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POTTERY OF THE PAJARITO PLATEAU AND
OF SOME ADJACENT REGIONS
IN NEW MEXICO

BY

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POTTERY OF THE PAJARITO PLATEAU AND OF SOME ADJACENT REGIONS IN NEW MEXICO

By A. V. KIDDER

INTRODUCTION

THE Pajarito plateau to the west of the Rio Grande in Sandoval and Santa Fé counties, New Mexico, is very rich in archeological remains. Although the location and general appearance of its ruins have been ably recorded by Bandelier¹ and Hewett,² no adequate description of the pottery found in and about those ruins has yet been published.³ Because of this, each new investigator has been without any hint as to what sort of pottery he might find in his region, or what he might reasonably infer from what he did find. Hence, much valuable evidence has undoubtedly been overlooked because of ignorance of its possible meaning. The finding, for example, of sherds of a certain type in a certain section of a ruin might be a discovery of the last importance, but it would hardly be recognized as such, and therefore not properly recorded, unless the investigator had a general knowledge of the distribution of the wares outside the immediate zone of his activity. Such a knowledge is not to be had in any published work, a very severe handicap to successful field and museum practice.

The present brief summary is intended as a start toward remedying this condition. It is, however, based on incomplete data, there being many ruins as yet unrepresented in our museums, nor have I had the opportunity of examining all the available collections. For this reason, it seems wisest to

¹ "Final Report," *Papers Arch. Inst. Am., Am. Series*, Vol. 4.

² "Antiquities of the Jemez Plateau," *Bull. 32, Bur. Am. Ethnol.*

³ A summary treatment of the subject is given by Hewett in *Communautés Anciennes dans le Désert Américain* (Geneva, 1908), p. 90.

present merely a short description of the known wares and not attempt to draw any final conclusions.

The ruins may be divided into two general classes: small scattered dwellings and large pueblos. There is, however, a more fundamental difference between the two than mere size, for the pottery of the small houses is entirely unlike that of the larger groups. Very little is known about the architecture or groundplans of these small ruins as no one of them has yet been excavated. They appear as inconsiderable mounds of fallen building stones or of adobe from disintegrated walls and seldom seem to have contained more than ten or a dozen rooms. There are numbers of them in most parts of the plateau suitable for human habitation that have so far been investigated. Little notice has been taken of them by archeologists, so that it is not possible to determine their exact range or to say whether or not they present any local peculiarities.

The larger groups are great aggregations of rooms, sometimes built of adobe, but more commonly of stone. While they cover considerable amounts of ground, an examination of their foundation walls and an estimate of the fallen building material in their rooms gives one the impression that they could never have been over two or possibly three stories in height. Their masonry is uniformly poor, little care having been taken in the shaping of the stones, which, moreover, were laid up with more adobe mortar than is compatible with permanency. As is well shown in the diagrams given by Bandelier¹ and Hewett,² the groundplans of these groups follow no very strict canons. There is, however, a general tendency to enclose a central court or plaza containing one or more circular kivas.

Between the very large and the very small there are found ruins of intermediate size, some of which appear to be allied to the one class, some to the other, while still others may perhaps be culturally intermediate. This question cannot be discussed until we have assembled our ceramic evidence.

¹ Loc. cit.—Frontispiece.

² Loc. cit.—Plates.

POTTERY OF THE SMALL RUINS

As none of these groups have been excavated, we have no whole pottery from them and this description is therefore based on collections of potsherds from the surface of a number of sites on the Pajarito itself and in the neighborhood of the city of Santa Fé.¹ The wares represented are the black-and-white, the red-and-black, and the corrugated.

BLACK-AND-WHITE WARE

The black-and-white preponderates. In general technique it much resembles the black-and-white found elsewhere in the Southwest. Such features as differences in shape, zones of decoration, and treatment of the design elements, which serve to distinguish Mesa Verde black-and-white pottery from that of Chaco cañon; Kayenta from Tularosa, etc., cannot be made out with certainty from such small sherds as are here available. It can be said, however, that this ware surely does not belong to the Mesa Verde or Kayenta groups; and that while it is quite as surely not an integral part of the Tularosa or Chaco divisions, it seems to show certain affinities to each of them.

The sherds have a dark gray paste, remarkably homogeneous and fine. It is unusually compact, the lines of fracture being almost as straight and sharp as those of kiln-burned crockery. Very little tempering material appears, but where present, it consists of tiny angular particles of some dark rock, apparently basaltic, with occasional bits of water-worn quartz, averaging about 1 mm. in diameter. The slip is very thin, considerably softer than the paste and is ordinarily little lighter than it in color. As in a few sherds, however, the slip is a clear white, it is possible that the dark appearance of the majority of the pieces is due to exposure to the elements. The surface is well smoothed down, probably with a wooden or gourd-rind tool which has left faint parallel striations scarcely visible to the naked eye. The surface is generally dull, the fine glossy finish produced by the rubbing stone being very unusual.

¹ On the Plateau: Ancho, Water, and Frijoles cañons. Near Santa Fé at Agua Fria and at Fort Marcy.

The paint of the decoration is uniformly a slaty black color. As in all other black-and-white groups, there are occasional examples in which the black paint, through some accident of composition or firing, is turned to a rusty red-brown.

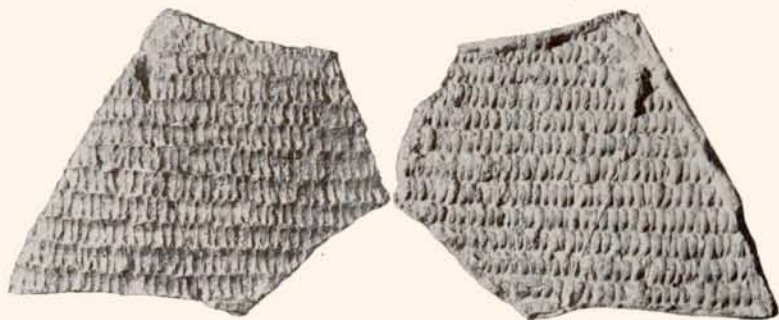
An extraordinarily high percentage of basket-marked sherds is found at the small house ruins. Such sherds occur, it is true, in most other black-and-white groups, but they are of the greatest rarity. Here, however, they can be picked up at almost any site. The impressions show that bowls and the lower parts of ollas were often formed in baskets. In these cases the clay was apparently coated on the inside of the basket and pressed down hard enough to render the marks of the weave sharp and clear. The upper parts of ollas were probably constructed by the regular coiling method. Some bowls, however, seem to have been molded or cast entire in basket forms, as the impression of the weave runs to the rim. The baskets themselves were all of the coiled variety, tray or bowl-shaped; the coils measure 4 to 5 mm. in breadth and there are about six stitches to the centimeter (plate XIV).

The common black-and-white vessel shapes are: bowls, ollas, and ladles. The bowls, as nearly as can be made out from the sherds, were fairly small, from 18 to 30 cm. in diameter for normal examples, the ware being from 4 to 6 mm. in thickness. They seem to have had flattish bases and rather abruptly rising sides. The rim is never thickened, is rounded off or sharp, and, with the exception of two or three examples from Ancho cañon which are curved outward, always rises evenly to its termination without flare or constriction.

In many cases the slip is applied only to the interior and the exterior is left in the dark gray paste; sometimes it is run over the rim and carried part way down on the exterior;¹ and now and then a sherd indicates that the entire exterior has been slipped. Decoration is normally strictly confined to the interior.

Of ollas very little can be said. I have seen only small fragments, none large enough to give any basis for reconstruction.

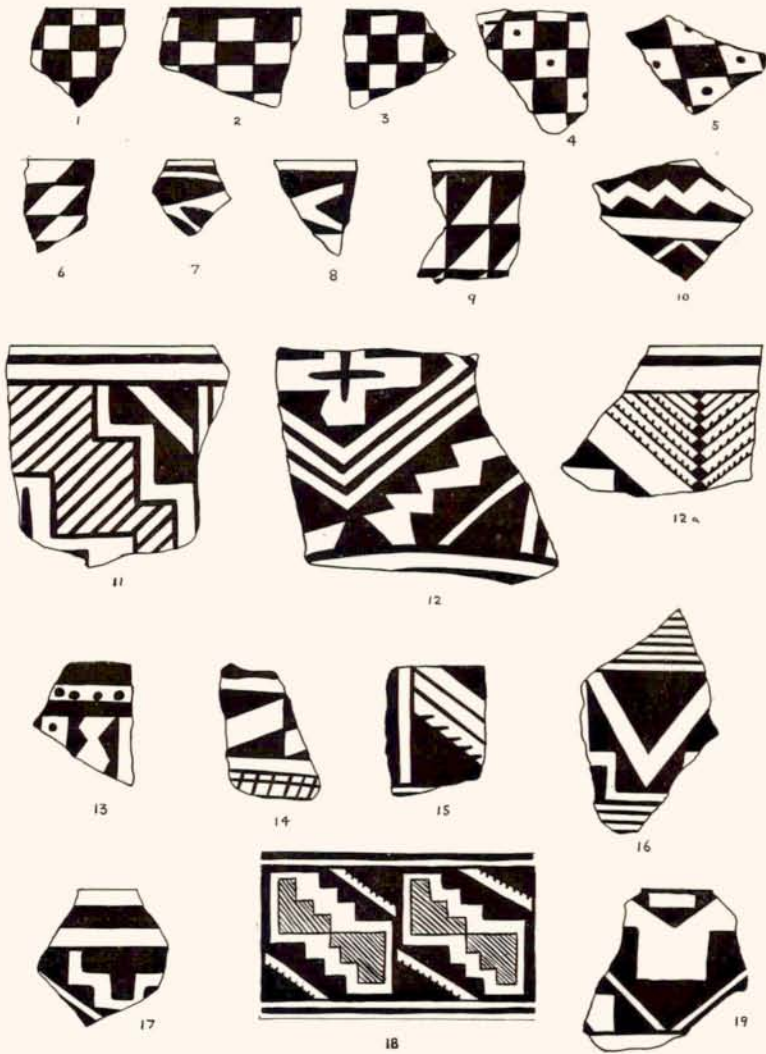
¹ This is a feature commonly found in Chaco cañon bowls.



SHERDS SHOWING CASTS OF BASKET MARKINGS



BROKEN OLLAS FILLED WITH TUFA, PROBABLY USED AS MOLDS



SMALL RUINS — BLACK AND WHITE DESIGNS

They are of much heavier ware than the bowls (7 to 8 mm.) and bear handles of the loop variety. From the angle at which the handles are set against the body, it would seem that they had the same downward rake as those of Mesa Verde and Montezuma creek ollas.¹

Ladles are of the "bowl-and-handle" type. I have seen no examples of the "half-gourd" style. One fragment in the Peabody Museum collection may have come from a high necked pitcher similar to those of Chaco cañon,² and another is perhaps from a canteen like those of Mesa Verde.³

Black-and-white ware decoration is strictly geometric. Designs, however, on the small fragments available can so seldom be made out with certainty that an analysis or characterization is quite impossible. Certain decorative elements and design arrangements typical of the better known black-and-white groups certainly do not occur, but there are many figures and combinations found here that are to be seen in one or other of them. Our knowledge of the distribution of black-and-white designs is unfortunately very vague, as most writers have lumped all the groups together and in publishing collections have selected for illustration the most striking and unusual pieces, neglecting the common, typical, and therefore most important specimens. I do not attempt therefore a classification, but give a number of drawings of designs (plate xv).

REDWARE

I have found bits of this pottery at all the small ruins where I have made a careful search, but it is common at none of them. Technically it is inferior to the black-and-white, is soft, more friable and has a much less homogeneous paste. In cross-section the pieces are dark gray, becoming yellow or red toward the surfaces which are covered by a rather heavy slip of fine rich Indian red. The tempering material is apparently the same as in the black-and-white, but is considerably more

¹ Cummings, *2d Archeological Bulletin, University of Utah*, p. 38.

² Pepper, *Putnam Anniversary Volume*, p. 220, pl. XIII.

³ Fewkes, "Sprucetree House," *Bull. 41, Bur. Am. Ethnol.*, pl. 20, b.

profuse. The decoration is in dull black paint which has no more luster than the surfaces upon which it is applied. All the pieces of redware which I have seen are from bowls with unthickened flattish rims. The finish is rather better than in black-and-white; the rubbing stone seems to have been used, but without producing a true gloss. While no whole designs can be made out, the decoration is plainly as severely geometric as is that of the black-and-white; hachure, angled, and stepped figures are commonly employed.

There is a sherd from Ancho cañon which does not conform to this type.¹ It is from the upper part of a bowl with out-curved rim. The exterior is well smoothed, clear red, and the interior nearly to the lip has a glossy black, almost polished surface. This, of course, very strongly suggests the bowls of the upper Gila.²

CORRUGATED WARE

Corrugated ware is the well-known indented type which has so often been described from other regions. As elsewhere it is made of coarse gray clay with much gross tempering and occasionally a slight admixture of mica. While the examples from the Pajarito do not offer any striking peculiarities which can serve to distinguish them from the general run of corrugated ware throughout the northern and eastern part of the Southwest, their quality is distinctly below the average. The coiling as a whole is not very evenly accomplished and the indentations are seldom sharp and clear; the latter were often made with the thumb tip, in which cases the nail marks and the skin-ridge impressions are visible. The coils and indentations are frequently almost obliterated as if the pieces had been wrapped in a skin or cloth before the vessel was thoroughly dried. Large round-bodied jars with large orifices seem to have been the prevailing forms.

¹ Peabody Museum Cat. No. 81837.

² Hough, "Antiquities of Gila-Salt Valleys," *Bull. 35, Bur. Am. Ethnol.*, p. 25.

