ANTHROPOLOGICAL PAPERS
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VOLUME XXVIII, PART II

THE BEGINNINGS OF POTTERY MAKING IN THE SAN JUAN AREA; UNFIRED PROTOTYPES AND THE WARES OF THE EARLIEST CERAMIC PERIOD

By Earl H. Morris

By Order of the Trustees
of
THE AMERICAN MUSEUM OF NATURAL HISTORY
New York City

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INTRODUCTION

In the papers of which this is the first, the writer will endeavor to trace the origin and development of aboriginal ceramics in that portion of the San Juan drainage lying eastward of the Chin Lee Valley and comprising the contiguous corners of Colorado, Utah, Arizona, and New Mexico. The remainder, or western part of the basin is omitted: first, because the writer has made only superficial investigations therein; secondly, the study of this section is progressing in the hands of Dr. A. V. Kidder and Mr. S. J. Guernsey, than whom none is more competent to solve the problems to be confronted. Hundreds of ruins and hundreds of thousands of potsherds strewn over an arid region which climatically has altered but little, if at all, since it first became the seat of human residence—a region in which even the maximum utilization of all available resources would support but a small population—give proof of a very long occupation. In seeking the relative ages of the multiplicity of archæological remains in the San Juan area, as elsewhere, the first objective is to find reliable horizon markers. It seems that the pottery making art, because of its inherent elasticity of form and ornamentation, could not long continue without change, unless imitation were to become a creed with power sufficient to stifle all originality. In any case, such a condition was never operative in the San Juan country, for, while there are dominant stylistic movements which might be projected upon the arc of time with a fairly definite rhythm, there are always at work the minor influences of originality and inequality of skill, the swing of which, if superimposed upon the major curve, would cross and recross it, dividing it into shorter sequential units. Thus, when the distinguishing features of these units are recognized and a plot of the movements worked out, the vessels and almost imperishable potsherds from any particular ruin, by their very character, establish the cultural position and relative age of that ruin as definitely as fossils identify a stratum for the geologist. In this light, the establishment of ceramic chronology, while in itself amply worth while, because of its revelation of the life history of a definite art and its technique, has the additional merit of providing time markers for culture history as a whole.

In these brief papers there will be no pretense of treating the subject completely or comprehensively. There are carloads of specimens still to be unearthed, and those available, if properly studied, would provide material for a voluminous monograph. Since present urgencies prevent the undertaking of a work of such magnitude, the little here recorded is set down with the hope that it will offer both a basis of departure and a stimulus to those who may carry the work to its end.

Although we are concerned primarily with ceramics, in beginning the discussion we must pause for a moment to acquire a perspective which will enable us to fit the initial element of the motive to which our attention is pledged into the intricate mosaic of San Juan culture as a whole.

The first traces of man thus far discovered in the San Juan drainage reveal him as possessed of a simple material culture, but one that is by no means primitive because of the extreme development of the few branches in which it specialized. As long ago as the early nineties, the Wetherill brothers, during the course of their digging in a cave in Butler Wash, recognized this initial, or Basket Maker culture, as distinct from that of the Cliff Dwellers. During the next decade the late Dr. T. Mitchell Prudden referred to these Basket Makers in an excellent popular article,[1] and the late George H. Pepper published a brief paper on Basket Maker material from Grand Gulch.[2] Then followed an interval during which the existence of the culture was in doubt. It remained for Kidder and Guernsey to reinstate it through their explorations in the Kayenta district, begun in 1913. Their excellent papers describe the Basket Maker culture and establish its priority to that of the Cliff Dweller-Pueblo beyond the slightest doubt.[3] Briefly characterized, the Basket Makers were an agricultural people, as I have expressed it elsewhere, "undergoing transition from nomadic to sedentary existence through the compelling influence of the cultivation of corn."[4] They may be styled a long-skulled stock, excellent weavers and makers of baskets, possessed of an architecture doubtfully worthy of the name, and no pottery whatever. They were followed by the Post Basket Makers.

Obviously, for the present, the delimitation of the periods must rest upon a cultural basis rather than upon known differences in physical characteristics. Even the physical status of the Basket Makers is uncertain. They are commonly thought of as a long-skulled people of uniform physical type. However, the late Louis R. Sullivan expressed to the writer a doubt engendered by an uncompleted examination of the Basket Maker crania in the Grand Gulch collection in the American Museum of Natural History, that the group of which they were represen-

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[1]Prudden, T. Mitchell, "An Elder Brother to the Cliff-Dweller" (*Harper's Monthly Magazine*, June, 1897, pp. 56–63, New York, 1897.)

[2]Pepper, George H., "The Ancient Basket Makers of Southeastern Utah" (*American Museum Journal*, vol. 2, no. 4, supplement, pp. 1–26, New York, 1902.)

[3]Kidder, Alfred Vincent and Guernsey, Samuel J., "Archæological Exploration in Northeastern Arizona" (*Bulletin 65, Bureau of American Ethnology*, Washington, 1919); "Basket-Maker Caves of Northeastern Arizona, Report on the Explorations, 1916–1917" (*Papers, Peabody Museum of American Archæology and Ethnology, Harvard University*, vol. 8, no. 2, Cambridge, 1921.)

[4]Morris, Earl H., "Chronology of the San Juan Area" (*Proceedings, National Academy of Sciences*, vol. 7, no 1, pp. 18–22, January, 1921.)

tative was physically homogeneous. This point can be cleared up only when some physical anthropologist is given time and facilities to make as exhaustive a study of Basket Maker skeletal remains as the importance of the problem demands.

