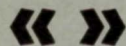

PREHISTORIC MAN

In the Navajo Country

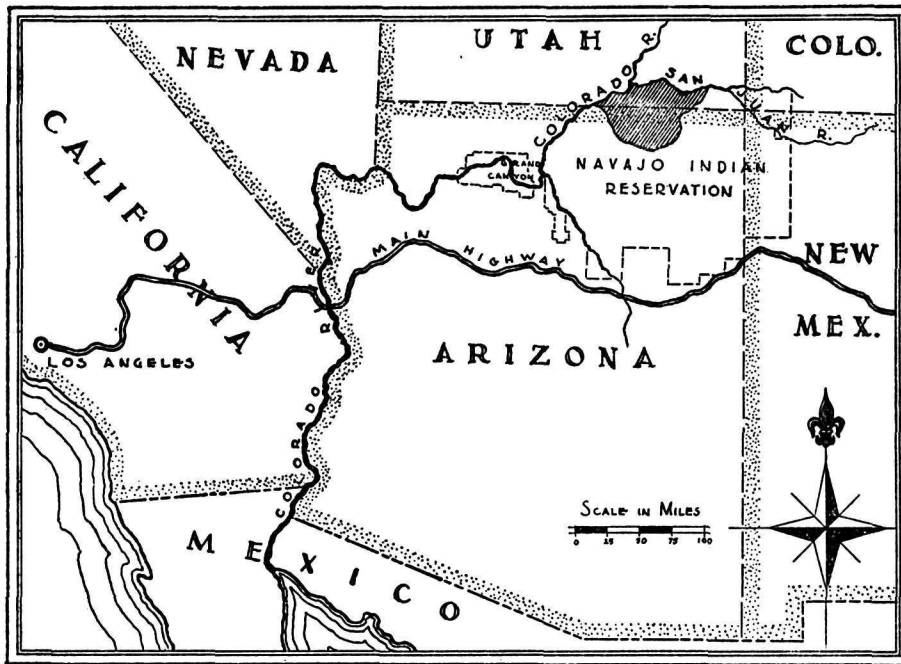
By Theodore H. Eaton, Jr.



**National Youth Administration
(Project 6677-Y)**

Berkeley, California

1937



Map Showing Location of Navajo Indian Reservation

Shaded portion indicates area where mapping and scientific field studies are being carried on by the Rainbow Bridge-Monument Valley Expedition.

Foreword

This is one of a series of bulletins on the northern Navajo country, produced under Project 6677-Y of the National Youth Administration, Berkeley, California. In its inception the project had for its main objective the publication of scientific data made available by the Rainbow Bridge - Monument Valley Expedition, resulting from four years of field work in the northern Navajo country.

Dr. Theodore H. Eaton, Jr., who has served as a member of the Expedition's biological staff in the field, was chosen N. Y. A. project director to supervise the assembling, editing and publishing of this fund of knowledge in some form in which it might be useful to the layman or student. As the work progressed it was decided to widen the scope of the project to include information from all reliable sources with a view to producing a usable scientific manual of the Navajo country. This necessitated a research program pursued mainly among publications in the library of the University of California and that of the Expedition.

Acknowledgment is due to a number of agencies and individuals without whose cooperation the production of these bulletins would not have been possible; to the Alameda County Free Library for the earlier sponsorship of the project; to the National Park Service for space necessary for the work; to the University of California for furnishing published material, collections, and space for investigators; to the trustees of the American Exploration Society (under which the Rainbow Bridge - Monument Valley Expedition operates) for unpublished scientific data collected in the field and for contributions in cash toward publication expenses; and - most of all - to Arthur M. Yale, Frederick S. Clough and other administrative officers of the National Youth Administration, who have recognized the importance of this work and have assisted in many ways toward its completion. To all these, and to all the other individuals who have assisted without recognition here, the undersigned, sponsor of the project, expresses his sincere thanks.



Ansel F. Hall

Berkeley, California
April 10, 1937

T A B L E O F C O N T E N T S

* * *

INTRODUCTION	1
FOLSOM MAN	2
THE LATER PERIODS	5
BASKET MAKERS	7
MODIFIED BASKET MAKERS	11
DEVELOPMENTAL PUEBLO PERIOD	12
Pottery	17
THE GREAT PUEBLO PERIOD	19
Pictographs	24
Baskets	26
Pottery	26
End of the Great Pueblo Culture	27
CONCLUSION	
Names of Periods	29
Nomenclature of Periods	29
Chronological Chart	30
Past Conditions of Life	30
Main Lines of Cultural Evolution	31
(a) Dwellings	31
(b) Food	32
(c) Cloth and Textiles	33
(d) Social Changes	33
BIBLIOGRAPHY	35

I L L U S T R A T I O N S

* * *

Fig. 1 -- Use of the Atlatl	9
Fig. 2 -- Plan of Basket-maker III Slab Foundation; Seginatsosi.....	Opposite 14
Fig. 3 -- Plan and Cross Section of Basket Maker III House Foundation	Opposite 14
Fig. 4 -- Plan of Largest Room of Pueblo I Site Near Church Rock	Opposite 16
Chronological Chart of Western Maize Area	Opposite 30
PREHISTORIC POTTERY of the Tusayan-Kayenta- Rainbow Plateau Area	After 43

PREHISTORIC MAN IN THE NAVAJO COUNTRY

By

Theodore H. Eaton, Jr.

Introduction

In the southwestern United States we can find all the stages of man's cultural development, from hunting nomads of the Stone Age up to the pueblo dweller with his arts and crafts, his division of labor, and his dependence upon cultivated crops and domestic animals. Our knowledge of this transformation is surprisingly complete for some of the steps, but for others, especially the oldest, it is still meager. Broadly speaking, we have made out the changes of the last 1500 years, but of the 15,000 or more before that, during which man lived in the United States with mammoths, mastodons, camels and other extinct animals, we have only the scantiest information.

The southwest is largely a desert; some of it is high, some low, some parts are level and open, others incredibly rough and broken. The Navajo country, in northeastern Arizona and southeastern Utah, contains all of these elements. It is a portion of the "plateau province", the great uplift on which the Rocky Mountains stand to the northeast. The lower, hotter zone penetrates into it along the Colorado river, the San Juan and the little Colorado. A brief description of the natural setting of this region will help in understanding how it favored early man, and how it modified or controlled his cultural development.

Most of the Navajo land is between 5000 and 8000 feet in elevation, with Navajo Mountain and the Chuska and Carrizo Ranges standing well above the mesas which surround them. There is a great difference of climate between seasons and even between localities only a few miles apart. The Painted Desert and Monument Valley are inhospitable at any time of the year, hot and dry in summer and bitterly cold in winter. Neither in the past nor at the present time have they offered any encouragement to human occupation. The mesas, northwest and south of Kayenta, stand from one to two thousand feet above these deserts and are interrupted repeatedly by deep canyons and other breaks in the contour. In summer they are cool, especially at night, and in winter there is often a heavy snowfall. The heads and walls of the canyons contain springs, although the water supply is slight. Rain falls frequently in July and August. The storms are nearly always violent, causing the creeks to rise suddenly and pour torrents down through the deeply cut washes in the canyon bottoms. Such a stream will ordinarily run dry within a few hours and unless the water is caught in a reservoir it will do the land more harm than good.

Another agent affecting the fitness of the country for human occupation is the wind. This blows continually over most of the area, and sometimes comes in violent gusts, raising clouds of sand or dust. Thus gradually one spot may be buried while another is eroded away, and there is no doubt that the flying sand is responsible for erosion of some of the mesa walls.

The quantity of exposed rock and sterile gravel, produced by the wind and occasional torrents, limits the extent of fertile ground on which crops may be raised. Pinyon pines, which furnish a seasonal supply of nuts, grow on the upper parts of the mesas, from about six thousand to eight thousand feet. There is a very small amount of grass scattered here and there, especially in some of the meadow-like areas on the mesa tops. Birds and mammals are only moderately common. Those which might be used for food seem to be especially rare. The rodents, as in any desert or semi-desert country, maintain a considerable population, but they are largely immune from human influence. There are no fish except in the permanent streams, the Colorado and San Juan.

The topography of the country can hardly have changed at all during several centuries. It is at least likely that the water supply and therefore the fertility of the land were better during those times than they are today. It is certain that more kinds of wild animals roamed the mesas and canyons a thousand years ago than now. Most conspicuous of these were mountain sheep, deer, antelope and wild and domesticated turkeys.

Folsom Man

We may put into one brief section all that we know about prehistoric man in the southwest country prior to about 2,000 years ago.

During the last few years there has been a rapid accumulation of evidence that a large part of the United States was occupied by one or more races of early man at least 12,000 years ago and possibly as much as 20,000. A certain type of spearpoint or arrowhead has been found on the eastern slope of the Rocky Mountains and throughout most of the eastern part of the country. These are known as the "Folsom points" after the locality in New Mexico where they were first found. They are broad, carefully chipped, and with a shallow trough along each side. They show greater skill and more careful working than the arrowheads of recent Indians. The "true Folsom points" occur from New Mexico north along the eastern border of the Rocky Mountains, while a slightly cruder type occupies the rest of the range (Roberts, 1935).

At the Lindenmeier site, north of Fort Collins, Colorado, a recent expedition from the Smithsonian Institute excavated a considerable variety of stone implements and the charcoal of campfires associated with these Folsom points, all buried deeply in an ancient river terrace. The following list gives the proportions of the different type of tools that were found:

points.....	11.3%	hammerstones.....	0.8%
scrapers.....	32.8%	hematite (shaped).....	1.6%
gravers.....	5.6%	channel flakes from grooves in faces of points.....	13.6%
chisel-gravers.....	1.0%	sandstone rubbers.....	4.0%
choppers.....	0.5%	bone showing work.....	0.5%
knives.....	3.0%	flakes, nondescript.....	19.0%
large blades.....	6.3%		

Evidently the people who made these objects were primarily hunters, and may have come to particular camping grounds to prepare their weapons once a year. We know what they hunted because the skeletons of extinct species of bison have been found with Folsom arrowheads embedded in the bones. The bison, of both living and extinct species, roamed the plains in great herds, just as the pioneers found them in the early days of exploration. Probably the "Folsom Culture" was based on the bison and the people followed the herds from place to place, using the meat for food and the skin for clothing.

At Dent, Colorado, mammoth bones occur with the Folsom implements; in Nevada and in New Mexico the giant ground sloth* is also associated with them. At other localities the points occur with skeletons of musk oxen which today live north of the Arctic Circle. This shows that the climate must have been much colder than it is now during at least part of the period of Folsom Man. In contrast to this, however, the Lindenmeier site contains the shells of several species of mollusks, two of which occur today several hundred miles farther south; the interpretation to be put on this is probably that the climate was warmer during the occupation of this site than it is now. Thus we see that man has lived through a long history of changing climates and corresponding migrations of animals in North America. But we do not know yet whether the presence of extinct species like the giant ground sloth indicates a very ancient date for man or whether the discovery of human culture shows that these animals became extinct only a short time ago. At any rate, the musk oxen and bison are animals of plains or tundras while the ground sloth was definitely a forest animal; therefore there has probably been a great change in the kinds and distribution of plants.

*Footnote at bottom of next page

With all the scattered evidence and speculations about "Folsom Man" we have yet to find an authentic human skeleton or even part of one which can be positively connected with the known cultural remains. Therefore this earliest race of prehistoric America remains a puzzle, although many archeologists are at work on it and at any time the long-sought bones may be found.

Footnote: The ground sloth was a gigantic animal somewhat resembling a bear, but approaching the size of an elephant. It is believed to have browsed on forest trees, sitting on its haunches and dragging down the branches with its front paws. There were several species in North and South America a few thousand years ago, but they had vanished completely long before the white man reached the new world. Their only living relatives are the small tree sloths of the South American jungle. Other animals which early man in America probably met were the mastodons (similar to a mammoth and probably extinct in certain parts of South America within the last 2,000 years), wild horses (these were extinct before the Spaniards came; the horses of the present Indians are derived from those brought by the Spaniards), and peccaries (a small species of wild pig which now occurs from southern Texas southward).

The Later Periods

Of the later periods in which prehistoric man lived in the southwest we know considerably more. Two tribes or races, rather indistinctly separated, succeeded each other in the northeastern part of Arizona and nearby states. The older of these, the so-called Basket Makers, appeared sometime before the first century A.D., and were succeeded in the beginning of the eighth century by the Pueblo Indians, who have survived in small numbers as the Hopis and Zunis of today. We do not know the fate of the Basket Makers, but they seem to have blended more or less completely with the Pueblos in northern Arizona and adjacent parts of New Mexico, while in many other places they may have continued living unchanged for several centuries, eventually giving rise to certain nomadic Indian tribes like the Paiutes or the Mojaves. At about 1300 A.D. the Pueblo Indians of northeastern Arizona suddenly disappeared during a severe drought that lasted 23 years. We find that certain pueblos of the Hopi country and of northern New Mexico increased in population, and we may infer that this was due to the refugees from the drought. The great cliff dwellings of the Navajo country have stood unoccupied ever since, and some of them have kept in almost perfect condition the architectural details, the baskets, pottery, textiles, weapons and even the mummified bodies of the people who built them.

