DEVELOPMENT OF DESIGN ON HOHOKAM RED-ON-BUFF POTTERY

by

Alfred Peterson

A Thesis

submitted to the faculty of the

Department of Archaeology

in partial fulfillment of

the requirements for the degree of

Master of Arts

in the Graduate College

University of Arizona

1937

Approved: Byron Cummings, May 24, 1937

Major Professor. Date.

ACKNOWLEDGMENT

I wish to acknowledge the helpful suggestions and kindly guidance of Dr. Byron Cummings in the preparation of this thesis. Also I wish to express my appreciation of the courtesy and privileges accorded me by the Gila Pueblo through the kindly offices of Dr. Emil W. Haury, which was of great material assistance. The helpful attitude of the teaching staff of the Department of Archaeology is gratefully remembered.

CONTENTS

DEVELOPMENT OF DESIGN ON RED-on-BUFF POTTERY

Introduction

When the first venturesome Europeans explored the Americas, they found primitive peoples who were mostly living in a state of culture known as the Late Stone or Neolithic Age, with just the beginnings of the use of metal in some few places. These people were sufficiently similar throughout the two continents to be considered as being of the same racial stock and were called Indians because Columbus thought he had found the East Indies. While the culture of these Indians was recognizable as being similar in many respects, closer acquaintance revealed that there were areas or regions distinguishable from each other because of certain differences in the material possession, the customs, and religious practices of the people. And, as is found in the study of any people, there were certain districts that were leaders in evolving new practices, industries, arts, etc., and from these districts cultural traits spread throughout the region occupied by their own people and often into neighboring regions through the medium of trading relations, friendly contacts, and even by war, thus producing a blending of cultural traits on the borderlines of adjoining areas. The centers of highest attainment in the Americas were two in number,-one in South America in the region around Peru where the Inca Empire had been founded on the remains of

earlier cultures, and the other occupying the region from the Valley of Mexico south and east through Central America where the Mayan, Toltec, and Aztec civilizations had their rise and fall. As a secondary center of culture, subsidiary to the Valley of Mexico, we have the region known as the Southwest in the United States, the home of a number of sedentary tribes grouped under the name of Pueblo Indians. A further division of this region sets aside what we might term sub-centers of cultural dissemination, and such is the area in southern Arizona with which this paper is concerned--the home of the Hohokam people and the Red-on-buff culture which flourished and faded long before the coming of the Spaniards in the first half of the sixteenth century.

The name Hohokam, "the ancient ones", is the term used by the Pima Indians, a tribe living in the center of this region, when referring to the former inhabitants of the ruined villages of the area, in answer to questions put to them by the first Spanish visitors. The term "Red-on-buff" culture, referring to the culture of the Hohokam people, which reveals distinct traits when compared to the Pueblos to the north and east, is born of the fact that the most distinctive and apparent trait of the Hohokam was the manufacture of a ceramic product with a buff-colored background over which is painted decorative designs in a characteristic red color.

The territory involved is principally that known archeologically as the Middle Gila Area, but with special stress laid on the extent of the distribution of Red-on-buff pottery, which means a region whose boundaries are not always the same as the tentative outlines of the Middle Gila. Earlier investigations in this area by the Hemenway Southwestern Archeological Expedition, Fewkes, Bandelier, Hodge, Mindeleff, and others furnished a background for the research work of Cummings for the University of Arizona, Gladwin for the Southwest Museum, Woodward for the Los Angeles Museum of History, Science and Art, and the investigations of the Gila Pueblo, Globe, Arizona. Through this work, some of it consisting of excavation and much of it being surveys of surface indications, it has been fairly well established that the distribution of the Red-on-buff culture has its center somewhere in the district surrounding the Casa Grande Ruins, or, more broadly, in the region extending from the confluences of the Gila River with its branches, the Salt River, and the Santa Cruz River, eastward and southeastward along these streams for some fifty to one hundred miles. The farther reaches of the distribution of Red-on-buff carries one to the west to the neighborhood of the Colorado River; to the north as far as Prescott, Montezuma Castle National Monument, and even some scattered evidence as far as Flagstaff; to the south as far as the Mexican Border; and to the east the Red-on-buff sites were located along the Gila as far as Safford which is some

distance beyond Bylas, the point set for the eastern limit of the Middle Gila Area, and up the San Pedro Valley to Benson in the southeast.[1] Every stream almost throughout its entire length in this area, reveals numerous sites formerly occupied by these people who followed an agricultural life, frequently augmented by hunting and gathering of wild plants.

The topographical features range from mountainous to mesa and desert conditions with the greater part of the occupied land consisting of the broad alluvial plains or basins through which these river-beds wend their way. The Gila River bisects this territory from east to west with the northern part being drained by the Salt River and its branches, such as the Verde River and other smaller streams which flow from north to south to empty into the Salt which, in turn, goes westward to join the Gila. The southern part is drained by the Gila River and its two main branches, the Santa Cruz River and the San Pedro, both of which flow generally from the southeast to the northwest, with mountain ranges separating them in this same direction. These streams have their origin in the high mountainous country to the north, east, and southeast of this area, and the altitude of the habitable land, not considering the higher peaks which run from 5,000 to 9,000 feet and more above sea-level, is generally from

---

1. Gladwin, 1935, p. 211.

3,500 to 4,000 feet in the eastern half of the region down to 200 to 300 feet above sea-level in the southwestern part where the Red-on-buff sites reach their westward limit not many miles from the mouth of the Gila. In the higher altitudes the terrain is well wooded with yellow pine, spruce, juniper, aspen, oak, and other trees and shrubs, and at the same time game is fairly plentiful, ranging in size from deer down to quail, thus making this district more conducive to a hunting, nomadic existence. However, the amount of precipitation would be sufficient for dry farming such as the ancients were capable of carrying on. The lower, and by far the greater part of the area, is arid, semi-desert country, consisting of broad basins or valleys rimmed with mountains on nearly every side, overgrown with cacti, mesquite trees, palo verdes, and other typical desert growth, with only a meagre supply of small game.

This, then, is not the desert of our school geographies, great stretches of waste and sand dunes, but rather a type of terrain that blossoms forth with myriads of colorful blossoms and shrub-like growths when provided with moisture, such as occurs during the rainy seasons. This is testimony to the fertility of the soil, and the ancient Hohokam evidently were aware of this and diverted the waters of the streams to nourish their crops which were their chief means of subsistence. There is some evidence that the water table in this desert region has gone down in historical times, largely because of over-grazing with cattle and sheep. This removed the ground

cover or floral growth to such an extent that when the torrential summer rains came, at which time the annual precipitation of five inches to ten inches occurs, there was nothing to prevent it from rushing to the stream beds and cutting the river channels deeper and generally lowering the water table. Since the Hohokam had no animals to graze, this could not have happened to them. However, slower changes in climatic conditions have evidently been taking place during the time elapsed since the last Ice Age. As the ice caps melted and retreated farther to the north and the streams and lakes thus formed dried up in their wake, the Southwest has gradually become more desert-like. At any rate, Hohokam sites are found some distance from streams, indicating that possibly more moisture and higher stream levels were available in the days of their development, thus enabling them to divert water to greater distances from the main waterways.

Geological conditions are closely associated with the development of some of the arts and crafts of primitive peoples, in that it governs, to a great extent, the kind of materials available for building purposes, ceramic products, stone tools, etc. In regard to ceramic products, beds of clay must be at hand or within easy travel distance, and usually a tempering material must be added to the clay, unless the potter was so fortunate as to find clay mingled with sand or mica. This calls for sharp sand or some sort of rock, such as micaceous schist, to be ground up for

tempering material. All of these seem to have been available to the Hohokam, as well as the red or brown colored ores containing iron, such as hematite or limonite, to be ground up and mixed with some liquid to be used as paint in applying the decorative designs on vessels. Paints may also be made of very thin mixtures of clays containing iron oxide, giving a range of colors in the reds, browns, and yellows; and such clays also give a distinctive color to the paste in ceramic products, since the firing or baking frequently brings out these colors. Other types of paint, not usually found as having been used by the Hohokam, are made of vegetable or organic matter such as the dried gum of the mesquite tree.

Since the Red-on-buff pottery of the Hohokam is probably their most characteristic and distinguishing trait, the problem taken up in this paper is an attempt to trace the development of the decorative patterns painted on this pottery from their earliest to their final known stages, with the hope that it will be, when used in conjunction with other cultural traits and in stratigraphical studies, an aid in identifying, chronologically, the different cultural periods of the Hohokam people. This problem involves a study of the reports on excavations carried on in this area, as mentioned above, as well as the personal examination of pottery vessels and sherds in the Arizona State Museum, the museum at the Casa Grande National Monument, and at Gila Pueblo, Globe. At the latter place, through the courtesy of Dr. Haury, the pottery fragments and

vessels excavated at Snaketown, near Sacaton, were put at my disposal for study, as well as portions of the manuscript of the report on this work which is in process of being published. The pottery from this latter site, through careful stratigraphic study, has the distinction of carrying the analysis of Hohokam pottery back to such an early time that painted decoration was not used, and this is followed by the first crude attempts at making painted designs. This will be gone into in that section of this paper dealing specifically with the evolutionary changes in these designs.