POTTERY OF THE GREAT RUINS¹

PAJARITAN POTTERY

This very distinct group of wares may be called for convenience sake Pajaritan, because the Pajarito plateau, although merely one of the regions where it is found, has given us most of our available study collections; also because the Pajaritan potters seem to have been singularly expert in the handling of the characteristic techniques. I shall, therefore, describe the salient features of Pajaritan pottery as the best known single group in order that it may be used as a standard with which to compare like wares from other localities.

Pajaritan ceramics differ from all others of the Southwest in technology and decoration. We have, to begin with, at least four wares only found in this group, three of which have decorative systems peculiar to themselves.

The wares are as follows: red and glaze, biscuit, incised, black.

REDWARE

The redware is firm, solid, and dense; though fairly hard, it is less so than the average black-and-white pottery of the same region and can be scratched rather more easily with a steel point. The paste varies greatly in color according, apparently, to the degree of heat applied to it in burning. The usual shades are reddish, tending in some cases towards yellows and grays. Tempering is either quite absent or consists of fine structureless gray particles, $\frac{1}{4}$ to $\frac{1}{3}$ mm. in diameter which have the appearance of pulverized potsherds. Visible surfaces of all vessels are coated with a red slip of very smooth texture,² the normal color of which is a clear rich brick red that turns on

¹ The vessels and fragments upon which this study is based were taken from the following ruins: Puyé, Tyuonyi, Yapashi (Stone Lions), Tshirege, Otowi and Tsankawi. The excavations were made by Dr Hewett assisted, during two seasons, by the author. The collections are now in the National Museum, New Mexico State Museum, and Peabody Museum. The author is greatly indebted to Dr Hewett for permission to describe and figure vessels collected by him.

² Ferric oxide, Fe_2O_3 , according to analysis at the Harvard University Laboratory.

overfiring to brown or fawn. The glazed paint is really the distinguishing feature of this class. The pieces were decorated with a black pigment in which there was evidently mixed a flux that produced, in firing, a vitrification of the lines of the ornament. With the exception of one small piece mentioned by Hewett,¹ the glaze has never been found to cover the entire surface of any vessel. Analyses by two advanced students of chemistry in the Harvard laboratories, made under the direction of Drs. Forbes and Clark, showed the glaze to be a silicate of lead, colored with iron and manganese.²

The glaze varies a great deal both in consistency and in luster. The lines are sometimes very irregular and "running" and again sharp and clear. As to luster, the paint is often dull or "crusty," having entirely failed to "take." Between this and fine, glossy, more or less iridescent, glaze, there are all stages, the two being sometimes found on the same pot. These differences are undoubtedly due to the composition of the mixture and the accidents of firing; no change seems ever to have been brought about by exposure or the action of humus acids.

In general, it may be said that the Pajaritan glaze paint could not be made to produce narrow lines, or, in most cases, lines of any great sharpness or accuracy of outline. This fact must obviously have had a great influence on the selection of designs and on their development; as certain features, such as hatching, small figures, and the like, could not be drawn. It would have been an impossibility to approximate even, in Pajaritan glaze, such ornamentation as is found on the black-and-white pottery. Many designs are so confused by the running and spreading of the glaze as to be quite illegible. These conditions must have tended toward the production of large figures, and the elimination of detailed intensive embellishment such as is the rule in the older black-and-white ware

¹ *Communautés Anciennes*, p. 83.

² Hewett states (*loc. cit.*, p. 83) that the glaze is a salt product, made by painting over the decorative lines with a solution of salt in water. Further chemical researches are necessary.

and in the contemporaneous biscuit. The emphasis would naturally be thrown on mass and color. Beginnings of this feeling are seen in the red and white fillings which appear in Pajaritan ceramics. Red fillings are much commoner than white, and a consideration of them is not without interest. The red is a heavy pigment of a rather brighter and richer color than the slip. It was applied before the glaze lines, which were afterward drawn around it. This is proved by the many instances where the glaze overlaps the red. The exact color of the slip must have been more or less a matter of chance, depending on the degree of heat developed in firing. While in some cases the slip is so nearly the color of the red filling that there is difficulty in deciding whether or not the latter is present, there is usually a distinct but harmonious contrast. This is particularly the case where the slip is of a yellowish or brownish tinge; it is on pieces of these colors indeed that the red filling is most frequently found, so that it seems probable that the potters had at least some idea of the approximate final shade of their wares. As the red fillings were applied first, they must have been painted on with the ultimate decorative scheme well in mind. Any error would produce an unsightly variation which would have to be outlined in glaze. This may perhaps have had an influence on the development of designs. As a possible morphological factor it should, I think, be considered.

BISCUITWARE¹

This pottery, so characteristic of the ruins of the Pajarito and of the northern Rio Grande culture as a whole, is distinguishable from all other light-colored wares by its peculiar yellowish and grayish tone and by its lightness and softness. The paste is usually yellowish gray, homogeneous in structure, somewhat granular, and in most specimens a trifle porous. The majority of sherds contain no tempering material, but where it does occur, it consists, in all the pieces that I have examined, of bits of water-worn quartz $\frac{3}{4}$ to 1 mm. in diameter.

¹ The term "biscuitware" is mine. It is applied because of the light, porous nature of this pottery.

The visible surfaces of all vessels are coated with a slip varying in color from almost lemon yellow to dark gray. A light gray is perhaps the commonest shade; pure white is never seen. While the slip is apparently incapable of taking a high polish, it was evidently always worked over with the rubbing stone. The decoration is in sharp, clear, black paint, much less variable in color than that of black-and-white ware; it is quite lusterless and therefore entirely distinct from the glaze paint of the red-ware. Although I have not yet had it analysed, I suspect it to be of vegetable origin.

Biscuitware is much softer than either red or black-and-white; some pieces can be scratched with the finger nail and all may readily be carved with a sharp knife. The ware is very thick, but it is so light that a vessel of biscuit and one of red, both of the same size, are approximately equal in weight.

INCISED WARE

This third characteristic Pajaritan ware is technically closely allied to the biscuit. The paste is, according to the magnifying glass, the same; like biscuit it is seldom tempered and it has the same lightness and softness. Unlike biscuit, however, the pieces are always thin. I have not been able to find any example that bears a true slip, the surfaces appear to have been left in the paste and are, accordingly, quite uniformly dull gray. In a few cases, however, a sort of micaceous wash seems to have been applied to the vessels after they had been finished and decorated, but before firing. The ornament consists of rectilinear geometric designs of uniform style. The lines were made by the so-called "trailing method" with an implement having a blunt point 1 to 2 mm. wide. Occasionally, punctate ornamentation appears in the form of rows of dots or dashes; there is a single sherd from the Oso basin in the State Historical Society collection, Colorado Springs, that shows a line of thumb prints.¹

BLACKWARE

Rough black is the ordinary cooking ware of the region, as is indicated by the heavy coating of soot found on the pieces.

¹ Collected by Jeancon.

It is made of a poor grade of clay, often very full of sand or even tiny quartz pebbles and is seldom even carefully smoothed on the exterior. The coil, with which, of course, all the Pajaritan pottery was made, is seldom left intact on the blackware as was done in the case of the corresponding culinary pieces in many other regions. Where the coil does appear it is merely indicated by a faint ribbing on the surface and it was very rarely, if ever, notched to give the well-known corrugated effect so characteristic of the black-and-white group.

Micaceous black should be classed, perhaps, as a subdivision of the black pottery, and indeed it is the same in general technique, having the poor clay, rough exterior, and occasional semi-obliterated coils. It differs in that it contains a considerable admixture of finely ground mica, and furthermore there is sometimes added to the outer surface a micaceous wash. This gives it a grayish, and in extreme cases, a silvery appearance. However, the mica seems to have had a deleterious effect upon the ware; it so rots in the ground, that it scales at the least touch and for this reason no whole piece, as far as I know, has ever been excavated.

SHAPES

A lack of exuberance, if such a term be admissible, is seen in the pottery shapes of the Pajarito. There are a few simple, well-defined forms from which there is comparatively little variation. To this simplicity and standardization may perhaps be due that beauty of line which manifests itself in all the vessels of the region.

Pitchers, ladles, mugs, and seed-jars, all familiar types in other localities and found to a certain extent, at least, in the local black-and-white, do not occur; while only one new shape, the so-called "prayermeal bowl," appears. The first three of the lacking forms are all handled vessels, and it is a peculiarity of Pajaritan pottery that handles are not conventional on any form. A few fragments of handles have been found at Puyé; they seem to have belonged to pieces of eccentric shape, small cups and the like, forms which are not standard in the region.

It may be that the clays with which the Pajaritans chose to work, or the processes of firing with which they were familiar, were not favorable to the making of dependable handles.

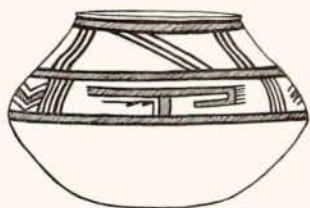
REDWARE

OLLAS.—Ollas are characterized by their flatness, the diameter being usually from $\frac{1}{3}$ to $\frac{1}{2}$ greater than the height. The underbody is gracefully curved and the bottom may or may not be convex. The upper body is fairly flat and the orifice large. The most common shape is that shown in plate XVI, figs. 1 and 2, where there is very little differentiation in angle between the body and the neck. The red slip which covers the exterior is carried down only a short distance into the interior, the rest of that surface being left in the yellowish base clay, only partly smoothed. Decoration is confined to the upper body and the neck. Usually there is a band about each, the two separated by a series of lines. A constant characteristic of redware ollas is a slight flare of the lip of the orifice (see plate XVII, fig. 8).

BOWLS.—Plate XVII, figs. 1, 2 and 3, shows redware bowls from the Pajarito region. Fig. 3 is a very distinct type which is found in all the larger Pajarito ruins, most commonly, perhaps, at Puyé. It is called the "olla bowl" because of its somewhat restricted aperture. The ordinary bowls have a very uniform shape, full rounded bottom with rim which tends to turn in somewhat at the top. The bowls are neither shallow nor deep, for while they are not as flat as biscuitware bowls they are still in the "less than hemispherical" class, averaging about 26 cm. in diameter by about 10 cm. in depth. The structure of the rim itself is noteworthy, it is thickened considerably on the inner side just below the edge.¹ This makes a ridge which must have been very useful as a "stop" to keep liquids from slopping out of the bowl.

THE DECORATIVE ZONES OF REDWARE BOWLS.—(Plate XVII, figs. 1 and 2.) The *exterior* is always decorated from a little below the rim to the upper part of the undercurve, some-

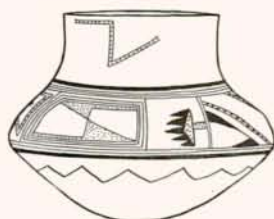
¹ See plate XXVII, fig. 6.



1



2



3



4



5



6



7



8

"PAJARITAN" WARES—OLLA SHAPES

times with a band with framing lines; sometimes with a series of repeated independent units. Interior decoration may consist of: first, a band under the ridge of the rim, leaving a fairly large, clear circle in the bottom, which again may have a symbol in it; or, second, the whole interior may be taken up with decoration.

OLLA BOWLS.—(Plate xvii, fig. 3.) Decoration is confined to the upper part of the exterior. There is no interior decoration although that surface is slipped and polished as in ordinary bowls. There are two known examples of bowls of this type that are provided with spouts.¹ This is a feature unique in the Southwest. Both are from Puyé. (Plate x, fig. 6.)

"PRAYERMEAL BOWLS."—(Plate xvii, figs. 4 and 5) are small, square or rectangular dishes, with straight sides which are either perpendicular or slightly outside the perpendicular. They are rarely over 10 cm. in length and 4 cm. in depth. The long sides are frequently terraced. Decoration is on the exterior of all four sides and on the interior bottom.

OTHER REDWARE FORMS.—There is a canteen in the New Mexico Historical Society collection. It is of redware with typical glazed ornamentation and appears to be ancient. Its provenance is unknown. A sherd from a smaller though similar canteen was found at Puyé. Sherds of one or two eccentrically shaped pieces have been picked up, but these are of the greatest rarity.

BISCUITWARE

OLLAS.—The ollas of this ware are very seldom recovered in perfect condition as they were apparently never buried with the dead, and in house ruins they are found broken into many fragments, making collection and restoration difficult. From the sherds, however, and from the few perfect or restored specimens now in museums, it would seem that the biscuitware olla is taller than the red and has more neck (plate xvi, figs. 3 and 4). In their zones of decoration, the biscuit ollas also

¹ See Hewett, *Communautés*, pl. xv, fig. g. The second example is a fragment in the New Mexico Museum.

differ from the red. The neck design, usually a band in the latter, often takes, in biscuit ollas, the form of three, or more commonly four, independent repeated units. (Plate XVI, fig. 3). The body-bands occupy approximately the same positions, but festoons, dashes or zigzags (plate XVI, fig. 3) are sometimes applied to the underbody.

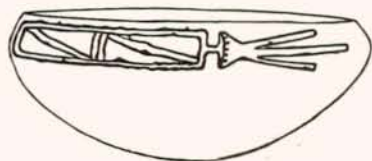
BOWLS.—Bowls may be roughly divided into two classes: (1) Small (17-23 cm. in diam.) with incurving rim (plate XVII, fig. 10). (2) Large (23-35 cm. in diam.) with straight rim (plate XVII, figs. 8 and 9).

Examples of Class 1 are deeper in comparison to their diameter than those of Class 2, but both classes are shallower than the redware bowls. Their depth is usually little more than one third of their diameter; they also average considerably larger than red bowls. A recurved bottom is frequently seen, particularly in large specimens.

The decorative zones are the same as in redware; the upper part of the sides, both interior and exterior. As in redware the design is usually in the form of a band, but may be replaced on the exterior by repeated units, and in the interior by a device covering the whole surface. Biscuit bowls are peculiar, however, in that they almost always bear ornamentation on the inner surface of the straight rim. This may consist of repeated small independent units, a zigzag line, a festooned line or some narrow decoration of that nature. (Plate XVII, fig. 9). The flat top of the rim itself is usually ticked at fairly wide intervals.