The Post Basket Makers, as the name implies, were the immediate successors of the Basket Makers. While skeletons from this period have not been studied, observations in the field make clear the following conditions. In the La Plata Valley in southern Colorado, where the sites excavated were representative of a highly developed and presumably late phase of Post Basket Maker culture, the crania were, without exception, very long and high crested, in superficial appearance indistinguishable from typical Basket Maker crania. In contrast, in the country south of the San Juan, on Captain Tom's Wash, east of the Tunicha Range, and in Cañon del Muerto, draining westward from these mountains, intermingled with the long skulls are a considerable proportion distinctly brachycephalic in index, but *undeformed.* Thus it would appear that while the bearers of Post Basket Maker culture in some localities may have been a fairly pure and homogeneous group, certainly in others they had been recruited from more than one physical type. For the field-worker among the prehistoric ruins of the San Juan country, the one infallible criterion by which to judge the age of a cranium is the presence or absence of occipital deformation,[1] since this artificial accentuation of head form has not been observed to occur before the Pre-Pueblo horizon, during and subsequent to which it became sufficiently universal that the writer has observed but one exception.

The first statement that pottery of Post Basket Maker origin is older than that found in masonry cliff houses was made by the present writer in 1915 in a paper that did not come from the press until 1919.[2] In this report, however, the writer failed to distinguish between Post Basket Maker specimens and those dating from the next period, as pointed out by Kidder and Guernsey.[3] These authors named the Post Basket Maker period in 1920.[4]

As previously indicated, pottery is present among remains dating from the Post Basket Maker period. All authorities agree that up to the

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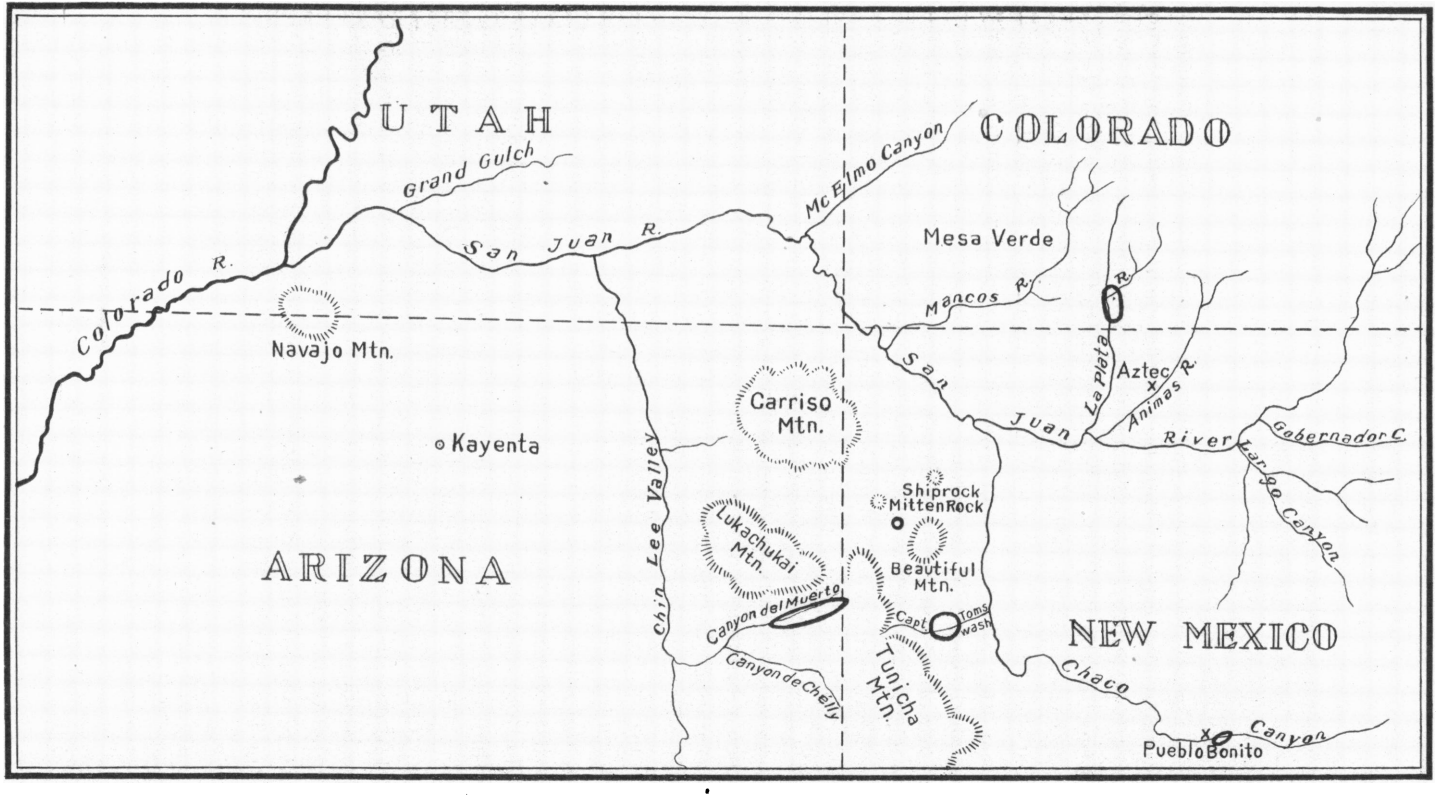
[1]The word prehistoric is inserted because the graves pertaining to the post-Spanish settlements in Cañon Gobernador and vicinity contain only undeformed skulls.

[2]Morris, Earl H., "Preliminary Account of the Antiquities of the Region between the Mancos and La Plata Rivers in Southwestern Colorado" (*Thirty-third Annual Report, Bureau of American Ethnology,* pp. 155–205, Washington, 1919), 204.