It seems that there is considerable criticism from some quarters aimed at the archaeologist who spends much time and effort in analysing pottery types, and the complaint is that this study is being carried too far and into endless insignificant details. There may be some justification for such criticism, when people jump to the conclusion that a new type has been formed just because some potter had a new color or design element, but for the specialist in a certain area it is necessary to know the fine distinctions in order to analyze the influences exerted on and by neighboring peoples and their culture. However, it seems that for the layman and the beginning students there should be a broad general classification of ceramics, such as the usual terms applied to a culture district as a whole, capable of being broken down into smaller subdivisions as the study progresses; and then for the

specialist even finer subdivisions might be worked out in his task of tracing out the genealogy of ceramic family trees. It would seem that the designation of a new pottery type should be made only after it has been found in sufficient quantity to be a real factor in the analysis of the pottery of an area. The writer hopes to avoid all semblance of hair-splitting or fine subdivisions of pottery patterns, but wishes to quote the following in justification of the study of ceramic decoration:

"And I believe decoration to be the single most valuable criterion for the classification of Southwestern pottery, as well as for tracing the descent of types and for establishing collateral relationships. Whole compositions, and perhaps to an even greater degree the elements which are combined to form them, contain a wealth of information for the solving the difficult problems of Southwestern pottery. It is in the embellishment of vessels that ceramic styles are most emphatically expressed. Decoration was one of the main preoccupations of the potter. Bunzel's work at Zuni and Acoma makes this very clear. And as our research deals with an individual product, these elements which were of importance to the craftworker herself are of correspondingly great significance for unravelling the history of her craft." 2

And Amsden points out that:

"Color and texture and composition are determined primarily by the available material, only secondarily by the deliberate choice of the potter. They represent at best a compromise between the human potential and the ecologically possible. Pottery has other features in which the human element is more nearly free of basic trammels. Such are form and decoration." 3

---

2. Kidder, 1936, pp. XXVII & XXVIII.

3. Amsden, 1936, p. 2.

Approach to the subject involves consideration of descriptive and classification terms applied to patterns and designs, as it is well known that people can talk of the same thing in terms that give quite different impressions. Standardized and accepted terms will be used whenever possible, and for this purpose the recent work of Amsden[4] and Clarke[5] have been given consideration and study.

---

4. Amsden, 1936.

5. Clarke, 1935.

I. HOHOKAM CULTURAL TRAITS

Distinctive Traits:

Before proceeding with this problem it may be well to briefly outline the cultural traits that distinguish the Hohokam from their neighboring tribes of the plateau to the north and east. It seems that the Hohokam culture was born of an independent line of growth from that of the Pueblos, until toward the later periods of their development when Pueblo traits and people entered the Hohokam area and influenced their method of building, their burial customs, and introduced new types of pottery.

One of the first differences is the fact that the Hohokam chose the arid valley-basin country in the southern part of what is now Arizona for their homes, whereas their neighbors took up or developed their homes in the higher terrain to the north and east, where the altitudes are much higher, the summers shorter, the winters more severe, and where different types of material were available for building and ceramic products. There is, of course, an overlapping where the plateau dweller moved down toward the desert and the desert-dweller ventured to make his home farther and farther upstream toward the higher ground, but the typical Hohokam terrain is the arid country already described.

The Pueblo Indian frequently had enough rainfall to carry

on intensive dry-farming, sometimes augmented by minor irrigation ditches. The Hohokam, on the other hand, were almost entirely dependent on the water in the streams near their homes for moisture to nourish crops, and since they were decidedly an agricultural people who had ingenously adapted their methods to arid conditions, we find they had a system of irrigation canals that enabled them to carry on farming operations on many hundreds of acres of the comparatively flat, level land. The size and extent of these several hundreds of miles of canals have been the wonder of many an early settler and investigator.[6]

The type of home or dwelling was also somewhat distinctive. The most common sort of Hohokam home was one story high, frequently a pit-house with a comparatively shallow pit about eighteen inches deep, and usually a vestibule entrance on one side. The form of the pit ran from circular to rectangular, with the great majority of those excavated being of the transitional or rectangular varieties. This latter type, as found at University Ruin, near Tucson, gave no evidence of the vestibule, but several examples of side entrances or doorways were found.[7]

---

6. Cummings, 1926.

7. Cummings. 1936, p. 3.

Walls and roofs were frequently made of posts, poles, brush or reeds, and clay, the wooden parts forming the supports, and the clay the final covering. Also, many walls were made of upright posts thickly covered with the adobe-caliche mud, or the later type of house may have had solid adobe walls, and may have had a shallow pit or built on the surface of the ground. Many sites in the Hohokam area reveal a much more pretentious type of structure of several stories, such as the Casa Grande. While there are many indications that structures of more than one story were made by the Hohokam, some investigators believe that the large, massive, compact structures of several stories were the result of the influx of the plateau peoples in the later period, since the multi-storied communal house of stone is typical of the Pueblo region to the northeast.

Customs in burials shows another difference between Hohokam and Pueblos. The Hohokam cremated their dead, burning the bodies on large funeral pyres and then disposing of the remaining fragments of bones by burying them in the ground, sometimes in trenches or pits, and later the bone fragments were placed in jars and then buried. The Pueblos did not cremate but buried their dead in the ground.

A difference in physical characteristics also seems to be well taken; that is, the Hohokam people are considered to have been dolichocephalic or long-headed people, although the evidence to support this claim is rather scant owing to the

cremation burial custom practiced. Undoubtedly it would be a rare case when one of these people were buried without being cremated, more of a chance or accident than intentionally planned. A few such cases have been reported, and one case is that in which Dr. Cummings found a burial on the floor of a pit house at Martinez Hill Ruin near Tucson. The skull measurements showed it to be dolichocephalic and undeformed, whereas it is well known that the Pueblos were and are typically brachycephalic or broad-headed with artificial posterior deformation.

The prevalent method of making pottery among the Hohokam was the use of a paddle and anvil rather than the coiling method of the Pueblos. That is, the Hohokam started with a mass of clay, properly mixed and tempered, and pressed and shaped it by hand to form the vessel, and then used a stone or some such smooth object on the inside of the vessel as an anvil and a wooden paddle applied on the outside, instead of the usual Pueblo method of shaping the paste into a long strand about the size of a lead pencil and then coiling it upon itself in successive spiral layers to form the vessel.

Another trait of the Hohokam was the making of a stone axe in which the handle groove extended only along three sides of the stone, leaving the fourth face plain. On the other hand, the typical Pueblo axe was grooved entirely around and was generally shorter. An exception or borderline case

is at Kinishba, a pueblo ruin near Fort Apache where many Hohokam type axes were found.

Other traits that are rare or absent among the Pueblos but rather prevalent among the Hohokam are the use of slate tablets for paint pallettes and the carving of sea-shell jewelry.

Although there are overlappings and similarities in the cultural development of the Hohokam and the plateau Pueblo peoples, consideration of these distinguishing characteristics indicates sufficient grounds for setting aside the Hohokam area as a sub-center within the Southwest as a whole.

Hohokam pottery types:

The question of ceramic products is deserving of more mention than the foregoing comments on the method of making. While the typical Hohokam pottery was made by the paddle and anvil method, some types of pottery evidently made in this area was constructed by the coiling method..At the Tanque Verde site east of Tucson, Dr. Cummings found a few pieces of coiled ware under such circumstances as to suggest that the two methods were used contemporaneously, even at fairly early times, although the predominating and typical method was the paddle and anvil.[8] The coiling may have been the

---

8. Dr. Cummings, personal interview.

result of intrusive ideas from neighboring peoples to the east. The Hohokam potters made more than one type of pottery, naturally, and, as is usually the case among Southwestern Indian tribes, this pottery may be placed in two broad general classes,--plain utilitarian or kitchen ware, and decorated ware.

Plain ware.- This is by far the most abundant and apparently the most wide-spread, since it is found throughout the area and the Gila Pueblo found it in "fairly large quantities at several Pueblo II sites in the Muddy Valley," in southern Nevada, considerably beyond the farthest reaches of the Red-on-buff distribution.[9] This ware is made in the typical paddle and anvil way, and is found in two colors,--brown and red. The paste for both these ranges in color from brown to gray and is rather coarse, being tempered with sand and mica. The red ware is somewhat the finer. The mica tempering material is very evident in the plain unslipped vessels, but the later red ware is slipped and polished and seemingly has finer tempering material which is not so apparent. The forms or vessel shapes are the usual open bowls, ollas, or jars, ladles or scoops, and some less common shapes as long-necked vases and effigy forms. The later red wares also were

---

9. Gladwin, 1935, p. 206.

quite often made in the form of pitchers which are the same as jars with the addition of a vertical handle running from the body to the lip of the jar. This type is also known as Onion Ware because of the striations made on the surface of vessels by wiping them when the slip was still wet, leaving the appearance of onion skin.

This plain ware has been classified by Gila Pueblo as (1) Gila Plain Ware, a soft russet brown; (2) Santan Redware, with both inside and outside surfaces dull, never polished; and (3) Gila Redware, in which the interiors are black, both polished and dull, with exterior firing clouds.[10] These three wares, in the order given, are assigned to the Colonial, the Sedentary, and the Classic periods respectively.

Red-on-buff ware.- While far from being the most abundant, the decorated pottery is the more important archaeologically for the reason that the painted patterns and design elements are the most conspicuous and usually the most reliable features to be used as a basis of pottery classification. This is especially true of Red-on-buff ware for this area. Other types of decorated wares were made in this area, but the Red-on-buff seems to be the only one that may be attributed wholly to the Hohokam, since the other decorated

---

10. Gladwin, 1930c, 1933, and 1935, p. 220.

wares, which will be briefly described below, may be the result of Pueblo people and customs entering the Hohokam area. Since Red-on-buff is to be taken up in detail in the section devoted to tracing the design development, at this point only some general descriptive information will be added. The paste runs in color from gray to tan or brown, and is rather coarse in the early ware and somewhat harder and finer in the later vessels. The tempering material used was sand and mica, with the mica being quite conspicuous in the vessels having no slip, such as found in the vicinity of Tucson, or only a thin buff wash or color floating to the surface as the result of working the paste with the paddle and anvil. The surfaces in the early Red-on-buff were dull and not polished, while the late ware had smoothed and sometimes well-polished surfaces. The background color was not always uniform, but ranged from a light gray through various delicate shades of buff to a pinkish or reddish buff. Smudged spots or areas on the surface of vessels also occurred at different periods and parts of the area. This smudging seems to be especially characteristic of the late period in the southern part of the area, as exemplified by bowls found at Martinez Hill and Tanque Verde near Tucson, while nearer the center of the area, in the neighborhood of the Casa Grande ruins, the late vessels had a fairly uniform buff color without smudged spots. The work of the Gila Pueblo at Snaketown shows that in very early times, the Pioneer Period, smudged areas on vessels were so prevalent

as to suggest intentional treatment or crude ability in firing.[11] The color used in applying the design was a deep maroon or brownish red, and while this varies slightly, it is somewhat more consistent than the background color.

