threads of fiber or hair, plaited

1. Lumholtz, *New Trails in Mexico*, p. 142.

yucca leaf sandals and wads of cotton.¹

The mounds of Babicora produced a few textile articles in the form of basketry and two ply fiber rope. The basketry was diagonally plaited in the three-strand-over-²three -strand-under design.

Clay discs that could have been used for spindle whorls were found by the author in the Ascencion region.

Spindle whorls were found by Sauer and Brand at several Sonoran sites.

Some evidence of textile manufacture is noticeable on certain effigy pieces of pottery. Breech cloths, head-dresses, etc., are depicted.

It is not strange that more examples of spinning and weaving do not exist due to the fact that little scientific excavation has been done and that the valley ruins are not conducive to preserving fabrics. The bulk of textile material will come from the cliff ruins which are comparatively dry and much more suitable for maintaining basketry, matting, cotton material, etc.

CERAMICS

CHIHUAHUA

The ceramics of Chihuahua have always been of great interest to the archaeologist as well as to people in other walks of life. The great variation in shapes and

1. Lumholtz, Unknown Mexico, Vol. I, p. 68.
2. Carey, H. A., An Analysis of the Northwestern Chihuahua Culture, p. 366.

the skill with which the designs were executed, particularly upon the classic ware, has caused much admiration on the part of art lovers.

Lumholtz writes: "The pottery which was excavated here (San Diego) is superior in quality, as well as in decoration, to that produced by the Pueblos of the Southwest of the United States. Though the designs in general remind one of those of the Southwestern Pueblos, as, for instance the closed terraces, scrolls, etc., still most of the decorations in question show more delicacy, taste, and feeling, and are richer in colouring."¹

The San Diego collection² represents most of the types of pottery manufactured by the people of the Chihuahuahua culture.

No doubt many of the pieces are of fine technique, both in shape and decoration, but it seems that Lumholtz made his description of Casas Grandes wares a bit too strong, especially when one considers the paste and surface finish of Old Hopi polychrome ware, or the excellent decorative technique employed by the Mimbres and Kayenta peoples on their Black-on-White specimens. However, much of the pottery coming from this area certainly ranks very well with that produced in other Southwestern drainage

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1. Lumholtz, Unknown Mexico, p. 94.
 2. Shown in table form, p. 329, American Anthropologist, Vol. 33, 1931, by H. A. Carey.

areas.

Much of the following discussion on Chihuahua ceramics is based on the study of specimens in the Arizona State Museum, and sherds collected by the author in 1934 and 1935. There are some two hundred and eighty pieces of pottery on display from this region of Mexico. Part of the specimens are being loaned by Mr. R. D. Pearce of Columbus, New Mexico, while the rest of the examples are property of the Museum. Most of the types are well represented in these two collections, which makes it possible to state facts that are quite characteristic and will apply to Chihuahua wares displayed in other localities.

According to Dr. Brand¹ painted ware includes 50-70% of all sherds and vessels with the exception of plain ware. The majority of the pieces, both sherds and vessels concerned in this percentage, were found to be without a slip.

Motifs of decoration that are characteristic on the Casas Grandes polychrome fall into nine types which Carey has termed: key designs, interlocked spirals, step designs, triangles having one side extended and bent, triangles, single spiral, leaf element, circle in negative, drawing with dot inside (sun symbol), and dot within a small square, (corn symbol).²

1. Brand, Material Culture, Ceramics, Part III, p. 76.

2. Carey, H. A., An Analysis of the Northwestern Chihuahua Culture, p. 346.

In this thesis the interlocking spiral, spiral and interlocking key will be termed interlocking scroll, scroll and interlocking zigzag. Also motifs depicting the macaw's head and a wing design will be included. The macaw's head design is pictured by Carey¹ and termed the negative painting (formal process) design.

In addition to these eleven most abundantly used designs, there are other more specialized motifs of limited use (i. e. the serpent, wild turkey, human form, etc.).

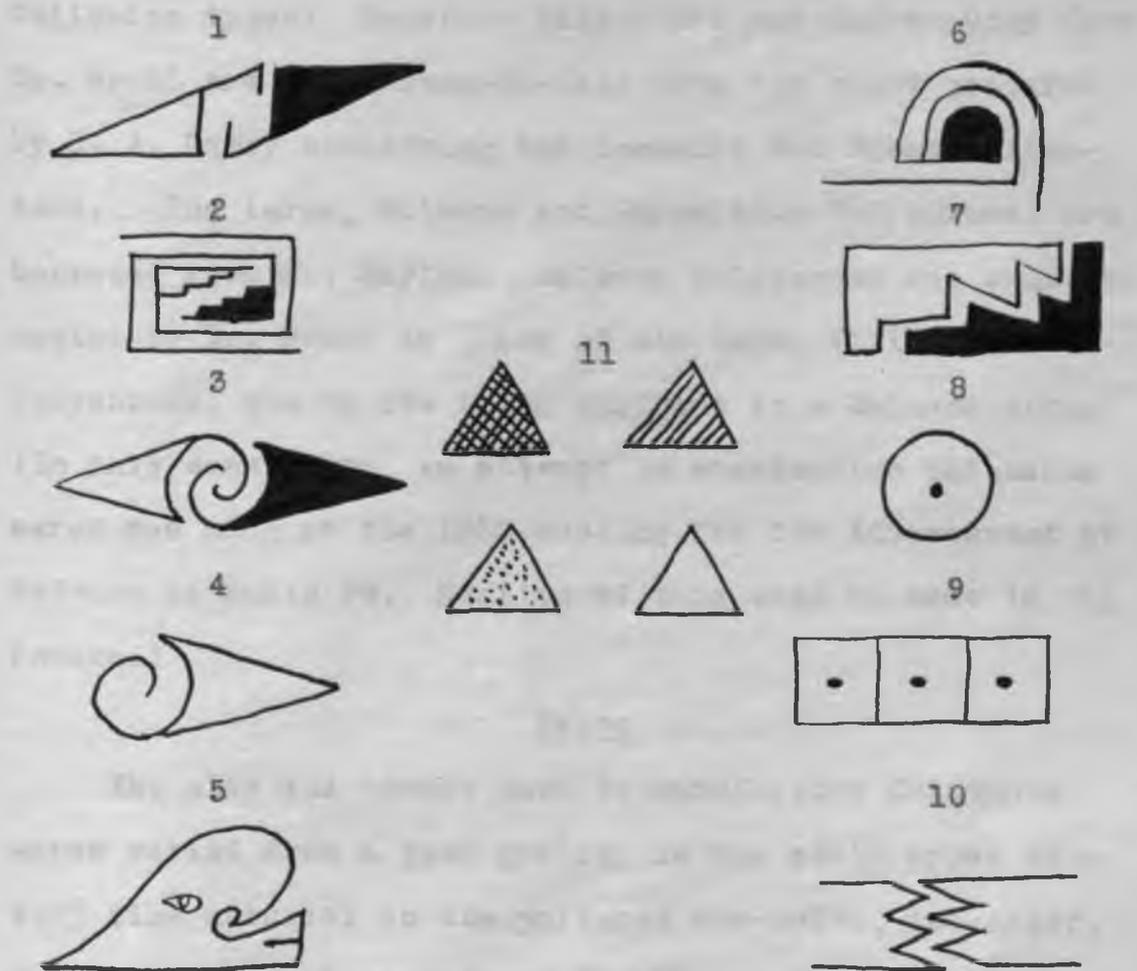
The classification of Chihuahua wares advanced by the author is an attempt to simplify the pottery of a region that presents many variations in technique. The use of many names and numbers, applied to prehistoric wares, leads to confusion on the part of the reader unless he is specialized in the fields in which such wares are found.