[3]Kidder, A. V. and Guernsey, S. J., Review of *Preliminary Account of the Antiquities of the Region between the Mancos and La Plata Rivers in Southwestern Colorado* in *American Anthropologist,* n. s. vol. 22, pp. 285–288, 1920.

[4]Kidder, A. V. and Guernsey, S. J., "Peabody Museum Arizona Exploration, 1920" (*Proceedings, National Academy of Sciences,* vol. 7, no. 3, pp. 69–71, 1921.)



Map of the San Juan Archaeological Area. The localities from which came the types of pottery discussed in this paper, are enclosed by heavy lines.

present no true pottery has been found in direct association with Basket Maker material, and since excavations in Basket Maker sites have been reasonably extensive, it is not to be expected that future research will disprove this generalization. Obviously, then, pottery came in between the norm of Basket Maker and the norm of Post Basket Maker culture. Yet in existing literature the initial stages of pottery making are not accounted for. In what is regarded as a pure Basket Maker site, Nusbaum found fragments of two unfired vessels,[1] and Kidder and Guernsey have recovered similar fragments in the Kayenta district.[2]

While mud dishes provide a rational and convenient hypothetical ancestry for fired vessels, a meager number of sherds was not considered enough to prove the case. However, excavations in Cañon del Muerto, Arizona, yielded a relative wealth of such specimens, occurring in a stratigraphic relationship which settles the question in a convincing manner. These sherds were found in association with textiles where pottery does not occur, and also, for instance, in one burned room, side by side with typical Post Basket Maker vessels. Nevertheless, whether mud sherds first appear in a terminal Basket Maker horizon, or in an early Post Basket Maker stratum, has not been decided. It may be a long time before a decision is reached on this point, since, because of the fact that these cultures developed one out of the other, the line of demarcation between them must be more or less arbitrary, hence subject to the individual judgment of different investigators.

A brief characterization of the areas which provided the material upon which this paper is based, may not be extraneous at this point. In importance, Cañon del Muerto, Arizona, stands out preeminently. The caves in this gorge which furrows the heart of both the Pueblo and Navajo areas are archives in which the aborigines have, ere they passed on, laid down the record of their cultures in full sequence. Two large collections have been taken from del Muerto and its sister cañon, de Chelly. The tremendously important and tantalizingly inaccessible one in the Brooklyn Museum, gathered by the Days, father and sons, came from both cañons; while the one in the American Museum of Natural History, containing all the del Muerto material herein figured, was taken exclusively from del Muerto during two expeditions directed by the present writer. The del Muerto-de Chelly cañon system affords positively the best opportunity for the study of early San Juan culture. The vast

[1]Nusbaum, Jesse L., "A Basket-Maker Cave in Kane County, Utah" (*Indian Notes and Monographs, Museum of the American Indian, Heye Foundation*, New York, 1922), 138–144.

[2]Guernsey, S. J. and Kidder A. V., "Basket-Maker Caves of Northeastern Arizona" (*ibid.*, 98, pl. 25a).

quantity of rubbish in the caves and the absolute dryness of many of them have provided and preserved an astonishing bulk of the perishable materials which in open sites would have decayed beyond the possibility of recognition.

There may be caves in the abrupt escarpment which forms the eastern slope of the Tunicha Range, but if so they have not been reported to the writer. Therefore all the excavations on the eastern side of the mountain were conducted in the open sites clustered here and there along the courses of the ephemeral streams which drain eastward from the mountain skirt toward the Chaco Valley. In these open sites all degrees of simplicity or complexity may be found, but complexity is the most common condition. The early peoples dwelt most frequently in close proximity to tillable land, preferably on a knoll or elevation, and in consequence, a site once chosen as a building place was in a fair way to be successively occupied by every group which chose to plant in the vicinity. As an example, along Captain Tom's Wash there are a few typical Post Basket Maker slab houses uncovered by the wind until they stand forth nearly as clear and complete as models; occasional early Chaco and degenerate Mesa Verde small houses, and many single structures pertaining to the chaotic, efflorescent, and difficultly separable ceramic interim between the Post Basket Maker and the formal Chaco periods. In contradistinction, the largest site along this watercourse, consisting of a full half mile of continuous house sites and cemeteries, situated on the mesa tongue known to the Navajo as Pesh-do-tlizh-dez-a-hi, is a jumble of dwelling ruins and refuse mounds, interchangeably superimposed. These cover the entire range from Post Basket Maker to early Chaco. In all this maze the position of the Post Basket Maker layer is most satisfactorily discoverable. The graves pertaining to it customarily are cut down into the subsoil, and uniformly the initial stratum of refuse blanketing the whitish natural clay bears only the sparsely decorated, red-washed sherds.

The few Post Basket Maker bowls listed from Pueblo Bonito might be misleading were not the facts concerning them explained. These vessels are not from the great Bonito ruin, but are among the hundreds of specimens exhumed from the small sites up and down the Chaco and sold to the Hyde Expedition by commercial collectors. The heavy lime coating which it was necessary to remove to make visible the patterns on those herein illustrated was proof positive that they came from shallow graves and not from the deep rooms of the great house.