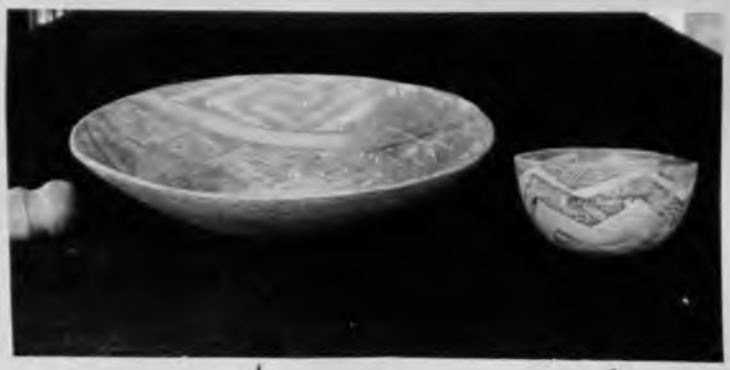
Hohokam Polychrome.- This is evidently a further and later development of Red-on-buff pottery, and seems to be more prevalent in the southern and eastern part of the area than in the other districts. It is the result of the before mentioned smudging being applied to the inner surface of bowls which have been decorated on both inside and outside with red designs. This makes the inner surface vary from a sort of blue-gray or slate color to black with red decoration, while the outer surface is red-on-buff. This same idea seems to have been carried to the extent of the inner surface being burnished black and then decorated in red.

In addition to the above there are other types of Hohokam pottery that have been recently uncovered by Gila Pueblo in their excavations at Snaketown, in the center of the area. These consist of undecorated wares, designated as Vahki Plain and Vahki Red, and of decorated wares designated as Estrella Red-on-grey, and Snaketown Red-on-buff. All these types belong to the Pioneer Period, the earliest known period of the Hohokam, and the names of the wares,

---

11. Haury, 1937, In preparation.

PLATE I



1. 2.

3. 4.

1. Red-on-buff Bowl, of the Early or Sedentary Period, fire clouded over design.

2. Hohokam Polychrome bowl, from Martinez Hill.

3. Plain ware jar with lip handle.

4. "Onion ware".

Vahki, Estrella, Sweetwater, and Snaketown, designate the phase of the culture as classified by the Gila Pueblo.[12] As prototypes of the later Red-on-buff wares, these will be given some consideration later.

Associated Wares.- The above briefly described wares appear to be native developments of the Hohokam people, whereas the associated wares are evidently the result of the influences of the Pueblo peoples coming into this area, and, therefore, are included here because they were made in the area under discussion.

Corrugated ware.- This is necessarily a coiled ware, and therefore, not typically Hohokam. It is found in association with Red-on-buff, especially in the later periods, and is more abundant in the eastern and northeastern part of the area. This ware may be subdivided into (1) indented coil, gray and red in color; (2) fine flat coil; (3) partially obliterated coil, and (4) partially obliterated coiled ware having an exterior decoration in white. These have black interiors,[13] some of which are burnished.

---

12. Haury, 1937, In preparation.

13. These brief mentions of Associated Wares are based on Dr. Cummings outline in The Kiva, Oct, 1935.

Two colored wares.- The last class of corrugated ware mentioned above really belongs in this group, since it has a red wash on the exterior, over which is painted a faint white triangular design with a dull black interior. This is the Salado Redware as defined by the Gila Pueblo, and occurs principally in the northeastern part of the area.[14]

Black-on-white wares appear to be intrusive from a north eastern center but this type has been found at University Ruin.[15] The paste is coarse and gray, tempered with sand, and well fired. Vessel shapes are bowls, pitchers, and effigy jars, with the pitchers far outnumbering the others. The black decoration painted on a white background shows a characteristic tendency toward longitudinal hatching combined with solid geometric patterns. This Black-on-white ware is generally subdivided into Tularosa and Roosevelt phases. The distinguishing features are that the Tularosa has small effigy handles, while the Roosevelt handles are plain; necks and shouldersof pitchers of the Roosevelt are painted white with groups of vertical black bars at intervals around the neck, while the Tularosa pitchers have the necks entirely covered with a design of frets or keys; and the design on the Roosevelt pitchers ended at the bottom in such a manner that the bottom

---

14. Gladwin, 1930c.

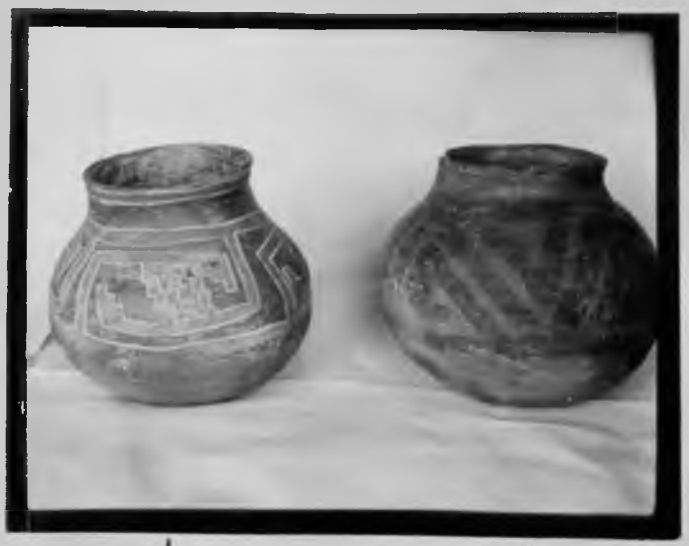
15. Cummings. 1936, p. 3.

~~in such a manner that the bottom~~ of the pitcher shows a white circle, while the Tularosa pitcher bottom shows a star-shaped white area.

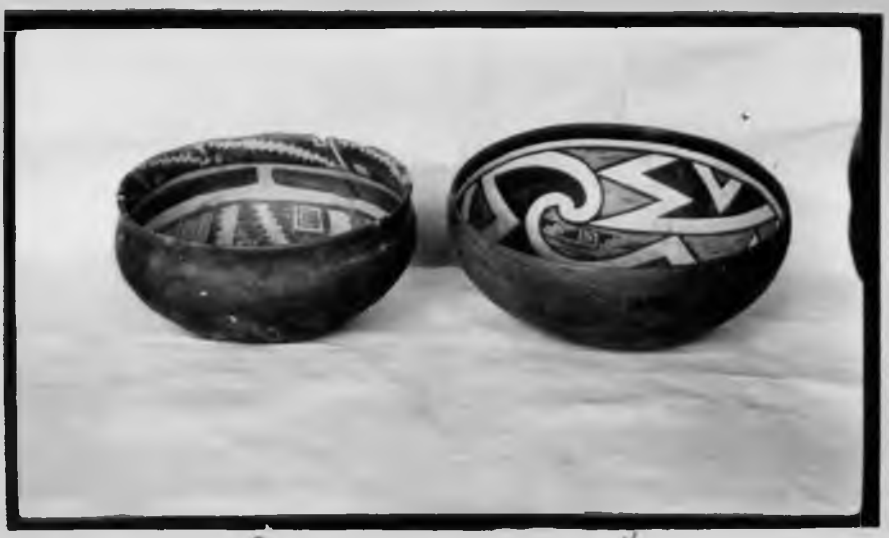
Other two colored wares that have been found in minor quantities are Black-on-red, Black-on-buff, White-on-red or buff, Black-on-gray, and Purple-on-brown.

Polychrome wares.- The most important of these are the Gila Polychromes,-Early and Late, and are found throughout the Hohokam area. The Early Gila Polychrome typical shape is the open bowl, although it is also made in the olla form, as well as effigy forms such as the duck-shaped containers. The bowls are red on the outside, being slipped on a red or brown base, The interior is slipped white on which is painted the well-made black decorations covering the entire surface. The designs are geometric and are chiefly composed of hatched and solid elements. The rims of bowls are slightly incurved or restricted. Late Gila Polychrome seems to be a further and later development of Early Gila Polychrome, since it has the same colors, but the black, white, and red may form a part of the design on both the inside and outside of bowls (some are decorated on the inside only), and on the outside of ollas, vases, and eccentric forms and have the life line broken. Instead of being restricted, bowl rims flare slightly from ~~slight~~ straight sides. However, the workmanship in applying the design is much cruder than in the Early Polychrome, and the

PLATE II



1. 2.



3. 4.

1. 2. Tucson Polychrome

3. Late Gila Polychrome bowl

4. Early Gila Polychrome bowl

geometric designs are so different that there is no confusion of the types. This is the ware classified as Tonto Polychrome by the Gila Pueblo.

A type of polychrome which was third in order of abundance at University Ruin, following Gila Polychrome in this respect, is a ware made in the usual forms and decorated with heavy black, outlined in white on a red background. This has been designated as Tucson Polychrome.[17] Another polychrome, of which but few pieces have been found as yet, is the one named Nogales Polychrome, because specimens were found in an ancient cemetery under a street in Nogales, Arizona. These are bowls, and the decoration consists of purple and bright red applied to a cream-colored slip on the interior, while the exterior is red.[18]

The foregoing is far from a complete description of the pottery types mentioned, and very possibly it does not include some types known by investigators to exist in the area. Neither has it taken into consideration the trade wares that have found their way into the area, but it is hoped that this brief sketch will aid in orienting the Hohokam culture in relation to the development of design on their pottery.

---

17 and 18. Cummings, 1936, p. 4.

PLATE III

1. 2. 3.

4.