The classification of Chihuahua pottery used in this thesis is given below:

<u>Buff Ware</u>	<u>Red Ware</u>	<u>Black Ware</u>
Plain	Plain	Plain
Polished	Polished	Polished
Decorated	Decorated	Decorated
<u>Two-Color Ware</u>	<u>Polychromes</u>	
Black-on-Orange	Casas Grandes	
Black-on-Red	Galeana	
Black-on-White	Huerigos	
Red-on-Gray	Corralitos	
Dark Brown-on-Gray		

1. Carey, H. A. op. cit., p. 352.

PRINCIPAL MOTIFS ON CHIHUAHUA POTTERY



1. Triangles with one side extended and bent
2. Step design
3. Interlocking scroll
4. Scroll
5. Macaw head
6. Leaf
7. Interlocking zigzag
8. Circle with dot (sun symbol)
9. Squares with dots (corn symbol)
10. Bird's wing
11. Triangles

In this classification the author has borrowed the following types: Huerigos Polychrome and Red-on-Gray from Dr. Brand and Dark Brown-on-Gray from the chart prepared by H. A. Carey concerning the Lumholtz San Diego collection.¹ The terms, Galeana and Corralitos Polychrome, are borrowed from Mr. Sayles. Galeana Polychrome has been accepted by Dr. Brand in place of his term, Villa Ahumada Polychrome, due to its being dominant at a Galeana site. (In this connection, an attempt to standardize Chihuahua wares was made at the 1935 meeting for the Advancement of Science at Sante Fe. Mention of this will be made in the future.)

Paste

The clay and temper used to manufacture Chihuahua wares varied from a poor quality in the plain types to a very fine material in the polished one-color, two-color, and polychrome wares, except Corralitos Polychrome.

The clay varied in color from a whitish through a buff to reddish brown. The white clay was used in making Black-on-White and Casas Grandes Polychrome. Buff colored clay was used as the basis of all buff wares. Reddish brown clay was used in the manufacture of all red wares and probably black ware.

Tempering material was coarse in the plain wares and

1. Carey, H. A., op. cit., p. 329.

Corralitos Polychrome effigies. In the remaining wares the temper was usually quite fine. It was composed predominately of white crystalline particles and fine gravel with some sand present at times.

The paste was generally made up of sixty to sixty-five percent of clay and thirty-five to forty percent of tempering material. In plain wares the clay percentage often dropped to fifty-five due to the abundance of tempering material present.

The texture correlates with the paste composition. That is, in plain wares and some Corralitos Polychrome effigies the paste was of poor texture. It had not been well mixed before firing. In general the remaining wares were well textured so that a fairly even paste resulted. Huerigos Polychrome and Galeana Polychrome were slightly poorer in texture than Casas Grandes Polychrome.

Hardness also correlates with the paste consistency and texture. Plain wares and Corralitos Polychrome effigies were quite soft. The remaining wares were well fired and hard, with the polished and Casas Grandes Polychrome wares ranking first in hardness.

Shapes of vessels in northern Chihuahua vary a great deal but ollas, bowls, and effigy pieces are most abundant. These forms occur in all the plain wares and the Casas Grandes and Galeana Polychromes. It is not certain if Black-on-White or Red-on-Gray ollas were manufactured.

Also, in this connection, there seems to be a lack of Red-on-Gray and Black-on-Orange effigy pieces and a lack of Black-on-White, Black-on-Red, and Corralitos Polychrome bowls. In addition to these three main forms there were many other variations manufactured. For instance, polished black vases, Casas Grandes Polychrome bottles, rectangular four-legged trays, seed bowls, and double ollas and bowls.

Decoration

Decoration of one color wares was accomplished by surface alteration using incised lines, gouges, reed marks, indented coils, corrugations, striations, adding and removing paste, etc.

These techniques were also applied to polychrome wares but apparently are lacking in two-color wares except for the latter method named.

Decoration of two-color and polychrome wares was accomplished both by painting and altering the surface of vessels much as in one-color wares.

Means of Suspension or Carrying

Means of suspending or carrying Chihuahua ollas was accomplished by piercing holes, in pairs or three on both sides of the vessel. These holes were always near the rim. Also two and sometimes three vertical lug handles were attached from the rim down on to the sides of the ollas. These handles were never very large but were quite thick

and had a small hole pierced through them so that a cord or thong could be attached which would allow them to be suspended or carried.

Buff Ware

In Chihuahua one finds a considerable number of Buff ware sherds scattered over the mounds. However, not many complete Buff ware specimens exist which seems strange due to the fact that buff clay was used so extensively in pottery manufacture in this area. It is found throughout the region but polished buff seems a later development and is more restricted to sites in the Casas Grandes region.

Forms and decoration have been mentioned.

Black Ware

Chihuahua is well known for the abundance of Black Ware produced by the prehistoric population. This is especially true of the polished type which was made by smudging and polishing the vessels so that a very smooth black surface resulted.

It is well distributed throughout the area but incised and gouged Black Ware seems more common in the Corralitos region.

The three main shapes mentioned are most abundant among this ware but there are also odd forms present such as vases, bottles, and cup-like vessels.

Ollas are usually small and average four to six inches in height. They are rather squat and have a shoulder

PLATE VIII



Buff Ware Olla and Bowl, Chihuahua
1. Plain buff olla
2. Polished buff bowl



Red Ware Ollas, Chihuahua
1. Decorated with Incised lines
2. Polished

from one-third to one-half the distance to the orifice. The greatest diameter is approximately the same as the height. In addition, there are some plain black ollas that were comparatively large.

Red Ware

The various types of Red Ware make up about fifteen percent of the Chihuahuan wares. This ware is spread throughout the entire region and presents many variations in technique of decoration by altering the surface of vessels. The use of incised lines, gouges, reed marks, and combinations of incising and coiling are very common on decorated Red Ware.

Shapes follow the three form classification and seem to correlate in size to Black Ware vessels. There is a scarcity of odd forms such as those present in Black Ware but excavation will be necessary to determine how often such shapes occur.

Two-Color Wares

The list of five two-color wares, given in the early part of this discussion on ceramics, indicates that they were common in Chihuahua. However, this is not the case for two-color wares are much in the minority as compared with one-color and polychrome wares. It seems queer there are not more examples of two-color technique because the majority of the specimens were well made and decorated with the typical Chihuahuan motifs.