Post Basket Maker remains in the upper La Plata Valley comprise a singularly uncontaminated group. At a point slightly north of the Colorado-New Mexico line the late stone ruins which are thickly sprinkled over the lower valley abruptly cease. Thence mountainward for several miles, the river terraces bear many Post Basket Maker dwelling sites and cemeteries. So true to type are these sites, that among more than one hundred graves pertaining to them, not one deformed skull, or one atypical pottery vessel was found. The La Plata sites examined are all in the open; in fact there are no caves within the confines of the valley. However, shelters are to be found in the cañons which lead in from the Mancos divide to the westward, and caves are plentiful enough in the gorges which drain westward from this divide to the Mancos Cañon. There is every basis for the expectation that adequate search in these caves would yield baskets, sandals, and other perishable artifacts to fill out the complex of Post Basket Maker culture as it existed in the upper La Plata region, now known principally from its super-excellent ceramic products.

VESSELS AND OTHER OBJECTS OF UNFIRED CLAY FROM THE BASKET MAKER-POST BASKET MAKER TRANSITION

Since the collection from Cañon del Muerto contains the first relatively large series of sherds and other unfired objects thus far obtained from the Southwest, the specimens will be described in considerable detail, even at the price of unavoidable repetition. Such treatment, while objectionable from several points of view, is justified by the significance of the material to be considered.

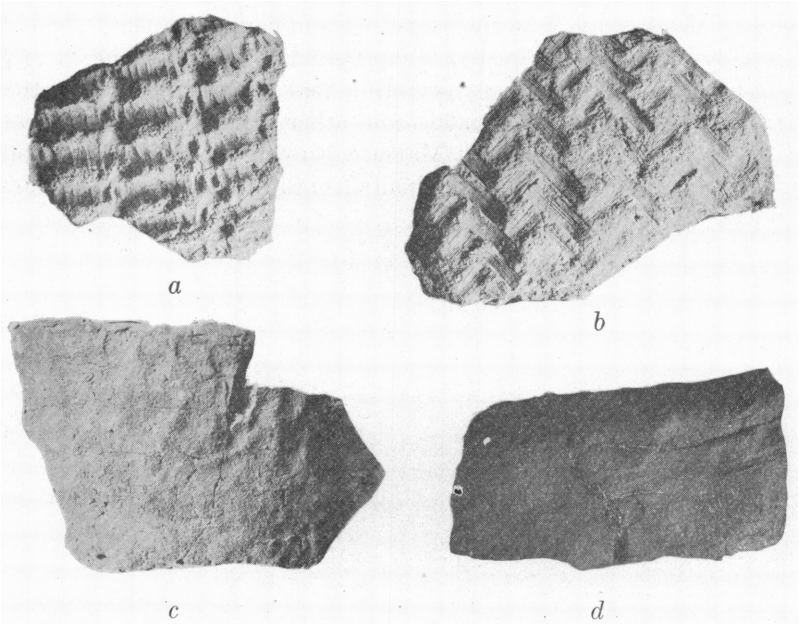


Fig. 1 (29.1–632, 1550*a*, 818*c*, 905*b*). Basket Moulded Sherds. *a*, with vegetable temper, Cyst 1, Cave 1, Cañon del Muerto; *b*, in a plaited container, Mummy Cave, Cañon del Muerto; *c*, with vegetable temper, Mummy Cave, Cañon del Muerto; *d*, without vegetable temper, Area 14, Cave 1, Cañon del Muerto.

Basket-Moulded Vessels with Vegetable Temper

Fragment of a bowl of brown clay (Fig. 1*a*) tempered with a moderate amount of shredded cedarbark. The average thickness is ⅜ inch. The interior is rough and uneven; on the exterior is the impression of a very coarse basket, with coils 7/16 to ½ inch wide. There are also secondary impressions of vertical elements sewed into the basket at ¾ and ⅞ inch intervals.

Sherd of a basket-moulded bowl (29.1–703) of brown, rather sandy clay containing a very small amount of vegetable temper. The average thickness is ⅜ inch. The interior is moderately smooth.

Portion of bowl (Fig. 2*a*) 15 inches or more in diameter and about 6 inches deep. The brown clay is heavily reinforced with rather finely shredded cedarbark. The basal two-thirds of the vessel was moulded in a coiled basket of which the impression is very dim. Above the basket edge a rim of clay was built up to a height of 2¼ inches. The walls vary from 3/16 inch in thickness at the constriction, produced by the basket-margin, to ½ inch at the bottom. The free rim is rather crescentic in vertical section, being ½ inch thick at the center. Its top is wavy and uneven. The interior of the vessel is bumpy and irregular, but dark and shiny from use.

Two-thirds of a bowl (Fig. 2*b*) about 7 inches in diameter and 3 inches deep. It was moulded in a coarse coiled basket above the edge of which was added a rim about ⅞ inch high. The clay is brown and very thickly reinforced with shredded cedarbark. The average thickness is approximately 5/16 inch. The interior is abraded, but was at one time shiny from use.

Sherd of a basket-moulded bowl (29.1–753*a*) of brown clay, tempered with bark, 5/16 inch thick. Sherd of a large basket-moulded bowl (29.1–753*b*) of dark brown clay containing some shredded bark. The thickness varies from 3/32 inch near the rim of the mould to 17/32 at the lowest point represented. The interior is smeared with a pasty organic substance. Sherd of a large bark-tempered basket-moulded bowl (29.1–753*c*) showing a portion of the rim added above the basket. The clay is nearly black from accidental burning. The thickness is quite uniform, averaging 3/16 inch. Portion of the free rim of a basket-moulded bowl (29.1–753*d*) of dark clay, reinforced with bark. The interior is glossy from use. The thickness is 7/16 inch.

Sherd of the free rim of a large basket-moulded bowl (29.1–753*e*) growing progressively thinner from ½ inch at the base to ¼ inch at the top. It is 1⅝ inches high. Both surfaces are stained dark from use. The brown clay is reinforced with bark.