1. Tucson Polychrome, odd form
2. Plain ware vase
3. Black-on-gray, using Hohokam design
4. Nogales Polychrome (compare with Plate V)

II. PROBABLE PERIOD OF DEVELOPMENT OF RED-ON-BUFF CULTURE

The time involved in the development of Hohokam culture is admittedly great. Previous to the introduction of Dendrochronology by Dr. Douglass less than a decade ago,[19] the best that archaeologists could do was to estimate the time elapsed since the inception of a culture or a people in any given area or district,--in which practice they were greatly exceeded by the "old-timer" laymen who vaguely added a few thousands of years to the estimate of the archaeologists. In some cases the formerly supposed time necessary for the growth of a culture was far longer than that set by tree ring dates, while other estimates were very close to the correct time. In the Hohokam area proper, datable timbers are seldom found in ruins due to the climatic conditions and the resultant types of timber in the vicinity not being conducive to reliable tree ring dates. However, in the most eastern part of the area and all through the regions to the north and east tree ring dates are obtainable. Then by cross-dating by means of identifiable pieces of pottery which have found their way from those regions into the Hohokam area and vice versa, reasonably accurate times may be placed on different phases of Hohokam cultural develop-

---

19. Douglass, 1929.

ment. In the days before dendrochronology it was frequently estimated that the Hohokam people probably began their development in the Gila Valley about 2,000 to 2,500 years ago. The work of Gila Pueblo at the Snaketown site shows that this culture had its beginning in that place at least before the inception of the Christian Era, probably around 300 B.C. or earlier.[20] This is not far from the old estimated time. This period of time, however, as based on tree ring dates and cross-dating only in its later and greatest part,--that is, back to about 500 A.D. Beyond that time dates are estimated on the basis of the amount of cultural advancement made during a given time within the known sequences. That is, if it took two hundred years to accomplish a certain stage in cultural advancement or change, then it was logically assumed that an equal amount of change or advancement in the earlier times would take an equal time--(or even longer considering that cultural evolution speeds up as it advances and pyramids its cultural traits).

To clarify this long period of development and show its relation to the different stages of progress, below is given a brief chronology of the Hohokam in terms of approximate time, architecture, and pottery. In this I have endeavored to correlate the simplified classification used for a number of years by Dr. Cummings at the University of Arizona,[21] with that of the Gila Pueblo which I have reduced for the purposes of this paper.[22]

---

21. Cummings, 1935, p. 1.
22. Haury, 1937. In preparation.

Hohokam Chronology

(Cummings)		(Gila Pueblo)	
PERIOD	Approx. Time	PERIOD	Approx. Time
Late Pueblo:	(900-1540)	Classic:	(1200-1400)
Compact pueblo	(1100-1450)	Pueblo structures	
Pottery:		Pottery:	
Hohokam Polychrome		Casa Grande Red-on-buff	
Late Gila Polychrome		Gila Polychrome	
Early Gila Polychrome		Tonto Polychrome	
Tucson Polychrome		Gila Redware	
Nogales Polychrome		Gila Plain Ware	
Red-on-buff, Late			
Black-on-buff		Sedentary:	(900-1200)
Black-on-red			
Black-on-white		Villages of pit-houses and surface houses, within surrounding wall	
Corrugated:			
Plain and Indented		Pottery:	
Plain ware:		Sacaton Red-on-buff	
Red and Brown		Santan Redware	
Small House groups	(900-1100)	Sacaton Buff	
Pottery:		Sacaton Redware	
Similar to Rectangular Pit-house types		Gila Plain	
		Colonial:	(500-900)
Early Pueblo:	(500-900)	Pit-house villages, wide-spread	
Pit-houses:		Pottery:	
Rectangular		Santa Cruz Red-on-buff	
Transitional		Santa Cruz Buff	
Circular		Gila Butte Red-on-buff	
Pottery:		Gila Plain	
Hohokam Polychrome		Pioneer:	(300 B.C.-500 A.D.) (estimated)
Tucson Polychrome		Larger pit-houses	
Early Red-on-buff		Pottery:	
Black-on-buff		Snaketown Red-on-buff	
Black-on-red		Sweetwater Red-on-gray	
Corrugated:		Sweetwater Polychrome	
Plain and Indented		Estrella Red-on-gray	
Plain ware:		Gila Plain	
Red and Brown		Vahki Red	
Archaic:	(? B.C.-500 A.D.)	Vahki Plain	
Shelters			

III. DEVELOPMENT OF PAINTED DECORATION ON RED-ON-BUFF POTTERY

Until a comparatively recent date no prototypes of Hohokam pottery were definitely known. All the formerly known types distinctly indicated a much earlier developmental period, inasmuch as the ceramic industry and styles of decoration were evidently well-established and standardized, even in the Early or Colonial Red-on-buff. The most recent excavation work in the area is that carried on at the Snaketown site, near Sacaton, by the Gila Pueblo, Globe, Arizona, in which much earlier horizons of pottery-making among the Hohokam were established.[23] While the results of these excavations in the central part of the area may not be exactly the same as more extensive research in other districts might reveal, it seems reasonable to assume that similar stages of development occurred throughout the greater part of the area as a whole. Since it is known that Early or Colonial Red-on-

---

23. Gladwin, Haury, 1937. "Excavations at Snaketown." This is now in process of printing and will be available in September, 1937. The writer had access to portions of the manuscript and the opportunity to examine quantities of sherds which formed the basis of their classifications and conclusions, but does not pretend to go into all the ramifications of these classifications, merely using this information to show the beginning of decoration on Red-on-buff. In order to avoid frequent repetition in footnotes, credit is here given Gila Pueblo, especially in connection with the help and information received on the earlier types of decoration.

buff is very widespread in southern Arizona, would it be unreasonable to suggest that this may be the result of the more primitive Hohokam of the Pioneer Period having occupied and developed in those sites instead of having become established in them during the Colonial Period? Would deeper delving into some of these Colonial sites show such a condition? This possibility, followed by the more restricted distribution of the later sites as the result of pressure by neighboring peoples on the peripheral districts, might show the earliest stages to be somewhat homogeneous, although some later phases, due to neighboring influences, may show superficial differences. This is neither a theory nor hypothesis, but merely a suggested line of thought that is probably not new. Until further information on the subject is unearthed, it should be reasonable to use the early Snaketown types as prototypes for Hohokam Red-on-buff throughout the area.

Prototypes of Hohokam Pottery.

The earliest ceramic types were found at the lowest levels in the stratigraphic tests made at Snaketown, and belong to the Pioneer Period of the Gila Pueblo classification. This Period is divided into four phases of culture given names as heretofore mentioned. Usually a new phase is accompanied by a new type of pottery or by marked changes in the design, color, or shape of the decorated ware. This is not always the case, however, since a phase may be indicated

by a combination of changes in other cultural traits, such as burial customs, house types, type of stone pallettes, etc., with ceramic decoration remaining practically the same.

First Phase Pottery. This phase is named the Vahki, and the pottery is of two types called Vahki Redware, and Vahki Plain ware. The surfaces are smooth but dull, plain gray, brown, or red, and specks of mica, so typical of Hohokam pottery, are much in evidence. There is no decorated pottery in this phase. The method of making was the paddle and anvil. Estimated age, 300-100 B.C.

Second Phase Pottery. This is the Estrella Phase, and in addition to the plain pottery there is the first type of pottery with painted decoration. This has been designated as Estrella Red-on-gray, because the prevailing background for the faint red decoration was a gray, and according to Haury only about 2% of all the pottery produced was of this type. Obviously, such a small percentage is to be expected at a time when apparently painted decoration is first coming into practice. Estimated age, 100 B.C. - 100 A.D.

The background color ranges from a light brown through a gray-brown to gray. No slip or wash was applied to the surface. Fire clouds were so prevalent that, as Haury points out and the writer observed, the designs were almost obliterated in some instances. In a few of the lighter spaces between clouds, one may recognize what might be taken for an off-color,

poorly fired, unslipped, early type red-on-buff, except that the designs are so faint, crude, and quite different from later Hohokam Red-on-buff. Minus the painted decoration, this might look much like the plain ware of the district.

Forms were hemispherical bowls, bowls with slightly ~~slightly~~ in-curved or restricted rims, and some with vertical rims; small jars with flaring rims; and a few heavy-walled vessels.

Designs were usually of the s ectioned pattern (Amsden), in which the interior of bowls is usually divided into quarters by two broad lines drawn across this surface at right angles to each other. The resulting quarters were then filled by a few broad-lined chevrons of graduating sizes being placed in each, forming a sort of coarse, broad-line chevron hatching. Exteriors were usually decorated with several, generally four, rude chevron hatched triangles depending from the rim with the points toward the bottom. Some designs also included a few simple, solid line scrolls and small elements.

The chief design elements, then, were broad, coarse lines, some as broad as a man's finger and others somewhat smaller; very rudimentary hatching of the chevron type; and non-interlocking, solid-line scrolls.

Two different types of surface treatment were used on Estrella Red-on-gray as regards polishing or smoothing, In

one type, in addition to the light hand and tool smoothing of the surface to bring it to a consistent finish as was typical of this ware, "a tool, probably a pebble, was used to 'fix' the patterns. Polishing strokes always follow and were confined to the lines. This process frequently blurred the sharpness of the line margin and in some cases so blended the color with the base that it is difficult to see."[24] The other type, not polished over the decoration, usually has the design applied in somewhat finer lines.

Incising is another surface treatment that appears to have had its inception among the Hohokam in this phase. In discussing this incising, Haury says:

> "It originated in the Estrella Phase from the desire to deepen the troughs between the coils of coiled pottery. In other words, its inspiration was dependent upon a structural detail of the pottery. Incising was rare at first (less than 1% of the painted pottery in the Estrella Phase) but increased sharply toward the end of the Pioneer Period.....declining all the while in technical excellence. A factor contributing to the decline was the loss of coiling as seen in the Estrella Phase."

And, with further reference to this subject of incising as well as the method of pottery manufacture:

> "The basic method of pottery manufacture among the Hohokam was paddle and anvil. This however, does not mean that coiling in any form was not used..... In spite of what has been said, it was somewhat of a surprise to find pottery at Snaketown, even occasionally, showing a technique of coiling, which was indistinguishable from the coiling of the Anasazi and Mogollon.

---

24. Haury, 1937. In preparation.

> Although there was no reasonable doubt that it was made by the Hohokam, the presence of only paddle and anvil pottery in the Vahki Phase persuaded us that the technique as such may have come to the Hohokam from the outside. The oldest pottery with narrow, unmodified coils at Snaketown was Vahki Red of the Estrella Phase. Most of this showed grooves between the coils artificially achieved by the aid of a tool. In the same phase some of the painted pottery was similarly treated, but thereafter coiling in Vahki Red was lost and the grooving became incising." 25

Painting of designs over this grooving on the exterior surfaces did occur, but this was an infrequent happening.

Third Phase Pottery. This has been named the Sweetwater Phase and the painted pottery is called the Sweetwater Red-on-gray. The background color runs from a light brown to gray, and, as was the case with the preceding type, firing clouds greatly effect this ground color. The decorated ware of this phase constituted about 4% of the total pottery produced, thus showing some increase over the Estrella Phase and an increasing popularity of the painted pottery. Estimated age, 100 A.D. - 300 A.D.