Black Ware Olla and Bowl, Chihuahua
1. and 2. polished type



Black-on-White Effigy and Black-on-Red Olla,
Chihuahua
1. Black-on-White
2. Black-on-Red



Black-on-Orange Effigy and Olla, Chihuahua
1. Effigy
2. Olla



Casas Grandes Polychrome Ollas, Red and
Black on Buff Unslipped
1. Shows leaf and triangle with one side
extended and bent motifs
2. Shows the use of opposed step motif

Perhaps the introduction of the polychrome caused a sharp decline in the manufacture of two-color wares. Not enough material was available as regards these types to set forth any great number of facts concerning them. However, one point of importance is that the Red-on-Gray type is restricted to the lower Carmen region and occurs only in bowl form. It is often associated with El Paso ware and Three Rivers Red-on-Terra Cotta.

Polychromes

Casas Grandes Polychrome (Ramos Polychrome +Sayles+) is the name applied to the best known and most carefully decorated of the Chihuahua wares. It represents the peak of pottery making in this area.

It has been mentioned that, in general, the polychromes were very well made and were composed of fine clay and temper which was well mixed before vessel construction. This resulted in a hard container when the piece was fired. Casas Grandes Polychrome represents the best of these examples.

The color of the clay used in this type was either a buff or white. However, it does not seem best to make two types due to a slight variation in clay color due to the fact that the decorations applied in both cases were identical in pattern and technique.

The three main shapes mentioned compose a large percentage of this type, but bottles, four-legged trays,

PLATE XI



Casas Grandes Polychrome Olla, Red and Black
on White Unslipped Surface. Note the use
of the double macaw head motif.



Casas Grandes Polychrome Ollas, Red and
Black on Buff Unslipped
1. Coiled snake motif noticeable
2. Feathered serpent motif noticeable

double ollas, and bowls are present.

Ollas vary much in size but maintain a general similarity in contour. Four of the largest specimens in the Arizona State Museum were 9 1/8", 9", 9" and 8 3/4" in height. The greatest diameter of the first one mentioned was 10" and it had a 4 3/4" orifice diameter. Three small ollas were measured and were found to be 3 1/2", 3 1/4", and 3" in height. The diameter of the smallest was 4 1/2" and it had a 2" orifice diameter. The average sized olla seems to be between 5" and 6" in height. A noticeable factor concerning the ollas is that the body diameter and height are almost the same measurement and are about twice the orifice diameter. This fact applies to Chihuahua ollas in general.

The basal portion of these vessels curves gently to the shoulder, which is usually one-third the distance to the orifice, then slopes very gradually to the neck, which is straight or slightly outcurving.

Bowls

Casas Grandes Polychrome bowls vary much in size but an average diameter seems to be from 5" to 7". They are shallow, as is characteristic of all Chihuahua bowls, and have an incurving rim which is usually rounded.

Effigies are very abundant in this type and were made to represent human, animal, bird, and reptilian forms.

H. A. Carey has given a good classification of human effigy

PLATE XII



Casas Grandes and Galeana Polychrome
Effigies

1. Casas Grandes Polychrome male effigy
2. Galeana Polychrome female effigy



Casas Grandes Polychrome Effigies

1. Badger representation
2. Macaw representation

pieces. There are four types of human effigies: (1) True effigies in which the entire form of the vessel portrays human figures, often in a sitting position; (2) those in which one side of the neck is extended above the aperture to represent a human head; (3) those with human faces or features modeled on the sides of the vessels; (4) jars with body parts protruding from the sides.¹

Decoration was accomplished by painting red and black on an unslipped buff or white surface. All the motifs mentioned were used on this type and also some others, such as snakes, frogs, birds, and linear decoration. The decoration, in general, covers three-quarters of the vessel. In addition, surface alteration with incised lines, cutting or adding paste, and punching were present. This brings out the fact that both paint and surface alteration were present together on many pieces.

This type is well distributed throughout Chihuahua.

A variation of this type which Mr. Sayles has termed Dublan Polychrome is present in a fair amount. It consists of a painted decoration in red and black on buff around the middle portion of ollas. Above this painted decoration, horizontal comb-like lines were made.

Galeana Polychrome

This type of polychrome was named by Mr. Sayles of the Gila Pueblo due to the fact that it was dominant at a

1. Carey, H. A., op. cit., pp. 340-1.

site in the Galeana district. Dr. Brand named it Villa Ahumada polychrome but has since accepted the term advanced by Mr. Sayles.

Specimens of this ware are very similar to Casas Grandes Polychrome except there was a white slip painted on the portion of the vessel that was decorated. This white slip often presents a flaked and crackled appearance.

Shapes and sizes correlate very well with the preceding type.

Decorations were black and red on the white slip, but more simple than Casas Grandes Polychrome. The interlocking scroll, and opposed zigzag were used very extensively. Life designs were practically lacking. In the arrangement of these motifs, a horizontal band pattern was often used. Several bands with the same motifs would be painted on one above the other on the upper three-quarters of the vessels except effigies.

In both Casas Grandes and Galeana Polychromes there was an abundant use of lines to separate pattern elements which were almost invariably balanced.

Huerigos Polychrome

In general this type was not well made. The paste was somewhat coarser than the two preceding types and was composed of orange-buff clay with considerable sand temper which can be felt when passing the hand over the surface.

Shapes are quite definitely restricted to bowls. The

author knows of no complete ollas or effigies but sherds would indicate that the former shape was produced.

Decoration was applied in black and white on orange and was composed of linear motifs. The interiors of bowls were often slipped white and then black lines painted on in vertical orientation. A noticeable characteristic of the black is that it often appears in relief and has a green glaze tendency.

It is distributed primarily in the very northwestern part of the state of Chihuahua and reaches over into northeastern Sonora.

Corralitos Polychrome

This term has been applied to a polychrome type that shows southern Mexican influence by Mr. Sayles. It was made of fair paste except effigy pieces which were composed of coarse material.

Shapes seem to be restricted to ollas and effigies.

Decoration was applied by the combined use of color and surface alteration in incised lines. A band of broken, solid black lines, in meander pattern was painted on the upper third of vessels. This band was outlined with incised lines. Below the band of decoration a red slip or band was applied.

It is not a well represented type of Chihuahua ware but seems to occur sporadically over the area under consideration.



Corralitos Polychrome Effigy and Olla,
Chihuahua
1. Fish effigy
2. Small olla



Nogales Polychrome Bowl and Purple-on-
Red Seed Bowl, Nogales, Arizona

SONORA

Very little material is available that concerns the pottery of Sonora. In the work of Sauer and Brand a fair discussion of pottery is presented.¹ They have classified the predominating wares but as further investigation is carried on in Sonora, there will undoubtedly be a change. There are five wares in this area exclusive of trade wares. These are: Nogales Polychrome (Trincheras Polychrome - Sauer and Brand), Santa Cruz Red and Black-on-Crackled Gray, Purple-on-Red, Striated wares, and Plain ware.

Nogales Polychrome

This is a purple and red on white ware of rather poor workmanship. The only complete specimen known by the author is a bowl in the Arizona State Museum, which came from Nogales, Arizona. It is a fairly well made pottery with a well-mixed paste which was fairly hard.

The design was painted in a four-sided plan around a roughly circular design in the bottom. Around the rim on the inside alternating semicircles were painted in purple and red. Just inside the rim the four sided continuous line design was applied which was in alternating lines of purple and red. In the bottom of the bowl there were three circles composed of hatched diamond motifs. The exterior of the bowl was red.