JARS.—Jars (plate XVII, fig. 11) seem to form a well-marked type intermediate between the bowl and the olla. They are small pots 12 to 17 cm. high and 20 to 25 cm. in diameter. Their rims are somewhat similar to those of bowls, but they are not decorated in the interior, the one ornamented zone being a broad band about the outside.

I know of no other biscuitware shapes, nor has there ever been found, I think, any sherd of an eccentric or otherwise extraordinary piece.



1



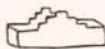
2



3



4



5



6



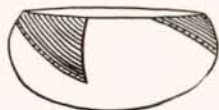
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8



9



10



11

"PAJARITAN" WARES — BOWL SHAPES

INCISED WARE

The only form of gray incised pottery that has yet come to light on the Pajarito is the olla. Perfect examples are so rare that I cannot say anything as to the type shape; plate XVI, figs. 5 and 6, shows two of the very few known. The decorative zones are bands about the body and lower neck.

BLACKWARE AND MICACEOUS WARE

I group these together as the shapes seem identical. As in the case of the gray incised we have little material to work with, but for a different reason. The gray is rare even in the form of sherds; but while the black, having been employed for the manufacture of cooking vessels, is correspondingly abundant, it is very friable, and because of its lack of beauty and the difficulty of distinguishing fragments of one pot from those of another, there being no designs to aid in the restoration, collectors have failed to recover any considerable number of specimens. In spite of the paucity of evidence, however, it is at once apparent that the black ollas are quite different in shape from the types just examined. They have full, round, bodies with no salient shoulder, very large orifice, and sharply flaring rim (plate XVI, figs. 7 and 8). The sherds show that some of them were of considerably larger size than any of the ollas of the other classes.

BIRD-SHAPED OR FOOT-SHAPED JARS.—The pieces of this form, so far recovered, have all been made of blackware, a fact which suggests that their shape may have had some practical culinary use. In other regions where this type occurs it is always decorated and is never of the coarser cooking ware. They exhibit very little naturalism, a slight protuberance on the elongated side being the only feature which even remotely suggests the life form. They lack the "wing knobs" or "wing ridges" seen elsewhere.¹

This completes the list of standard Pajaritan shapes and there now remain to be considered reworked pieces of broken pottery. These occur in some abundance.

¹ See Hewett, *Communautés*, pl. xv, fig. j.

There are:

1. Sherds smoothed on the edges and worked into various forms; some for pendants and like objects of personal adornment; some for scrapers used in the manufacture of pottery.

2. Olla bottoms cut down to serve as small, shallow dishes or plates. Some of these show signs of having been employed as paint holders.

3. Tufa-filled pot molds. (Plate XIV, fig. 2.) These are very common in all the larger Pajaritan ruins, but are not found, as far as I am aware, in any other region. They were made from ollas which had become broken or worn through at the bottom. A cut was made around the shoulder, removing the broken base, and the upper part of the vessel was utilized as follows: the piece was turned upside down and rested on the neck (which was sometimes cut away to give a firmer stance). The orifice was then stopped up with a large potsherd, a mat, or a basket and the inside filled with a mixture of tufa and ashes. I think there is little doubt that these curious and ingeniously made articles were used for starting coiled vessels. They might also have served as braziers for carrying coals of fire, or possibly as trays for roasting nuts.¹

General Technical Features

Redware with glazed ornament,	{	Ollas, Bowls, Prayermeal Bowls, Canteens.
Biscuitware with ornament in dull black,	{	Ollas, Bowls, Jars.
Gray incised ware,		Ollas.
Black and micaceous black,	{	Ollas, Bird-Shaped Jars.

Simple shapes and lack of handles; three distinct decorative systems for first, red; second, biscuit; third, incised; broken ollas reused as pot molds. Lack of good coiled ware and of

¹ See Cushing, "A Study of Pueblo Pottery as Illustrative of Zúñi Culture Growth," *4th Ann. Rep. Bur. Am. Ethnol.*, p. 484 and fig. 501.

such smaller handled receptacles as ladles, pitchers, and mugs. Lack of effigies and eccentric pieces.

DECORATION

BISCUITWARE¹

Of the 260 designs that have been studied in preparing this paper, about 250 are taken from bowls. The rest are from ollas, and small jars. In most cases both interior and exterior decorations of each bowl were obtained.

The majority of the designs are of the band type; framed above and below by two, three, or four parallel lines, the top-most and bottom ones usually being heavier than the others (plate xvii, figs. 8 and 9). Beside the band form there are decorations which cover, more or less fully, the whole interior surface of bowls. With a very few exceptions these may be divided into three groups: whirling awanyus; cross figures; and hatched triangles depending from the rim. This last form also occurs on bowl exteriors where it approximates the band style.

BAND DECORATIONS

There seems to be no difference or correlation between the band decorations from the exterior and interior of bowls, or between the bands on bowls and those on ollas. Analysis shows the bands to consist of: first, recurring units; or, second, a continuous pattern. Alternation of two unlike elements, so characteristic of redware is not seen in the biscuit system of ornamentation; nor is the redware method of marked panelling of the band by groups of vertical lines, often resorted to. When such panelling does occur it seems to be a part of the units themselves rather than a conscious segregation of the units.

RECURRING UNITS

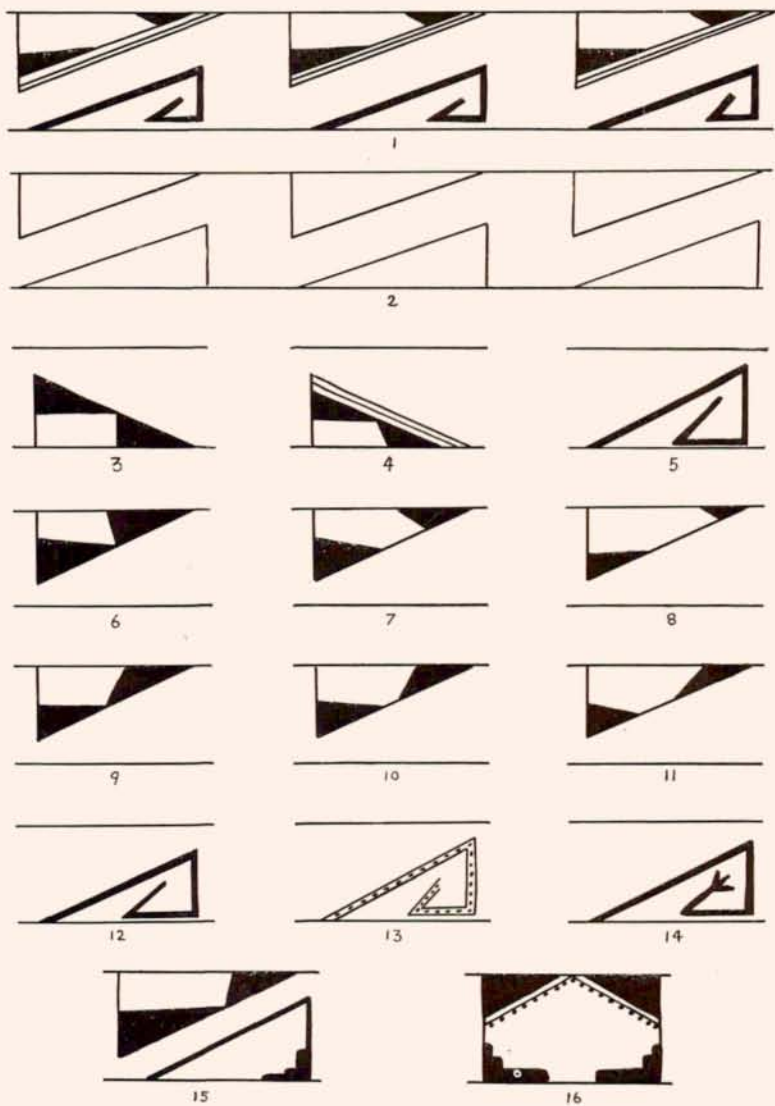
With a very few exceptions all band decorations of recurring units may be described as based on recurring pairs of opposed

¹ The treatment of the decoration, both of biscuit and redware in this paper, is purely analytical and descriptive. Mr K. M. Chapman is engaged in studies on the morphology of the symbols, which, when published, will surely go far to aid us in understanding the development of the decorative art of the Southwest.

right triangles with oblique hypotenuses (plate XVIII, fig. 2). The right triangles are not solid but are merely triangular fields which contain more or less elaborate interior decoration (plate XVIII, fig. 1). The two triangles which go to make up the unit may be like in structure or, more often, unlike, in which case the triangle which varies from the standard usually takes the form of a heavy line bent into triangular form (plate XVIII, fig. 1).

The standard triangle is almost invariably present. It is characterized by an open space at the base formed by cutting off and filling in two of the angles (plate XVIII, fig. 3). The hypotenuse is usually paralleled by one or more straight lines (plate XVIII, fig. 4). The variations of the filled angles are interesting and may, perhaps, give us a basis for developmental study. The most obvious method of cutting off the corners is at right angles (plate XVIII, fig. 3). And this would theoretically seem to be the earliest form. A development in two directions is possible, all the stages of which are actually found on the pottery (plate XVIII, figs. 6, 7, 8, in one direction; figs. 9, 10, 11, in the other). It may be stated as a general rule, that as the angles are modified from the theoretically first stage, the lines paralleling the hypotenuse become more numerous and are more often elaborated with dots (plate XVII, figs. 8 and 9).

As was stated above, both triangles of the unit are not always alike, but as was also stated, the standard form is almost always present. The varying triangle when in the form of a bent line may be simple (plate XVIII, fig. 12), or it may consist of several fine parallel lines which usually contain dots between them (plate XVIII, fig. 13). In a few cases the bent line ends in three points (plate XVIII, fig. 14). Another variant from the standard which occurs in fifteen cases contains (usually in the right angle) an ornament which seems related to the step-figure of black-and-white ware (plate XVIII, fig. 15). This element is not infrequently seen in other designs, such as the cross figure. It is always used to fill the corner of a square or triangle.



BISCUITWARE—ANALYSIS OF "STANDARD" DESIGN

BAND DECORATIONS OF REPEATED UNITS OTHER THAN THOSE BASED
ON OPPOSED TRIANGLES

When a part of an awanyu, arm or body, or of a cross figure partakes of the nature of a band, it is often decorated with units of the type just discussed. Other units are also used which, though they seem more typical of awanyus and cross figures than of true bands, nevertheless occur occasionally in regular bands and so may perhaps best be discussed here. Such units are the "opposed birds" and the "cut down rectangle."

The first of these two forms consists of a rectangular panel in which the two diagonals have been drawn. The upper and lower triangles formed by drawing the diagonals are filled with dots, and one of the diagonals has a small crook at each end (plate XIX, fig. 9). That this figure was meant to represent two birds may seem far-fetched, but it should be noticed that the bodies of most of the really naturalistically drawn birds are spotted (see fig. 14), and that in a very similar figure found on the ancient black-and-white ware, the heads are depicted in the same manner.¹ Some variants of this design are perhaps somewhat nearer the naturalistic, in the possible indication of the tail (plate XIX, fig. 10).

The second figure, the "cut down rectangle," seems purely geometrical. It is made by reducing the area of a rectangle by drawing pairs of lines parallel to the sides, then parallel to the ends inside the first set and so on (plate XIX, fig. 11). This system is also applied to reduce the area of a rectangle somewhat, without entirely filling it up, in which case a figure, often the "opposed birds," completes the pattern (plate XIX, fig. 12).

Still another band unit, which we may call for convenience the "drawn curtain," occurs but twice. It might be considered a sport but for the fact that the two examples come from Tyuon-yi and Ojo Caliente respectively, and that in these two widely separated pueblos the design is executed in exactly the same

¹ See Cummings, loc. cit., p. 42.

manner. A drawing explains this figure better than a verbal description (plate XXVIII, fig. 16). It will be noticed that the elements that make up this unit are characteristic of the typical opposed triangle figures.

BAND DECORATION, CONTINUOUS PATTERNS (PL. XIX, FIGS. 1-8)

These decorations are all based on the zigzag. The simplest, a plain zigzag line (plate XIX, fig. 1), is very rarely found. The commonest form is composed of two parallel zigzags with dots between them (plate XIX, fig. 5). When three lines are thus combined the dots are usually applied to their outer sides, giving a rather different effect (plate XIX, fig. 7). A succession of diamond-shaped units is occasionally produced by crossing two zigzags (plate XIX, fig. 8). This series is very short, however, and is, perhaps, not allied to the single zigzag. The zigzag designs are used both on the interior and exterior of bowls and also as neck ornaments for ollas. When applied to a bowl exterior or an olla they are, of course, bands pure and simple, but in the interior of a bowl they sometimes give the effect of a star.