Forms. Bowls were of several shapes, chief among which are two forms of flare-rims, (1) deep with flat bottom, almost vertical sides, and a flaring rim, and (2) shallow with wide slanting sides and a flare outward at the rim. Other bowls were of the hemispherical type, shallow and deep, and bowls with incurved or restricted rim. Jars were small with globular bodies as before, but the opening was somewhat more restricted and the rim flared less. Also there was a seed

---

25. Haury, 1937. In preparation.

jar,--a small globular shaped vessel with small opening. Other forms were the scoop or dipper, beaker or drinking mug, and some heavy-walled bowl-shaped vessels.

Design elements were chiefly hatched and enclosed within lines forming triangles and scrolls, and show the first real development of hatching. The chevron elements of the preceding Phase are in the minority and are made of much finer lines, showing a more specialized culture. All line work was finer, and greater care was used to keep lines parallel. The solid line scroll of the Estrella Phase was replaced by the elaborate, broad, hatched-line scroll which formed a curvilinear design, usually single, but sometimes double or interlocked.

These elements were used in sectioned patterns on the interior of bowls, sometimes bisected or quartered, and covered with plain hatched areas, and sometimes in banded patterns composed of a hatched band just below the rim, terminating with a zigzag line towards the bottom. Exteriors of bowls were frequently decorated with hatched triangles pendant from the rim, and these were sometimes applied over spiral incising. Decorated jars usually had bands of hatching or these hatched elements around the body, and smaller hatched triangles were painted on the inside of the flaring lip of these jars. Occasionally small elements and keys were included in designs.

Surfaces show that hand and tool polishing was used to bring the surface to a consistent smooth texture. No slip or wash was applied, and since nearly all of the interior and exterior surfaces of some vessels were darkened by firing clouds, it appears that this was intentional, or perhaps the technique of firing had not reached the point of avoiding such smudging. Incising was more prevalent than in the Estrella Phase, since it is found on 25% of all vessels. However the grooving or incising between coils of the former phase has given way to the free-hand drawing of incised lines on paddle and anvil pottery in this phase. This incising follows the pattern of a spiral, ending at the bottom of a vessel in the same manner as would the coil of coiled pottery. The ridges between grooves were flattened, however, indicating that polishing or smoothing had been done after the grooving. Incising in the form of patterns and punching of vessel surfaces is an accompanying development which took place at this time.

Fourth Phase Pottery. This phase is the Snaketown, and the decorated pottery is named the Snaketown Red-on-buff, because the predominating color of the background is buff, but ranges to gray because of fire clouding. This does not mean that there was a decided difference in color from the preceding Red-on-gray pottery. On the other hand, it appears to be a gradual change to a somewhat lighter color and while this type is the first to be recognized by Gila Pueblo as

being a red-on-buff, it is darker, as a rule, than the red-on-buff of the following periods. The percentage of painted pottery again shows an increase since, according to Haury, the decorated ware amounts to slightly less than 20% of the pottery produced, as against 4% for the Sweetwater Phase. Estimated age, 300 A.D. - 500 A.D.

The forms of vessels were similar to those mentioned in connection with the Sweetwater Phase,--that is, the two types of flare-rimmed bowls, jars, scoops, and heavy walled vessels, both plain and in effigy form.

In regard to designs, the specializations begun in the preceding (Sweetwater) phase were refined and elaborated, growing into a formalized type of ceramic decoration. Hatching is the predominating use of line work which was fine and more intricate than formerly, and elements were opposed to bring about a balanced pattern. There is a decided inclination toward the use of zigzags and serrated edges, and these used in connection with the hatched interlocking scroll "appeared as a bold, free design, beautifully executed, with flying pennons attached."[26] And used on the opposed faces of the broad, hatched-line, interlocking keys (similar to the scrolls but made with right angles), these formed stepped

---

26. Gladwin, 1937. In preparation.

or terraced figures. In addition to the stepped elements, another new element was what Amsden calls bulls eyes. These are generally an element composed of a solid, less frequently a densely hatched area, with a small window, sometimes repeated making a series of little windows, which generally in later phases, frames some simple figure such as a dot or a small element of more complex form. Apparently the object in employing these was to bring about a better balance between the light and dark areas. Small elements also became more noticeable in this phase, since they take on some of the characteristics of a small solid and their irregular outline seems to be born of the tendency toward the use of zigzags and serrations. This is the form which in later phases appeared to resemble conventionalized birds in flight or alphabetical shapes. Still another innovation on pottery was the negative painting of life forms. A typical example of this has the appearance of having been based on the idea of taking the carved form of a bird, such as one made of shell, tracing its outline on a vessel, and then filling in the surrounding area with paint, leaving the bird form revealed in the color of the background.

The chief elements of design, then, were the emphasized use of hatching, the continued use of scrolls but elaborated by the introduction of pronounced serrated lines or pennons, the use of interlocked keys, the use of bullseyes, and the negative painting technique. The marked use of the zigzag

or serrated line apparently contributed decidedly to the changed appearance of elements, including the small elements.

These elements are used in sectioned, banded, and all-over patterns around the bodies and necks of jars. The series of hatched triangles around the rims of jars and the exterior of bowls also constitute what might be termed a banded decoration. These hatched triangles on the exterior and pendant from the rims of bowls are more numerous (as many as eight or nine on a vessel) than those of the preceding phase (Sweetwater) and the enclosing lines of the triangle are usually zigzagged on one side.

In regard to finishing of vessel surfaces, Haury says that all, except jar interiors, were hand smoothed and lightly gone over with a polishing tool. Generally no slip nor wash was applied, but in cases where washing did occur, tool polishing was not used and the color was lighter. Incising shows another increase, since about 65% of bowl exteriors were so treated; but jars were seldom incised. The incising was still rather evenly done but losing in quality of workmanship as compared to the preceding phase in which it had attained its best. Designs were frequently painted on after the incising had been done.

This, the Snaketown, is the fourth and last phase of the Pioneer Period, and it is interesting to note that Haury has identified sherds of all these earliest types

coming from a site in the Santa Cruz drainage near Tucson. The site is the one now being excavated by Mr. and Mrs. Wetmore Hodge.[27] While this material has not been correlated and analyzed, finding of these sherds seems to argue for the widespread distribution of the Hohokam throughout this part of the area during the Pioneer as well as the Colonial Period.

Early or Colonial Period Red-on-buff.

The name Early Red-on-buff of the Cummings classification which is simple and easy to understand, has for some years adequately covered the Hohokam decorated ware of the Colonial as well as a great part of the Sedentary Period of the Gila Pueblo classification. In addition, the Gila Pueblo, based on extensive research, feels justified in dividing the Colonial pottery into two phase types,--the Gila Butte Red-on-buff and the Santa Cruz Red-on-buff. This is rather appalling when one considers that even many of those archaeologically initiated have difficulty in discerning between the Colonial and Sedentary types, not to mention the phase differences. However, in following the development of the designs one can recognize a gradual transition from one type of decoration to another which should be examined, and when these changes have progressed far enough and long enough there are recognizable

---

27. Haury, 1937. In preparation.

differences which might be designated as stages or phases of development. For the sake of convenience these stages might be given such names as those used by Gila Pueblo. In this instance it is found that there were a number of differences between the last Snaketown phase of the Pioneer Period and the first (Gila Butte) phase of the Colonial Period.

First Phase Colonial or Gila Butte Red-on-buff. The ground color is generally a light buff to gray, depending on fire-clouding. This smudging or fire-clouding may have been intentional in order to obtain a mottled appearance, or it may be that the aim of the potter was to attain a buff color but as yet had not learned how to control the fire. At any rate, the color was lighter than in the preceding phases, but still somewhat darker than in the following. Approximate age of this phase, as given by Gila Pueblo, based on cross-dating with the northern Pueblo area, is 500-700 A.D.

Forms of vessels include the bowls, jars, and scoops, as before, and in addition plates were made, as well as a pedestal vessel which seems to be the fore-runner of legged vessels that belong in later periods in the central part of the area. The slightly flaring bowl rim which began in the preceding phase was developed into a full-flaring rim, in some cases almost horizontal, and this is the most characteristic bowl form of the Colonial Period. A new and larger bowl form was like the incurved rim type with an out-curved

extension added. It should be noted that some jars show a tendency to become wider at the bottom and shorter in the neck, with the lip somewhat everted or recurved. This tendency is more marked in the next phase.

Design elements includes line work in which the zigzag line has taken on some sharper angles giving it the appearance of a lightning symbol in some instances. Also a fringed line was apparently becoming popular, and frequently appears to be the outgrowth of a custom of leaving off the enclosing line on one side of a diagonally hatched broad line such as was used in the preceding phase and continues in this. This idea was carried to bowl exteriors in which the enclosing line on the bottom of the band of hatched triangles is omitted, thus giving this a sort of fringed appearance, although the groups of lines composing the hatching are opposed to each other. A still further development of this idea on bowl exteriors seemingly led to the custom of putting on a number of lines, about a dozen or more, trailing from the rim toward the bottom in a lazy sort of curve. Later in the Colonial Period these trailing lines became less and less in number, being reduced to three or four by the end of the last (Santa Cruz) phase, when exterior decoration of bowls was discontinued. (Plate IV, 4). Solid lines replaced many of the broad lines composed of fine diagonal hatching enclosed within parallel lines previously described. Zigzagged or serrated edges were still more popular than formerly.

Hatching seemingly was losing in popularity, in some respects, but was still used in broad lines as above described, to fill geometric areas, such as triangles, some of the interlocked keys, stepped figures, and scrolls, in rim decoration, and as a background for negative representations of life forms. Hatching, in various forms, continued to be important in Hohokam design throughout all periods.

Solids replaced hatching in some elements, such as in terraced figures, interlocking keys, and some triangular shapes. The broad hatched lines of the Snaketown interlocked keys and scrolls, single and interlocked, were compressed into narrower solid lines, and the pennons were reduced to a sort of fringe on the outer edge of the interlocked scroll which is roughly shaped into a rectilinear pattern by corner filling, thus forming small triangular solids at the corners. (Plate V, 3). Solids were also used as backgrounds for negative life forms and as frames for bullseyes which had their inception in a hatched background during the Snaketown Phase.