Sherd (29.1–753*f*) of free rim of a good-sized basket-moulded bowl; both surfaces are smooth and stained dark from use. The clay is red and bark tempered. The wall of the bowl is only 3/16 to ¼ inch thick at the constriction made by the edge of the basket. The thickness of the rim at the base is 11/16 inch, tapering slowly to an abruptly rounding top curved more on the inside than on the outside. The rim is 1 3/16 inches high.

Sherd of the free rim of a bowl (29.1–753*g*) moulded in a basket, with ragged margin. Both surfaces are glossy from use and taper slowly to an abrupt outcurve, producing a thin rim, straight on the outside. The height is 1⅝ inches and the maximum thickness, ⅝ inch. The clay is brown, containing some bark.

Sherd of the free rim of a good sized basket-moulded bowl (29.1–753*h*); both surfaces are glossy and dark from use. The wall of the

bowl opposite the margin of the basket is at one point only 5/32 inch thick. The rim is 3/8 inch thick at the base, tapering to 1/2 inch just below the rounded top. The brown-gray clay contains specks of charcoal and a few fine shreds of bark. The height is 2 3/8 inches.

Sherd from the side of a bowl (29.1–905*a*), 8 to 10 inches in diameter, moulded in a coiled basket. The wall of that portion covered by the basket is thin, averaging 7/32 inch. The free rim, which was added above the margin of the basket, is thicker, 3/32 inch to 3/8 inch. At the maximum point 1 1/8 inch of this rim remains, but originally, it was considerably higher. The sherd was partially fired by the burning of the room in which it was found. There was very little vegetable reinforcement in the clay.

Sherd from the free rim of a basket-moulded bowl (29.1–905*c*). The margin is thinned more from the exterior than from the inner side. At its thinnest point, below the rim, the vessel wall is 1/4 inch thick. The rim proper is extremely rough on both surfaces and has an average thickness of about 3/8 inch. It is 2 1/4 inches high. The clay is very rich and has contained a considerable amount of bark temper which was charred by the burning of the room in which the sherd was found.

Abraded sherd (29.1–906) from the side of a fairly large basket-moulded bowl. It varies from 7/16 to 9/16 inch in thickness. The material is a very sandy clay, plentifully reinforced with shredded bark.

Portion of a basket-moulded bowl (Fig. 3*b*) about 11 inches in diameter and 5 inches deep. The impression of the mould is very distinct. It was a much worn basket, rather flat-bottomed and of fine texture, the coils averaging 5/16 inch in width. Below the rim the vessel wall varies somewhat from an average thickness of 3/8 inch. The interior is quite smooth. The free rim, added above the margin of the basket, is 1 1/2 inch high, 5/16 inch thick at the base, and tapers thence upward to a thin rounded edge. The outer surface is dark-stained and glossy from use. Rising at an angle of slightly more than 45 degrees from the base of the rim is a broad flat lug, the tip of which reaches almost to the plane of the margin to the bowl. This lug is 1 7/16 inches long, the same in width, and 7/16 inch thick at the center. The method of attaching the lug is that customarily used in the manufacture of ancient Southwestern pottery in general and was observed in use among the Hopi by the writer in 1920. The handle was fashioned to approximately the desired shape and at the base an extension was left, comparable in function to a rivet. A hole was punched through the vessel wall at the desired point of attachment. The Hopi woman did this with the first finger of the right hand, which passed between the spread second and third fingers of the left hand, the latter being held flat against the inside of the vessel to prevent bending of the clay. The tapering part of the lug was inserted in the hole, the tip pressed back and "riveted" completely to fill the opening and to unite with the clay of the wall. Subsequently, the junction on the outer side was pinched and rubbed to produce a uniform curve and a structural union of the two elements. The brown clay of this sherd is very "rich" and contains an almost negligible amount of very finely