The Navajo Indians, a nomadic race of Athabascan origin and language, have meanwhile entered the Pueblo territory. Their clans and legends are very largely of Pueblo origin, which implies that at some time in the past these two races associated closely, probably for several generations. When first discovered in 1628, the Navajos lived on the Chama river in New Mexico, but they may have lived also in northeastern Arizona; we know very little about their history during the first century or two of Spanish occupation.

Before describing the lives and progressive development of the Basket Makers and ancient Pueblos, a few words should be added concerning the ways of the archeologist, who is our sole authority for everything we know about those races. He is a man trained to interpret the relics left by early people. He is not a pick-and-shovel wielder primarily, nor a fanatical collector of "perfect specimens" of pottery and baskets. Instead, he is constantly building in his mind a picture of the life and the history of the men and women of by-gone days. He thinks of them as human beings more or less like himself and tries to put himself in their place and understand their ways of life. To do this every possible bit of evidence must be brought into consideration, from their own buried skeletons to the rings in the logs with which they built their houses, from the tiniest beads they wore to their influence on the present population of wild animals. The archeologist is constantly putting things in rows, to see how one type of pottery may have developed into another, or how arrowheads from Nevada resemble or differ from those of Texas. He

must compare and analyze, and afterwards interpret what he has seen. He has the difficult job of telling everything possible about ancient people who, having no written language, could tell nothing about themselves.

The most startling and useful recent development in southwestern archeology is the method of learning the exact date of a ruin or of any prehistoric site where logs are preserved, by studying the annual rings in the wood of those logs. Every tree as it grows makes a new ring of wood each year, in a dry year a narrow ring, and in a wet year a wide ring. The irregular succession of rings of different thicknesses, from the heart out to the bark of a log, gives a fairly accurate record of the climatic changes during the life of the tree, and, needless to say, this record will be much the same for all trees in an area of similar climate. Now we can make a chart on paper showing the ring-sequence of a tree cut down at a known (recent) date, and that chart will fit any ring-sequence from trees growing during the same period. A log from an older tree, however, may only partly correspond to the chart we have made, but this gives us new information, for now we can carry the chart back through the life of this older log, and so know what the climate was like back to the year it started to grow. With still older logs the same process may be carried on, for all the periods from which logs are available, provided that there is a partial overlapping of years of growth between one and another, so that the chart remains connected with a known date. So for the last decade archeologists in the southwest have gone to numerous Pueblo ruins, historic and prehistoric, and to Lasket Maker sites, cutting out sample pieces of wood from the logs, until they have obtained a chart of tree-ring sequences back through nearly 1500 years, and have dated accurately scores of ancient human habitations. This method of dating, called "dendrochronology", was the discovery of an astronomer, Dr. A. E. Douglass, who was investigating the influence of sun-spots on climate cycles.

Basket Makers

The earliest definite remains of human skeletons in the southwest are associated with an already complicated culture. The more perishable objects left by this culture are found in dry caves, where, sheltered from rain and decay, there are corncobs, squash rinds, colored bags woven of Apocynum (dogbane) fiber, blankets of fur string, shell beads, stone and shell pendants, sandals woven of fine cord with toe fringes, and a variety of other articles indicating a stable, productive people. Predominant among their goods were coiled, loosely woven baskets, decorated with black and red designs. The name Basket Makers originated from the large carrying-baskets which were nearly always placed over the heads of the dead in their graves. It was first applied by the Wetherill brothers, who discovered this culture.

On account of the cultivation of corn and squashes, and the weaving of textiles and baskets, it seems probable that the ancestors of these people occupied the same area and passed through the preliminary stages of learning cultivation and domestic arts. We do not know anything tangible about them, however. Before 1935 the ancestral Basket Maker phase was called Basket Maker I, and the first known culture Basket Maker II. Roberts then proposed a new classification in which the former stage, being hypothetical, is not included, and the latter is called simply Basket Maker.

Remains of this culture occur widely through the southwest, from Texas and northern Mexico to Nevada and southern Utah. The Navajo region therefore stands at a central point, and it is from the Navajo region primarily that the later advanced cultures arose.

Physically, the Basket Makers were heavy in build, long-headed as contrasted with the later round-headed Pueblo Indians, and did not deform their skulls by cradle boards. Kidder and Guernsey (1921) described the styles of hairdressing as shown by the mummified bodies taken from Basket Maker burials. The simplest style is that of a young woman whose hair was hacked off to a length of about two inches all over the head. The men's hair was much more elaborately arranged. On the back of the head there was a long queue joined with a thin lock from the center of the crown and wound with string. The scalp was shaved in the center, sometimes in a spot, sometimes in a broad band back of the forehead to the crown. The side hair either fell loosely or was gathered into a bob or a braid below the ears.

Their clothing was simple, probably consisting, as a rule, of little more than a breech-clout, but for colder weather they had blankets roughly woven of twisted fur string, and robes of dressed skins. Feather head-dresses are also known from the Basket Maker period. There was a considerable variety of ornaments, the simpler being pendants and beads of stone and even of seeds. The shells of Olivella were abundantly used, and those of Abalone appear occasionally. These, which are marine mollusks,

indicate trading with tribes of the Pacific coast. There was no turquoise. Comb-like ornaments made of wood and beads, with or without feathers, were worn in the hair.

In habits the Basket Makers were semi-nomads, living either in caves or in the open, in temporary dwellings that could be abandoned at short notice and built elsewhere with little trouble. For food they probably depended as much on hunting animals, such as Mountain Sheep, and gathering wild vegetable food, such as pinyon nuts, as they did on their agriculture, for the latter was in a primitive state and of course limited to the growing season.

The only remains resembling dwellings, authentically known to belong to the Basket Makers, are found in the floors of caves. They are small circular pits lined with upright stone slabs, sometimes probably having a superstructure of poles and brush. Similar pits or cists were used for granaries, and sometimes they were lined with bark and grass. A few pits of this type have been found in the open (Hargrave, 1935) but in the absence of the characteristic Basket Maker sandals and other perishable articles we cannot be sure that they do not belong to the later Modified Basket Maker period (Roberts, 1935). Such articles would not survive a thousand years unless protected from water by lying in the dust of dry caves. Our only clue so far to the age of these supposed Basket Maker pit-houses in the open is the absence of fired pottery, but this has only the value of negative evidence.

The food of the Basket Makers we have already mentioned in passing. A single variety of yellow flint corn with small kernels, and gourds and squashes were apparently the only cultivated plants. Pinyon nuts and other seeds were gathered when in season. The larger animals and birds probably furnished a more or less constant supply of meat. No fish bones have ever been found in sites of this or later periods, although several species of fish occur in the San Juan and Colorado rivers.

The weapons of these people, as far as they are known, were two: the curved club, decorated with parallel grooves, and the atlatl and dart. The latter combination consisted of a short spear tipped with a flint or obsidian point, and a throwing stick, the atlatl, by which the spear was given far greater impetus than when thrown by the hand alone. The atlatl was held in the hand as shown in the figure, (next page) and the spear balanced just above it, the butt end of the latter fitting into the hooked or notched end of the atlatl, so that in throwing the spear the atlatl, being retained in the hand, continued the thrust far beyond the length of the man's arm.

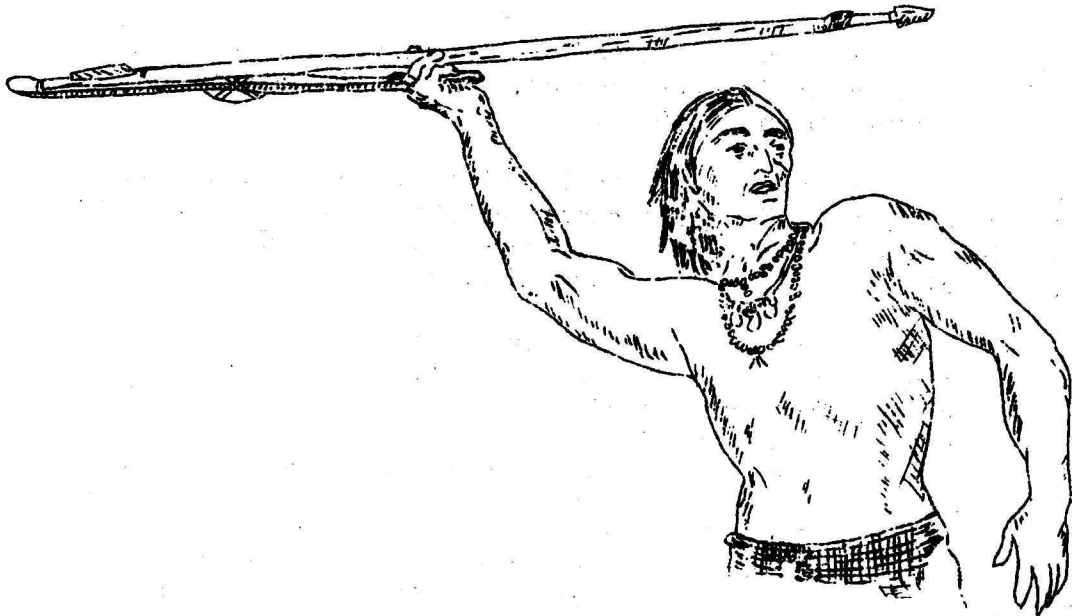


Figure I. Use of the atlatl

The atlatl is used today by some of the Indians of the South American jungle, and by the aborigines of Australia and New Guinea. Among prehistoric tribes in the New World it was much more widespread. The Mayas of Yucatan depicted its use in their elaborate carvings; the Incas of Peru employed it; and similar atlatls are known even from the Bering Sea (Kidder and Guernsey, 1919, pp. 178-181). To give added weight to the atlatl a stone was added to the back of the shaft and the Basket Makers used loops of string at the grip end to keep the stick from slipping out of their fingers.

How much fighting the Basket Makers did among themselves or with other tribes we do not know, but at least the spear must have served for killing the larger game animals, for bows and arrows were unknown in the southwest at that time.

Accompanying the use of corn, nuts and seeds came the grinding stones. At first the metate, or piece on which the grinding was done, was a simple flat rock, easily carried about or replaced. The mano, a smaller rounded stone, was held in the hand for grinding. These two stones and the fire were the principal equipment used by the women for preparing food. But at the same time containers became necessary. The baskets would hold dry objects, but pottery had not yet been invented for holding liquids. Out of this need came the first crude attempts at making clay bowls. These were in the form of large basins often showing the imprints of baskets in which they were molded, and tempered with shreds of

cedar bast, corn chaff or grass. Some of the bowls were built up in a manner suggesting the beginning of the later coiled method. The early Basket Makers had not learned, however, to bake their pots after shaping. (Morris, 1927).

Of clay they also modelled small statues of figurines, usually of the female figure. These are characteristic of the Basket Makers and Modified Basket Makers, and are thought to be symbolic of Mother Earth, like similar figurines of early Mexico.

On cliff walls the artistic ability of these people was expressed in painted figures, white, red or yellow, which have partially withstood the weathering of centuries and which often have drawings of a later date superimposed on them. These figures, supposedly made by the Basket Makers, are square-shouldered, square-headed, roughly triangular, conventionalized men. Usually they are crossed lengthwise by zigzag lines like those on the basket designs. Probably the custom of making hand and foot prints in red or white paint began in this period. Such marks are either direct prints of the wet hand, drawings of it or of the foot, or outlines, traced crudely around the hand held in place against the rock. Other painted designs of mountain sheep, snakes or apparently meaningless geometrical forms may belong to this age, but usually it is impossible to tell definitely the antiquity of a pictograph, and it is certain that drawings of one kind or another have continued on down to the Navajo of today.

Finally we may consider the way in which the Basket Makers began and ended their lives. There were at least three types of cradles (Guernsey, 1931). One was made with a rigid wooden frame, a back of twigs, and shaped like a guitar. Another, also guitar-shaped, had a flexible edge of grass bundling, and a back of yucca leaves. The third was a simple container made of soft juniper bark.