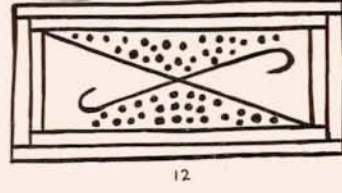
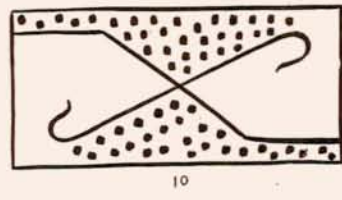
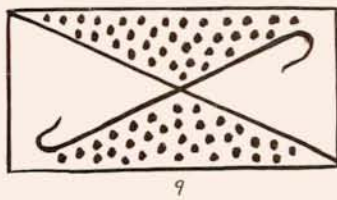
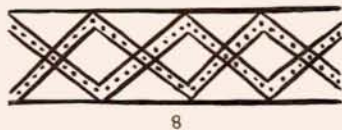
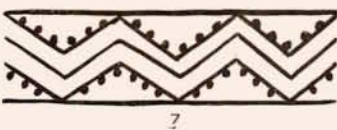
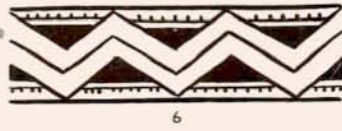
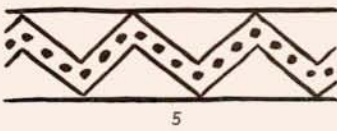
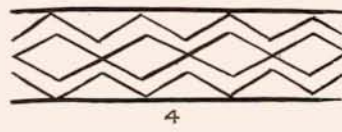
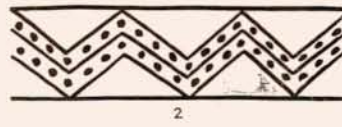
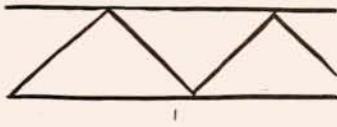
HATCHED TRIANGLES DEPENDING FROM THE RIM

Figures of this class are found only on small bowls with incurved rims. Such bowls are almost always decorated either



FIG. 12.—Biscuitware.—“Double flag” figure.

inside or out with hatched triangles. The units usually hang directly from the rim rather than from a line. They may be either right-handed or left-handed. On the exterior they



BISCUITWARE DECORATIONS

encircle the bowl (plate XVII, fig. 10), while in the interior their apexes approach each other (plate XXI, fig. 3). In the interior there are usually three units of the design, two and four occurring more rarely. The exterior follows the interior in number of units. The interior and exterior are identical in about fifty per cent. of the cases. Other designs combined with this one are the "dotted zigzag," the "double flag" and in two cases the "cross figure." It is never found with the whirling awanyu or the standard band decoration. An interesting feature of this system of decoration is the fact that with it are found the majority of the life symbols, turtle (fig. 15), speckled body bird (fig. 14), and dragon fly.

The "double flag" decoration occurs fifteen times. Like the hatched triangle design it is usually found on the smaller bowls, but it is also used as a "filler" in larger devices such as awanyu, and as a neck ornament for ollas (see plate XVI, fig. 3). It is fairly constant in type, a straight line with parallel terminal projections running in opposite directions (fig. 12). The projections vary in number and length and the top and bottom ones are sometimes dotted (fig. 12, *b*). Three of these units placed in the interior of a bowl fall into a sequent or whirling order which may prove of morphological importance.

THE AWANYU

This form of decoration occurs on about thirty per cent. of the pieces tabulated. It is particularly characteristic of bowl interiors, there being few instances of its presence on ollas, and but one case, and that considerably modified, on a bowl exterior.

The name awanyu I borrow from Hewett, merely as a convenient term, but without indorsing his identification of the symbol.¹ More investigation is necessary before we can speak with certainty of its meaning. The characteristic features of the symbol are the five-pointed triangular figures which form what one might call the heads. These seem essential to the true awanyu.

¹ Hewett, *Communautés*, pp. 91, 92.

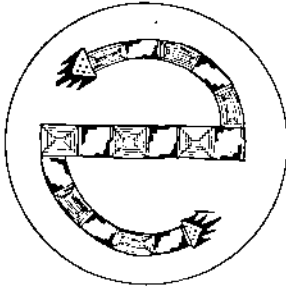
Awanyus may be classified as follows:

	No. of examples
I. Whirling Type (pl. xx, figs. 1-4):	
(a) Double head with body (pl. xx, figs. 1 and 2).....	23
(b) Triple head without body (pl. xx, figs. 3 and 4).....	8
II. Band Type:	
(a) Head attached to half a standard band decoration (pl. xxi, fig. 2)	4
(b) Body and head a band (pl. xxi, fig. 1)	4
III. Independent Head Types:	
(a) Dependent from rim (pl. xxi, fig. 4).....	2
(b) Diamond type (pl. xxi, fig. 3).....	2

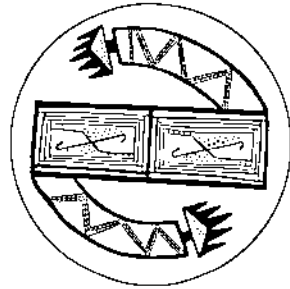
WHIRLING TYPE.—As the table shows, somewhat more than three quarters of the examples belong to the whirling type and of these three quarters are of the double head with body variety. These awanyus have a rectangular body painted across the circular interior of the bowl, and two arms attached to diagonally opposite corners of the body, which, running anti-clockwise, fill out the two halves of the circles, terminating in the typical five pointed heads (plate xx, figs. 1 and 2). Considering the parts of the figure separately, we see that the body is usually a decorative panel or is divided into two or more panels according to its length and thickness. The arms are less commonly so treated, often being merely dotted or even plain lines. The body sometimes terminates in two triangular projections. These are seen in one awanyu of the band type (plate xxi, fig. 1), where they are suggestive of a forked tail.

The bodyless type of the symbol is much less common. It is usually three-armed, (plate xx, figs. 3 and 4), though there are examples with two and four arms. In the typical form the three branches or arms start near the center of the bowl, but without being joined together, and run nearly to the rim where they are bent to the left or against the hands of the clock, and terminate in the typical heads. The arms consist of one, two, or three parallel dotted lines, and are never panelled or decorated as are the bodies and arms of the previous class.

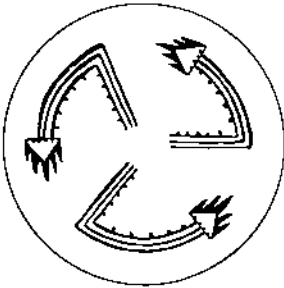
BAND TYPES.—Here the awanyu fills the comparatively narrow band under the rims of bowls or about the bodies of ollas and consequently loses its circular or whirling form.



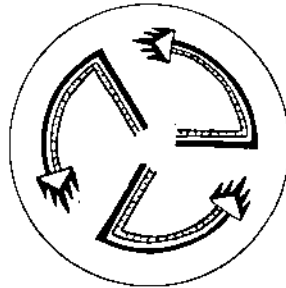
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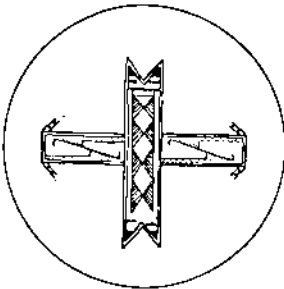
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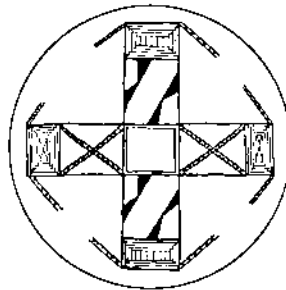
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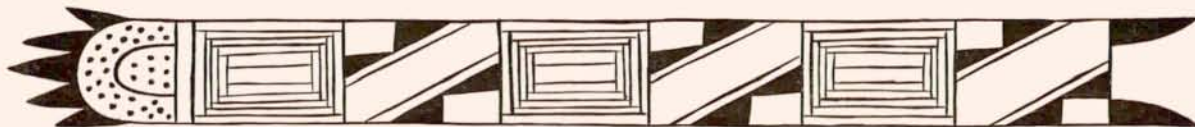


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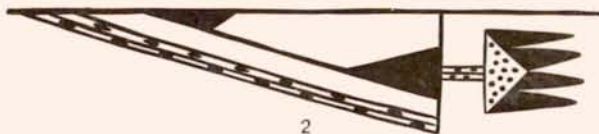


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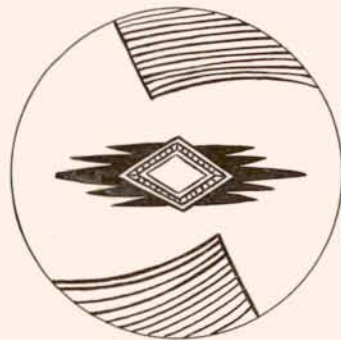
BISCUITWARE - WHIRLING AWANYUS AND CROSS FIGURES



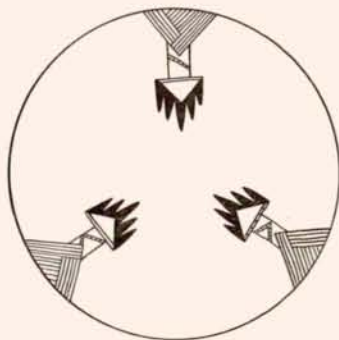
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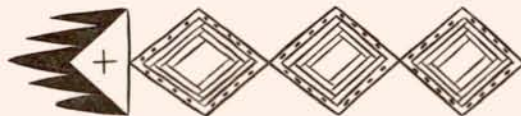
2



3



4



5

Examples of this style are uncommon. They fall into two divisions:

1. Those having for body one of the "pointed filled" triangles with its accessory hypotenuse lines of the standard band form (plate XXI, fig. 2).

2. Those with a long, panelled body similar to the body of the first whirling type (plate XXI, fig. 1 and plate XVI, fig. 3). There are, of course, no arms in either case, the heads being joined directly to the ends of the bodies. The anti-clockwise direction is also usually adhered to in designs of the band class.

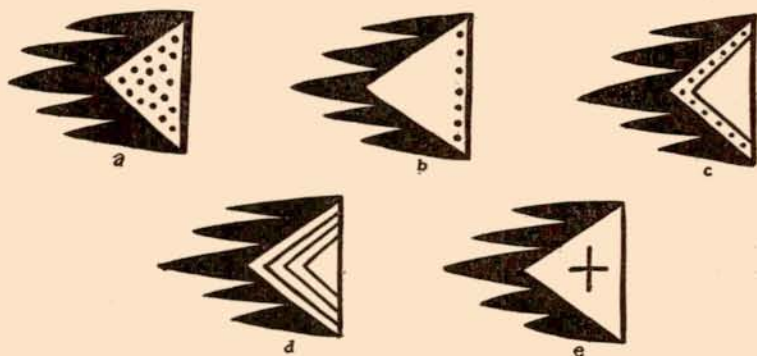


FIG. 13.—Biscuitware.—Awanyu "heads."

INDEPENDENT HEAD TYPES.—There are only three specimens in which the head is the predominating feature. Of the three, one has three heads on very short arms and partly indicated bodies, which are attached to a line under the interior rim (plate XXI, fig. 4). The other two lack arms entirely, the five points of the heads being applied to the long ends of a diamond figure which apparently represents the body (plate XXI, fig. 3). The two examples come, one from Otowi, one from Ojo Caliente, a fact which would seem to indicate that the form is neither accidental nor the work of a single potter.

The "head" or "heads" of the awanyu vary less than any other part of the symbol. As has been shown above, any other feature may vary or be absent, but this element always holds to its regular form. It has five tapering projections

arising from a triangular base (fig. 13). The projections are uniformly painted black and the base left open. The occasional rounded form of the base (plate XXI, fig. 1) and the rare occurrence of four or six projections are, I am sure, due to careless drawing. The same cause, I think, is responsible for the few cases in which the heads are pointed with the hands of the clock. About half of all the heads contain some arrangement of dots in the open base (fig. 13, *a, b, c*); a few are embellished with concentrically drawn triangles (fig. 13, *d*) and there are two cases in which a small cross is introduced (*e*).

THE CROSS FIGURE (PL. XX, FIGS. 5 AND 6)

There are only five examples of this decoration, three from Otowi, one from Tschirege, and one from an unknown locality. It is a cross with arms of equal length placed in the round field of the bowl interior. The arms are divided into panels and there is usually a square panel at the junction of the four. In three cases there are two parallel lines with dots between them, running from each corner of the ends of the cross arms. In one example these are replaced by the "bird wing" and in another the ends are forked as in some of the awanyu bodies.

The panel designs of these cross figures are strikingly like those of the panels in awanyu bodies, particularly in the prevalence of the "cut down rectangle." Some relation between the two seems probable, but theorizing on such scanty evidence is dangerous.

LIFE FORMS

There are a few decorative elements which may reasonably be identified as naturalistic representations. That some of them are birds seems certain (fig. 14), others are more doubtful and resemble what have been called butterflies and dragonflies in other regions. Points to be observed in future morphological investigation are: the form of the bird head with the two parts of the beak shown, the form of the wing, of the feet, and particularly the presence of dots in various parts of the designs. There are two turtles, shown fairly realistically (fig. 15), but no human, floral, quadruped, or snake forms.



FIG. 14.—Biscuitware.—Birds.

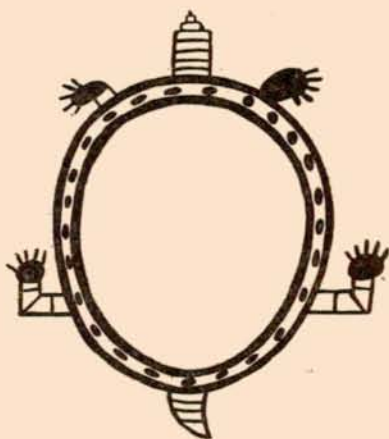


FIG. 15.—Biscuitware.—Turtle.

MINOR DECORATIONS

On biscuitware pieces, particularly bowls, there are several areas usually, but not invariably, decorated; areas too circumscribed for the application of large standard designs. In bowls these surfaces are the flat top of the rim, and the interior margin of the rim. The top is almost always embellished by spots or dabs of paint which I have called "ticks." They occur in many ways: at regular intervals all around; in groups of two, three or more; or in more complex groupings such as 2, 3, 2, 3, etc.

The most common form of ornamentation for the inner margin is the zigzag line (fig. 16, *a*, *b*) or the festoon (*c*). Broken parts of these zigzags are also seen (*d*), as well as figures which have something the appearance of birds (*e*). When, as sometimes occurs, another line is added, a figure approaching the naturalistic is formed (*f*). In which direction this sequence ran, it is, of course, impossible to say without further material.

Other areas of minor decoration are the underbodies and the inner margins of the rims of ollas. These bear the same zigzags and festoons seen in bowls, as well as the broken-up parts of the same. Series of vertical and horizontal bars are

also occasionally met with (fig. 16, *g*), as are various combinations of straight or curved dashes (*h*, *i*, *j*).