1. Sauer and Brand, Prehistoric Settlements of Sonora, pp. 107-111.

Design work seems crude on this ware and the white wash is not good. Also a noticeable feature is the small shiny particles in the purple paint.

This ware is found in the Altar district in more pronounced quantities than has been found in other parts of Sonora up to the present time.

Santa Cruz Black and Red-on-Crackled Gray

Sauer and Brand describe this ware as being "in general very different from other wares."¹ The core fired a black or gray with a regular checked appearance on the surface. The design was applied in red and black in solid and parallel lined trinagular motifs with the presence of many small squares surrounded by parallel lines.

The description of this ware seems to indicate a crude variation of Nogales Polychrome with the influence of Chihuahua triangular design.

It is located chiefly in the Upper Santa Cruz drainage.

Purple-on-Red

This type of ware is the most common decorated pottery in Sonora. It is a coarse brittle ware usually in the form of large ollas although a seed bowl of this type is in the Arizona State Museum. In addition there were plain bowls.

1. Sauer and Brand, op. cit., pp. 110-11.

The design was a purplish color with a metallic sheen and was applied as a thick paint on the red background with a rather crude technique. Hatched lines, solid lines, triangles, some scrolls, and wavy lines form the primary motifs employed.

Purple-on-Red is distributed in the Altar district eastward to Nogales and into the San Miguel drainage. It is apparently lacking in the Sonora River drainage and to the east thereof.

Striated Wares

This ware occurs commonly in the western portion of Sonora and seemingly was carried into western Chihuahua as trade ware.

It was probably a utilitarian type, mostly in olla and bowl shapes. The surface was roughly brushed often on both the interior and exterior.

The clay employed varied from a red to yellowish color and was composed of many gravelly particles which produced a rather porous pottery.

Plain Ware

Plain ware was widely distributed over Sonora and was identical in composition and shapes to the types just mentioned. Some plain ware was fairly well smoothed and well fired but the average was not carefully treated.

Several sherds of bowl rims were collected by the

1. Sauer and Brand, op. cit., p. 107.

author and they seem to be direct with a rounded contour.

TRADE WARES

CHIHUAHUA

Trade wares in Chihuahua are far more abundant along the peripheral borders. Naturally the strongest influence of the various trade wares is found closer to the hearth of that particular culture area, that is, Gila Polychrome as trade ware in Chihuahua would be more abundant in northwestern Chihuahua as this region is comparatively close to the Gila drainage.

Brand found that the upper Carretas, Sierra Madre, upper Santa Maria, San Miguel, Piedras Verdes, and Tapicitas drainages were the most purely Chihuahuan as regards pottery types. In these regions he found less than two percent of trade ware and in the central Chihuahua area less than five percent of trade ware based on sherd collection.

Predominant types of trade wares in Chihuahua from southwestern culture areas to the north are: El Paso Polychrome, Gila Polychrome, Little Colorado Polychromes and Black-on-Red, Mimbres Black-on-White, Chupadero Black-on-White, Three Rivers Red-on-Terra Cotta, and Gila Red-on-Buff. From the west there was a trade influence of Sonoran raked and striated ware.

1. Brand, op. cit., pp. 84-5.

El Paso Polychrome

This ware is a crude type, composed of rather coarse clay with primarily a sand temper, but often shows particles of mica. The core of the paste is often black, due to carbonization effected when the piece was in the process of being fired. It is a very friable ware and crumbles rather easily when it is placed under pressure. It was roughly smoothed at times.

The colors of the paints applied in the decoration are a red and a black on a brown surface, which may be a thin wash or the result of floating. Decorations show poor technique and oftentimes the red is quite fugitive.

Bowls, ollas, and jars make up the bulk of the forms.

Bowls are characterized by being deep and round-bottomed and by having a flat to roundish rim which is direct. Ollas and jars are wide-mouthed, round or flat bottomed and wide bodied with a constricted neck and flaring rim.

The distribution of El Paso Polychrome is rather wide spread. W. S. Stallings found the type location of this ware to be in the Hueco Basin of Texas and the southern part of the Tularosa Basin in New Mexico.

Dr. Brand found it in a considerable quantity in Chihuahua as far south as Villa Ahumada and in more sparse amounts in the Animas Valley. It was fairly strong in the Playas regions, present in the Carretas, Janos-Ascencion

country, sparse in the Casas Grandes Valley, well represented in the Lagunas Guzman and Tildio area, and middle Carmen, very pronounced in the northeastern stations of Loma de Montezuma, Ajos Calientes de Santo Domingo and Mt. Riley. It was lacking in the cave region of the Sierra Madre. This polychrome was frequently accompanied by late Mimbres wares and Chupadero Black-on-White.

Gila Polychrome

Gila Polychrome is generally a well made ware, extremely common in the Gila-Salt drainage. Suffice it to say here that it is a black and white on red ware of good technique and many forms.

Gila Polychrome is found well represented as a trade ware in Chihuahua, especially the northwestern portions of the area. It entered Mexico through the Animas Valley which accounts for strong influence noticeable in the Carretas, Janos-Ascencion, and lower Santa Maria sections. Apparently this ware did not reach the eastern and more southern portions of the Chihuahua culture area.

Several specimens of imitation Gila Polychrome are in the Arizona State Museum which were obtained in the Casas Grandes Valley.

Little Colorado Polychromes and Black-on-Red

All of these (three polychromes and the Black-on-Red) wares are of fine ceramic technique, well shaped, and carefully finished and decorated. Bowls and ollas make up the

PLATE XIII



Galeana Polychrome Olla and Bowl
1. Olla with opposed zigzag motif
2. Bowl with interlocking scroll motif



Large Galeana Polychrome Olla
Note the opposed zigzag and interlocking
scroll motifs.



Chupadero Black-on-White Bowl
from La Ascencion, Chihuahua



Imitation Gila Polychrome and Red-on-Buff
Incised Ollas from near Colonia Dublan,
Chihuahua

1. Gila Polychrome - Note the use of
the macaw motif.
2. Red-on-Buff

majority of shapes. Colors used are black, white, and a red which has more of an orange tinge than the red of the Gila Polychrome. Good descriptions of Little Colorado polychromes and Black-on-Red can be obtained in almost any publication dealing with Southwestern culture areas.

These wares are fairly well represented in Chihuahua in the Carretas, Janos-Ascencion, and Casas Grandes valley regions. It seems strange there is so much Little Colorado trade ware because it is separated from Chihuahua by an intermediate culture area, the Gila. It does not seem unreasonable to state that the fine technique and decoration of the polychromes and Black-on-Red, envied in other culture regions, accounts considerably for the wide distribution as a trade ware.

Mimbres Black-on-White

The Mimbreno people were fine potters and they produced a ware (Black-on-White) with such excellent fine line technique that it is hard to imagine some mechanical means was not employed in the process. In addition to line decoration a large number of pieces were decorated in zoomorphic and human figure motifs. The most abundant shape of this ware is a rather deep round bowl with a direct, flat rim.

Mimbres ware had a wide distribution in the prehistoric Southwest. It ranged from southeastern Arizona to El Paso and into Chihuahua in the Carretas and Upper Tapiecitas

regions. To the east it has been found at Carmen. Also found in Janos-Ascencion and Laguna Patos areas. A specimen of imitation Mimbres Black-on-White is in the Arizona State Museum, which came from the Ascencion region.