The Basket Makers buried their dead in the debris of caves. Nearly every cave in the Navajo country is a wide, high hollow worn in the vertical wall of a canyon, and the fragments that fall from the roof and back of such a cave pile up a considerable depth of sandy or rocky soil on the sloping floor. In this, and in the open, the Basket Makers dug graves and lined them with slabs like the granaries, or they may have used the granaries themselves. The dead were flexed, that is, bent double with the knees under the chin, wrapped in blankets, and laid in the grave. Sometimes many bodies occur in the same grave, up to ten or more. Always they were accompanied by the gift of baskets, and their own ornaments and other personal possessions usually went with them. The burial, therefore, is the most prolific source of information about prehistoric people in the southwest, because they, like the Navajos of today, believed that a departing spirit needs his property in the next world.

The Modified Basket Makers

About 500 A.D. a new era began in the Basket Maker culture. The people were racially the same as their predecessors, and in most of the ordinary features of their lives they remained the same. But a number of new developments appeared, foremost of which was the discovery that clay baked in a fire became permanently hardened. This brought an immediate change from the old plain clay basins to true fired pottery. At first the baking was uneven and the walls of the pots thicker than they needed to be. Sand furnished the tempering and caused a slightly roughened or stippled surface. The color in at least 99% of the pieces which have been found was gray or whitish, and the small remainder were plain brick red. Of the gray ware about 3% are distinguished as Black on Gray or Black on White; these are open basins with a transverse interior decoration of narrow black lines forming a double or triple band across the center, and variously angled or zigzagged. In the Virgin river basin of southwestern Utah is found the Virgin Gray of this period, in which a decoration of angular black lines runs around the edge close inside the rim. All of these styles were forerunners of the much more elegant pottery of the Pueblos, and it is possible to follow the derivation of most of the succeeding patterns and colors from these. The earliest shapes of pottery in the Modified Basket Maker phase were open round basins, globular jars with necks, and presently with necks drawn upward to some extent, in one type bulging like a separate head. There also came dippers with handles, shaped like a gourd which has been split in two lengthwise, and ollas or storage jars with side loops for attaching reed handles. Roberts (1935) mentions a small globular pot with lateral spouts as being characteristic of this period.

The houses of the Modified Basket Maker period were an improvement over those of the Basket Makers. In fact they were, for the first time, actual houses instead of holes in the ground merely covered with brush. They were, however, built over a pit, either circular or oval, and large enough for a family to occupy. The pit was lined with stones and plaster or upright poles, or both, and bore a conical or truncated roof of poles covered with brush, mats and plaster. The mats were loosely woven of grass twined in bunches. There was a central smoke-hole and a side entrance, often with a passage and antechambers. Several of these pit-houses, with granaries clustered around them, were sometimes built close together in a village. Naturally this more elaborate construction took them out of the caves into open canyon flats, where they could also be nearer to their cultivating.

Although no new kind of food seems to have been introduced, the metates were improved, having a central trough to retain the grain. The woven bags were coarser than before, and the cloth, such as it was, consisted of coarse fiber string. Sandals of this period may be recognized by the scalloped toe, the colored design above, and the woven pattern of the sole. Burials were now made more in the open than in caves, probably for convenience. In the last part of the period an occasional round-type skull occurred, probably as a first infiltration of the Pueblo race. The great invention of the bow and arrow came also during the Modified Basket Maker era, presumably from some outside source.

We find these ancient people, then, between 700 and 900 A.D., widespread through the southwest, and already progressing rapidly towards the sedentary, communal life which they were never to see. At the close of these two centuries the Pueblo Indians entered their country and probably largely absorbed them, at least in the central area, although signs of intermingling may be seen in an occasional long-headed skull in the later Pueblo burials for many generations. Whether any actual descendants of the Basket Makers live today we do not know, but it may be that in outlying areas they contributed somewhat to the stock of a few tribes of semi-nomadic Indians, such as the Paiutes.

The Developmental Pueblo Period

For nearly five hundred years, from about 700 to 1200 A.D., the Pueblo people went through a slow and gradual development along the lines started by the Basket Makers, whose culture they seem to have adapted to their own use. These people were slighter in build than the Basket Makers, round-headed, and wore their hair something like that of the Hopis of today, who are, indeed, remotely descended from them. A trait seen in most ancient Pueblo burials is the flattened occipital region of the skull, sometimes carried to the extent of gross deformity, on account of the pressure of the babies' heads against the backs of their cradles.

The names "Basket Maker" and "Pueblo", as applied to these succeeding peoples, often creates an exaggerated idea of the difference between them. Actually the apparent replacement of Basket Makers by Pueblos was probably a gradual transition, resulting in a more complete change in some areas and little or none in others. We do not know whether the Pueblo people arrived in one wave of migration or whether they filtered in gradually. Nor do we know whether the contact was peaceful or violent, nor to just what extent the Basket Makers contributed to the physical heritage of later times. The culture, like the physical features, continued with no decided changes.

With the establishment of a definite and widespread Pueblo culture, the southwest broke up into several cultural areas, which gradually lost connection with one another, not completely, but enough so that each area progressed in certain features and lagged in others, tending to lose step with neighboring regions. The area centering in northeastern Arizona, bounded on the north by the San Juan, west by the Colorado, east by the meridian along the east edge of Black Mesa, and reaching about as far south as Flagstaff and Sunset Crater, formed the focal point of cultural development all the way through the Developmental and Great Pueblo period, except for a lag in the perfection of masonry dwellings. This large region is variously treated by different authors, who are by no means unanimous either as to its extent or its distinctness from neighboring areas. If we were to divide it into districts, the first such division would set the Little Colorado drainage apart from that of the San Juan. In the former the Flagstaff district would occupy the part south of the Little Colorado, and the Hopi country proper north of it. In the latter, by the way, Pueblo culture and pottery-making have continued unceasingly to the present day. The San Juan drainage, to the northward, contained a large population scattered irregularly from Navajo Canyon, south of Navajo Mountain, to the valley of the Chinle and from the San Juan south through the Tsegi Mesas to Black Mesa. It is with this district, which is commonly called the San Juan or Kayenta or Tsegi area, that we are mainly concerned. Others will come in now and then as illustrations of particular details.

To the north and west we find that little progress occurred beyond the Modified Basket Maker and Developmental Pueblo stages (Steward, 1933). The culture of the upper Colorado basin was primarily that of the late Basket Makers, reflecting a few features of Developmental Pueblos, such as the houses. Beyond this it never went. In western Utah there was a settled agricultural life, and the houses advanced to the upper Developmental Pueblo stage of rectangular form and adobe walls. From there south to the Grand Canyon the culture was much the same as in northeastern Arizona, except that the succession of cultural changes was a bit mixed, and, according to B. W. Wetherill, there is little or no evidence of the Great Pueblo or any later Pueblo culture.

In this northern area, unlike the southern, we find a rather sudden collapse of the Pueblo culture near the end of the Developmental Pueblo period, according to Steward, 1933, evidently because of invasion by hostile and tribes of nomad Indians, who wiped out what they found, saving nothing and using nothing. They probably had difficulty in penetrating to the plateau north of the Grand Canyon, however, for forts appear to have been built there and in southwestern Utah.

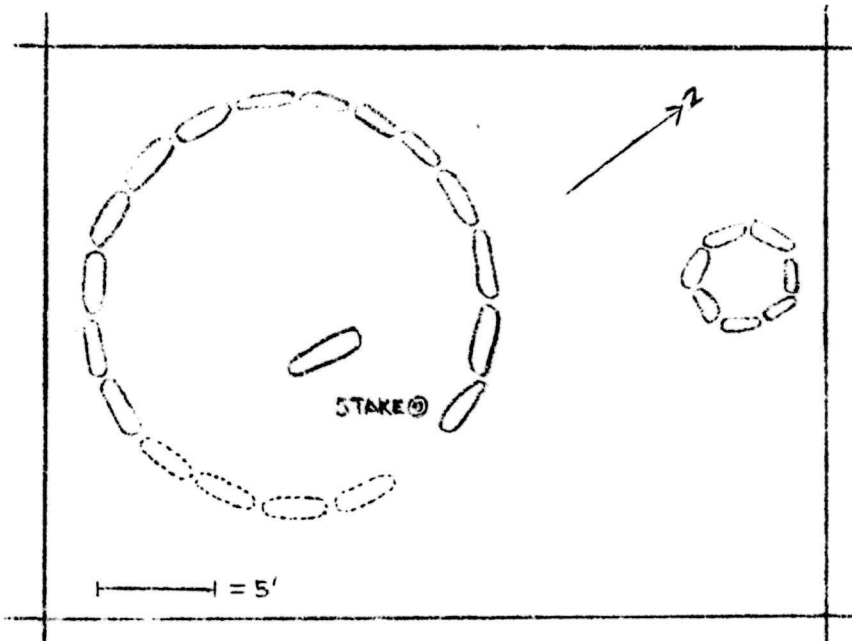
South of the large area we have described, that is, south of Flagstaff and the Little Colorado, there came a transitional zone in which the Pueblo culture made itself felt only partially and temporarily. In this section the natives occupied pit-houses, or surface dwellings of a similar nature, then had a spell of building community houses similar to those of the north, after which they relapsed again to the flimsier houses, probably because the desert climate did not demand anything more substantial. Still farther south, while pottery prevailed throughout, the hot desert caused a complete absence of many other Pueblo traits.

In the northwestern corner of New Mexico, centering around Chaco Canyon, was the Chaco area, where masonry reached its highest perfection. Numerous great Pueblos are known in northern New Mexico, and it is unnecessary to discuss them here. Finally, in Colorado, the Mesa Verde area was another center of high culture, with the architecture second only to that of the Chaco. Besides Mesa Verde proper, this area includes Lowrey ruin and others on the plains north of the Mancos and San Juan rivers.

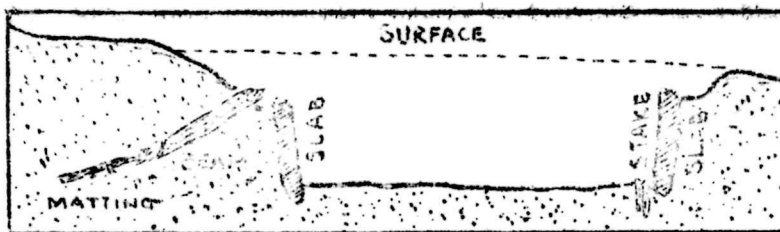
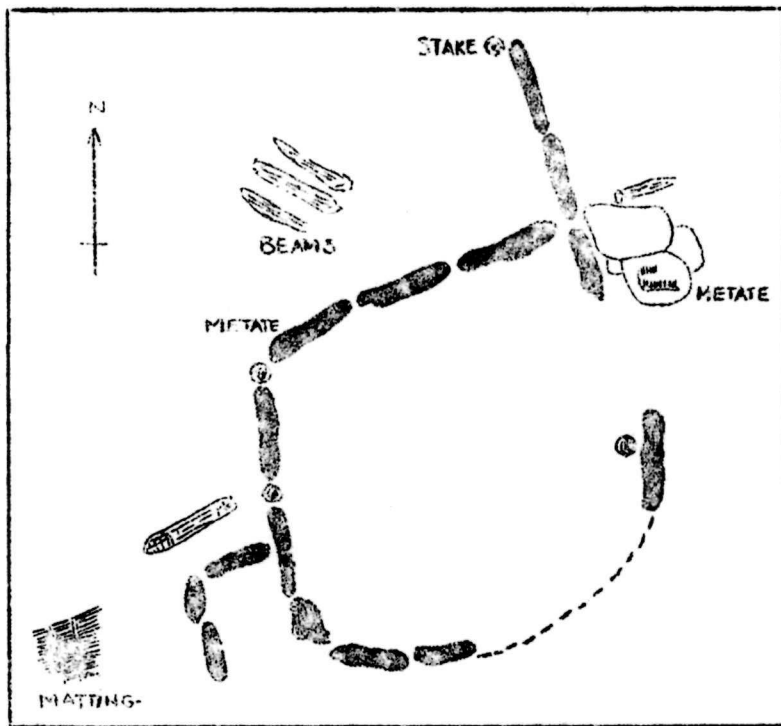
Starting with the first coming of the Pueblo people, about 700 A.D., we may recognize several cultural peculiarities, especially in the type of dwellings. These may be explained by briefly reviewing the structures of the previous period. Most of the published data regarding Modified Basket Maker and early Pueblo structural remains in the northwestern Navajo country are from caves. The nature of the materials covering cave floors, and the irregular contour, shape, and area of these floors, often cause the details of structure to vary from cave to cave.

The more typical groups of Modified Basket Maker structures on sites in the open consist of one or two roughly circular houses and from six to ten or more circular storage bins. There are larger groups, but only one has been excavated extensively. There are no descriptions or maps yet published regarding the details or the relative positions of these dwellings and storage bins. This large group is near the foot of Skeleton Mesa on the east side, while the smaller groups occur over practically the entire northwestern Navajo country. On the whole, these remains have the same general appearance as those excavated by Roberts in the Chaco Canyon section of northwestern New Mexico (see Roberts, 1929).