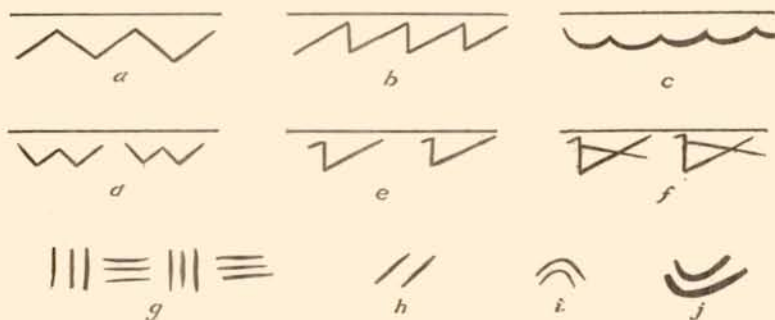


FIG. 16.—Biscuitware.—Minor decorations.

CORRELATIONS

In studying the designs an attempt was made to find correlations between the classes of decoration. I thought it possible that some particular form of exterior ornament might always, or at least often, be associated with some interior one such as, for example, the awanyu. This I was not able to demonstrate, nor, indeed, did I find any evidence of such a condition. Some forms, however, seem to have an affinity for certain others. With the hatched triangle, for instance, occur the majority of the life forms. With it, also, often occur the "dotted zigzag" and the "double flag," while the awanyu and the standard band decorations are wanting.

In the awanyu and the cross figure the panels are often occupied by the "opposed birds" and the "cut down rectangle" elements which rarely occur in any other connection.

On the exterior of awanyu bowls the commonest design is the standard band pattern, but all the forms of the zigzag band designs are also present.

REDWARE

The designs may be classified under three general heads:
I. Bands.



1



2



3



4



5

REDWARE—BAND DESIGNS

II. Independent units, usually repeated.

III. "Allover" Type.

There are, of course, examples which do not fall accurately into any one of these classes; but in general the decorations are remarkably uniform. Differences occur in the filling up of the framework rather than in the planning of the ornament as a whole.

I. BANDS.

Bands are divided into two types:

A. True bands with framing lines above and below (plate XXII, figs. 1, 2, 3).

B. A single "base line" with ornament:

(a) Placed upon it (plate XXII, fig. 4).

(b) Depending from it (plate XXII, fig. 5).

The true bands are greatly in the majority. They are very uniformly framed by lines of equal thickness, two above and two below (plate XXII, fig. 1). In this feature redware differs from black-and-white ware and biscuit, where the top-most and lowest lines are usually the heaviest, and there are series of finer lines between them and the design proper.¹ The "break" is almost always found, occurring on one side of the bowl or olla in the top set of lines, and on the opposite side in the lower pair (plate XXII, figs. 1 and 2). This is in accord with the rather carefully balanced nature of the ornamentation as a whole.

The idea of balance is still further carried out in the interior treatment of the band. Series of vertical bars are drawn between the framers, dividing the band into panels, usually four in number, which panels are occupied by the true units of the design (plate XXII, figs. 1, 2, 3). The standard arrangement seems to be an alternation of two unlike units. There is practically no variation from this rule.

Keeping in mind the fact just mentioned, viz.: that unlike elements are alternated; let us turn to an analysis of those elements, leaving for later study the decorations which consist of repeated units, and those which cover the whole interior of

¹ See Biscuit designs, plate XVI, figs. 2 and 3; plate XVII, figs. 8, 9, 11.

bowls. The most common arrangement seems to be the alternation of a conventional bird figure with a diagonal ornament composed of more or less elaborated oblique parallel lines (plate XXII, fig. 1). I consider the latter first as it is the more constant of the two forms.

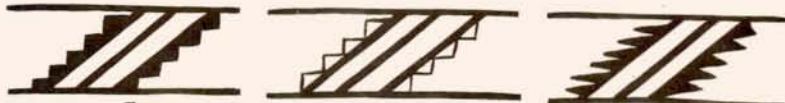
PANELS. OBLIQUE DECORATION

This element of the design consist of two or more lines drawn obliquely across the panel in either direction. In short panels they usually come from the corners (plate XXIII, fig. 1), while in longer ones they do not reach the vertical bars (plate XXIII, fig. 2). When the panel is even longer a second set, occasionally a third or fourth, may be drawn, thus forming a zigzag (plate XXIII, fig. 3). The elaboration of these oblique lines is interesting and is practically always found along their outer edges. I give a series (plate XXIII, figs. 4-15 incl.), illustrating the various developments.

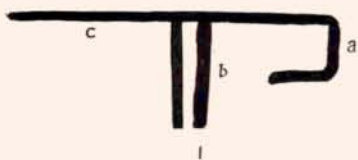
The variations given in plate XXIII are, I think, rather ornamental than symbolic. They are all closely related and apparently derived from the terraced form (No. 7). Poor drawing might have been the origin of Nos. 9, 12 and 13, while the produced sides of the terraces probably gave the idea for Nos. 10 and 11. No. 14 may also have started in this way; the crooks which give the little units their birdlike appearance having been an adaptation based on an accidental resemblance. Whether or not these should really be classed as birds, may be judged by the reader after we have presented that type. The little units are placed, as the drawings show (plate XXIII, fig. 14), on the outside of the sets of parallel oblique lines. They follow each other up on one side and down on the other. Plate XXIII (figs. 16-24 incl.) gives all the forms that I have been able to record.

BIRDS (PLATE XXIV)

We now come to the large class of symbols which, for want of a better term, we call birds. That they are by no means naturalistic representations is, of course, obvious. Neverthe-



REDWARE—OBLIQUE PANEL DESIGN



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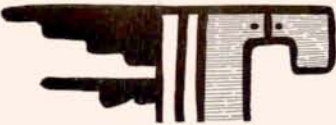
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REDWARE—THE BIRD FIGURE

less, they remind one of birds, and somewhat resemble bird figures from ancient black-and-white ware. On the exterior of black-and-white bowls from the Mesa Verde¹ there sometimes occur series of figures which undoubtedly represent birds. The heads are merely crooks, the bodies semicircular, feet and legs are drawn naturalistically, and the tails shown as three or four parallel lines. The two birds with touching breasts from the Cannonball Ruin, on McElmo creek, Colorado,² are built on the same plan. In these cases the head is depicted by a mere crook, the tail by parallel lines, and the legs and feet are hardly more elaborately drawn. It is interesting to note that the wings do not appear. I do not hold that the Pajaritan "birds" are necessarily the descendants of these black-and-white symbols, but merely wish to point out that a crook was there considered a sufficient representation of the head. On this somewhat scant evidence, I venture to identify as bird figures those elements bearing the crooked forward part or "head."

A classification of the "birds" is difficult; I have never seen two from different pots, exactly alike, yet they all have the following common characteristics which seem essential: the aforementioned bent or crooked "head" (plate XXIV, fig. 1, *a*), vertical "legs" (plate XIV, *b*), and a horizontal "tail" (fig. 1, *c*), the top of which is always drawn in the same plane with the head. This is the simplest form that contains all the elements.

Of the three parts the "tails" are the most variable; the "legs" the least. The latter consist of from one to four or even five vertical bars, running from the base line to the "head-tail" line. The upper line of the tail is always a continuation of the head line, and the additional parts of it lie below and against the upright "legs" (plate XXIV, fig. 2). The commoner forms of the tail are given in the plate. Where the tail ends in plain lines these are sometimes crossed, near their termination, by one, two, or three short vertical bars (plate XXIV, figs. 3, 5, 9).

¹ See Nordenskiöld, "*Cliff-dwellers of the Mesa Verde*," Pl. xxviii, fig. 3.

² Cummings, loc. cit., p. 42.

The crooked "heads" vary considerably. They may consist of a single line (plate XXIV, fig. 1), two lines (11), or an enclosed space (5, 12). A dot may, perhaps, be considered a representation of the eye. In a large number of cases there are small projections on the front of the crook, four to ten in number, but usually six (figs. 6 and 8 of plate XXIV).

Where red filling is present in the figure it is generally found in the head and front part of the legs, the whole making a solid line of color (plate XXIV, fig. 3).

GENERAL ARRANGEMENT

I have taken up the bird symbol here, among the panel decorations, because it is in panels that it is most commonly found. Some of its other occurrences are of interest. A rule of two seems to hold fairly constantly throughout its manifestations—two figures appear in the panel arrangement, two birds form part of several of the "allover" designs (see below), while many exterior decorations consist of two large red-filled birds variously placed.

Little birds are sometimes seen on the apexes of triangles and I have observed traces of this feature on many sherds too badly broken to be copied.

There are a few figures which have bird characteristics, but which lack the crooked head. They all have legs and tails; in three the head is replaced by a triangle, one has no trace of head, while the fifth bears the projections seen on some heads in the place where the head should be.

A decoration very commonly used as a panel-filler, alternated with the oblique types,¹ appears to be derived from the archaic opposed keys. It consists of two opposed figures, coming from the top and bottom framing lines respectively. Plate XXII, fig. 3, shows a pair of these decorations. It will be noticed that the addition of a crook head is all that is necessary to add to the figures in order to make a typical bird symbol.

Another panel figure, though uncommon, is so regular in its structure that I think it may be considered a type. There

¹ Never, I think, with bird symbols.

are seven instances of it. Five come from Tuyonyi, and one each from Tschirege and Otowi, this fact proving that it is neither the work of a single potter, nor a purely local development. Its make-up is better shown by a drawing than by a description (plate XXII, fig. 2). The main bent line always appears, the stepped appendage (which bears some resemblance to certain birds' tails) is present in four cases; and the dotted line, or lines, across the broad angle occurring in all but one example, seem to be an essential part. It is alternated with bird or allied symbols four times; once with a diagonal, and once with a zigzag.

THE "JOG FIGURE"

Perhaps a bare description of this symbol, and a statement of its occurrences, is better than an attempt to fit it into a classification. There are five instances: (three from Tuyonyi, two from Ojo Caliente); all from olla-bodies and apparently all

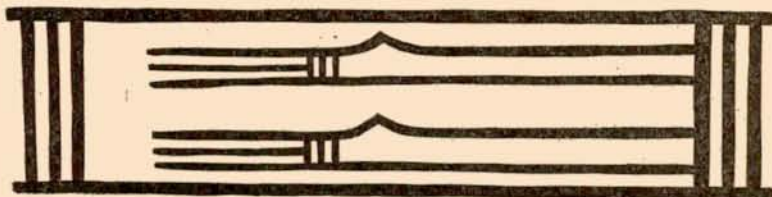


FIG. 17.—Redware.—Jog figure.

in panels. As the type-drawing shows (fig. 17), it is a double figure with duplicate parts: long shafts, "jogs" pointing upward, and tripartite ends cut off from the shafts just beyond the jogs by cross lines. Its tripartite ends seem to ally it to the "three finger type" (see below). Some Ojo Caliente examples, however, by vertical bars (legs), and terraced terminations (tails) seem to show analogies to bird symbols.

SPECIALIZED PANEL DECORATIONS FROM OLLA NECKS

Two forms of panel designs, which are practically restricted to the neck-bands of ollas, may be called:

- (1) The "swallowtail"—eleven examples (fig. 18, *b*)
- (2) The "dash type"—six examples (fig. 18, *a*)

They are single figures, varying only in detail, and are best illustrated by the drawings. The swallowtail is apparently derived from the produced sides of triangles drawn on horizontal bars. It is often elaborated with dots along the lines, and with smaller interior triangles.

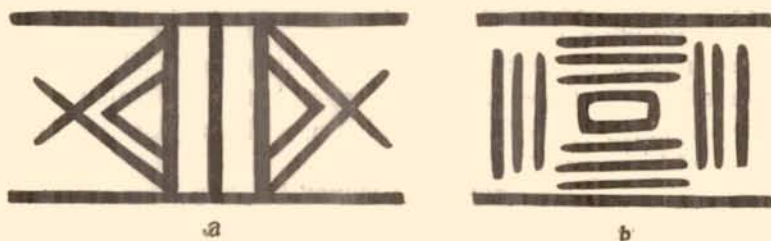


FIG. 18.—Redware.—Olla-neck designs.

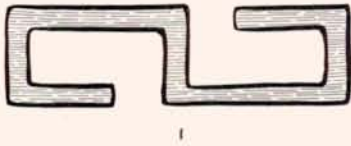
The "dash" figure is cross-shaped in plan, consisting of sets of dashes arranged about a common center, which sometimes takes the form of a small rectangle.

There are two occurrences of the "swallowtail" on bowls, one exterior from Puyé, one interior from Tyuonyi. The "dash" design I have found only on olla necks.

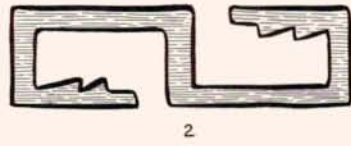
SINGLE-LINE BANDS

This form of decoration is practically restricted to bowl exteriors and particularly to those of the "olla type." In it the units of design are attached to a single line or single pair of lines, rather than placed between pairs of framing lines as is the case with true bands. The elements may be on top of the line or may hang from it. A single unit is repeated; there is, of course, no panelling; and alternation occurs very rarely. There are two types:

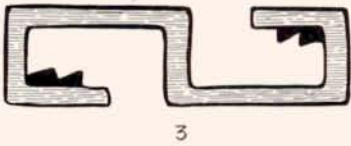
1. Where the elements are attached to the line
 - (a) Above
 - (b) Below
2. Where the decoration is part of the line itself
 - (a) Above
 - (b) Below



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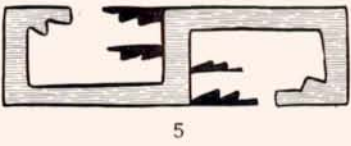
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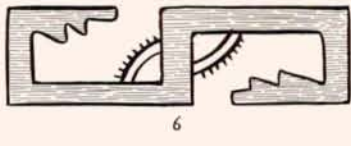
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REDWARE—THE DOUBLE KEY FIGURE

1. (a) Detached symbols placed along the line, usually on the upper side.