Small elements of various irregular and alphabetical forms became very prominent and life forms, such as birds, quadrupeds, lizards, and even humans, were correlated developments. Negative painting also received more attention and was largely devoted to life-form representations.

In summing up the design elements of this phase, we see

the beginning of line work in the form of fringes, narrower solid lines in place of some of the broad hatched lines, and trailing lines on the exterior of bowls. Hatching was still important but changing to solids in some elements. The development of the use of solid elements is important largely because of being in the beginning stages. Scrolls are still prominent, but now are mostly of solid lines instead of hatched. Bullseyes were in solid frames, and interlocked keys were made with solid lines. Life forms and the repetition of small elements are very important in the ceramic decorations of this phase. Stepped or terraced elements, in triangular form, appear to be a possible development from the opposed serrated faces of the interlocked keys, and are opposed and balanced in banded patterns.

These elements were made into patterns on bowl interiors in the form of a band encircling the vessel below the rim and extending toward the bottom, in a banded pattern in which several bands parallel each other across the inner surface, in figured patterns made up of small elements repeated in concentric circles or so placed as to give the dynamic impression of circling birds in motion, and in all-over patterns similar to a checker-board. Sectioned patterns of the quartered type probably occurred, but I have found no specimen definitely identified. Banded patterns undoubtedly occurred on jars, but here again definite identification is lacking. Inasmuch as these are undoubtedly very similar to those of the next fol-

lowing (Santa Cruz) phase of the Colonial Period, jars will be taken up later.

In regard to surface finishing or treatment, it is noted that smoothing was done by hand, except interiors of jars which show the marks of the anvil tool. A wash or light slip was generally applied, aiding in producing the lighter color, and the painted decoration is more permanent than some of the later types in which designs may be washed off. Incising of the exterior surfaces of both jars and bowls increased greatly in quantity over the previous phases, but decreased in quality of workmanship. Haury says that at Snaketown about 85% were incised, but that the work was done in a haphazard way. The strokes were more or less parallel to the rim but not continuous, and they were made with a blunt tool and have little depth. Painted decoration was applied over the incising as heretofore.

The Snaketown excavations again showed a decided increase in the amount of decorated pottery, since the percentage for this phase is over 30% of the total ceramic product, as against about 20% in the preceding phase.[28]

Second Phase Colonial or Santa Cruz Red-on-buff. This is the second and last phase of the Colonial Period, and there

---

28. Haury, 1937. In preparation.

is considerably less difference between these two phases than between the last phase of the Pioneer Period and the first of the Colonial Period.

The color of this decorated ware may be described as being a light buff with a pinkish tinge, and in general is somewhat lighter than the ground color of the Gila Butte Red-on-buff. There appears to be a decided tendency toward producing a more uniform color, but these color differences do not appear to be an especially good distinguishing feature except in the broader subdivisions of the Red-on-buff pottery.

Vessel forms include several bowl forms, some of which are new in this phase. There is the typical flare-rimmed bowl which is shallow with an almost horizontal rim, and a deeper variety of this flare-rimmed type. Other bowls are the usual hemispherical types, a flat-bottomed bowl with sloping but straight sides, the larger bowl with the double curve in the wall from the bottom to the rim as previously described as an outgrowth of the in-curved rim bowl, a rectangular bowl with round bottom, and a rectangular bowl with flat bottom. Plates and scoops are also present, and the plates were made in larger sizes than formerly. Jar forms were small and changing from the globular body shape of the early phases to a wider more squat body, short neck, and a flare-rim. (Plate V, 3). Accompanying this is one with a body of similar shape but smaller, and having a much higher

flaring neck. A new form was the vase. This bore some resemblance to a small pear-shaped, handleless pitcher. Also, there were the heavy-walled vessels.

Among the design elements we find that extensive use of line work was made in the form of straight, wavy and fringed lines. There was a decided leaning toward the use of the wavy line in some part of every hatched area. Hatched areas were chiefly bands or broad lines, hatch-filled quarters or triangular areas, and sometimes filling in between opposed elements. The hatching was made in several styles,--plain, wavy, combined plain and wavy lines, plain chevron, or combined plain and wavy chevron. (Plate IV,2).

Solid elements occur in the form of triangles or stepped figures in band patterns as filled corners, and as backgrounds for negative figures. Bullseyes were also used with a small element within the frame.

Scrolls were made in single, double, and complex forms, and as a series of hook-like interlocked elements in a band.

Small elements, repeated, reached the height of their popularity during this last phase of the Colonial Period, and the "flying bird" element was prominent among them. (Plate IV,1).

Life forms constituted another important type of decoration in this phase, and these included birds, reptiles, quadrupeds, and humans as before.

A chief characteristic of the designs of this phase is the new and prevalent use of the fringe. It was conspicuous as a rim decoration and in circular figured patterns on bowl interiors in the form of concentric circles of fringe alternated with a similar circle of repeated small elements. This same treatment was applied to the exteriors of jars in a banded pattern. An example of this last in the Arizona State Museum shows this pattern on a Gila shouldered jar which form is more typical of the next following or Sedentary Period--a borderline case. (Plate VI, 2). Other examples of interior bowl decoration show a most prominent development of the sectioned pattern of the quartered and off-set quartered types. The quarters were usually filled with chevron hatching in a combination of straight and wavy lines for the greater part, with the remaining small triangular spaces filled with solids or bullseyes. (Plate IV, 2). All-over patterns similar to the checker board type of the preceding phase pottery were used. Banded patterns, similar to those described for the Gila Butte Phase were also used on bowl interiors. A typical example of the Santa Cruz Red-on-buff banded bowl shows stepped solids used with line work, a characteristic of this phase. (Plate V, 1). Bowl exteriors were decorated with a few of the trailing lines formerly described. As before stated, these lines became fewer in number until at the end of the Colonial Period and this, the Santa Cruz, phase exterior decoration of bowls was discontinued.

Jars had the fringed lip decoration and banded designs made up of the elements described especially the scroll elements, in addition to the bands of fringe and repeated small elements already mentioned. In some instances the designs were applied so compactly that a repetition of the painted element appears in the negative.

Interior and exterior surfaces of bowls and the exterior of jars were smoothed, with anvil marks generally showing on the interior of jars or ollas. The surfaces usually visible to the eye were covered with a slip or wash of a buff color, which made a poor base for the painted decoration since this can be washed off. It is rather surprising to learn that the poorly done incising which was so prevalent on bowl exteriors during the Gila Butte phase has entirely disappeared in this, the following phase, according to findings at the Snaketown excavations. The age allotted to this phase by Gila Pueblo, based on cross-dating with definitely dated pottery types from the northern region, is 700-900 A.D.

Middle or Sedentary Period Red-on-buff.

In the Gila Pueblo classification there are two phases assigned to the Sedentary Period, but there is but one type of Red-on-buff pottery running through both and this is named the Sacaton Red-on-buff.

Sedentary Period or Sacaton Red-on-buff. The ground

color of this ware is practically the same as preceding (Santa Cruz) type of Red-on-buff, but is reported to be somewhat more permanent and withstands washing somewhat better. The color is fairly uniform, but may show some clouding from secondary firing when this occurs.

There is a marked increase in the number of vessel forms included in the decorated ware. The well-known, flare-rimmed, bell-shaped bowl is present and is somewhat larger and deeper than in the preceding periods. A second flare-rimmed bowl is deep and has a flat bottom, has straight slanting sides with a flaring rim. The hemispherical bowls are generally larger, a small variety of the in-curved rim bowl is present as are the rectangular bowls, with either round or flat bottom. A new and very large bowl shape is the caldron, and seems to be an outgrowth of the earlier type that had an in-curved wall with an out-curved rim, since the in-curve of the wall is begun at an angled shoulder low down on the wall. The cauldron does not seem to have been wide-spread in the area as far as is yet known, but the low "Gila shoulder" is a typical Hohokam feature.

The plates also show an increase in size and a noteworthy development is that of legged vessels especially in a tray form having three or four legs. Effigy vessels were found at Snaketown and other sites, as were the heavy-walled vessels also in effigy form. Scoops or dippers are again present, and the most typical form, as formerly, bears some resemblance

to a half-gourd shape. (Plate VII,3).

Perhaps the most typical form of Sedentary Red-on-buff is the new development in large jars with the low, angled shoulded, commonly known as the Gila shoulder. These had their beginning in a small way in the last part of the Colonial Period, but their great size, up to thirty gallons, and the forms of the rims are decidedly different in this period. The openings are comparatively small and have brief rims, one of which is termed the open returned rim and resembles a decided but brief flare, a second has the rim sharply returned, and a third has no returned rim, but sometimes has what might be called the vestige of a vertical neck. (Plates V,2; VI,1; and VII,2.)

In the design elements we find that the dividing framing lines are heavier than the filling lines, that fringed, zigzag, and wavy lines were still very popular. In hatching the chevron, straight, and wavy line-filled quarters are still prominent, and now the hatched band may be framed with a heavier wavy line. Solids are larger and heavier, and are especially noticeable as triangles in band patterns (Plate VIII,2) at bowl rims, in connection with panelled designs, and as backgrounds for negative figures. (Plate VII,1). The bullseye elements are more conspicuous, somewhat larger, and have a more complex element within the frame--sometimes a life form.

Life forms are usually larger than formerly and sometimes represent the principal interest in the decorated area. As already noted, these sometimes occur, in the smaller sizes, framed in the bullseye elements, and are sometimes represented in negative drawing. As formerly, the life forms include birds, lizards, mammals, and humans. A new variation of the latter represents a human with an hour-glass shaped body.

A new element involves a line with small triangles attached, thus forming a barbed line or serrated line. This varies from a sort of zigzagged edge to a sharp saw-tooth effect. This element occurs chiefly as a rim decoration.

Scrolls resemble the single, double, and complex varieties of the preceding types, but now show a tendency toward becoming rectilinear. Scrolls are placed in triangular and rectangular areas with the corners filled solidly, and late in the period it becomes an interlocked rectilinear scroll used in forming bands.