The most common type of Modified Basket Maker construction is the slab-lined storage bin. The upper edges of sandstone slabs projecting above the ground indicate the location and approximate size of these bins on sites in the open; when potsherds of characteristic Modified Basket Maker types are found strewn over the surface in the immediate vicinity of these outlines they may be considered as "field marks" for sites of the period.



PLAN OF BASKET-MAKER III SLAB FOUNDATION SEGIHATSOSI
FIG. 2



PLAN AND CROSS SECTION OF
BASKET-MAKER III HOUSE FOUNDATION
FIG. 3

The typical Modified Basket Maker house of this district was a single circular room perhaps averaging 15 feet in diameter. A pit of this size was dug to the depth of a foot or 18 inches and a foundation formed by lining the sides with thin sandstone slabs placed on edge. The floor was either the hard-packed earth of the pit bottom or a layer of adobe plastered over it (see Figs. 2,3). The part of the dwelling built above ground was a conical or truncate structure of poles covered with grass mats, juniper bark, brush, adobe plaster and loose earth. It is not likely that the height from floor to ceiling was over six feet. Apparently the entrance to the house, when built in the open, was through the side. The antechamber type of entrance found by Roberts and others to the east has not been recorded from our section. Guernsey (1931) described a typical house of this period, found in the open. The ground plan and a cross section of a floor from fifteen to eighteen inches below the surface are illustrated here in Fig. 3.

The following is a summary of our knowledge of Developmental Pueblo structures in the northwestern Navajo country.

Pueblo I. A house excavated near Church Rock, in the Kayenta Valley, by Guernsey may be considered typical. It is illustrated here by a drawing of the ground plan after Guernsey (1931), Fig. 4. Possibly excavations will reveal the remains of two or more houses of this same general type on sites in the open. At least, in the early phase, however, other Pueblo I structures of this section were circular slab-lined bins similar to those of the Modified Basket Maker stage. Probably further investigation will reveal other types of houses, storage rooms, and some kind of ceremonial room or kiva of the Pueblo I period; kivas are known to have existed during the Modified Basket Maker period.

Pueblo II. Surface structures on sites of this period, which have partly withstood the elements, are rows of masonry storage rooms, rectangular, and averaging about eight feet in width. These are now being excavated by the Rainbow Bridge-Monument Valley Expedition on site number 551. Associated with these rows of storage rooms, and a few feet to the south, is a circular subterranean house or kiva.

Similar subterranean rooms have been found associated with small groups of storage rooms in the San Francisco Mountain region and designated as pit-houses by Hargrave. Nevertheless, it appears that circular subterranean rooms accompanying groups of granaries of the Pueblo II period in the northwestern Navajo country, were primarily ceremonial rooms, and that intensive investigation will bring to light some type of pole-and-adobe surface structures which were used as living-rooms. In fact, a Pueblo II pole surface

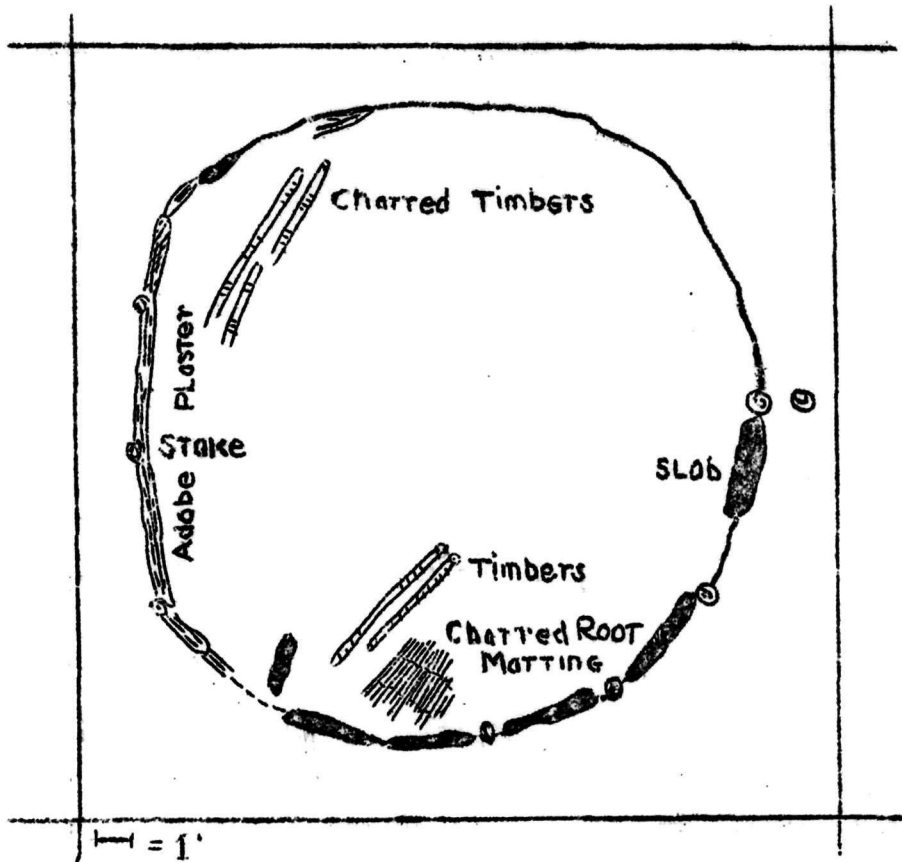
structure was discovered in the Dogozhi Canyon by the Rainbow Bridge-Monument Valley Expedition during the summer of 1934. It appears possible that granaries on this site could have been demolished by erosion and the subterranean room covered by the growth of juniper and pinyon. On the other hand there is a possibility that it was a temporary summer camp for Pueblo II people. Pueblo II masonry granaries of the common kind were found within one-half mile.

One of Hargrave's main reasons for designating subterranean rooms of the San Francisco Mountain region as pit-houses is the absence of surface living-rooms. But even if surface living-rooms did exist in association with a subterranean room it is likely that the inhabitants used the latter for living quarters during the cold winter months, although it was primarily a kiva. Specialized ceremonial rooms are known to have been in use during the Modified Basket Maker stage and the Pueblo III period following Pueblo II.

(This review of the Modified Basket Maker and Developmental Pueblo dwellings we owe to the kindness of Mr. B. W. Wetherill.)

The kiva was a ceremonial chamber in which the men of the community gathered probably as they do now in the Hopi and Zuni villages. The earliest kivas were rectangular and partly subterranean with upright posts supporting a roof of poles. In the center was a fire-pit and also near the center of the floor a small hole was dug, the sipapu, a symbolic entrance for spirits. Later the kiva had a "ventilator", which may have been sacred passage; it had an opening near the floor beyond the fire leading to a chimney-like shaft, because all other entrances were probably closed while the kiva was in use. Between the fireplace and the opening of the "ventilator" there usually stood a "deflector" or altar in the form of a upright slab of rock. This was sometimes built of masonry. The kivas at first did not have benches, but sometimes had shelves to support the roof poles. These shelves may have suggested the later built-in benches which are found in some of the Great Pueblo kivas. The kivas of the Tusayan region on the south rim of the Grand Canyon kept the primitive features up into Great Pueblo times. They may have been pit-houses, showing northern influence, for, like pit-houses, they had no benches. It was characteristic of the outlying areas, even in these days, to be conservative and keep the old styles.

In the crafts the Developmental Pueblos introduced several innovations. They had cotton cloth for the first time, of a plain loom weave. The basketry was partly that of the earlier period, with more elaborate designs, and partly of a new type, the twilled ring basket. This, instead of being coiled from the center, was based on a ring of willow or some other light wood across which the body of the basket was woven. They made mats of twined rushes and reeds. They also made string from feathers and wove it into



PLAN OF LARGEST ROOM OF PUEBLO I
SITE NEAR CHURCH ROCK

FIGURE 4

Figures 2, 3 and 4 are adapted from Guernsey, 1931.
They are figures 10, 9 and 12 respectively in his paper.

blankets, keeping, as well, the fur string blankets and robes of the Basket Makers. The sandals had a round toe and a coarse woven pattern beneath.

The Pueblo Indians did not adopt the atlatl of the Basket Makers. Their weapons were almost entirely bows and arrows. For chopping wood and possibly for fighting they had polished grooved axes, which continued into recent times.

We find more than one kind of corn with the coming of the Pueblos, and beans as well as the original squashes. Now for the first time we discover domestic turkeys, but the dogs were presumably descended from those of the Basket Makers.

Burials of the Developmental Pueblo are found in the talus of caves, in rubbish heaps, sometimes under floors, and in the open; eventually in cemeteries. The bodies are bent double and wrapped in blankets as during the Basket Maker Period.

Pottery

In the development of pottery there are no very sharp or significant breaks from the invention of firing to the present time. There is, rather, a gradual change in the proportion of different types, in the manner of decorating them, and from time to time the introduction of a new style. (See the pottery chart at end of this bulletin.) The plain gray ware of the Modified Basket Makers develops, in the earlier Developmental Pueblo stage, into two or three varieties differing more in the manner of construction than in general appearance. The whole pot was built of coiled strips of clay, laid around and around in a spiral from the bottom up. These strips were smoothed down to make a uniform surface except on the neck. Here the edges of the strips were left overlapping somewhat, and giving a corrugated appearance on the outside. Sometimes the roughness of the surface was increased by indenting it either with a stick or the thumb-nail, these giving the two main types of corrugated ware. During the earlier stages this was done on the neck only, but later all over the pot. The coils were entirely obliterated in all Black-on-White ware. This type is characterized by crude designs, usually of angular figures, parallel lines, or zigzags in which the lines overlap at the angles. Guernsey (1931) describes the basic element of design as solid triangles with ticks or dentals (teeth) along one edge. On the other hand the sharp edges of the overlapping coils of the neck were frequently tooled down to make smooth ridges and in still other cases the coils were nearly but not quite obliterated, either by hand or with an instrument. If the pot is an open basin the design is usually on the inside, but

if a jug or narrow-mouthed bowl it is outside. This white or gray ware with black decorations is by far the commonest during the Developmental Pueblo. There is a steady increase in the perfection of the design and also in its complexity. A number of different named types occur during the latter part of this phase, such as Dogoszhi, Deadman's, and Flagstaff Black-on-White. The red ware also acquired a black decoration but remains less abundant than the black-on-white.

The incompleteness of this account of the important subject of pottery may be justified partly by inadequate facilities for illustrating and partly by the continually growing literature. New classifications are being proposed every year or so and some of the old nomenclature is being replaced by new. For a fuller account the reader may consult Morris (1927), Guernsey (1931), and Hargrave (1932). The folding chart in the back of the book gives an outline of the succession of pottery types from Modified Basket Maker to Great Pueblo Period.

The Great Pueblo Period

The dawn of the Golden Age came gradually between 1100 and 1200 A.D. in the San Juan area. It was not a sudden replacement of the Developmental Pueblo culture by a new one, but rather the natural climax of that long period of development, and it came more rapidly in some areas, especially eastward. For three or four generations there flourished here one of the highest forms of culture which has ever existed among native Americans of the southwest.

The most conspicuous feature of this culmination was the mushroom-like growth of the dwellings from small clan houses into veritable cities containing sometimes more than 200 rooms. The greatest of these, like Pueblo Bonito, are in the open, but in the San Juan and Mesa Verde areas they are largely in caves. The requirement of an immense space sheltered by an overhanging wall is satisfied by the peculiar weathering properties of the Navajo and Mesa Verde sandstone. In the former a cave is usually shaped like the cut a lumberman makes in felling a tree; the ceiling slopes steeply downward towards the rear, and the floor slopes, less abruptly, from the rear outward, dropping off as a steep ledge at about the point where the overhanging cliff edge ceases to shelter it. This awkwardly tilted floor carries a deposit of several feet of talus or croded fragments from the ceiling above, making construction easier than it would be on bare rock. The steep wall behind usually furnishes support for the innermost chambers and forms their inner sides. The dimensions of such a cave may be enormous, sometimes 600 feet wide, 300 or 400 high, and 100 or more in depth. The caves of Mesa Verde, on the other hand, tend to have much lower roofs and to penetrate inward more deeply, coming to a low acute angle between floor and roof at the rear. Their floors as well as ceilings are more nearly horizontal than those of the Navajo region. We find, therefore, that the rear rooms of the pueblos seldom stand against any part of the cliff, and that in the space left behind rubbish usually accumulated.