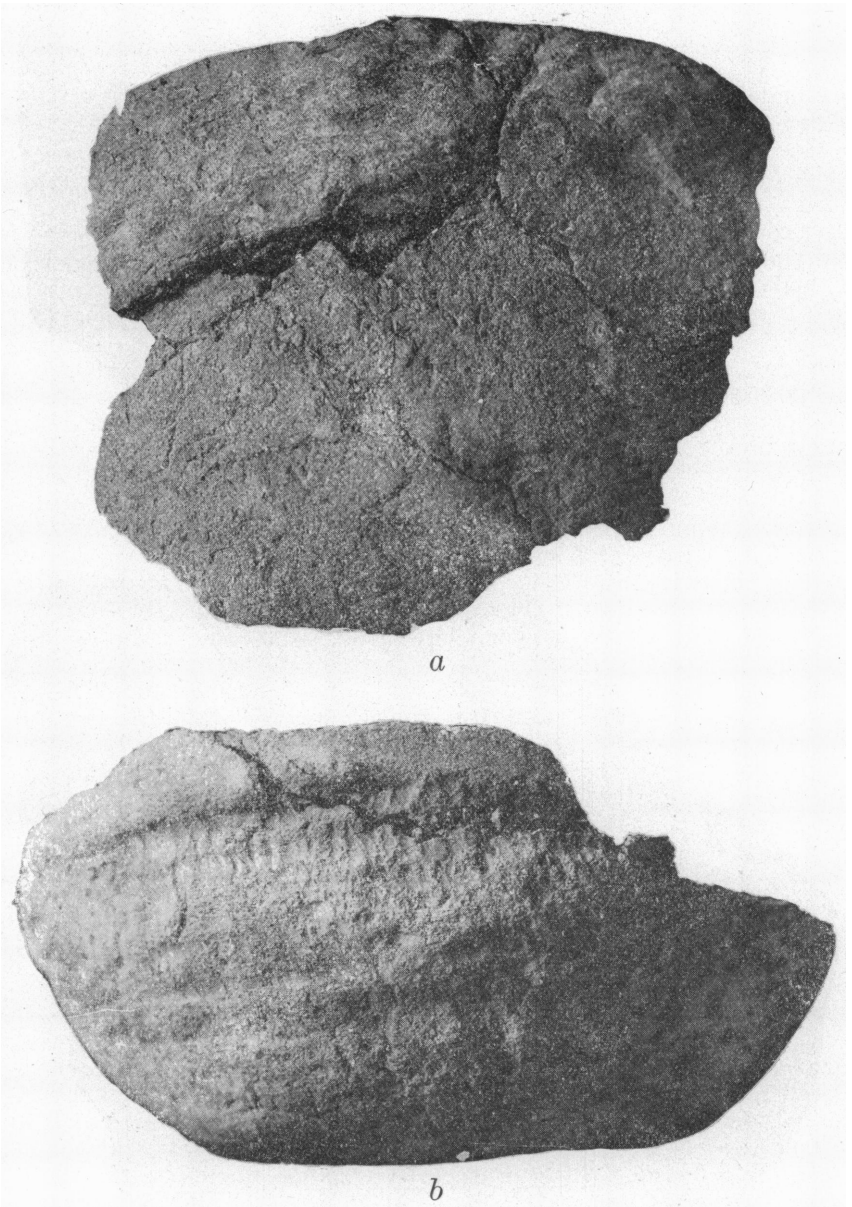


Fig. 2 (29.1–751, 752). Parts of Unfired Bowls of Clay reinforced with Shredded Cedarbark. From refuse between Cyst 3 and Prekiva 2, Cañon del Muerto.

Fig. 3 (29.1–1551*a*, 907). Sherds from Basket Moulded Bowls with Lugs at the Rims. *a*, Mummy Cave, Cañon del Muerto; *b*, Area 14, Cave 1, Cañon del Muerto.

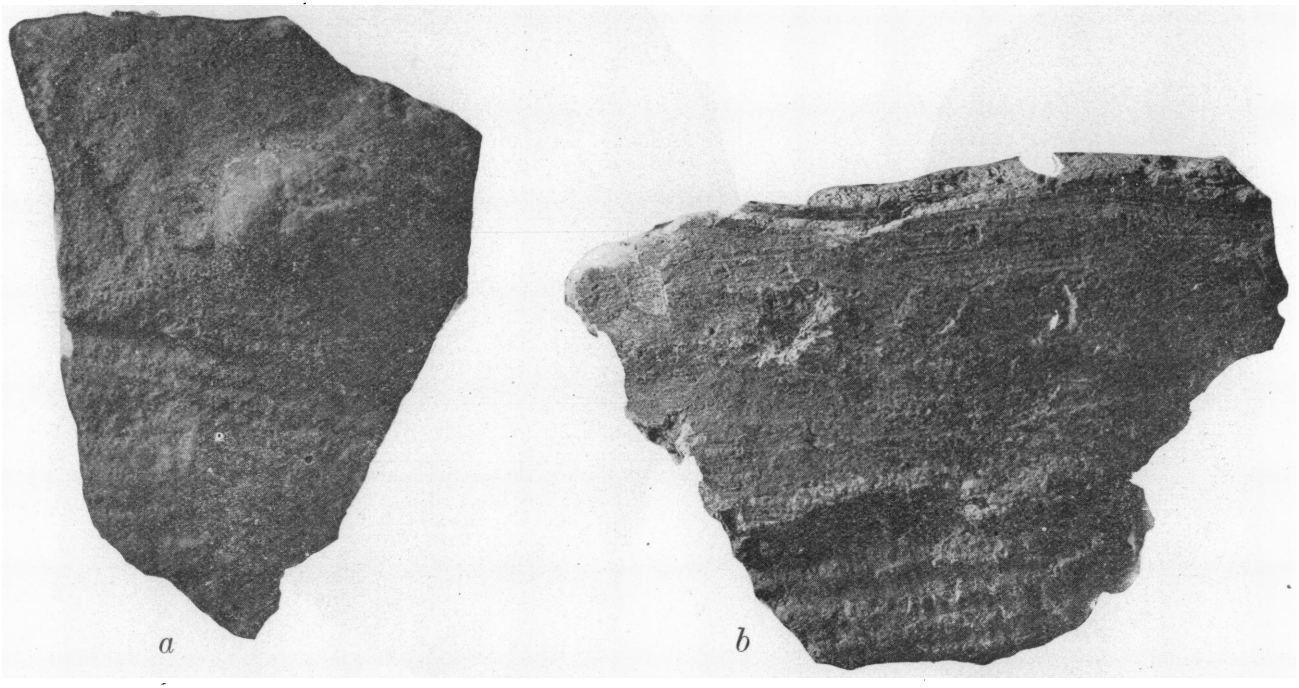


Fig. 4 (29.1-1551*b*, 1552*b*). Rim Sherds from Basket Moulded Bowls. Mummy Cave, Cañon del Muerto.