Small elements were still very much in evidence in the early part of the period, but losing in popularity later. These are represented by a variety of geometric and complex forms.

Regarding patterns, the above elements were included in designs on the interior of bowls in the form of a band encircling the bowl; as cross-bands in which the rectilinear

interlocked scroll was prominent; as an all-over checker-board pattern, sometimes with dots in the buff colored squares; in sectioned patterns with hatch filled quarters and in quartered patterns consisting mainly of scrolls and bullseye elements, or scrolls and serrated lines made into panels. Also, a typical style of decoration was the offset quartered pattern in which four panels form the principal parts and are so placed as to give an effect of a plaited or folded design. (Plate VIII,4). Other examples of bowl decoration was a pattern composed of repeated small elements enclosed within a border of joined solid elements resembling flattened triangles, and a figured pattern having a similar but heavier border and a single large life form occupying the center. (Plate VII,4).

Decoration on jars shows examples similar to some used formerly, such as the alternate bands of fringe and repeated small elements, the scrolls placed in bands encircling the body, and variations of these. Distinctive patterns seem to be the plaited and semi-plaited designs, massive line hatching, the vertical panel, and the large figured repeated life forms. These appear on jar bodies in broad encircling bands which extend from the rim to the low angle of the Gila shoulder. The plaited design seems to be the outgrowth of the use of opposed bands of triangles on smaller jars, and when more space was available for decoration on the larger jars, the triangles were enlarged and then broken up by the

insertion of a scroll or key element, and the remaining space was made into diagonal separating panels composed chiefly of zigzag, fringed, and straight lines which intersect each other in such a manner as to suggest a textile weave. (Plates V,2;IX,1). The massive hatching fills this band with broad, horizontal, zigzag lines which are alternately composed of a heavy solid line and a line of fine hatching enclosed within heavier framing lines. The vertical panels, extending the full width of the band, are typically panels of alternating solid color and hatching. The large figured life forms are repeated throughout the band which is bounded by lines of joined solid elements.

Therefore, the distinguishing designs of this period appear to be the large figured, the plaited, the massive hatching, the use of large solids as in the vertical panels, and the use of solids at bowl rims.

Surfaces were finished in the same manner as on the preceding type of Red-on-buff. Based on the excavations at Snaketown, Gila Pueblo has estimated the age of this pottery as being from 900 to 1200 A.D.

Late or Classic Period Red-on-buff:

The Late Red-on-buff, or the red-on-buff of the Classic Period of the Gila Pueblo classification was named the Casa Grande Red-on-buff, and this extends through both phases of this period, the distinguishing features of the phases being

based on other artifacts than ceramics. Approximate age of this period--1200-1400 A.D.

In general, this is a period of decadence probably presaging the breaking down of Hohokam culture. A characteristic of the period is local differences in ceramic wares which may be the result of more contact with neighboring peoples as well as migrations into the Hohokam area by peoples from the north and east. Such migration is a well established fact in the northeastern part, and the influences are found widespread throughout the area.

The ground color of this late ware varies somewhat in different parts of the area. In the district around the Casa Grande ruins it is typically a light buff to a faint brown but some vessels appear much darker with a reddish-brown tint. This latter color is even more prevalent in the Santa Cruz Drainage, especially in the vicinity of Tucson. In this latter district smudging of surfaces, either before or after the design was applied, was fairly common. Surfaces are generally well smoothed and sometimes are polished. The lighter colored vessels have a much less permanent coloring as it is easily washed off. The darker varieties of the southeast appear to be more permanent, probably on account of secondary firing which may also account for the smudging and the darker appearance. A characteristic of these is a smoke blackened interior frequently burnished or polished.

Vessel forms were fewer in number than formerly, being chiefly jars or ollas with short, vertical necks, globular bodies with merely a faint suggestion of the earlier Gila shoulder; bowls of the hemispherical types, the other eccentric forms apparently having been discontinued; and pitchers, resembling small jars with a handle running from body to lip.

Design elements can be easily traced to earlier types, but one marked difference is the absence of curvilinear designs. Interlocking scrolls are always rectilinear. Line work is generally fine, and is used in hatching as a filling for triangular and rectangular areas, broad hatched lines similar to earlier types but with different appearance because of the prevalence of cross-hatching. Hatching seems to have been more popular than at any other period. Hardly a pattern is without it in some form. Cross-hatching, which appears to have been absent in the earlier periods predominates; but plain hatching is used, sometimes in the form of a few lines in a longitudinal manner reminiscent of Little Colorado or Mimbres ceramic decoration. Plain hatching with a single kink or offset in each line at graduated distances from the frame was a method of relieving the monotony of hatched areas. The fringed line was changed to more of a ticked line, since the fringes were made short and stiff. Solids appear as triangles on barbed lines, and as triangles pendant from the interior and exterior rims of bowls, and as

triangles in connection with a hook or key element. Solids were also present as stepped elements.

Patterns were chiefly based on the triangular form with the rectilinear interlocking key or scroll playing a prominent part. Some designs had a suggestion of the former complex diagonal panel of the plaited band, while other late jars revealed a decided basket weave pattern. (Plate IX,2). A small pitcher with broken handle from Martinez Hill ruin near Tucson shows a plaited design, ticked or fringed lines, solids, and early type small elements enclosed within a frame. (Plate VI,3). Jar patterns were of the banded type--a wide band around the body and a narrow one on the vertical neck. Body bands and neck bands on the same jar usually had a different pattern. Body bands were filled with the foregoing elements in different combinations. (Plate X,1,2). Neck bands typically were simple but some, especially those of the southeast or Tucson district, were complicated. (Plate IX,4;X). The most typical neck decoration was composed of small panels of vertical lines placed at intervals around the neck. (Plate XI,1). Another common neck band is made up of opposed lines of points or small triangles. (Plate VIII,1). This same is quite typical of interior decorations on bowl rims. (Plate VIII,3). Bowl exteriors show cross-hatched elements, interlocked rectilinear scrolls and ticked or fringed lines. This is especially true of the eastern and Tucson districts. (Plate IX,3-5). These bowls are of the darker colored variety of Red-on-buff in which a smoke blackened

or burnished black interior is frequent. Those which show decoration applied to the blackened interior belong to the Hohokam polychrome previously described.

Distinguishing traits in design are: (1) neck panels on jars; (2) cross-hatching; and (3) absence of curvilinear elements. Other traits are pitcher forms, and, for the southeastern part of the area especially, the darker colors and the blackened interiors.

PLATE IV

1. 2.

3. 4.

Early or Colonial Red-on-buff

1. Flare-rimmed bowl, "flying bird" design
2. Quartered and hatched pattern
3. Fringed rim and repeated small elements
4. External trailing line decoration

PLATE VI

1.

2. 3.

1. Gila shouldered jar, Sedentary period, with the earlier small elements combined with a plaited design

2. Gila shouldered jar, with alternate bands of fringe and small elements

3. Late or Classic type pitcher, showing plaited design and earlier small elements.

PLATE VII

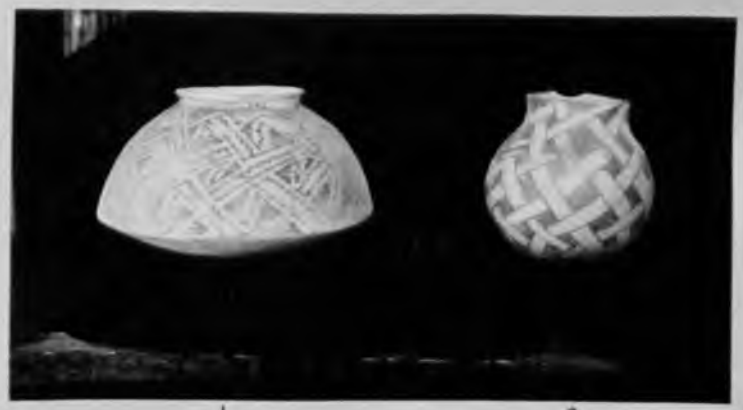
1. 2.

3. 4.

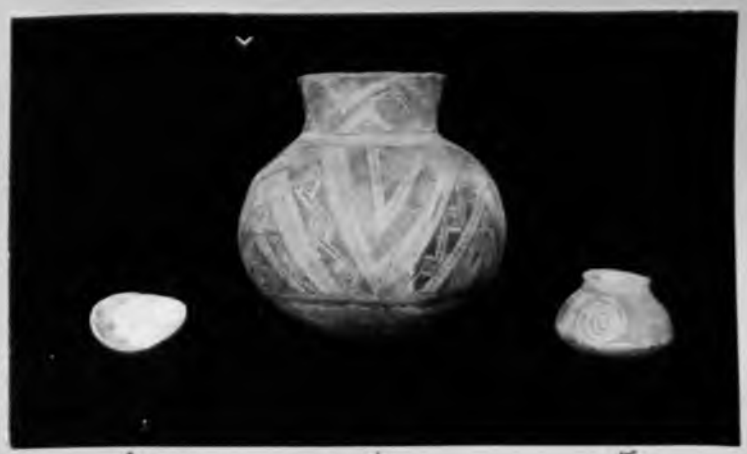
Early or Sedentary Red-on-buff

1. Shallow bowl; life form in negative
2. Shallow bowl; quartered design
3. Scoop or ladle
4. Plate, figuring a single life form

PLATE IX



1. 2.



3. 4. 5.

1. Early or Sedentary Gila shouldered jar with plaited design

2. Late type jar; basket weave design

3. Miniature scoop

4. Late or Classic jar from Martinez Hill ruin

5. Miniature Gila shouldered jar

PLATE X

1.

2.