Built at the same period as these great cliff palaces were a number of pueblos in the open, such as Wupatki, near Flagstaff, Arizona, and Lowrey ruin, near Ackmen, Montezuma County, Colorado. Both of these are enlargements of Developmental Pueblo houses, and were nearly or quite deserted in the early part of the thirteenth century (Hargrave, 1933; Martin, 1936). There were also, during the Great Pueblo age, smaller cliff dwellings of a few rooms, probably limited by the size of their caves.

The two largest cliff dwellings in the Kayenta region are Betatakin and Kit Sil. The first of these had originally about 135 rooms and the latter more than 150, thus being the second largest cliff dwelling in the southwest. Cliff Palace, at Mesa Verde, is the largest, having over 200. The rooms are built

wherever the slope permits, from the inner wall down to the rim of the ledge, where the overhanging cliff no longer provides shelter. The walls are supported on the slope by corner-posts set in drilled holes. In both of these ruins, which are the ones most likely to be seen by visitors to the Navajo National Monument, the rooms look like a quantity of rectangular blocks scattered over the floor of the cave and sometimes piled on top of each other but with no regular order and no common level. The approach is either up a steeply sloping ledge in which holes may be carved for steps or up a ladder made by cutting notches in a pole. The living-rooms are regular rectangular chambers, not quite high enough for an average person to stand up straight inside. One enters through a hole in the roof or else through a small door in one side, having to stoop to get in. Sometimes there are benches inside and nearly always the walls are blackened by soot. There are often small windows in the walls facing out from the ruin, and the number and size of these in certain rooms suggest portholes through which the occupants could watch approaching enemies and shoot arrows as if from a fort. There are some large rooms with fireplaces in the center, which may have been for family gatherings, and still other rooms contain bins with metates for grinding corn. Besides these we find a certain type of ceremonial room called a kihu. It is similar to a kiva but less elaborate, being rectangular and built on the surface instead of subterranean. (Fewkes) There is a door on one side and a deflector which stands between it and the fire-pit. A smoke hole is present in the roof. Finally, each great cliff dwelling contains a few kivas. These are as in the previous periods partly subterranean, circular (except in Betatakin) and contain long built-in benches on one side.

In going from one end of the ruin to the other one travels, at Betatakin, in a broad semicircle, walking generally on the roofs of the rooms, but also in some places on bare rock or on built-up benches corresponding to streets. There are a few ladders left standing where one might climb from one roof to a higher or lower one, and a few others protrude from the roof holes. A long pole stands against the rear wall of the cave and leads to a balcony some twenty-five feet above the rest of the ruin. There are no notches in this pole, from which we must imagine considerable agility on the part of the cliff dwellers. This balcony contains remnants of a few walls. Many of the rooms in Betatakin have either crumbled away or slipped down the steep ledge, leaving gaps in which one can only guess how many existed formerly.

About the construction of walls, floors and roofs little has been published. The floors were either of packed earth made hard by trampling or they were sometimes laid as wet mud and allowed to dry into hard adobe. Most of the walls were of masonry. That is, the builders selected flat stones, sometimes straightening

them along one edge, and laid them in courses, filling in between them and on top of each layer with mud. Sometimes the room would be divided by a less permanent kind of wall called wattle and daub. This was a series of reeds or sticks set up on end and interlaced with others like a mat and then plastered outside with mud. The roofs were supported by beams set into the walls and overlain with several criss-cross layers of smaller sticks, finally coming down to matting and on top of that a layer of mud.

In personal appearance the Pueblo Indians of prehistoric times probably were similar to the Hopis of today, short figures, with the hair cut off above the ears and long in back. The women, as shown in some of the pictographs of the Great Pueblo period, as well as in the burials, did not cut their hair but wore a roll on each side, tied with string.

Most distinctive of the kinds of clothing in this period were the fine cotton robes, of loom weave, either plain or elaborately decorated. In some of their cotton cloth they used a coiled netted weave. Feather string blankets, probably depending upon the supply of domestic turkeys, persisted through the Great Pueblo age, as did the dressed skins of animals.

By way of ornaments these people wore many kinds of pendants of turquoise and other stones, of shell for the ears, and an abundance of beads. Because of their shape the Olivella shells, brought by trade from the Pacific as in the Basket Maker period, made convenient beads. Minute stones and bits of turquoise were drilled, strung together, and smoothed by rolling.

There were two kinds of sandals, one with a notched toe, woven of either fine string or yucca leaf, the other with a square toe, woven in the twilled style, of yucca leaf.

The cradles in the Great Pueblo period had a rigid frame, a twilled yucca leaf back, and a hood of bark (Guernsey, 1931). There is reason to believe that the round headedness of the Pueblo race contributed to the deformity of the back of the skulls, because, as Von Bonin (1936) suggests, such a head would be likely to lie with its weight against the back of the cradle instead of turning on one side for comfort. It may not be necessary to suppose a firm binding of the baby's head to make it flat behind, although this may have been practiced. The flattening of Pueblo skulls is often one-sided.

To conclude with the personal discussion of the Great Pueblo phase, burials were of diverse types, seeming to mingle the methods of previous periods and to add still more. Sometimes the dead were buried in the talus of caves, or sometimes in the open, and

occasionally they were placed in walled-up tombs. Cometeries became frequent in this period. The bodies were either flexed or extended, and were often accompanied by quantities of pottery, baskets, ornaments, weapons and other property. (Guornsey, 1931)

Our knowledge of the household or community life comes from various sources besides the construction of the ruins themselves. There are, for instance, numerous indications of the kinds of food, and many crafts directly concerned with food. The staple was corn, and from the poor variety grown in the Basket Maker times it had been developed into a large-kernelled strain, white, red or blue. Potatoes and manes, more elaborate than before, ground this into flour, some yellow, some white.

The women must have worked together, for the potatoes frequently stood in bins arranged in rows, and varied in coarsoness so that the meal could be ground successively finer. Usually these rows were placed close to the wall, where the workers might brace their feet or lean back to rest (Bartlett, 1935).

Besides corn there were squashes, beans and pinyon nuts, as before. Domestic turkeys, to judge by the accumulation of droppings and of bones and feathers, were abundant and useful in many ways. The feathers were woven into feather cloth, or used in ornaments or to tip the arrows. Presumably the people ate the meat and, perhaps, the eggs.

A variety of wild animals supplied the larder of the Great Pueblos. Kidder and Guornsey (1919) give the following list of species determined from bones excavated from the cliff houses:

1. Long-tailed red fox (Vulpes macroura Baird) This fox is now mainly limited to the wilder parts around Navajo Mountain, but occurs sparingly over the mesas.
2. Desert coyote (Canis ostor Morriam) This animal is probably as abundant as over in the Navajo Region.
3. Wolf? (Canis species) There are no wolves in the Navajo region now, although a few probably survive in Colorado and Utah.
4. Woodchuck (Marmota species) There is no record of Marmots nearer than the mountains of Colorado and Utah today.
5. Pocket gopher (Thomomys bottae alexandrae Goldman) The present distribution of pocket gophers in the Navajo country includes only the western part of the reservation, between the Colorado and San Juan Rivers, and Navajo and Paiute Creeks,

6. Arizona bushy-tailed woodrat (Neotoma cinerea arizonae (Merriam)) Woodrats of at least five different species or subspecies are present today in the Navajo country, and it is not likely that the Pueblo Indians preferred one more than another.
7. Texas jackrabbit (Lepus californicus texianus (Waterhouse)) Jackrabbits are not especially abundant in this area today, and they must have been rather difficult for the Pueblo Indians to catch unless by snaring or by driving them into a corral. The Paiutes of northwestern Arizona do this today. Nets made of Yucca string have been found among the Pueblo artifacts, and the size and coarseness of these nets indicates that they were for snaring small animals.
8. Colorado cottontail (Sylvilagus auduboni warroni Nelson) The two species of cottontails which occur in the Navajo country now seem to be limited to the thicker vegetation at the heads of canyons and on Navajo Mountain, where they are not too common.
9. Rocky Mountain mule deer (Odocoileus hemionus hemionus Rafinesque) Today there are few deer in the Navajo reservation. Indeed they were largely exterminated from northern Arizona and Utah, but have been introduced again to the Kaibab Plateau, north of the Grand Canyon, where they are too abundant. Some occur in the San Juan and Colorado canyons.
10. American pronghorn (Antilocapra americana americana (Ord)) This so-called antelope formerly ranged in vast numbers from southern Canada through the arid West to northern Mexico. Its bones are scarce in the caves, probably because it prefers more open and level country than the Navajo region affords. Although the only ones which a visitor is likely to see at present are those introduced at Indian Gardens in the Grand Canyon or those in the vicinity of Flagstaff (both east and west of it), there are two other bands known in northern Arizona, both almost inaccessible. One is in Tuweap Valley in Grand Canyon National Monument, on the north side of the canyon. The other is a herd of 100 or more in the little-known wilderness of the Kaibito Plateau, east of Lee's Ferry, and north-west of Tuba (B. W. Wetherill).

11. Rocky Mountain bighorn sheep (Ovis canadensis canadensis Shaw) Mountain sheep bones are very common in the caves, and drawings of them occur in great numbers on cave walls, so that this interesting animal must have made a great impression on the prehistoric people. Probably the mesas and canyons were at first an ideal habitat for the bighorn, but gradually their numbers decreased and the surviving few retreated to the wildest and most inaccessible canyons. There are two or three records of bighorn in the Navajo region since white men entered it, the most recent being a suggestion that a few survive between Navajo Mountain and the Colorado River (Benson, 1935). The Rainbow Bridge-Monument Valley boat expedition of 1933 reported seeing tracks of at least six below Cummings Mesa in two places, near the river. In the higher parts of southwestern Utah and in the mountains of Colorado they still exist in small numbers.

For weapons the Great Pueblo Indians used bows and arrows, and they developed a kind of throwing club. Probably this weapon was useful in knocking over small animals like rabbits or else in fighting. They also had the nets of Yucca string which were mentioned above and which sometimes reached a length of over 100 feet. They were probably set up on sticks to make a corral or trap into which rabbits were driven. The meshes and knots used are almost identical with those of the Italian fishermen on the Pacific Coast, but there are no fish in the Navajo country except a few in the San Juan and Colorado Rivers, and there is no evidence that the prehistoric Indians ever caught them.

Pictographs

The artistry of the Pueblo period took a number of different forms. One of the most striking of these is the pictograph, already discussed in connection with the Basket Maker Period. Among the earliest pictographs or drawings on rocks most or all seem to have been painted, but in the Pueblo times many of them were pecked into the rock by using sharp stones. Of all the figures on the walls of caves the mountain sheep are probably the commonest. The amount of detail in such drawings depends largely on the size. Many of the mountain sheep figures have the divided hoof clearly shown; but always the drawing is stiff and conventionalized. In general a mountain sheep pictograph is recognized by a deep boat-shaped body, the two curving horns, and four straight legs each ending in a divided hoof. Often the hoof mark is repeated in a series behind the animal to show its footprints.

The human or human-like drawings are next in abundance, sometimes humpbacked, sometimes tailed, and sometimes in odd positions such as lying on the back with feet in the air. Drawings of the "Flute Player" are as common and characteristic of Pueblo art as the Madonna in European painting. This is a human figure shown holding a stick with one end in its mouth and the fingers placed along it as if on the holes of a flute. Actual flutes of reed have been found in some Pueblo ruins. An interesting feature of the flute player is that his flute is always tipped up, and that he is usually, but not always, lying on his back. The Hopi Indians, at least up to a few years ago, had a rain-making ceremony in which the priests played on flutes. Part of the ceremony consisted of standing in a pool of water and then lying down until completely submerged, in which position the priest would probably breathe for a short time through the flute which he held in his mouth. This might be a survival of some old ceremony of the prehistoric Pueblo Indians which is partly depicted in the "Flute Player" pictograph. The same figure occurs sometimes on pottery.

Occasionally there is a recognizable bird, but the species one can only guess. Snakes, being strange in shape and easily represented, are numerous, usually a zigzag or wavy line with a head on one end. In addition to these natural objects there are some geometrical figures which may have represented religious or ceremonial subjects but which are quite beyond interpretation. One of these is the figure which the Navajos call the "Bat Woman," and this may be the name used by the Pueblos. It is a large vase-shaped or gourd-shaped design with a circular body and a narrow vertical neck, painted in white on the wall above Bat Woman Pueblo in a branch of the Dogoszhi Biko.