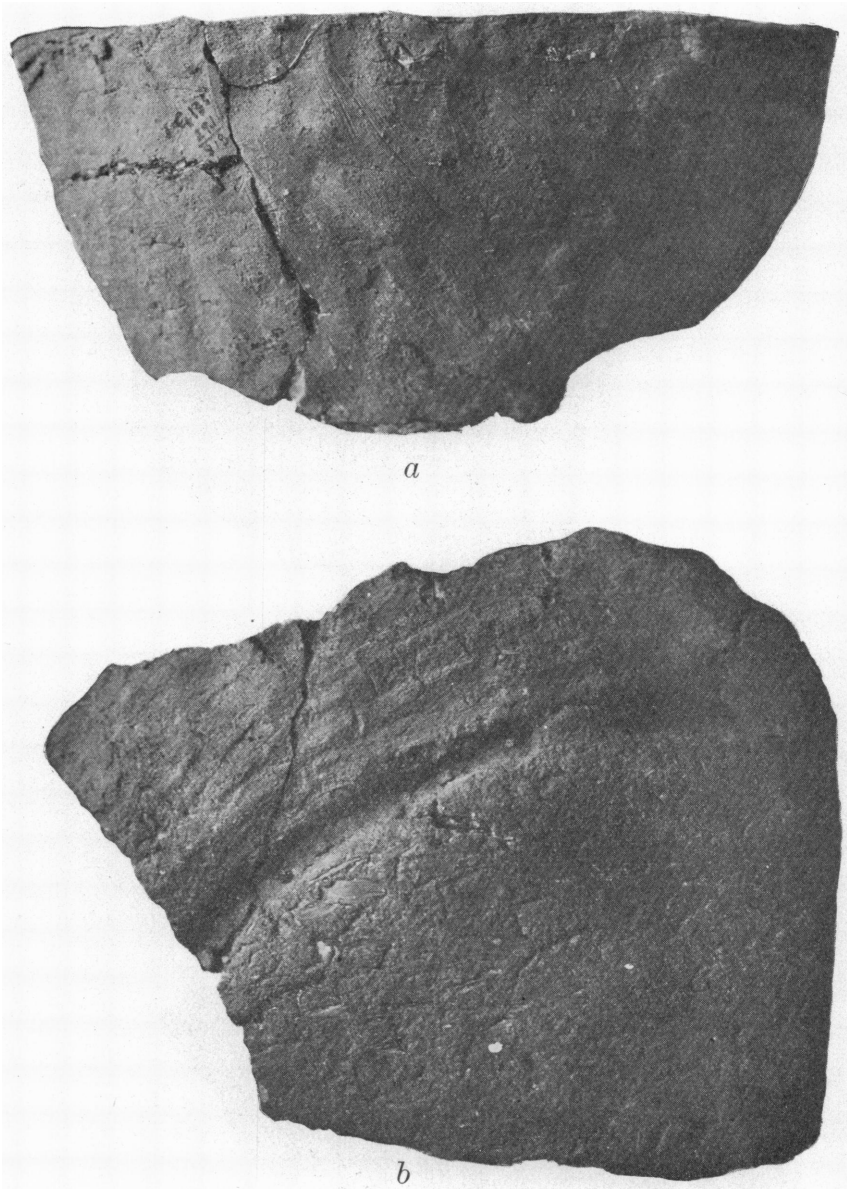


Fig. 5 (29.1–818*b*, 1554*g*). Rim Sherds from Basket Moulded Bowls. *a*, Pre-kiva 2, Cañon del Muerto; *b*, Mummy Cave, Cañon del Muerto.

shredded cedarbark, which is conspicuous only in the neighborhood of the handle.

Section of a basket-moulded bowl (Fig. 3*a*), about 11 inches in diameter, bearing a horizontal lug on the free rim. The latter is not appreciably thicker than the basket-marked portion of the wall. Both surfaces are very lumpy and irregular. The outer one is black and shiny with the stain of long service. The average thickness, below the abruptly curved margin, is 7/16 inch. The height of the free rim is 2 inches. The lug is a stubby flat protruberance, 2 inches in width at the point of attachment, which is 1 3/16 inch below the margin; 3/4 inch thick, and 1 inch long. It is slightly upturned at the tip. The material is a homogeneous, hard, fine-grained brown clay sparingly tempered with shredded bark.

Sherd of a basket-moulded bowl (Fig. 4*a*) bearing a horizontal lug on the free rim and blackened as the result of accidental burning. The basket-marked portion of the vessel wall averages 5/16 inch thick; the free rim, 7/16 inch. The margin is rounded. The rim is 2 inches high. The lug is 1 3/4 inches wide, 3/4 inches thick, and 15/16 inch long. It is practically flat on top and curves upward on the lower side. The inner surface and the exterior of the rim are characteristically lumpy and irregular. The material is a compact, slightly sandy clay, containing a few cavities left by burnt-out vegetable temper.

Sherd of a bowl (29.1–1552*a*), 9 to 10 inches in diameter, with basket-moulded base. The free rim is 2 3/8 inches high and slightly thinner than the basket-moulded part, the former averaging 11/32 inch, the latter 15/16 inch. Both surfaces are very irregular, showing deep indentations made as if by pressure with the fingers, smoothed somewhat by horizontal wiping movements. The free rim was clearly made of three horizontal bands pinched together. The clay is hard, slightly gritty, and contains a very little bark temper.

Rim sherd of a large basket moulded bowl (Fig. 4*b*). The wall is 5/16 inch thick, the free rim 3/4 inch thick. The inner surface is fairly uniform, but shows many shreds and impressions of vegetable reinforcement. The exterior was finished with long wipes in a horizontal direction, most of them blurring over the original bumps. This surface is black from use. The rim height is 1 7/8 inches. The material is a white, light, friable clay, containing some sand and a great amount of shredded bark temper.

Rim sherd of a large basket-moulded bowl (29.1–1552*c*). The free rim is 2 1/4 inches high, thinner than the true wall, the former being 5/16 inches thick, the latter 7/16 inch. The surfaces are rough, the margin thinned and rounded. The material is a brownish clay originally containing some bark tempering which was burned out by accidental firing.