Chupadero Black-on-White

Chupadero Black-on-White is a fairly well made ware but does not compare with the best of the southwestern potteries. Mr. H. P. Mera of the Laboratory of Anthropology at Sante Fe has made a good study of this ware.

Predominate shapes are bowls and jars. The former are quite thin and often have a "disc bottom."¹ The latter are characterized by flaring tops and handles composed of two or three rolls of clay placed side by side, or a piece of clay incised so as to give the coil appearance.

Designs are of broad black lines with the use of solid black and hatched elements in alternate pattern. Between the heavy black lines there is often the presence of a promiscuous dotting in black. The black paint in many cases turned red when subject to excessive heat. This fact is also present in many Mimbres pieces.

The type locations for Chupadero Black-on-White, in view of the evidence that is now existent, are southern Torrance and eastern Socorro counties in New Mexico.

The distribution of this ware is very extensive. On

1. Mera, H. P., Chupadero Black-on-White, p. 3.

the north it reaches the southern part of Salinas, on the east into the White Mountains of Arizona, and on the west into the Rio Grande Valley. The southern spread of this ware is found in Chihuahua in the Laguna Guzman region at Las Viboras and westward into the Playas Animas and Upper Carretas areas. It is well represented in the Ascencion country, rare in the Casas Grandes valley, upper Santa Maria, and upper Carmen regions, strong in the lower Santa Maria, and dominant in the lower Casas Grandes. It is well represented in the Villa Ahumada and Santo Domingo country. It is usually accompanied by El Paso Polychrome, "and occurs in greater relative abundance when associated with an increasing percentage of that ware, and a decreasing percentage of Mimbres shards."¹

Three Rivers Red-on-Terra Cotta

This ware is centralized in the Tularosa basin but it is also found in the lower Carmen and lower Casas Grandes valleys. The earlier phases of this ware are considered contemporaneous with Mimbres Black-on-White.

Lincoln Black-on-Red

This ware is fairly well made and belongs to the southern New Mexico pottery sequence. Seemingly this ware is a development of Red-on-Terra Cotta and later faded into the Rio Grande Glaze I red.²

1. Brand, op. cit., p. 87.

2. Mera, H. P., Lincoln Black-on-Red, Bulletin 2.

The type site for Lincoln Black-on-Red is on the Rio Benito near Lincoln, New Mexico.

Bowls are the only forms known and are decorated exclusively on the interior.

Its distribution in Chihuahua is rather restricted and is very sparsely represented. It is found south into the lower Carmen basin which is almost directly south of El Paso.

Gila Red-on-Buff

Gila Red-on-Buff is found in limited quantities in northwestern Chihuahua and entered the region through the same corridor as did the later Gila polychrome. Evidence that Red-on-Buff influence was felt to the Casas Grandes valley and Janos-Ascencion regions is present in the imitations of this ware that are in the Arizona State Museum.

Sonora Wares

Along the western periphery in the Carretas country there was a trade influence of Sonoran ware, which are decorated in raked, rough incised, and triangular gouged style. The paste of this ware is coarse and gravelly with often a carbonized core apparent in sherds.

Two routes of comparatively easy passage from Sonora into western Chihuahua are the upper Bavispe canyon and Pulpito Pass which opens out of the Sierra Pulpito via the Canyon de las Varas into the Llanos de Carretas. At the

present time the absolute distribution of Sonora ceramics as trade ware is not definitely established.

SONORA

Several trade wares were brought into Sonora from the north and east. From the north the Gila Red-on-Buff ware was abundant and also a Black-on-White, which was found by Sauer and Brand at Las Trincheras. From the east the Chihuahua wares were well represented. Casas Grandes and Huerigos Polychromes were found westward to the Trincheras district. Gouged ware, incised, and Black ware were found in the eastern and northeastern portion of the state.

ORNAMENTS

Based on the material evidence of ornaments in the collections at the Arizona State Museum, the Gila Pueblo, and Art Museum at Sante Fe, the fact is apparent that the Chihuahua people were experts in the art of working shell and stone. Many more articles will be brought to light as excavation is carried on in the many ruins throughout the area. The majority of the shells employed for articles of adornment in Chihuahua and Sonora are similar in type to those employed in other southwestern regions. In addition, the extensive use of the amphissa seems a Chihuahuan characteristic.

Several different minerals and stones, primarily turquoise, were carefully cut into pendants and beads. Also the use of wood, indurated clay, pottery, and bone was

present in a limited extent.

Shells

The common shells employed for the manufacture of ornaments were the Connus, Glycimeris, Olivella, Amphissa, Pecten, and Turritella, which probably came from the Gulf of California.

The Connus is a white cone-shaped shell averaging about one-inch in length. This shell had a hole pierced through the apex and was placed on a string, probably in groups to form "tinklers" and pendants. Oftentimes a section was cut across the bottom portion to make rings.

The Glycimeris is a large white, rather smooth surfaced bivalve and was used extensively by both Chihuahuan and Sonoran cultures. Bracelets, armllets, and a bracelet-shape with a hole for suspension were manufactured by cutting round sections from the shell. These articles compose the majority of the ornaments from the Glycimeris. In addition, pieces of this shell were used to make "tinklers", washer-like beads and pendants. This last type of article mentioned was cut into various geometric shapes such as rectangles and diamonds. At times this shell was carved to represent frogs.

The Olivella is a small cylindrical shell, tapered at each end and about one-half an inch long. It was used very extensively by prehistoric cultures. By piercing a hole through the upper portion, this shell was very well adapted

for necklace use. It is also of a whitish color.

The Amphissa is a small spiral shell averaging about three-eighths of an inch in length. It is a brownish color and has small projections on the exterior. This shell was used in large numbers for necklaces. A small hole was drilled in the mouth portion and was then strung. Due to its small size a great many shells were necessary to make an article of adornment. The inhabitants of the mound region just northwest of Colonia Dublan had quantities of this shell for sale, which they had recovered from the ruins in the vicinity.

The Pecten was employed in more limited quantities for ornamentation. It is very often a white to brownish colored bivalve with a ridged exterior and double winged growth at the point of connection of the two halves. A hole was drilled in this connection point and the shell was strung. Probably several were used on the same string or perhaps one pecten and numerous olivella shells were used on the same string to form a necklace.

The Turritella was employed in a limited degree for ornament. It is a long whitish, spiral shell that tapers gracefully to a pointed apex. It varies much in size but examples from Chihuahua are about one inch long. A hole for stringing purposes was usually pierced through the mouth.

In addition, two other types of material were used.

One was a white chalky shell-like substance that was commonly in a double-lobed shape. These lobes averaged about one-half an inch in length, one-quarter in width and one-eighth in thickness. Shell beads of this shape have been found in numbers in northern Arizona in cave sites.

The second material was a pinkish color, which appears to be some form of fossilized plant. Beads were made from this material and averaged three-eighths of an inch in diameter and about an eighth thick.

Minerals

Turquoise jewelry was manufactured in fairly large quantities in this region of Mexico. Pendants, beads, and a mosaic of turquoise on *Glycimeris* shell, are in the Arizona State Museum.