It cannot be said that the pictographs of any southwestern Indians approach the artistic skill and sense of reality seen in the prehistoric paintings of the Altamira Caves in southern France, which may be fifteen or twenty thousand years old. The drawings are crude and appear childish to us. Rarely is there any grouping of figures and never any perspective or depth indicated. Nevertheless, this may be excused in part by the limitations of the methods known to the artists, for neither pecking nor white-washing encourages skill or cleverness. The Navajos even today contribute a little to the rock drawings, but they have learned nothing from their predecessors, and make no attempt to develop the art. Their drawings are usually of charcoal or simply scraped on the flat surface. They show such objects as men on horseback, wagons, a few other products of contact with white men, and one or two wild animals like the deer. Their human figures faintly suggest the Egyptian, being of a simple hour-glass shape, the body in front view and the feet turned sideways. They are not as conventional as the Pueblo drawings, and they are usually less carefully done.

Baskets

The baskets of the Great Pueblo Period are largely of the twilled ring type, carried over from the developmental Pueblos. Occasionally a coiled rod and bundle basket is found with a fine, close weave, but not decorated.

Pottery

Many types of pots were made in the Great Pueblo period, but in the different culture areas through the southwest the styles differed extensively. We shall only describe here the principal kinds found in the Hopi area, that is, from the San Juan to the Flagstaff district. There has been a tendency among some recent authors to multiply the number of types and subtypes of different wares and to give each variation a name comparable to that of a species or subspecies in biology. Aside from the difficulty of being sure of the characteristics of each type with our present knowledge, there are certain practical difficulties involved in comparing pottery to species of animals and plants. One is that a true species is usually set off from all others by the barrier of mutual sterility, so that in going from the area occupied by one species to that of another there will be certain distinct changes between the two. In pottery, on the other hand, there is nothing to keep one type from varying either gradually or suddenly at any time, and changing, at the whim of its manufacturers, between one region and another only a few miles away. Therefore it seems wise to pay attention to only a few of the largest divisions and, for the rest, to await the final verdict of archeologists, even if we have to wait several years.

In general the Plain Gray, the Black-on-Red, and the Black-on-White Wares of the Great Pueblo Period followed directly from those of the Developmental period. In addition, there were Polychrome types in which the general style of Black-on-Red Ware continued, but with the addition of orange, yellow, or white in the pattern.

Plain Gray Ware prevailed from the Modified Basket Maker Period. The pots of this style were plain globular jars, or wide-mouthed pitchers with a single handle, and not decorated. The Tusayan and Moonkopi Corrugated Ware occurred from the early part of the Developmental Period through the early Great Pueblo. Several styles of Black-on-White characterized this period, especially the Flagstaff, Tusayan and Kayenta types. Of these, the Tusayan lasted into the Regressive Pueblo stage and also gave rise to the Kayenta Black-on-White by the addition of other designs in the Great Pueblo Period.

Farther north the Tusayan Black-on-Rod and Tusayan Polychrome preceded the highly colored styles of later years. For instance, the Kayenta Polychrome occurs in the last years of the Great Pueblos, and the Jeddito Black-on-Orange in the Hopi country. All these styles and wares are illustrated on the folded chart.

End of the Great Pueblo Culture

At about the year 1275 A.D. the Great Pueblo communities in this district were at their peak of bustling activity, with a larger population, at least locally, than ever before or since, a wider range, and a greater variety of productions. The seeds of disaster had already been sown, however, for nomads from the north had swept down nearly to the Colorado river and wiped out the provincial Pueblo culture of Utah and northwestern Arizona. The dense sedentary population of the canyons in the Navajo region, while outwardly busy and prosperous, probably suffered from diseases resulting from inadequate sanitation, as we find in the recent Hopi and Zuni pueblos. They had built up a great complex machinery of cooperation and division of labor, and in so doing deprived themselves of the nomad's versatility and his power to adjust to sudden change.

Therefore when 1276 brought an ominous dry season, and when this exceptional drought kept on for year after year while the people prayed for rain and their crops withered and died, they were finally obliged to give up everything they had gained. Probably relentless famine and disease killed a great part of them before they realized they must migrate to a place where life was possible. For twenty-three years, as the tree rings show, the great drought kept on, and during that time the population of the Hopi pueblos seems to have increased notably, while that of the San Juan area was completely eliminated. Evidently the refugees found shelter in outlying places, and they never returned to the cliff dwellings they had abandoned.

Why not, after suitable conditions once more developed there? Twenty-three years is long enough to produce a new mature generation and to remove by age or accident a large proportion of those who were mature before. Therefore many, possibly the majority, knew no other life but one of famine and distress, and it is not likely that they realized the temporary nature of the drought in the region where their elders had lived. The strength of their superstition may have peopled the deserted area with ghosts or angry spirits, and by the time the drought had been forgotten habit had taken hold of their lives in the new pueblos, so that there would be no pretext for a return migration. Thus

the Great Pueblo era came to a violent end, and further history shows a gradual regression from the climax, until in recent times the pueblos are few and their inhabitants quite unambitious.

Conclusion

Names of Periods

The history of archeology in the Navajo region is briefly sketched in the historical section of this Handbook, but for the names applied to prehistoric people here we need not look farther back than 1888 or 1889 when the Pueblo ruins in the cliffs of Mesa Verde were discovered by Richard Wetherill and Charlie Mason. The name of Cliff Dwellers soon became popular. A few years later excavators found still older cultural evidence buried beneath these ruins, and since the prevailing artifacts were baskets, the convenient name of Basket Maker came into use.

For some years the exact relation of these cultures to one another was not clear, and we find discussions of a slab-house period, of prepuablo remains, and other apparently intermediate phases, while the study of pottery provided the only good clue to their relative ages.

The Pecos Archeological Conference in 1927 finally adopted a simple classification which was based on the racial distinction then recognized between the makers of baskets and builders of cliff houses. Basket Maker I was the hypothetical pre-agricultural stage which must have existed to account for the first culture actually found, the latter being Basket Maker II. The coming of fired pottery distinguishes the third and last Basket Maker period.

Pueblo I leads up to masonry houses, Pueblo II is the period of clan houses, usually in the open but sometimes in caves, and Pueblo III is the phase of great communities.

Roberts (1935) removed the tendency to artificiality, which became more and more evident in the Pecos classification, by suggesting the period names given on the right side of the following table, and these we have adopted.

Nomenclature of Periods

<u>OLD (Pecos, 1927)</u>	A. D.	<u>NEW (Roberts, 1935)</u>
Basket Maker II-----	Up to 500	Basket Maker
Basket Maker III-----	500	-----Modified Basket Maker
	600	
Pueblo I -----	700	----- Developmental Pueblo
	800	
Pueblo II -----	900	
	1000	
Pueblo III -----	1100	----- Great Pueblo
	1200	
Pueblo IV -----	1300	----- Regressive Pueblo
	1400	
	1500	
Pueblo V -----	1600 to Present	----- Historic Pueblo

Chronological Chart

The accompanying chart, "Chronology of the Western Maize Area", shows how, in each of four large regions, cultures succeeded one another, and developed in a somewhat parallel manner. The areas were not wholly independent, however, and the arrows and curved lines show the spread of each phase from the region where it began outward into other parts in later centuries. This chart is modified from "Ancient Civilizations of Mexico and Central America," by H. J. Spinde, 1928. (American Museum of Natural History, New York)

Past Conditions of Life

Looking back far beyond the Basket Makers to the undated period of Folsom Man, we find an abundance of large mammals which are now absent altogether. These earliest men of the southwest lived in a wealth of animal life equal to that of Africa today. They hunted camels, wild horses, two or three species of bison, bears and wolves, giant ground sloths and mastodons. This rich fauna dwindled away and largely vanished sometime before the coming of the Basket Makers.

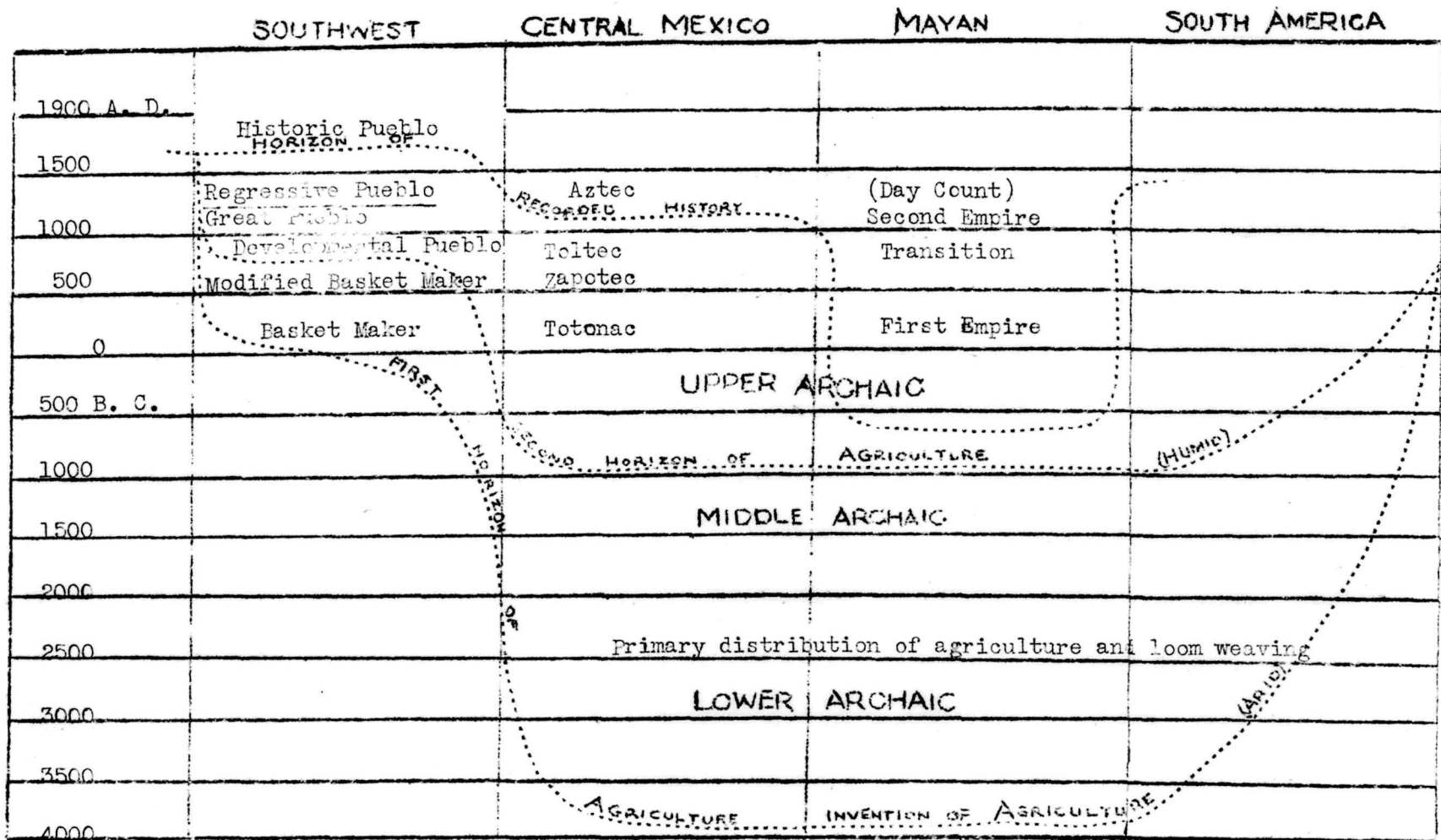
We have seen that in Basket Maker and Pueblo times, however, a few kinds of animals still roamed the mesas and canyons, which are no longer to be found there; notable among these were deer, antelope, mountain sheep and wild and domestic turkeys. The plant life was different from that of today in certain details, and the water supply and fertility of the land were better.

We may now see some of the changes which have affected the Navajo country since prehistoric times. First the coming of the Navajos and the white men influenced some of the natural resources of the country. For instance the uncontrolled pasturing of sheep by the Indians, who drive their flocks here and there as grazing is needed, reduces the amount of forage vegetation, and causes extensive replacement of the original plant life by other species which resist pasturing. Possibly there has been destruction of timber, for the Navajos continually cut down pine and other trees to build their hogans. All the existing sources of water have been used, or at least discovered. The standing pools are usually polluted and the running springs are often dug out or made into tanks for animals or for irrigation. Aside from these things, however, human occupation probably has made little difference since the Great Pueblo period.

There are at least two ways of judging the rate and amount of weathering which has taken place since the cliff dwellings were abandoned. One of these is by the falling of rocks and accumulation

CHRONOLOGY OF WESTERN MAIZE AREA

FROM THE SOUTHWEST TO SOUTH AMERICA



of cave debris or the slipping of ledges in the caves, which has not been serious enough to cause any great damage since the thirteenth or fourteenth century. Another indication is the amount of sand deposition in the open. Usually a pueblo built in the open acts as an obstacle to the wind, from whatever direction it may blow, and sand and dust tend to accumulate on all sides. Gradually a mound piles up, partly or completely covering the site in the course of a few hundred years.