(b) Continuous pattern, usually of swallowtail triangles, along under side. Found principally on olla bowls (plate XXII, fig. 5).

2. These are large, bold, red-filled designs, the elements of which are integral parts of the "base line." The base line is double; one of its sides is continuous, the other (upper or lower as the case may be) is worked into the desired form, the red filling being unbroken (plate XXII, fig. 4). The repeated symbols generally represent birds. As they depend largely on the mass of their red filling for effectiveness, little detail is indulged in. The crooked head and upright leg-region run through the series. In general appearance, these red-filled single line bands suggest the designs of independent repeated units, the next group to be considered.

II. INDEPENDENT REPEATED UNITS

Designs of this class are found, almost exclusively, on bowl exteriors. The few exceptions occur in the decoration of olla necks.

A short series best illustrates the forms taken by the commonest type, that of the bent line ending in key figures (plate XXV). Two of these units regularly constitute the exterior ornamentation of a bowl or of an olla-neck (see plate XXV, fig. 2). This arrangement occurs again and again, particularly on bowls from Puyé. The variations in the figures consist largely of differences in the terracing of the key ends (plate XXV, figs. 8-12 incl.). These do not seem to be of much importance. More interesting are the details shown in figs. 3, 5 and 6, the first two resembling features commonly associated with birds' tails, the latter having some affinity to the "sun symbol." These analogies to the bird are still further noticeable in the ornament as a whole. The key part is not unlike some birds' tails, the addition of a crooked head would make a very typical bird. Just this is seen in plate XXV, fig. 7.

The second main group of designs of independent repeated

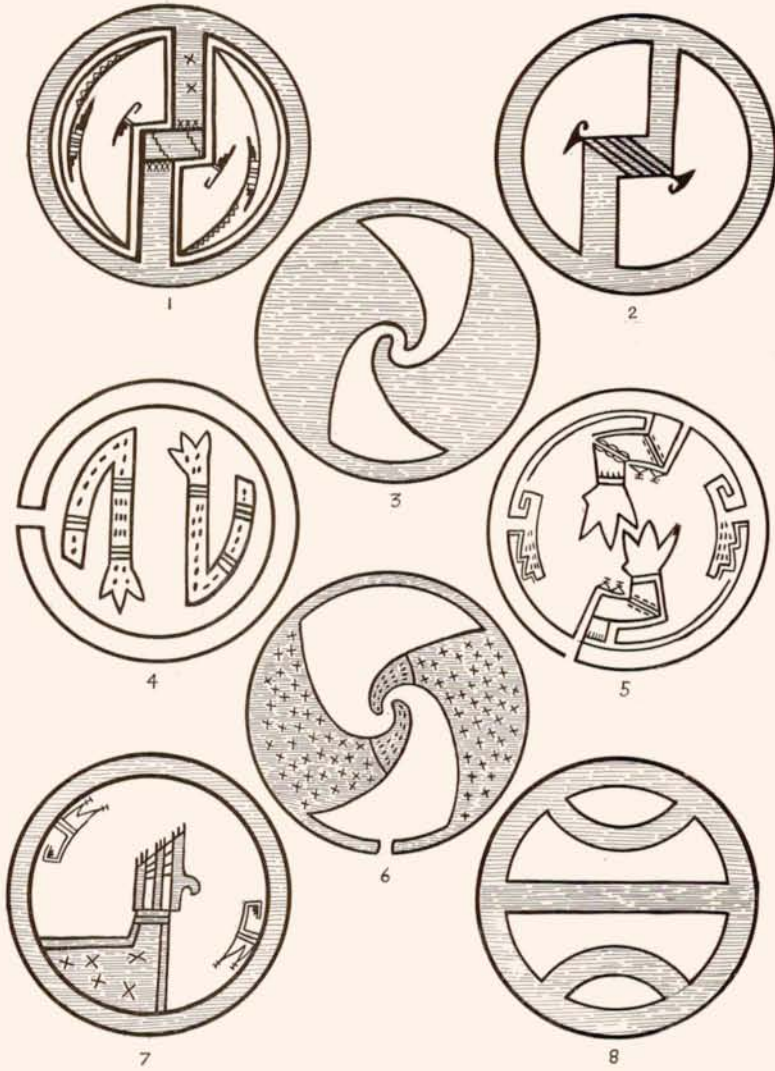
units may be called the *Three Finger Type* (fig. 19 and plate XVII, fig. 1). These are very interesting because they adhere closely to a fixed standard, and because of their possible relation to the "jog" figures, certain "allover" types, and also to the awanyus of biscuitware.



FIG. 19.—Redware.—"Three-finger" design.

They occur exclusively on the exteriors of bowls, usually run from left to right and are always two in number. They may be described as having a long rectangular "body," short "neck," and a triangular "head," from the point of which grow three long, square-ended projections. The whole is drawn in outline, and is filled, except for a long rectangular space in the body, with red paint. The open body space is treated as a band, but is rarely panelled. It usually contains three plain or dotted lines, arranged in a zigzag. I have twenty-five examples, three whole, the rest more or less fragmentary. Eighteen show the distinguishing "three fingers," three the equally typical neck, while the remaining four are probably parts of bodies. In twenty-two cases the direction is evident; twenty run from left to right, two in the reverse sense.

The three fingers, as I have said, are blunt-ended, either square or slightly rounded. The middle one is the longest and runs horizontally in the same line as the body; the other two diverge somewhat, the upper reaching to the rim. The junction between the "fingers" and the apex of the head is usually cut across by bars, the inner one often dotted. The head apex is turned away from the body in all but two cases, the inside of it is decorated with a triangle three times, and with what may be crude representations of the human face twice. This latter feature I imagine to be an adaptation due



REDWARE—ALLOVER DESIGNS

to the accidental resemblance of the whole to a plumed head.

The short neck is often crossed by bars but may be left open. The decoration of the body space is largely confined to line zigzags, but key-figure, terraced line, and short T marks also appear.

While evidence as to the termination of the body is scant, a square end seems to be conventional. One example from Tschirege has a dotted butt, one from Tyuonyi is finished off with a T-shaped appendage.

Occurrences by locality are: Ojo Caliente 1, Tschirege 2, Puyé 3, Tyuonyi 19.

III. "ALLOVER" TYPE (PLATE XXVI)

As I remarked in the introduction to this study, those designs which cover the whole interior of bowls are but poorly represented in collections, because of the fact that they can only be made out with certainty when a large part of the piece is recovered. There are, however, a few examples, one group of which, bearing some resemblance to the three fingered figures, may, perhaps, best be considered first.

Little can be gained by a description of these (plate XXVI, figs. 4 and 5); their similarities and dissimilarities are obvious. The three-branched ends, while not strictly like the three finger type, give the same general effect; there are two units in the design, the filling of the arms, and the cutting off of the heads by crossbars, seem to be points in common. There may have been a convention that a given symbol on the exterior of a bowl should take a certain form: on the interior a different one. It is hardly safe to theorize.

More homogeneous are the designs shown as figures 1 and 2 of plate XXVI. I am sure that this is a standard decoration, as I have seen many fragments from designs of the same style that I have not been able to restore. The essential feature seems to be a band drawn boldly across the surface of the bowl, jogged in the middle, with a small bird perched on each angle of the turn of the line. No inferences can be drawn from the

supplementary ornamentation of fig. 1; the crosses in the red line, however, should be compared with those seen in figs. 6 and 7 of the same plate.

Figures 3 and 6 are interesting as being the only examples of the spiral in any form that I have seen from the wares of the large ruins on the Pajarito.

Figure 8 shows an example of a general type which the sherds prove to be not uncommon. It depends for its effectiveness on a symmetrical division of the interior by red-filled bands and little on detailed decoration.

Figure 7, plate xxvi, is, as far as I know, unique. The two birds, however, are placed in the same relative positions as those in fig. 5.



FIG. 20.—Redware.—Human heads.

Figure 20 shows the only three certain representations of the human face that have so far been found in "Pajaritan" pottery. The left hand one is from a bowl-bottom, the center from a bowl exterior, that on the right from an olla-neck.

Only two good examples of animal forms have been found, one from a bowl exterior, and one from a small olla. The latter belongs to a type which is not unusual on the pottery of other regions. It is also commonly found in the pictographs of the San Juan drainage. The identity of the species represented is problematical. No plant forms occur.

What may be called the "sun symbol" is a circle or semi-circle with radiating lines. It appears twice from Puyé and once from Tyuonyi; in this last case it is alternated with the human face. It is an uncommon and variable feature at best and probably should not be given typical rank.

The little rectangular "prayermeal" bowls are interesting because of the likeness which they bear to the ceremonial dishes in use among the modern pueblos. It seems probable that they had a like use in ancient times, and this view is perhaps strengthened by the uniformity of their decoration. This consists of a terraced figure in six of the seven cases recorded. It should also be added that one of the prayermeal bowls in the New Mexico Museum (plate xvii, fig. 5) has terraced sides. This feature is also found in modern Zuñi and San Ildefonso ceremonial dishes.

I have described the decoration of the "Pajaritan" wares, both red and biscuit at considerable length because the art of this group is without question the most homogeneous and highly specialized development of its kind known in the Southwest. This homogeneity and susceptibility to analysis renders "Pajaritan" decoration of particular value for comparative purposes and for studies in the development of Southwestern culture.

PRE-PAJARITAN WARES

There are a number of sites along the Rio Grande and its tributaries which produce red and biscuitwares like, yet unlike, the pottery from the large "Pajaritan" and allied ruins. The majority of these houses are of from ten to forty rooms; smaller communities than the Pajaritan settlements, yet larger than the houses at which black-and-white occurs. I have no idea as to what their distribution may be, but they seem to run from the Jemez mountains in the north nearly to El Paso.¹ Ceramically, they appear to fall into two groups, one of which is more like the standard Pajaritan than the other. Although I have seen sherds from many sites, I have adequate material for description from only one of each of the groups. These are "Agua Fria School House" (least like Pajaritan) and "Frijolito" (more like Pajaritan).

AGUA FRIA

"Agua Fria School House" ruin lies on the Santa Fé creek at Agua Fria, about three miles south of Santa Fé. I call it

¹ Sherds in the Bandelier Coll., Peabody Museum.

the "School House Ruin" to distinguish it from another nearby ruin at which only black-and-white ware is found. Here in 1911 I made a large collection of sherds.¹ They consist of red and biscuitware, the former much the more abundant. There is also some black-and-white.

REDWARE

This pottery is gray in cross-section and carries little or no tempering material. The visible surfaces are coated with a fine, clear, red slip which is well smoothed, but not at all glossy. The decoration is applied in very thin, "flat," jet-black glaze, with none of the iridescence and brownish shades seen in the Pajaritan. It is seldom glossy, parts of nearly every line are "untaken," and where the vitrifying substance is thickest it has usually collected in little flat, rounded masses, giving a rugose appearance which is very characteristic.

SHAPES

Only two forms are represented in the collection: bowls and ollas. The former were apparently from 12 in. to 14 in. in diameter and in spite of this fairly large size were strikingly thin and light. The ware seems to have been very tough and strong. The body of the bowl was gently rounded and the rim, which had no thickening, was without bevel in either direction. The edge of the rim was square.

Of the ollas little can be said, as only a few fragments were recovered. The underbody was surely round without the abrupt shoulder seen in some other classes; the neck was elevated in a direct collar from 1 in. to 2½ in. high. There were no handles.

DECORATION OF BOWLS²

With the exception of two sherds which show oblique rectilinear designs in thin white lines (fig. 21, *d*) suggestive of Halonawan and Heshotauthla, there is no exterior decoration at all. The interior is ornamented either directly upon the red

¹ P. M. Cat. No. 81853.

² Olla decoration not ascertainable.

slip or upon a band of white or yellowish slip.¹ The ornament begins at a single line set $\frac{1}{4}$ in. to $\frac{3}{8}$ in. below the rim and ends at a similar line near the bottom. Sets of framing lines do not seem to occur. Pure geometric elements were apparently the rule; there is no sign of bird or other life figures, nor of such symbolic representations as the awanyu or the Pajaritan "bird." Curvilinear motifs, the circle and scroll, are rare.

The general arrangement of the designs is oblique and the elements employed are pairs of opposed key figures on raking stalks (fig. 21, *a*), stepped lines (very commonly) (fig. 21, *b*); and bands of single checkerboarding each open space bearing a dot (fig. 21, *c*).

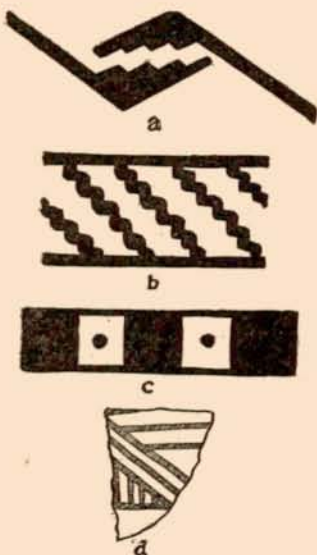


FIG. 21.—Agua Fria Schoolhouse Redware.

BISCUITWARE

Biscuitware is much less common than red. It is more like black-and-white ware than is the biscuit of the standard Pajaritan class. From black-and-white ware, however, it is easily distinguished by its much greater thickness, softness, and lightness. The slip is dull whitey-gray well smoothed over the whole interior. The exterior is unslipped and therefore rough, showing the coarse dark gray paste.