Many shapes of pendants are represented. Triangular, square, rectangular, lobed, elliptical, hexagonal, and cylindrical patterns were cut from this material. These articles were well smoothed, polished and accurately cut. Usually there was a hole drilled in the top part of the article but at times this was in the center.

Beads vary in size from very minute ones to some a quarter of an inch in diameter.

The turquoise mosaic piece, mentioned previously, is an example of very skillful workmanship. Nineteen small pieces of turquoise were placed on a roughly circular piece of *Glycimeris* shell, one and five-eighths inches in diameter.

PLATE XVI



Ornaments from Chihuahua. Note the turquoise mosaic and pendants in the foreground.

There was a small squared neck projecting from the top of this shell which was drilled for suspension. All but three of the pieces of turquoise were rectangular and averaged one-quarter of an inch in length by one-eighth in width. The remaining three pieces were circular. The turquoise was arranged in a horseshoe pattern with a circular piece in the center and one at each point of the pattern.

Gypsum, red indurated clay, white spar, hematite and pottery were used for pendant or bead manufacture. Lumholtz¹ pictures a pendant of wood.

Some bone and a species of sea worm, which produced a tubular lime carbonate crust, were used for beads and no doubt other types of ornament.

Copper Bells

One copper bell is in the Arizona State Museum, and they are also represented in the collections of Gila Pueblo and in the Sante Fe Art Museum from Chihuahua. They average about one-half an inch in diameter and have a suspension ring on the top. It is probably of southern Mexican origin although there is some feeling that copper may have been worked in the Southwest.

In many respects the ornaments of Chihuahua and Sonora are similar to those of the Southwest. There must have been an extensive trade in shell and turquoise established between

1. Lumholtz, Unknown Mexico, p. 69.

the various culture areas. Most of the shell probably came from the Gulf of California or the Pacific Coast. It was carried across Sonora into Chihuahua via the Pulpito-Arroyo de las Varas gap into the Carretas region. From this region, which must have a great trade center if pottery diversification is any indication, shells spread throughout Chihuahua.

The turquoise must have entered the region from New Mexico south of Lordsburg to the west of the Big Hatchet Mountains or in the Columbus region. It seems very probable that this material was brought into Chihuahua during Mimbres times.

The extensive trade that must have gone on in prehistoric times between northern Mexican and Southwestern areas, would argue in favor of linking Chihuahua and Sonora with the Southwest. No doubt cultural influences were felt in Mexico as a result of this trade.

BURIAL CUSTOMS

CHIHUAHUA

The subject of burial customs in northern Mexico is one that needs a great deal more investigation before any final statements can be made regarding the methods and practices employed in caring for the dead. This can and will be done soon by careful excavation in the many ruins that are scattered over the area. Careless pothunting, at many sites, has destroyed every evidence of burial customs except to leave broken bones with sherds and other refuse on dirt piles, thrown out of the rooms. However, the author will advance the theory that inhumation was the most widely practiced method of disposal of the dead.

Based on Lumholtz's work in the cliff ruin along the Piedras Verdes river, it is safe to say that inhumation in uninhabited caves was generally practiced. After removing the skeleton of an individual below the floor level of a cave, Lumholtz states: "After this, we disinterred that of a mother holding a child in her arms and two other other bodies, all lying on their left sides, their knees half drawn up and their faces turned toward the setting sun."¹ The appearance of these mummies is very similar to those

1. Lumholtz, C., Unknown Mexico, p. 71.

in the Arizona State Museum that came out of caves in northern Arizona. The skin was clinging to the bones and some hair was still present on the head.

The bodies were wrapped in cotton cloth and matting in the loin region. He relates, "in a few instances the cotton cloth was dyed red or indigo."¹ This fact is not extraordinary as the caves were very dry and on the shady side of the river protected from the rays of the sun.

Articles such as pottery and stone implements were placed with the deceased person. Pottery was usually situated near the head.

In the region of La Ascencion, a number of burials of both adults and children have been removed. Many of the specimens of ceramics in the Arizona State Museum were uncovered in connection with these burials.

Burial was made below the floor level, usually in the center of the room. The graves varied in depth from a few inches to four feet beneath the surface. According to Mr. R. D. Pearce of Columbus, New Mexico, it was very possible to determine whether or not there was a burial in a particular room after it had been excavated down to the floor level. In the center of the floor there would be a circular area of slightly different colored earth than the remainder of the room. By digging out this circular area,

1. Lumholtz, C., Unknown Mexico, p. 72.

the burials were found. Thus, burial beneath the floor level in a circular grave was the common practice.

The positions of the dead were two in number; either the body was in a tightly flexed or sitting posture. Both of these forms appear in the Mimbres area though the sitting position was less common.¹ In one instance a bowl had been placed over the head of the seated skeleton.

Offerings in the form of pottery, stone implements, and ornaments were associated with the deceased. In the tightly flexed type the pottery was placed near the feet and at the sides of the body, which facts can be applied to the sitting burials except at times a pot would be placed in the lap of the individual. Probably this vessel contained food which was to help the person reach the other world.

In the Babicora district, Carey uncovered several burials that were under the corners of the rooms with no definite orientation, nor with much pottery. From this fact it appears that in the peripheral regions, at least the southern,² a cruder form of disposal of the dead was practiced. However, inhumation was the form of burial practiced.

At a large valley site, on the eastern terrace bank of the Arroyo Cuervo, the author found indications of four

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1. Cosgrove, H. S. and C. B., The Swartz Ruin, Plate 20 a, b.
 2. Carey, H. A., An Analysis of the Northwestern Chihuahua Culture, pp. 365-6.

burials, two of which were of recent excavation. Human bones were scattered on the dirt piles that had been thrown out. In the two cases mentioned the floor level could be traced about a foot and half above the burial cist. The word cist is used here due to the fact that there was a very definite outline of slabs in oval formation beneath the floor. The theory that slab-lined burials were a common practice in Chihuahua, is not advanced here, but in this case nothing else would explain the rocks.

This room was quite small, measuring four by six by five feet. It must have been a storage room before burial took place.

The second burial correlated very well with the one just described.

Burials in the San Diego district, along the lower Piedras Verdes river, were found by Lumholtz beneath the floor level in the corners of the rooms. "Here, as on the upper part of the river, the treasures we secured were taken from underneath the floors of the houses, where they had been buried with the dead. Here, as there, they consisted of beautifully decorated earthenware jars and bowls, some of them in bizarre representations of animal and human forms, besides stone implements, shell beads, pieces of pyrites and turquoise, all being generally unearthed intact.

The things were found alongside of skeletons, which

were huddled together in groups of from two to five in one of the corners. The jars, bowl, etc., had generally been deposited close to the body, as a rule near the head. The skulls of the skeletons were mostly crushed, and crumbled to dust when exposed to the air. There was no trace of charring on the bones, although in some cases charcoal was found close to the skeleton.¹"

Evidence points to the fact that some of the rooms were inhabited after the deceased had been laid to rest. This fact is borne out by the presence of tools and pottery on the floor. However, the author believes that most of the rooms (at La Ascencion) were abandoned after burial because if they had not been the circle of different colored soil could not be detected.