A third indication of changing conditions in the Tsegi area is the disappearance of a series of lakes in Tsegi canyon and some of its branches some fifty or sixty years ago. These seem to have been washed out by destruction of the alluvial dams which held them, and since that time the desert has crept in more and more through the bottoms which they occupied.

Main Lines of Cultural Evolution

Turning to the cultural evolution of prehistoric man, we may connect the fragments already presented into a few main lines of progress.

This cultural change depends less on racial change than one might expect in view of the sudden replacement of the Basket Makers by the Pueblos. Only a few distinct contributions were made at that point and these are no more important than those made at various other times.

a. Dwellings

The first Basket Makers probably had no permanent houses of any kind, but lived in the open, sleeping under trees, during the summer, and retired to caves in the winter, where they huddled around carefully-tended fires. They scooped out holes in the ground and lined them with slabs of rock or with upright sticks and roofed them over with brush. Some of these holes served for granaries. Others, packed with grass or juniper bark, were beds.

From these most crude beginnings the Modified Basket Makers, profiting by experience, constructed larger houses, of which the floor and part of the walls were below ground, and a fire burned in the center, easily warming the whole interior. These pit-houses had diverged in structure from the cists, which now served simply for storage and for burying the dead.

The pit-house dwellings, as we have seen, were adopted by the Developmental Pueblos, and lasted through most of the Developmental period in some areas. In the central area, however, the above-ground, masonry-built house soon appeared. Cists were forgotten, the pit-house survived in modified form as the kiva, and living quarters now lasted for several generations with the help of minor repairs.

The next step was an aggregation of dwellings, first as a few rooms occupied by a clan, and finally, developing around such a nucleus, a walled city of carefully laid stone and mortar. Often rooms stood on top of one another for two or three floors, and some differentiation appeared, even beyond that of the kiva. Some of the latter attained a magnificent size, the so-called Great Kiva of Lowrey ruin (which may have been for dancing) being an elaborate circular room nearly fifty feet in diameter.

The principal factors responsible for this evolution of dwellings were probably those of an increasing dependence on agriculture, which made it necessary to stay at home and attend to the crops, an increase in population resulting from this improvement in the food supply, and an increased division of labor, so that some of the people spent all their time in cultivating and harvesting, others were expert artisans, and still others were, of necessity, carpenters and masons. Doubtless this tendency only made a beginning, however, even in Great Pueblo times, and the entire able-bodied population probably turned out at certain times for harvesting or for defense.

b. Food

The first and most fundamental division of labor was that between men and women. The latter bore children, made the clothing and prepared the food, each of which tasks became more and more complicated during the passing years. That of food-preparation, in particular, involved labor of many kinds, from planting grain to shaping and decorating the pottery which was to hold the flour.

At the very beginning of the Basket Maker culture nature must have supplied all the food in a wild state. From some unknown source, probably Mexico, maize came to the Basket Makers, and with the little technical skill which its cultivation required they were able to secure a more plentiful supply of food with less trouble than before. Somewhere, likewise, they obtained squashes, and these two crops started them on the way to more comfortable circumstances and a larger population. The principal handicrafts developing from the cultivation of corn were manufacture of baskets to hold the grain, use of grinding stones to make it into flour, and the construction of cists to store it for future need. One

invention helps another, and sometimes makes it necessary. The use of grinding stones to make flour necessitated an active development of vessels to hold it and the invention of some convenience to overcome the disadvantage of baskets in cooking. At first this convenience was: clay plastered on the inside of baskets to make waterproof basins. These basins became hard enough to take out and use by themselves and it was no great jump from that to the baking which hardened them permanently. From this time on it was possible to boil water and cook food easily over a fire.

The principal changes concerned with food during the later periods were the coming of beans and new varieties of corn and the domestication of turkeys. The Indians still depended very largely on wild animals, on pinyon nuts and wild seeds of various plants. Probably the men alone were hunters, using at first the spear and from the end of the Basket Maker period the bow and arrow. The later Pueblo Indians developed snares and nets of Yucca string.

c. Cloth and Textiles

The clothing of the Basket Makers was simple and crude, consisting of dressed skin robes or fur string blankets, which were probably worn only in cold weather. They wore sandals which are recognized by a fine cord weave and the fringes on the toe. As with most savages the ornaments meant more than the protection of clothing, for they wore a variety of beads, pendants and other kinds of decorations.

The Pueblo Indians improved on this elementary stage by cultivating and weaving cotton which they made into blankets. With the domestication of turkeys they also learned to make feather blankets. The sandals were woven of string or Yucca leaf and had notched or square toes. The principal improvements in the clothing and blankets since the Developmental Pueblo period have been in the fineness of weaving and beauty of decoration.

d. Social Changes

Of the social evolution of the Basket Makers and prehistoric Pueblos we can say little beyond the obvious indications given by houses and by the arts and crafts already described. The Basket Makers were largely nomads, with a small population, and probably had no permanent group larger than a family. The development of pithouses during the late Modified Basket Maker period made it convenient to live in villages near the fields where they cultivated their crops, and probably this closer contact brought about some division into higher and lower classes. How long the medicine man has existed we do not know, but by the end of the Modified Basket Maker period he had become so important that a special ceremonial chamber was built in every village, over

which he probably presided. The kiva served the purpose of a parish church from that time on, and the medicine man, usually one of the elders and always one of the quickwitted, was both priest and doctor for the community. No doubt during the later communal Pueblo period the medicine man was more than an individual; he was a profession, and to judge by the number of kivas in a large cliff dwelling there must have been several in each Pueblo. The power of the medicine man was held partly by wit and partly by the development of an impressive ritual, while the power of a chief was held through respect either for age or for prowess.

BIBLIOGRAPHY

Bartlett, Katharine

- 1930 Stone artifacts; San Francisco Mountain region. Museum notes, Mus. of No. Arizona, vol. 3, no. 6, (Dec.) 4pp.

A brief description of some types of stone implements found in the southwest.

- 1933 Pueblo milling stones of the Flagstaff region and their relation to others in the southwest; a study in progressive efficiency. Northern Arizona Soc. of Science & Art; Mus. of No. Arizona, bull no.3, 29pp., illus., bibl.

A detailed report and description of metates and manos of the southwest, particularly those found in situ.

Bonin, G. Von

- 1936 (See Martin, 1936)

Colton, Harold S.

- 1932 A survey of prehistoric sites in the region of Flagstaff, Arizona, Bur. Amer. Ethn., bull. no.104, 45pp., illus., maps, bibl., index.

"The present report deals with an archeological survey of a small portion of northern Arizona lying between the San Francisco Peaks and the Little Colorado River." (Introd.) A summary of studies extending through ten summers.

- 1933 Pueblo II in the San Francisco Mountains, Arizona. Northern Arizona Soc. of Science & Art; Mus. of No. Arizona, bull. no.4, 13pp., illus., bibl.

An explanation of the Pueblo II period in the prehistory of the southwest. Based on museum expedition research.

- 1935 Stages in northern Arizona prehistory. Museum Notes, Mus. of No. Arizona, vol.8, no.1 (July), 7pp., bibl.

A brief explanation of methods used to determine relative ages of prehistoric ruins and a table of prehistoric culture stages.

Colton, Harold S. and Baxter, Frank C.

- 1932 Days in the Painted Desert and the San Francisco Mountains; a guide. 2nd ed. Northern Arizona Soc. of Science & Art; Mus. of No. Arizona, bull. no.2, 100pp., appendix, bibl., index.

A popular introduction to the Painted Desert region. No particular emphasis on archeology.

Clark, Eleanor P.

- 1935 Designs on prehistoric pottery of Arizona. Univ. of Arizona, Social Science Bull. no. 9 (May), 66pp., illus., maps, bibl.

"This paper is an attempt to understand the development of pottery among the ancient Arizonians; to trace, if possible, to their beginnings the various patterns on bowls and ollas; to analyze the different elements of which these designs are composed; and to seek in their similarities and their differences indications of migrations and cultural contacts." (Preface) Numerous plates and sketches throughout the text.

Douglass, Andrew E.

- 1929 The secret of the southwest solved by talkative tree rings. Nat. Geog. Magazine, vol. 56, no. 6 (Dec.), pp. 737-770, illus., map.

An account of researches in Pueblo Bonito; the object being the definite determining of important dates in the history of the region. Profusely illustrated and interestingly written.

Fewkes, Jesse Walter

- 1904 Two summers' work in Pueblo ruins. Bur. Amer. Ethn., 22nd Ann. Report, pp. 3-195, illus., map.

A detailed record of notes and other data bearing on the collections and explorations made by the author over a period of three years.

- 1911 Preliminary report on a visit to the Navajo National Monument, Arizona. Bur. Amer. Ethn., bull. no. 50, 35pp., illus.

This report is based on an archeological reconnaissance of the northern part of Arizona and particularly the Navajo Monument. Not especially detailed; it does, however, contain the author's conclusions and recommendations.

Gladwin, Winifred and Gladwin, Harold S.

- 1933 Some southwestern pottery types, series III. Globe, Arizona, Privately printed, Medallion Papers, no. 10 (Dec.).

An illustration of types of pottery investigated by Gila Pueblo over a period of years.

Guernsey, Samuel James

- 1931 Explorations in northeastern Arizona; report on the archeological fieldwork of 1920-23. Papers, Peabody Museum of Amer. Arch. and Ethn., vol. 12, no. 1, 120pp., illus., map, bibl.

"The present report concerns itself largely with this culture (i.e., Basket Maker III); but as fieldwork was devoted primarily to the search for the excavation of stratified sites... a number of caves and ruins occupied by other peoples were examined and data recovered." (Introd.)

Guernsey, Samuel J. and Kidder, Alfred Vincent

- 1919 Archeological explorations in northeastern Arizona. Bur. Amer. Ethn., bull. no. 65, 212pp., illus., bibl., appendix, index.

"The present report records the investigations in the Kayenta district of northeastern Arizona, carried on in the summers of 1914-15 by the Peabody Museum..." (Introd.) Different sections deal with the sites explored, a consideration of specimens recovered, and a discussion of the archeological problems encountered.

- 1921 Basket Maker caves of northeastern Arizona; report on exploration of 1916-17. Papers, Peabody Museum of Amer. Arch. and Ethn., vol. 8, no. 2, 117pp., illus., bibl.

A detailed report on the archeological work done by the Peabody Museum in the Kayenta region.

Hargrave, Lyndon L.

- 1930 Prehistoric earth lodges of the San Francisco Mountains. Museum Notes, Mus. of No. Arizona, vol. 3, no. 5 (Nov.).

A brief account of circular depressions investigated by the Museum of Northern Arizona.

- 1932 Guide to forty pottery types from the Hopi Country and the San Francisco Mountains, Arizona. Northern Arizona Soc. of Science & Art; Mus. of No. Arizona, bull. no. 1, 32pp., illus., map, bibl.

A classification of pottery types following rules adopted by the Museum of No. Arizona. Descriptive and explanatory.

- 1933 The Museum of Northern Arizona Archeological Expedition, 1933; Wupatki National Monument. Museum Notes, Mus. of No. Arizona, vol. 6, no. 5 (Nov.), pp. 23-26, illus., bibl.

A brief account of the work of the expedition centering around this important pueblo.

- 1933 Pueblo II houses of the San Francisco Mountains, Arizona. Northern Arizona Soc. of Science & Art; Mus. of No. Arizona, bull. no. 4, pp. 15-73, illus., map, bibl.

A discussion of Pueblo II architecture in a restricted region. The author makes no comparisons or correlations with other regions.

- 1934 The Tsegi country. Museum Notes, Mus. of No. Arizona, vol. 6, no. 11 (May), pp. 51-54, illus., bibl.

A brief description of the region known as the Tsegi Canyons or Mesas.

- 1935 Archeological investigations in the Tsegi Canyons of northeastern Arizona in 1934. Museum Notes, Mus. of No. Arizona, vol. 7, no. 7 (Jan.), pp. 25-27, bibl.

A summary of the work accomplished by the Rainbow Bridge-Monument Valley expedition.

- 1935 Report on archeological reconnaissance in the Rainbow Plateau area of northern Arizona and southern Utah; based upon fieldwork by the Rainbow Bridge-Monument Valley Expedition of 1933. Berkeley, Univ. of Calif. Press, 53pp., illus., map, bibl.

"Mr. Hargrave outlines the results of work in archeological reconnaissance and sets forth certain conclusions that contribute to the knowledge of the ancient cultures of the region." (Foreword by Ansel Franklin Hall). This is a more detailed bulletin following the General Report of the expedition.