The decoration of this biscuitware is not legible on the small sherds collected; but it can safely be said to be quite unlike that of Pajaritan biscuit, none of the typical elements of that

¹ When the decoration is over white slip, the glaze is often a bright green in color. This is also true of Little Colorado glaze when over a white base. That the change in color is due to some chemical action by the white slip is shown by the fact that the same lines become the normal black when they run off the white base on to the red ground.

style being observable. Whether it is allied artistically to the black-and-white or not is problematical. I am inclined to think it is.

FRIJOLITO

While this pottery is markedly different from what I have called standard Pajaritan it is much less so than that just described. Its place in the archeology of the region can be better discussed after an examination of the wares. Red and glaze

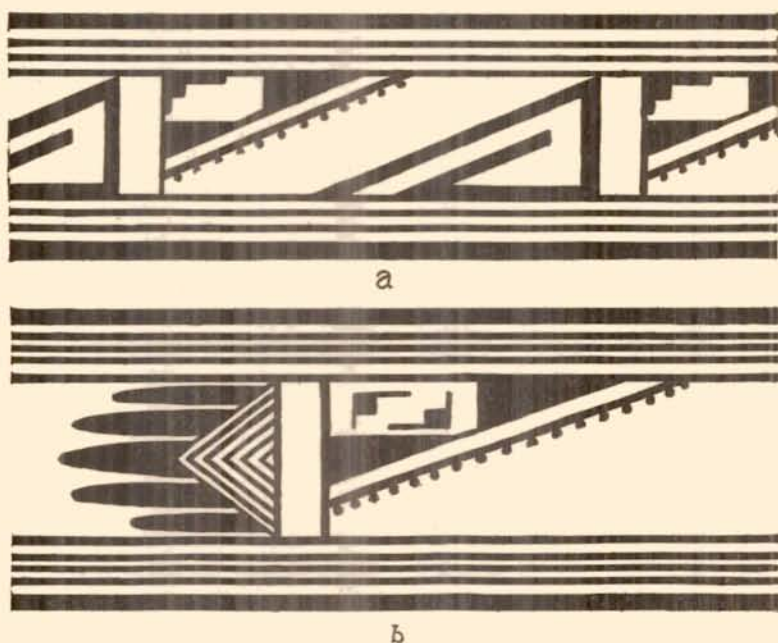
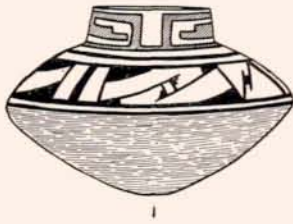


FIG. 22.—Frijolito biscuitware.

and biscuitware are both found, also the crudely made blackware, both smooth and coarsely corrugated. No trace of incised pottery was discovered.

While the biscuitware does not seem to differ very strikingly from that of the large ruins either in shape or decoration, the standard triangle design has the corners cut off at right angles to each other in the theoretically early manner (fig. 22) and



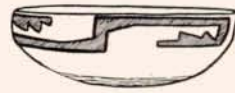
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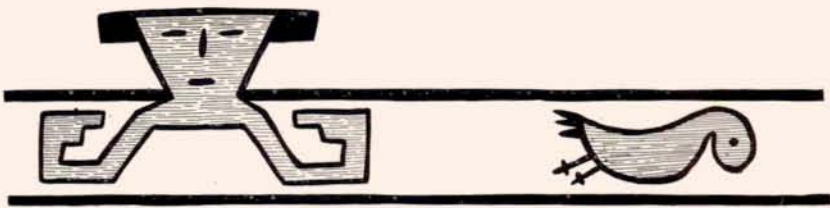
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FRIJOLITO REDWARE—SHAPES AND DESIGNS

the band awanyu seems to have, in every case, small figures in its open rectangular space (fig. 22). Fig. 23 shows a naturalistic bird. It is in the redware that the greatest variation is seen.

REDWARE (PLATE XXVII)

SHAPES.—Bowls from Frijolito have what we may call an "even" rim, that is to say, there is no pronounced thickening. The lip is square rather than rounded and the whole structure of the piece is lighter than in the Pajaritan type (plate XXVII, fig. 5—standard type shown in fig. 6). The olla has a very distinctive shape. It is flat-topped, with a very sharply marked shoulder, and an upright "collar neck" terminating in an "even" rim (plate XXVII, figs. 1 and 2—for rim see fig. 7. Fig. 8 shows standard Pajaritan olla-rim). Decorative zones are comparable to those of the Pajarito, except that when the collar-neck is low it is either left unadorned or treated with a narrow band ornament.



Fig. 23.—Frijolito Biscuitware.—Bird.

The base color of the ware is salmon-red, but those parts of the pieces, both bowls and ollas, on which the design is to be applied, are almost always covered with a white slip. This is sometimes heavy enough to give a dead-white background but in most cases is so thin that the red base color "shows through"; the result being a very effective pinkish or yellowish tint. The exterior bottoms of bowls and ollas always, and the interior bottoms of bowls and the necks of ollas, occasionally, are left in the salmon red base-color (plate XXVII, figs. 1-4).

The glaze is thinner than standard Pajaritan, and more tractable; hence, the designs are sharper, and can carry more detail. Red filling of a fine bright shade is much used, contrasting very effectively with the pinkish-white slip.

DESIGN.—(Plates XXVII and XXVIII.) All the examples that I have are confined to the true band and repeated unit types

confined above and below by framing lines of equal width. The lines are not necessarily two in number as in Pajaritan, nor is the "break" common or greatly emphasized. Distinct panelling of the band is the rule. The panels, however, vary considerably in number, and while alternation of symbols occurs, it is not at all rigidly adhered to. The greatest structural difference is seen in the marking off of the panels. This is accomplished in most cases by a single broad vertical bar, or by a mere open space, very seldom by a series of bars as is the rule in Pajaritan bands.

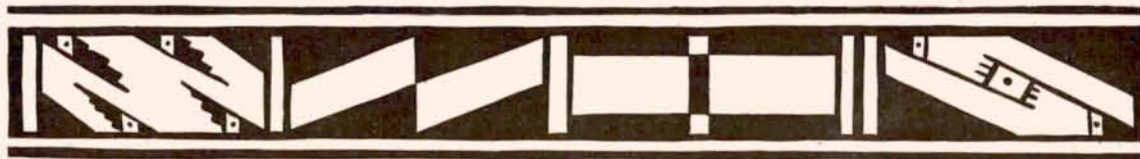
The ornamentation proper is of a pronounced geometrical character, largely planned on oblique lines which cut triangular spaces from the rectangular panels. A number of designs consist of this only, while almost all of the rest contain the "corner cut off," plus some other element.

The most striking of these supplementary elements are variations of the key-figure on stalks (plate XXVIII, fig. 2) or set directly on the base line and oblique in plan (plate XXVIII, figs. 1 and 3). An element apparently derived from the stalked key figures is shown in fig. 1 of plate XXVIII, (right hand panel). One of the most constant minor features is the dot, placed in a square space or in a narrow black-and-white checkerboard band. This occurs in about half the designs. This feature is also common at Holonawan and Heshotauthla and in the "schoolhouse" type (fig. 21).

Red filled decorations are confined to olla necks and the exteriors of bowls. They differ less than do the bands from the standard styles. The double-ended key figure predominates, but has some variations not seen in the Pajarito. Plate XXVII, fig. 9, shows an interesting design from the body of a small olla.

RECAPITULATION

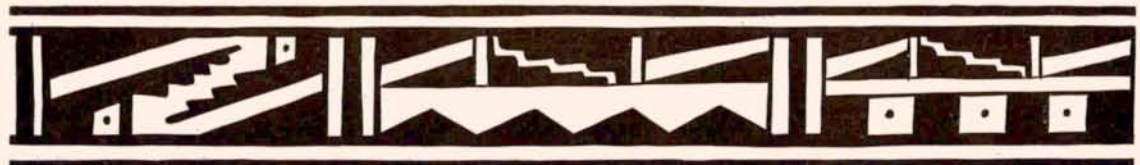
The black-and-white ware is without much doubt the oldest of the four groups ("black-and-white," "schoolhouse," "Frijolito," standard "Pajaritan"). Although as yet no stratified finds have given us absolutely conclusive proof of this, the wares come from small nearly obliterated ruins of obviously



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FRIJOLITO REDWARE DESIGNS

greater age than any others in the region. Furthermore black-and-white is found over almost, if not the whole, of the Southwest and is, theoretically at least, the generalized ancestor from which the more highly differentiated groups have sprung. Some strongly specialized black-and-white groups, such as that of Kayenta, Chaco cañon, the Mimbres, etc., may have been of comparatively late date, but there is no evidence that such was the case in the Rio Grande country.

The outside affinities of the local black-and-white cannot be ascertained without much more material.

"Agua Fria Schoolhouse" is tentatively placed second in point of age. I do not as yet know the range-limits of this style. The type specimens come from the vicinity of Santa Fé, but the wares occur to the south at Pecos and through the Galisteo basin (Bandelier sherd collection) to Bernalillo. Whether it will be found in the Pajarito plateau proper, in the Jemez and Puerco valleys and about Abo and Quivira in the Manzano country, I do not know. These regions were all occupied by makers of Pajaritan-like wares but it is possible that the earlier type had a more restricted distribution.

In considering the "Agua Fria Schoolhouse" class as a forerunner of the Pajaritan I may, of course, be in error. It may have been contemporaneous with it, but I am sure that it could not have been a later product. Its geometrical decoration, poor glaze, and less specialized forms, together with the fact that it is, in most cases at least, found at small ruins, lead me to think that it antedates the Pajaritan. Whether or not it was its ancestor is also uncertain, but I cannot think of any other form which, by any stretch of the imagination, could be regarded as having fathered the Pajaritan. The fact that both a redware with glazed ornament and a sort of crudely made biscuit were found at Agua Fria seems to ally the two groups in some way.

The exterior relations of "schoolhouse" pottery are fairly definite. It has strong likenesses to the wares found at the ancient Zuñi ruins, Halonawan and Heshotauthla,¹ in the

¹ See the collection in the Peabody Museum and Dr Fewkes's paper in the *Putnam Anniversary Volume*.

bowl shapes, thin black glaze and certain elements of design (stalked key, dotted-squares, stepped line). It lacks, apparently, the high development of exterior decoration in white which is so characteristic of the latter group, but a few sherds bearing white exterior designs are to be found in the collection from the "schoolhouse." As the old Zuñi wares are allied to those of the Little Colorado, we get on the whole definite western relationship for our type and are led to suspect that it is intrusive in the Rio Grande.

At the "Schoolhouse" ruin there are to be found black-and-white and corrugated sherds. Whether these were made at the same time as the redware or whether the site had been occupied in earlier times by black-and-white ware makers cannot be ascertained without excavation. It should be borne in mind, however, that the pottery from Halonawan and Heshotauthla in the Peabody Museum is also a mixture of redware (with thin glazed ornamentation) and black-and-white. The data with that collection are, unfortunately, too meager to show the relationship of the two types in that region. Nothing, as far as I know, suggesting biscuitware is found there.

"Frijolito" pottery is certainly much more closely allied to standard Pajaritan than is "schoolhouse." The only considerable collections of this ware that we have taken from a small ruin on the brink of Frijoles cañon on the Pajarito plateau. Just below the "Frijolito" lies Tyuonyi, one of the largest and most important of the regular Pajaritan sites. The "Frijolito" ruin consists of forty or fifty rooms built in the same manner as the rooms of the larger houses of the region. The masonry is of the same elongated tufa blocks, roughly laid in adobe; the round kiva (not excavated at "Frijolito") occurs in both.

The chief difference in the pottery lies, as was pointed out in the description, in the forms of the vessels, and the use at "Frijolito" of pinkish white slip with more truly geometrical ornamentation. These differences are at once obvious to any one familiar with Rio Grande ceramics; the types are distinguishable at a glance. On the other hand, the use of glaze

paint, the presence of biscuitware (which differs less than the red), and the likeness between the red-filled bird and key-figures on bowl exteriors from both groups, all show that there must have been a relationship.

From the fact that the Frijolito ruin is in close juxtaposition with a standard Pajaritan ruin, and that each site contains nothing but its own characteristic wares, I feel sure that the two cannot have been contemporaneous.¹ Some interchange would surely have taken place.

The geometric ornamentation, the lavish use of the key-figure, the presence of white slip as a decorative background, the simplicity of the bowl shapes and the small size of the ruin itself, all lead me to regard the "Frijolito" as an earlier group. If this is so the "Frijolito" would apparently fit in between the "schoolhouse" style and the standard Pajaritan. It has marked affinities to the "schoolhouse" in the shapes of the bowls, their thin glaze, and their geometric decoration; to the Pajaritan it is related most closely through biscuitware, and in the presence of red-filled bird and key-figures on bowl exteriors.

Aside from the type-ruin I know of no other that produces "Frijolito" ware, so that nothing can yet be said of its range. There are sherds of the same style in the Bandelier collection from San Cristobal, Cubero, and an unnamed ruin near Bernalillo. I have also picked up one or two at Pecos.

The term, Pajaritan, as was explained in describing the wares, is merely used for convenience. The Pajarito plateau was perhaps the center of the culture that produced them but they, or very closely allied types, are found in the large ruins from the middle waters of the Chama, and Taos, in the north, to the vicinity of El Paso in the south, and from Pecos, and the Manzano Salt basin, in the east, to Acoma, and the Rio Puerco, in the west.² The wares from these localities can probably

¹ I am informed by Mr Chapman that since this paper was written a few Frijolito sherds and one bowl have been recovered from the rooms in the north sector of Tyuonyi.

² These limits are established on the evidence of the Bandelier sherd collection in the Peabody Museum.

eventually be divided up into well-defined sub-groups of the Pajaritan such as: Pecos, Jemez, Manzano, etc. At present the material is insufficient.

The Pajarito plateau ruins are undoubtedly prehistoric, as no object of Spanish origin has been found in them; furthermore it is extremely unlikely that settlements as important as these must have been, could have escaped the careful recording of the conquistadores. Pajaritan, or wares nearly related to them, are found, however, at numerous historic sites.