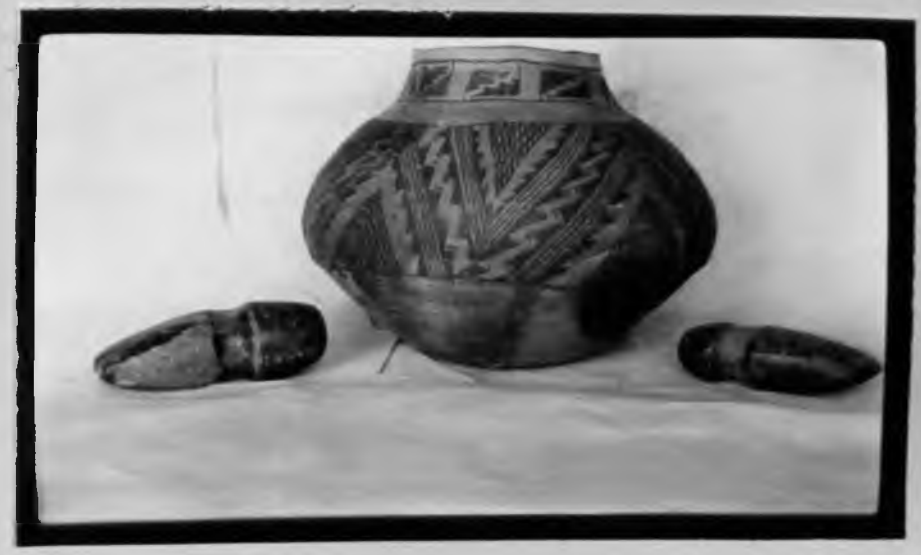
Late or Classic Red-on-buff

1. Large olla or jar from Martinez Hill ruin

2. Large olla or jar from Gila bank ruin in the eastern part of the Hohokam area

Both these vessels are of the darker red-on-buff variety with burnished black interiors.

PLATE XII



Late or Classic Red-on-buff jar of the darker variety, with black interior, from Gila Bank ruin on the Gila River in the eastern part of the area.

SUMMARY AND CONCLUSION

As has been previously mentioned, the development of the Hohokam ceramic art as disclosed at the Snaketown site gives us a more definite idea as to the earliest stages of this culture than was formerly known. This is true largely for the reasons that the opportunity to examine such large mounds of refuse is more or less limited to areas, such as Indian reservations, that have not been levelled by the white man for agricultural purposes, and, as indicated by surface surveys, this may be the center of distribution of Hohokam culture. While it is possible that conditions in the more peripheral parts of the area may have been considerably different from those of the center, because of culture lag, contact with neighboring people, geographical conditions, etc., such a condition seems to have existed principally in the late period of development since the earliest traits seem to be wide-spread and homogeneous. More extensive research is necessary before such questions can be answered.

The earliest phases of Hohokam pottery, as seen at Snaketown, show a people without decorated pottery but evidently in contact with people to the southeast, according to Haury, whose influences on ceramics are recognized by the investigators. The first primitive types of decoration are then introduced, consisting of simple layouts of crude broad lines, rectangular patterns on a variable gray back-

ground. These are developed into finer lined designs and somewhat more complex patterns in which hatching is emphasized. This grew into a formalized style of decoration showing extreme use of hatching on a lighter background.

Up to this point the phases have been of the early developmental sort which were followed by a great period in which new ideas, patterns, and design elements ran rampant through the Gila Pueblo's Colonial and Sedentary periods, being applied to ground colors that had become a true buff. This was terminated by new influences and people coming into the area.

Thus, the Late or Classic period was ushered in, and this is marked by a return to a formalized style and, as in the early developmental period, is characterized by rectilinear patterns, on a smooth or polished surface the color of which runs from a light buff to a darkened, reddish buff.

In following the evolution of designs it is seen that in nearly all cases the Hohokam ceramic decoration was based on the gradual development of basic ideas of the earliest phases, which were carried through, though somewhat altered, to the later stages. This brief summary would indicate that actually three great periods is about all that can be readily discerned in the development of Red-on-buff, the earliest of which is the developmental period as indicated by the new information on the earliest or Pioneer type ceramics, the second

is the great middle period covering the Colonial and Sedentary periods, and the last period is represented by the Late or Classic Red-on-buff.

B I B L I O G R A P H Y

Amsden, Chas. A.
1936. "An Analysis of Hohokam Pottery Design." Medallion Papers, No. XXIII; Gila Pueblo, Globe, Arizona. May 1936.

Clarke, Eleanor P.
1935. "Designs on the Prehistoric Pottery of Arizona." Social Science Bulletin No, 9, University of Arizona. (M.A. Thesis, 1933).

Cummings, Byron.
1926. "Ancient Canals of the Casa Grande." Progressive Arizona, 1926.

Cummings, Byron.
1935. "Archaeology of the Southwest." The Kiva, Vol. 1 No. 1, Arizona State Museum, Tucson, Ariz. 1935. May.

1935-37 Class Lecture Notes for 1932, 1935, 1936, 1937, University of Arizona.

1935. "Prehistoric Pottery of the Southwest." The Kiva, Publication of Ariz. State Museum, Univ. of Ariz. Oct. 1935.

1936. "University Ruin." The Kiva, Vol. 1, No. 8, Ariz. State Museum, April 1936.

Douglass, A. E.
1929. "The Secret of the Southwest solved by Talkative Tree Rings." National Geographic Magazine, Dec. 1929.

1935. "Dating Pueblo Bonito and Other Ruins of the Southwest." National Geographic Society Contributed Technical Papers, Wash., 1935.

Fast, John E. and Caywood, Louis R.
1936. "Life Figures on Hohokam Pottery." Southwestern Monuments Monthly Report, March 1936, National Park Service.

Fraps, Clara Lee.
1935. "Tanque Verde Ruins." The Kiva, Arizona State Museum, Tucson, Arizona. Vol. 1, No. 4, Dec. 1935.

Fulton, W. S.
1934. "Archaeological Notes on Texas Canyon, Arizona."

BIBLIOGRAPHY (Cont.)

Contributions from the Museum of the American Indian, Heye Foundation, Vol. XII, No. 1 and No. 2. New York, 1934.

Gabel, Norman.
1931. Martinez Hill Ruins. (M. A. Thesis) University of Arizona. 1931.

Gladwin, H. S.
1928. "Excavations at Casa Grande, Arizona." Southwest Museum Papers, No. 2, Highland Park, Los Angeles. Sept, 1928.

1929a "Red-on-buff Culture of the Gila Basin." Medallion Papers No. III, Gila Pueblo, Globe, Arizona. 1929.

Gladwin, W. and H. S.
1929. "The Red-on-buff Culture of the Papagueria." Medallion Papers No. IV, Gila Pueblo, Globe, Arizona. 1929.

Gladwin, W. H. S.
1930a "A Method for the Designation of Southwestern Pottery Types." The Medallion, Globe, Arizona, No. VII. 1930.

1930b "An Archaeological Survey of the Verde Valley." Gila Pueblo, Globe, Arizona. The Medallion.

1930c ~~"Gila Polychrome."~~ Series I, Medallion Papers, No. VIII, 1930. Gila Pueblo, Globe, Arizona.

Gladwin, W. and H. S.
1930d "The Western Range of the Red-on-buff Culture." Medallion Papers No. V. Gila Pueblo, Globe, Arizona. 1930.

1931. "Some Southwestern Pottery Types, Series II." Medallion Papers. No. X, Gila Pueblo, Globe, Arizona. 1931.

1933. "Some Southwestern Pottery Types, Series III." Medallion Papers, No. XIII. Gila Pueblo, Globe Arizona. Dec. 1933.

1934. "A Method for the Designation of Cultures and their Variations." Medallion Papers, No. XV, Globe Arizona. 1934.

1935. "The Eastern Range of the Red-on-buff Culture." Medallion Papers No. XVI. Gila Pueblo, Globe, Arizona. March 1935.

BIBLIOGRAPHY (Cont.)

Gladwin, Harold S. "Conclusions." Excavations at Snaketown, 1937. Vol. I, Medallion Papers No.XXV, Gila Pueblo, Globe Arizona, Sept. 1937. (In preparation).

Gladwin, Harold S., Haury, E. W., Sayles, E. B., Gladwin, Nora. 1937. "Excavations at Snaketown." Vol. I. Medallion Papers No. XXV, Chap. XVI, Gila Pueblo, Globe, Arizona. Sept. 1937. (Manuscript of Chap. XVI was placed at my disposal through the courtesy of the Gila Pueblo by Dr. Haury. Also "Conclusions" by H. S. Gladwin.

Hanna, Murel W.

1931. An Archaeological Review of Middle Gila Culture. (M.A. Thesis) University of Arizona, 1931.

Haury, Emil.

1932. "Roosevelt:9:6, A Hohokam Site of the Colonial Period." Medallion Papers, No. XI. Globe, Arizona. 1932.

1934. The Archaeology of the Salt River Valley, Arizona. A Study of the Interrelations of Two Ethnic Groups. (Ph. D. Thesis) Cambridge.

1936. "The Mogollon Culture of Southwestern New Mexico." The Medallion Papers No. XX. Gila Pueblo, Globe, Arizona, 1936.

1937. "Pottery Types at Snaketown." Chap. XVI, Excavations at Snaketown, Vol. I, Medallion Papers, Gila Pueblo, Globe, Arizona, Sept. 1937. (In preparation.)

Hawley, Florence, M.

"Prehistoric Pottery and Culture Relations in the Middle Gila." American Anthropologist, Vol. 32, No. 3
1930. pp. 522-536. Menasha, Wis.

1936. "Field Manual of Prehistoric Southwestern Pottery Types." University of New Mexico Bulletin. April 22, 1936.

Holmes, W. H.

1886. "Origin and Development of Form and Ornament in Ceramic Art." 4th Annual Report, B.A.E., pp. 443-459, 1886.

Kidder, A.V., and Shepard, A. O.

1936. The Pottery of Pecos, Vol. II, New Haven, 1936.

BIBLIOGRAPHY (Cont.)

March, Benjamin.
1934. "Standards of Pottery Description." Occasional Contributions from the Museum of Anthropology of the University of Michigan, No. 3, Ann Arbor, 1934.

Morris, E. H.
1927. "Beginnings of Pottery Making in the San Juan Area." Anthropological Papers of the American Museum of Natural History." Vol. XXVIII, part 2, New York. 1927.

Trischka, C.
1933. "Hohokam. A Chapter in the History of the Red-on-Buff Culture of Arizona." Scientific Monthly, Vol. XXXVII, pp. 417-433. Lancaster, Pa. 1933.

Woodward, Arthur.
1931. "The Grewe Site." Occasional Papers, No. 1, Los Angeles Museum of History, Science and Art. Los Angeles, 1931.