SONORA

The author knows of little material dealing with the burial practices in Sonora. Reports concerning this custom seem to show that cremation was the form employed. In the report by Sauer and Brand, mention is made of cremation urns in the vicinity of Atil, western Sonora. It is stated, "the upper site was both settlement and burial ground. It was especially rich in fragments of large cremation ollas, decorated in the Trincheras manner. Here a spindle-whorl fragment was found. Over the ollas had been placed small

1. Lumholtz, op. cit., p. 93.

heaps of stones, and with the shards were human bone fragments.¹"

At Soyopa, one hundred fifty miles east of Hermosillo on the Yaqui River, Dr. Cummings found thirteen inhumations without pottery or sherds. These burials were about ten feet below the surface of the present ground and about eight below cremations. Although this discovery was in the southern part of the area considered in this thesis, the evidence points to the fact that there was a period of inhumation previous to the development of pottery. Crude handstones were found with these burials, which helps to bear out this theory. Then with the introduction of pottery, cremation seemed to start. Further excavation in this region and other parts of Sonora will be necessary to establish this evidence as a cultural practice.

If cremation was the method of burial practiced in Sonora during pueblo times and as inhumation was the method in Chihuahua, it would argue strongly for two distinct cultures, which the author believes existed, although trade relations were not lacking. The pottery and house types of the two regions were different which substantiates the theory.

1. Sauer and Brand, Prehistoric Settlements of Sonora, pp. 98-9.

RELATIONSHIP TO OTHER CULTURES AND OTHER AREAS

CHIHUAHUA

In the preceding pages mention has been made of certain architectural characteristics, phases of material culture, and burial customs. These three factors are extremely important in separating one culture from another or in attempting to show relationships between two cultures. The author will use these factors in an attempt to locate the Chihuahua culture and, so far as possible, the Sonoran.

In architectural forms and materials used, the Chihuahua area fits in well with the Southwestern cultural groups. Valley pueblos, composed of adobe, pebbles, and caliche, and beam-supported roofs are present in both Chihuahua and the Middle Gila. Rectangular doorways of very similar average dimensions are found in both Chihuahua and the Southwest. A central firepit in the living quarters is common; but, as was mentioned, there is the presence of a rectangular block-type, that is constructed against the wall, in Chihuahua. Masonry types (i.e. puddled adobe in large rectangles, rubble, and stone set in clay mortar) present a striking similarity in Chihuahua and the Gila drainage. The ruins of Casas Grandes, Chihuahua, and Casa Grande, Arizona, could easily have been built by the same people. They are both huge pueblos, composed of puddled adobe blocks, smoothed

with clay plaster, and several stories in height. Agricultural canals were excavated at both places to make farming a more certain factor. The building of small storage rooms and larger living rooms was present in both Chihuahua and the Southwest.

In the cliff dwellings of the Sierra Madre and Arizona the common use of the T-shaped door is a strong argument for a connection because this shape certainly was not entirely of a utilitarian use. It seems very probable that these doorways were a result of diffusion. Room sizes and wall thicknesses of the two regions correlate very well. The method of roof construction seems similar in both Chihuahua and Sonora.

Points of architecture that are different are: large granaries built of straw and clay on the floor level of the cave, rectangular bench-like fireplaces, and the kiva. The first trait may be the result of a southern influence. Lumholtz mentions similar structures that are in use in Vera Cruz and Tlaxcala at the present time (1902).¹ The southern influence theory is quite strong; but these structures could be the result of independent invention. The pottery olla was widely used as a storage container and it is possible that some far-sighted individual conceived the idea of enlarging the olla shape so that great quantities of produce could be stored in one place, which seems that

1. Lumholtz, Unknown Mexico, Vol. I, p. 65.

these granaries argue for a communistic feeling among the cave inhabitants.

With regards to the fireplace, the author believes it was a natural development. When excavation is carried out more extensively in these cliff ruins, it will not be surprising to uncover firepits in the more central portions of the rooms.

The kiva, which is such a diagnostic feature in northern cliff ruins, is absent in the dwellings of Chihuahua. If the Chihuahuans were influenced or adopted certain architectural features from the tribes to the north, it may seem strange that some form of kiva was not employed. However, the kiva is directly connected with religion and very likely religious ceremonies in Chihuahua were different than those in the north. The author believes that the fundamental principles were the same. No temple structures or pyramidal forms that were so important in southern Mexico have been found in this area and also a lack of figurines in Chihuahua is pronounced. If none of these features are present, then it seems safe to conclude that the religious beliefs of the two regions (Chihuahua and southern Mexico) were distinct. Environment would play some part in this development but would not be responsible for a complete lack of religious evidence, in the form of architecture, if a strong southern influence were felt in the region.

Strong similarities in various phases of material culture

except certain pottery techniques argue for a closer connection of Chihuahua to the Southwest than to southern Mexico.

Agricultural practices in the Casas Grandes valley and in the Gila drainage were very similar. The use of canals in both regions was an outstanding development for a prehistoric culture. It is not possible to depend too much on this phase of development as a link between two cultures due to the fact that in Chihuahua and Arizona very similar environmental conditions exist, which would tend to cause similar developments in agriculture. However, we believe that agricultural methods employed in the two regions help in part to support the theory that Chihuahua should be considered a Southwestern culture.

The developments in stonework argue for a stronger Southwestern influence than southern Mexican. Household utensils show a striking similarity in form and technique of manufacturing. Implements, axes, hammers, picks, and mauls are often identical in shape and finish. The use of zoomorphic forms as decoration on axes was very rare and would indicate a local development. The use of the mountain sheep's head seems to bear out this supposition. There is no doubt but that these animals were abundant in prehistoric times as they are often depicted on pottery specimens. The excellent flaked knives and other examples of skillful obsidian work do not appear in Chihuahua.

At the present time it is impossible to connect the Chihuahua culture to the Southwest on the basis of textile art. Not enough is known of the productions of the Mexican state, but in the light of what articles are now in various collections, the argument is strongly in favor of the Southwestern rather than southern Mexican affiliation. Plaited yucca sandals, coiled basketry covered with pitch, yucca fiber cord, yucca leaf matting and cotton wrapping on nummies, all fit into the Southwestern culture pattern.

Ceramic development is the strongest argument that can be used against definitely placing the Chihuahua culture into the great Southwestern area. This phase of material culture is extremely important in tracing the developments of a group of people. There are several points about Chihuahuan pottery that argue for a Mexican influence and several for a Southwestern. Incised decoration, which is very common in Chihuahua, is found in limited amounts in the Southwest. Various modifications of incising (i.e. incised with paint fill, incised outline of a design, incised and smoothed portions on one vessel, etc.) all argue for a southern influence with local variations. Highly polished blackware ollas are not a Southwestern trait. Black-on-White decoration that is found abundantly in the Southwest is almost absent in Chihuahua. This may be due to the fact that white material was not present in large quantities. There is some use of white present in Casas

Grandes polychromes but it does not appear in abundance.