How much older than 1540 the ruins producing Pajaritan pottery may be is not yet established, so that their temporal range is indefinite in that direction. On the other hand the characteristic wares are not made today, nor have they been, as far as we know, during the last 150 years. There are indications, however, that glazing was practised at the time of the conquest, as Castañeda says:¹ "In all these provinces they have earthenware glazed."

From then (1540) until the revolt of 1680 the Pueblos led a more or less settled life, and it is improbable that any sweeping ceramic change occurred. At the revolt and during the period of reconquest, however, chaos reigned. Many towns were destroyed, the Indians migrated from one pueblo to another as danger threatened, and an immense amount of mixing up took place. After the pacification the priests adopted a policy of concentration in order to have the people more easily under observation and religious control, so that many of the smaller towns were abandoned. All these things must have had a very disturbing effect on the culture of the tribes and I believe that at this time the ancient glazed ware was discontinued and the foundations were laid for the modern styles.

So much for the range of Pajaritan pottery in time and space. The wares themselves must also be considered intensively and in their relation to those of other regions.

The heavy, brilliant, glaze decoration of the red vessels is the most typical single feature of Pajaritan pottery. What-

¹ Winship, 1886, p. 522.

ever its chemical composition may have been, it is probable that its discovery was accidental and was due to the presence of some vitrifying flux in the pigment, or in the water used to mix the pigment. If I am right in supposing that the "pre-Pajaritan," Halonawan and Heshotauthla and Little Colorado wares were earlier examples of glazing, it seems likely that the process was, in these groups, still more or less accidental and haphazard. The glaze in them is usually poor and is often absent. In the Pajaritan style, however, it is thick and lustrous and has seldom failed to "take." With the greater brilliancy, however, attained apparently by the deliberate adding of extra amounts of the flux, came lack of controlability of the paint during firing; it spread and ran and made it impossible to produce fine, accurate lines. This would naturally have had an immediate effect upon the designs by tending to emphasize broad masses of color and to produce large striking units with little intensive decoration.

As has been said, the glaze was only used in the lines of the decoration, never to cover the whole surface of vessels. If the Pajaritan potters had continued to make these wares unmolested it can hardly be doubted that they would eventually have accidentally applied so much glazing material to some small piece that it would have spread on firing and have coated the whole surface. They were thus on the verge of an important technical advance, that of producing absolutely watertight receptacles. That it would have come can scarcely be doubted. It would be interesting to know whether glazing in other parts of the world was also evolved, as it seems to have been in process of doing here, through the accidental introduction of fluxes into pigments.

In their glazing the Pajaritan red wares seem to be allied to the pre-Pajaritan and to those of the Little Colorado, but in design I can see no resemblance either to them or to any other group. The decoration is unmistakably Southwestern in its formality and general style, and particularly in the use of the ever-present key-figure. Relationship to anything else, however, I cannot as yet trace. That is one of the problems to be worked out.

Pottery of the biscuit class has a light-colored surface, varying in shade from gray to pale yellow. The black paint of the ornamentation is adapted to the production of sharp, firm lines. In this controlability the paint differs from the glaze used on redware. The latter was evidently more liquid, spreading and running over its background, and thus practically prohibiting any attempt at producing fine, sharp lines. Furthermore the effectiveness of fine-line designs is largely lost when applied to the dark base of the redware, whereas such designs are thrown into strong relief against the light surface of biscuit pottery.

It is at once obvious that the two systems, as we find them on the Pajarito plateau, are very unlike. Designs from biscuitware and redware copied side by side on paper are readily distinguishable, not only by the character of the drawing, the thickness of the lines, etc., but also by more fundamental differences in the designs themselves. There are few if any obviously recognizable common elements.

The principal biscuit designs are more uniformly geometrical than are those of redware, but, on the other hand, pictorial forms: birds, turtles, etc., are much more common on biscuit vessels than on red. They do not form part of the main decoration, but are put more or less haphazard on vacant spaces.

Biscuit designs also I cannot yet ally to the decoration of any other group, but their strong geometric tendency, coupled with the light colored base-clay, lead me to believe that they are descended from black-and-white types.

In this connection the distribution of the two classes should be considered. As far as I know no site contains all biscuit or all red. While the two are always together, there are, however, important differences in their relative abundance. In the more northern ruins: Ojo Caliente,¹ the pueblos of the Oso basin,² those about Taos and Picuris,³ biscuit strongly predominates. An examination of the sherds, at any one of

¹ Explorations of the author.

² Explorations of Jeancon.

³ Sherd collections of H. J. Spinden in the American Museum, New York.

these places, shows fifty or more biscuit to one red. In the Pajarito itself the two are fairly evenly divided, with biscuit predominating at Otowi, Tsankawi and Tschirege; red at Puyé Tyuonyi and Yapashi.¹ This is particularly interesting in view of the fact that at the former localities the collections were made from the burial mounds, while at the latter they all came from rooms. At first sight this would seem to indicate the mortuary use of biscuit; but at Puyé a cemetery was discovered containing nearly 200 burials with which there was no pottery at all. At Tyuonyi and Yapashi extensive search has as yet located only scattering interments and with them no pottery. As far as I can see Otowi biscuit and red are identical with Tyuonyi biscuit and red and so on throughout the plateau. The ruins themselves are very similar in construction, and apparently of about the same age.

In the south red seems to come to the fore and the Bandelier sherd collections from the lower Rio Grande in New Mexico, show very little biscuit. This, however, may be due to selective collecting and should therefore not be accepted without further research.

The question of how these two unlike wares came to exist side by side along the Rio Grande can certainly not be answered as yet. Summing up our present information, we find that both redware and biscuitware occur at all the large ruins on the Rio Grande from which we have adequate collections, but that the biscuitware seems to predominate at certain sites such as Tschirege, Otowi, and Abiquiu, while the reverse is the case at Puyé, Tyuonyi, Pecos, and probably at the southern towns. The material is, however, very scanty except from the Pajarito plateau, consisting of sherds so small that the decoration cannot be made out with certainty.

Possible explanations of the problem are:

1. That there was a mixing of two peoples or groups of clans who possessed independently developed systems and who held to them after amalgamation.

¹ Explorations of Dr Hewett, Mr Chapman, and the author.

2. That there were different centers of production and that the pottery was distributed in trade.

3. That one of the wares played some special rôle in the ceremonial or mortuary customs of the people and therefore held to a more archaic style or developed along different lines.

4. That the dissimilarities are due largely to technique, and that divergent evolution from a common earlier form caused the double system.

I present these theories for what they are worth and do not attempt to choose between them. They should all be kept in mind, I think, in future field-work in the Rio Grande drainage. The relative abundance and excellence of each class should be carefully noted at every site examined. The range of each symbol and its frequency should be considered, as well as any evidence of specialized function.

The third typical Pajaritan style is particularly interesting because of the absence of incising as a decorative agent in other parts of the Southwest. A few scratches are sometimes found in other localities, but extremely rarely. In no case do they conform to any definite standard, and being merely "sports" are negligible.

Here, however, we find a well-marked design system, different from any southwestern painted decoration, and carried on in incised lines. The patterns fill spaces with hatching or herringbone marks and do not constitute real designs at all. The key-figure, scroll, terraced triangle, and other typical painted elements are absent.

The headquarters of the style seems to have been in the northern Rio Grande; incised sherds are found much more commonly at Abiquiu and Ojo Caliente than on the Pajarito; and in the south, according to the evidence of the Bandelier sherd collection, they do not occur at all.

Incising is typical of the decoration of most of the pottery of the Mississippi valley, particularly in the south,¹ but there the style is preponderatingly curvilinear and cross-hatching (not found in Rio Grande incised ware) is very abundant. Rio

¹ See the works of Holmes and C. B. Moore.

Grande incised pots are also typically southwestern in shape and therefore radically different from the vessels of the Mississippi valley. Although the Pajaritan group is the most easterly of all the southwestern styles and the stimulus which gave rise to incising may, perhaps, have come from that direction, I am nevertheless inclined to regard it as of local origin and development.

The rough cooking wares, both black and micaceous black, are only remarkable for the evidence that they give us of the degeneration of the corrugated technique. They are the last gasp, so to speak, of decorative coiling. Most examples are almost smooth, but in a few the coil may be made out as a faint ribbing of the surface and, very rarely, it is weakly indented with the finger tip, or a blunt instrument.

The above paper confines itself pretty strictly to a presentation of the ceramic evidence now available. The few deductions made are wholly tentative and are only put forward as a stimulus to further research. Much more work must be done in the "border regions" between the Rio Grande and the other southwestern culture areas; the Rio Grande country, too, should be searched for stratified sites.¹

Some of the smaller "black-and-white" ruins must also be carefully excavated and their construction and contents compared with the construction and contents of ruins of the same types in other localities. Without much fuller data we cannot draw any reliable developmental or historical conclusions.

¹ *The American Museum Journal* (N. Y.) has just announced (Dec., 1914) the discovery by Mr N. C. Nelson of a deposit at the pueblo of San Cristóbal, New Mexico, which contained four distinct types of pottery. The deposit was so stratified that the relative ages of the types could be ascertained. What the wares were has not yet been announced but from the proximity of San Cristobal to the Pajarito plateau it can hardly be doubted that this most important discovery will throw real light upon the sequence of the types described in this paper.

PROVENANCE AND PRESENT OWNERSHIP OF PIECES FIGURED.

Abbreviations: P. M. Peabody Museum, Cambridge; N. M., New Mexico State Museum; S. W., Museum of the Southwest Society, Los Angeles, Cal.; Nat. Mus., National Museum, Washington. Sites: P., Puyé; Ty., Tyuonyi; Ot., Otowi; Tsch., Tschirege; Fri., Frijolito.

Plate XIV. 1, Ancho Cañon, P. M. 2, Ty. and P. N. M.

Plate XV. 1-6, Ancho Cañon, P. M. 7, Water Cañon Mesa, P. M. 8, Water Cañon, P. M. 9, Ancho Cañon, P. M. 10, Agua Fria, N. M. 11, Agua Fria, P. M. 12, Rowe, P. M. 13-17, Agua Fria, P. M. 18, near Puyé, N. M. 19, 20, Agua Fria, N. M.

Plate XVI. 1, P. N. M. 2, P. S. W. 3, Ty. N. M. 4, Locality unknown N. M. 5, Ojo Caliente (?), N. M. 6, Ot. Nat. Mus. 7, Ty. N. M. 8, Ty. P. M.

Plate XVII. 1, Ty. P. M. 2, Ty. P. M. 3, P. N. M. 4, 5, P. (?) N. M. 6, P. N. M. 7, Ty. N. M. 8, 9, 10, 11, Ot. or Tsch. Nat. Mus.

Plate XVIII. Ideal figures except 16, Ty. N. M.

Plate XIX. 1, P. S. W. 2, Tsch. N. M. 3, Ty. P. M. 4, Tsch. N. M. 5, Ot. N. M. 6, Tsankawi, N. M. 7, P. N. M. 8, Tsch. N. M. 9, Ty. P. M. 10, Tsch. N. M. 11, 12, Ot. Nat. Mus.

Plate XX. 1, Tsch. N. M. 2, Ot. Nat. Mus. 3, P. S. W. 4, Tsch. N. M. 5, Tsch. N. M. 6, Unknown locality, N. M.

Plate XXI. 1, Yapashi, N. M. 2, 3, 4, 5, Ot. Nat. Mus.

Plate XXII. 1, Ty. P. M. 2, Ty. N. M. 3, Ty. N. M. 4, P. N. M. 5, P. N. M.

Plate XXIII. 1, P. N. M. 2, Ty. P. M. 3, 4, P. N. M. 5, 6, P. S. W. 7, 8, P. N. M. 9, Ty. P. M. 10, P. N. M. 11, P. N. M. 12, 13, Ty. N. M. 14, P. S. W. 15, Ty. N. M. 16, P. N. M. 17, 18, 19, Ty. N. M. 20, Location unknown. 21, P. S. W. 22, 23, 24, Ty. N. M.

Plate XXIV. 1, 2, 3, Ty. N. M. 4, Tsch. N. M. 5, P. N. M. 6, 7, Ty. N. M. 8, P. N. M. 9, Ot. Nat. Mus. 10, Ty. P. M. 11, P. S. W. 12, Ot. Nat. Mus.

Plate XXV. 1, P. S. W. 2, P. N. M. 3, Ty. N. M. 4, 5, P. N. M. 6, Ty. P. M. 7, 8, 9, 10, 11, P. N. M. 12, Ty. P. M.

Plate XXVI. 1, Ot. Nat. Mus. 2, Ty. P. M. 3, Ot. Nat. Mus. 4, P. N. M. 5, P. N. M. 6, P. S. W. 7, Ot. Nat. Mus. 8, P. S. W.

Plate XXVII. 1, Fri. N. M. 2, Fri. P. M. 3, 4, Fri. N. M. 5, Fri. P. M. 6, Ty. P. M. 7, Fri. P. M. 8, Ty. P. M. 9, Fri. N. M.

Plate XXVIII. All Fri. P. M.

Figure 12, a, Ot. Nat. Mus. b, P. N. M. *Figure 13,* a, Ot. N. M. b, Ojo Caliente, N. M. c, Ty. N. M. d, e, Ot. Nat. Mus. *Figure 14,* a, Ot. Nat. Mus. *Figure 15,* Ot. Nat. Mus. *Figure 16,* a-e, Ty. N. M. f, Tsch. N. M. g, Ojo Caliente, N. M. h-j, Ty. N. M. *Figure 17,* Ty. P. M. *Figure 18,* a, P. N. M. b, Ty. N. M. *Figure 19,* Ty. N. M. *Figure 20,* a, Tsch. N. M. b, c, Ty. P. M. *Figure 21,* All Agua Fria "Schoolhouse" P. M. *Figure 22,* Fri. N. M. *Figure 23,* Fri. P. M.