- 1936 Pottery types of the Rainbow plateau area of northern Arizona and southern Utah; based upon fieldwork by the Rainbow Bridge-Monument Valley Expedition of 1933.

In press.

Harrington, H. R., Hayden, I., and Schellbach

- 1930 Archeological explorations in southern Nevada; report of first sessions expedition, 1929. Papers, Southwest Museum, no. 4, 125pp., illus., map.

This report consists of an introduction by Harrington (pp. 1-26), a report on Mesa House by Hayden (pp. 27-92), and a description of a burial in Mesa House ruin by Schellbach (pp. 93-125).

Harrington, H. R.

- 1927 A primitive pueblo city in Nevada. Amer. Anthropologist, vol. 29, no. 3 (July-Sept.), pp. 262-277, illus.

An account of the work done by the Museum of the Amer. Indian, Heye Foundation, in the ruins near St. Thomas, Nevada. The site is known popularly as "Lost City". The writer was in charge of this expedition.

Haury, Emil W.

- 1931 Kivas of the Tusayan Ruin, Grand Canyon, Arizona. Globe, Arizona, Privately printed, Medallion Papers, no. 9 (March), 26pp., illus.

A detailed description of two kivas recently unearthed in the Tusayan Ruin. "... a contribution towards our understanding of the development... of the Pueblo clan ceremonial chamber." (Text) Bibliographical footnotes, diagrams, etc.

- 1934 The Canyon Creek Ruin and the cliff dwellings of the Sierra Ancha. Globe, Arizona, Privately printed, Medallion Papers, no. 14, 155pp., illus., maps, bibl., index.

A report of exploration and excavation on a site located in a branch canyon of Canyon Creek on the Fort Apache Indian Reservation. It gives "first, a resume of the results of the original reconnaissance, and second, a report on the ruin excavated and the material which it produced." (Introd.) Well illustrated throughout.

Holmes, William H.

- 1886 Pottery of the ancient Pueblos. Bur. Amer. Ethn., 4th Ann. Report, pp. 265-360, illus.

A classification of Pueblo pottery based on study of collections available at the time.

Judd, Neil M.

- 1926 Archeological observations north of the Rio Colorado. Bur. Amer. Ethn., bull. no. 82, 153pp., illus., maps, bibl., appendix, index.

"The present paper records a succession of archeological observations in western Utah and northwestern Arizona... 1915-20." (Introd.) The report covers a large area; consequently detailed investigation was sometimes impossible.

- 1930 The excavation and repair of Betatakin. Smithsonian Institute, from the Proc. of the U. S. Nat'l Museum, no. 2828, vol. 77, art. 5, pp. 1-77, illus., maps.

An account of work done toward "preservation and repair of prehistoric pueblo ruins and cliff dwellings." (Text) The work was concentrated on Betatakin in the Kayenta district.

Kidder, Alfred Vincent

- 1924 An introduction to the study of southwestern archeology; with a preliminary account of the excavations at Pecos. New Haven, Yale Univ. Press (Published for the Dept. of Archeology, Phillips Academy), 135pp., illus., maps, bibl.

This paper, the first of a contemplated series, gives a brief description of Pecos and of its history and outlines the work accomplished in this region over a period of years. "The bulk of the work, however, is devoted to a general account of southwestern archeology." (Preface) Bibliographical footnotes and 15 pages of bibliography.

- 1927 Southwestern archeological conference. Science, vol. 66, no. 1716, (Nov. 13), pp. 489-491.

"The purposes of the meeting were: to bring about contacts between workers in the southwestern field; to discuss fundamental problems of southwestern history; to formulate plans...; to pool knowledge...; and to lay foundations for a unified system of nomenclature." (Text)

Martin, P. S., Roys, L., and Von Bonin, G.

- 1936 Lowry ruin in southwestern Colorado; with reports on masonry of Lowry ruin and of the southwest; and skeletal material from the Lowry area. Field Museum of Nat. Hist., Anthropological Series, vol. 23, no. 1, 209pp., illus., maps, bibl., index.

McGregor, J. C.

- 1932 Additional prehistoric dates from Arizona. Museum Notes, Mus. of No. Arizona, vol. 5, no. 3, pp. 13-16.

A brief preliminary note on material gathered by the Museum of Northern Arizona in the vicinity of Flagstagg and a chart of important dated sites.

- 1934 Dates from the Tsegi. Tree Ring Bull., vol. 1, no. 1 (July), pp. 6-8.

A classification of beams collected by the Rainbow Bridge-Monument Valley Expedition of 1933.

Mera, H. P.

- 1934 Observation on the archeology of Petrified Forest National Monument. Laboratory of Anthropology, Inc., Technical Series, bull. no. 7 (June).

Mindeleff, Victor

- 1892 A study of Pueblo architecture; Tusayan and Cibola. Bur. Amer. Ethn., 8th Ann. Report, pp. 3-288, illus., map.

"The more detailed studies of these ruins, to be published later, and the material embodied in the present paper, will, it is thought, furnish a record of the principal characteristics of an important type of primitive architecture..." (Introd.)

Morris, Earl H.

- 1927 The beginnings of pottery making in the San Juan Area; unfired prototypes and the wares of the earliest Ceramic period. Anthropological Papers of the Amer. Mus. of Nat. Hist., vol. 28, part II, pp. 125-198, illus., map.

"In the papers of which this is the first, the writer will endeavor to trace the origin and development of aboriginal ceramics in that portion of the San Juan drainage lying eastward of the Chin Lee Valley...." (Introd.) Several bibliographical footnotes and 43 illustrations.

Morss, Noel

- 1931 Notes on the archeology of the Kaibito and Rainbow Plateaus in Arizona; report on the explorations, 1927. Papers, Peabody Mus. of Amer. Arch. and Ethn., vol. 12, no. 2, 16 pp., illus., map, bibl.

The object of the explorations, upon which this paper is based, was to "get an idea of the culture sequence of the district as compared with that in the Kayenta country."
(Introd.)

Nordenskiöld, G. (Translated by D. Lloyd Morgan)

- 1893 The cliff dwellers of the Mesa Verde, southwestern Colorado; their pottery and implements. Stockholm, Norstedt, 174pp., illus., port., map, index.

"The present work is the result of researches (1891) in Mesa Verde. It contains a description of ruins, an account of excavations carried out, and of the objects discovered."
(Preface) An attempt at tracing the development of cliff dweller culture.

Roberts, Frank H. H., Jr.

- 1929 Shabit'eshchee village; a Late Basket Maker site in the Chaco Canyon, New Mexico. Bur. Amer. Ethn., bull. no. 92, 150pp., illus., map, bibl., index.

A paper showing the results of extensive investigation of the Chaco Canyon site which was discovered in 1926 and excavated in 1927. Illustrated with diagrams, sketches, and plates.

- 1931 The ruins at Kiatuthlanna, eastern Arizona. Bur. Amer. Ethn., bull. no. 100, 175pp., illus., maps, bibl., index

A detailed report of archeological investigation carried on in the summer of 1929, covering a study of 18 pit houses, the remains of 3 jacal structures, and a pueblo ruin with 49 rooms and 4 kivas.

- 1932 The village of the great kivas on the Zuni reservation, New Mexico. Bur. Amer. Ethn., bull. no. 111, 169pp., illus., maps, bibl., appendices, index.

A study of the structural remains of three communal dwellings and two great kivas, also pottery types of the period. Profusely illustrated with sketches, plates, and maps.

Roberts, Frank H. H., Jr. (Con't)

- 1935.1 A survey of southwestern archeology. American Anthropologist, vol. 37, no. 1 (Jan.-March), pp. 1-35, bibl.

This is a resume of the archeological work that has been carried on in respect to the southwest, including mention of early contributions and some recommendations for future work. A contribution of the Bur. Amer. Ethn., Washington, D. C.

- 1935.2 A Folsom complex. Preliminary report on investigations at the Lindenmeier site in northern Colorado. Smithsonian Misc. Coll., vol. 94(4), pp. 1-35, 3 figs., 16pls.

This is a report on one season's study of a newly discovered site containing Folsom artifacts and fossils of extinct animals. The report discusses Folsom man in general.

- 1936 Additional information on the Folsom complex. Report on the second season's investigations at the Lindenmeier site in northern Colorado. Smithsonian Misc. Coll., vol. 95(10), pp. 1-38, 5 text figs., 12 pls., 1 map.

A continuation of the preceding report.

Steward, Julian H.

- 1933 Archeological problems of the northern periphery of the southwest. Northern Arizona Soc. of Science & Art; Mus. of No. Arizona, bull. no. 5, 20pp., illus., map, bibl.

A discussion of the culture history of the northern periphery. The author's presentation reflects his own point of view.

Wetherill, Ben W.; Smith, W.; Hall, E. T.; Brainerd, G.; and Rinaldo, J.

- 1935 Rainbow Bridge-Monument Valley expedition; Preliminary bulletins--Archeological series. Berkeley, Calif. (Mimeographed), 28pp., bibl.

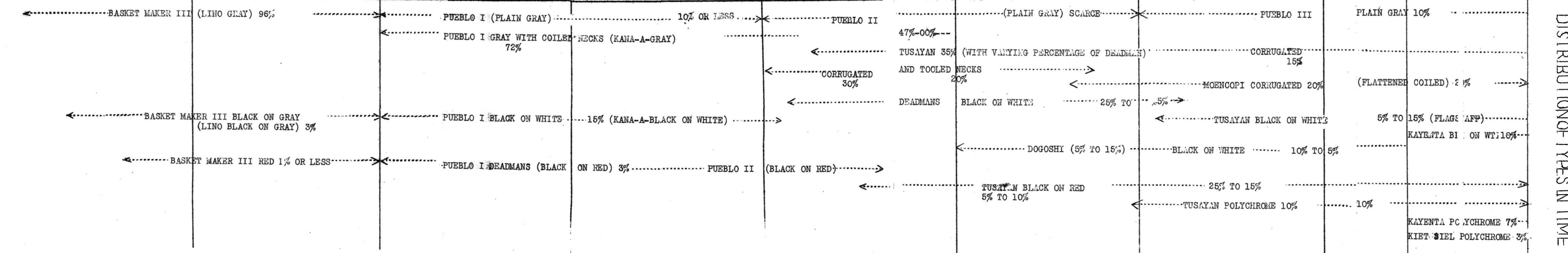
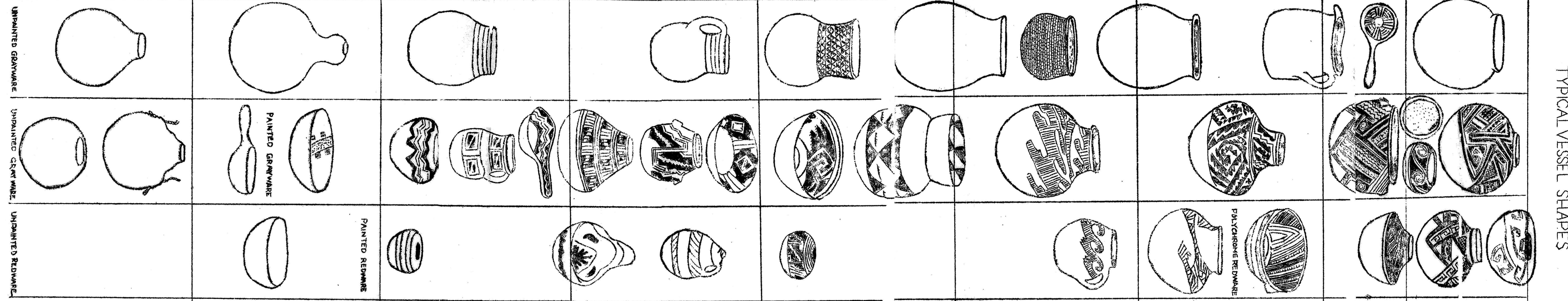
This series is made up of five reports: General Report of the Archeological Work (Ben Wetherill); Report of Some Sites Tested Near Marsh Pass (Smith); Report of Archeological Survey of Main Tsegi (Hall); Preliminary Report on Site RB-VM 568 (Brainerd); and An Archeological Reconnaissance of the San Juan and Colorado Rivers (Rinaldo).

MODIFIED BASKET MAKER

CHRONOLOGICAL SCALE READ ACROSS
DEVELOPMENTAL PUEBLO

GREAT PUEBLO

500 A.D. 600 A.D. 700 A.D. 800 A.D. 900 A.D. 1000 A.D. 1100 A.D. 1200 A.D. 1240 A.D. 1300 A.D.



TYPICAL VESSEL SHAPES

DISTRIBUTION OF TYPES IN TIME

PREHISTORIC POTTERY OF THE TUSAYAN-KAYENTA-RAINBOW PLATEAU AREA