Decorative motifs show local development and Southwestern influence more strongly than southern Mexican. The leaf design and macaw head motifs seem to be a local trait and are very characteristic of Chihuahua pottery. Carey states that "decoration on the pottery of Mexico farther south exhibits no design similar to the leaf element. Furthermore, no like design is found on Southwestern pottery. However, certain Southwestern interlocked spirals bear a superficial likeness to it."¹ Most of the other Chihuahuan motifs are present in the Southwest in varied forms except the "plumed serpent" which seems to be of southern origin where the serpent motif was abundant.

Another very characteristic trait of Chihuahua pottery is the abundance of effigy vessels. Many animal and bird representations have been found in the Gila drainage but the human depictions seem strongly influenced by southern cultures. Vessels of this type show a marked localization. Nowhere in the Southwest are the sex organs represented in such great abundance. This fact argues strongly for southern Mexican origin.

In general, vessel shapes would fit into the Southwest pattern rather than southern Mexican. Ollas differ somewhat and it is by this difference that a Chihuahuan vessel cannot

1. Carey, H. A., An Analysis of the Northwestern Chihuahua Culture, p. 350.

be mistaken as coming from any other region. Naturally, the colors of the design also are a criteria but the shape is important. Tall vase-shaped tripod vessels, flat dishes, and pitchers, which are well represented in the south, have not occurred as yet in the collections of Chihuahua wares.

Trade wares from the Southwest, especially from the bordering regions, are scattered over many of the ruins. The author knows of no trade ware from Chihuahua from southern Mexican cultures. This fact is not strange as distance was important in prehistoric times and the Southwestern areas were very close to Chihuahua. But the fact that Southwestern trade wares are abundant and design influence from these wares was felt in Chihuahua ceramics helps to locate this Mexican state in the Southwest cultural groups.

The materials employed and the ornaments manufactured in both Chihuahua and the areas to the north are fundamentally the same. The extensive use of the Conus for tinklers and rings, of the Glycimeris for bracelets, pendants, and beads, of the Pecten for pendants, and the Olivella for beads in both areas, argues for a connection between the two. The method of cutting and smoothing turquoise to form pendants and beads was similar. Mosaics of turquoise on shell are limited in extent but examples of these have been found in both Chihuahua and the Southwest. The turquoise entered northern Mexico from New Mexico, and with the material

certain techniques of working it also were introduced.

If the prehistoric people of Chihuahua were more closely allied with the southern Mexican cultures, there should be more evidence of metal work, particularly in copper. Small round bells of this material have been found in Chihuahua, as well as in the areas of the Southwest. These bells may be of pueblo manufacture but evidence seems to point to the fact that they were introduced from southern Mexico.

Lip plugs and nose and earrings were used extensively as ornaments in southern Mexico. Earrings probably were used in Chihuahua although evidence to the affirmative is lacking. However, no lip plugs are known to the author as having been found in Chihuahua.

Burial methods in northern Mexico are similar to those practiced in Southwestern areas. In Chihuahua inhumation was general throughout most of the area. We say most of the area due to the fact that excavation must be undertaken in the eastern section before the entire area can be included as a unit practicing inhumation. However, it does not seem improbable that the method was general in scope. The burials in the lowlands were placed beneath the floor level of rooms, usually in a flexed position. This factor correlates very well with the practice employed in the Mimbres area.

In the Sierra Madre mountains inhumation in uninhabited

caves was practiced. These burials were often wrapped in textile work and were also dried into a mummified condition. They appear very similar to mummies found in northern Arizona.

Articles of stone, ornaments and pottery were placed with the deceased in both Chihuahua and the Southwest, and as was mentioned, burial beneath the floors was practiced in both areas, which facts tend to connect Chihuahua to the Southwestern culture groups.

SONORA

The author thinks that the Sonoran culture area should also be included in with the Southwestern cultures rather than the southern Mexican. This belief is based on scanty evidence but what facts are known point to a northern rather than southern influence. As further investigation is carried on in this region, we are sure more similarities will be discovered that will strengthen the Southwest connection theory.

Architectural forms correlate with the Santa Cruz section of the Gila area. In northern Sonora, on the upper Santa Cruz, there is a strong influence of the Red-on-Buff culture and one of the associated house types, namely, the rectangular pithouse. These structures are found in single or connected plan. Farther south in the Magdalena and Sonora drainage areas, the presence of stone outlined houses exist, which structures often were built over a shallow pit.

They were rectangular in form and suggest a stage of development between the rectangular pithouse of the Gila and the peripheral Casas Grandes. Assuming that the Chihuahua culture developed in the early part of the Late Pueblo period, which was characterized by habitations on the surface of the ground, and as the Red-on-Buff culture was well developed in the Late Pithouse period it seems reasonable to think that the influence of these two cultures affected Sonoran house types so that they had certain characteristics of both areas. As the Chihuahua culture spread, it became a more dominant factor in Sonoran development and the Gila influence decreased.

The developments in material culture are not very well known in Sonora but the manufacture of stone implements, ceramic development, and to some extent, the working of ornaments give some evidence that can be used to place this area in the Southwestern culture pattern.

Suffice it to say that stone implements were very similar to the Gila and Chihuahua areas with few exceptions.

Ceramic development shows little similarity to other areas. The Sonoran wares, the polychrome, Purple-on-Red, plain, and surface textured types appear quite distinctly a local development. Also the Santa Cruz Red and Black on Crackled Gray¹ which Sauer states is a provisional term for

1. Sauer and Brand, Prehistoric Settlements in Sonora, pp. 110-111.

the ware, seems quite a distinct type from the Red-on-Buff and shows some characteristics of both Chihuahua and Sonora in the design.

Not enough material is available at present to work out a definite pottery sequence and range distribution.

Shell ornaments were very similar to those in the Gila and Chihuahua. This factor is not used as a particularly strong argument for connecting Sonora to the Southwestern cultures due to the fact that extensive trade was carried on across this state as it was located on the Gulf of California, which was the source of much of the shell used by prehistoric people. However, the fact that this area was situated in a position to be in constant contact with Chihuahua and the Gila would tend to make it related to these areas.

Burial customs are useful criteria on which to attempt to locate a culture. In the light of the evidence presented at the present time, Sonora would correlate with the Gila region. Cremation was practiced in both areas with the accompanied use of crematory urns. In the chapter dealing with burial customs of northern Mexico, mention was made of thirteen inhumations without pottery near Soyopa. This fact indicates an early inhumation period before pottery, but the author believes that, when further excavation is carried on in Sonora, inhumation burials will be uncovered. This theory is advanced due to the fact that

inhumation was practiced in Chihuahua and the author feels there was an influence from this eastern state (Chihuahua) into the western (Sonora).

In summary, the following facts tend to locate the two northern Mexico areas in the Southwest culture pattern. These are architectural forms, phases of material culture, and burial customs. The author is willing to admit that there is a southern Mexican influence in both Chihuahua and Sonora but these cultures differ much more distinctly from the south than from the north. In addition, it is hard to overlook the geographical factor which is very important in the development of a culture. Sonora and Chihuahua are closely associated with the Southwest and are far from southern Mexican cultures unless the southern peripheries of these areas extend a great distance southward, which does not seem probable. The people of Chihuahua and Sonora may have come originally from southern Mexico but this northward migration must have occurred before any great advancement in various arts had developed. If the migration was recent, certainly religious beliefs, which were closely related to architectural forms, would appear more strongly.

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