Sherd of large basket-moulded bowl (29.1–1552*e*) with free rim, crescentic in cross-section, 2 5/8 inches high and 5/8 inch thick at center. Both surfaces are rough, the outer one black from use. The clay contains a very little bark temper.

Rim sherd of large shallow basket-moulded bowl (29.1–1552*f*) with true wall 3/8 inch thick. The free rim is rounded with a uniform

margin, 1⅛ inches high, and 15/32 thick. The clay is brown, sandy, and contains a meager quantity of bark temper. Both interior and exterior are more than usually smooth.

Rim sherd of a large basket-moulded bowl (29.1–1552*g*). The height of the free rim is 1⅛ inches; thickness at base, the thickest part, is 11/32 inch. The surface is very uneven, but smoothed by horizontal wiping movements. The clay is whitish, poorly mixed, and tempered with much shredded bark.

Rim sherd of large basket-moulded bowl (29.1–1552*h*). The true vessel wall is 5/16 to 9/16 inch thick. The free rim is triangular in cross-section, 1 inch high, ⅝ inch thick at the base, and ¼ inch just below the rounded rim. Both surfaces are fairly smooth and stained brown from long use. The clay is light colored, gritty, and well mixed, containing a few pebbles and a small admixture of bark temper.

Ten rim sherds of basket-moulded bowls (29.1–1552*i*), apparently ea h representing a different vessel. All are within the range of specimens already individually described. Some are of reddish brown clay, one is black from accidental firing, one is of brown sandy clay, and one of white, hard, well mixed clay. All contain cedarbark temper.

Sherd of bottom of a basket-moulded bowl (29.1–1552*j*). This portion of the vessel was perfectly flat and was more than 6 inches in diameter. The clay is of uniform thickness 13/16 inch, and well smoothed on the interior surface. The brownish clay has been blackened by accidental firing. In it are visible grains of coarse sand and the impression of sherds of bark temper.

Sherd of bottom and side of a small basket-moulded bowl (29.1–1552*k*), burned black. The interior surface is very rough and lumpy; the exterior is deeply checked by shrinkage in drying. The thickness at the bottom is 9/16 inch and at the highest point represented, 3/32 inch. The clay contains sand temper, but the original presence of vegetable temper is doubtful.

Five sherds of basket-moulded bowls (29.1–1552*l*), each from a different vessel. None of these extended to the rim. Two are black from accidental firing and all contain varying amounts of shredded bark.

Sherd (Fig. 5*b*), 7 by 6 inches, of a bowl 16 or 18 inches in diameter and 7 inches or more deep. This was the most massive vessel represented by any of the sherds in the collection. It was moulded in a basket with a somewhat incurving margin, which produced a deep constriction at the base of the free rim. The only remaining basket impression is in this constriction. Either the interior of the basket was coated with some substance which gave it a smooth surface, or the marks of its coils were scoured off from the bowl after it was removed from the mould. The sherd was turned dark gray to brick red by the burning of the room in which it was found.

The thickness of the wall proper, that is, the part below the constriction, is from 7/16 to 11/16 inch. Opposite the constriction the thickness is ⅜ inch. The free rim, 2⅜ inches in height, was finished on the exterior by horizontal strokes with some uneven pointed tool which removed the

most conspicuous bumps, but left the surface wavy and irregular. This rim is somewhat thinner than the true wall and tapers to a rounded margin.

In addition to the above there are eight rim sherds of basket-moulded bowls, all containing bark temper.

Basket-Moulded Vessels without Vegetable Temper

Sherd from the free rim of a bowl (Fig. 1*d*), moulded in a very coarse basket. This rim flares slightly outward and is thinned and rounded at the margin, more from the inside than the outside. The dimensions are: height, from 1¼ to 1⅝ inches; thickness at base, ½ inch; and ¼ inch below margin, ⅝ inch. Three uneven horizontal bands were pinched together to make this rim. The material is hard, has been tempered with grit, and contains no vegetable reinforcement.

Rim sherd (29.1–1551*c*) of a basket-moulded bowl 10 to 11 inches in diameter, with horizontal lug. The rim is 2 inches high, ½ inch thick at the bottom, and 5/16 inch just below the thinned margin. The upper edge of the lug is 11/16 inch below the margin. This protruberance is 2¼ inches horizontally at the point of attachment, ⅞ inch thick, and 15/16 inch long. The hard, slightly gritty, clay contains no vegetable temper, and is darkened by accidental firing.

Sherd of a large basket-moulded bowl (29.1–1552*d*), with free rim, slightly thinner than the true wall. The thickness of the free rim is 5/16 inch. The interior of the vessel and the outside of the rim are rough, showing many horizontal strokes of a narrow rough-edged tool. The surfaces are blackened by use. The clay is hard and compact, without vegetable temper. The height of the rim is 1⅞ inches.

Vessels Moulded in Plaited Containers

Sherd of the side of a large bowl (29.1–1550*b*) moulded in a plaited receptacle. The weave of the latter was twilled, over two and under two. The longitudinal striations visible in the impressions of the individual elements plainly indicate that the receptacle was made of yucca leaves. More than likely it was a "ring basket." The interior surface is very irregular, showing plainly the indentations made by finger tips, somewhat smoothed by rubbing. This surface shows evidence of considerable use. The clay varies from 5/16 to 9/16 inch in thickness, and, though hard, was not well mixed and contains very little bark temper.

Rim sherd of a large bowl (Fig. 1*b*) moulded in a plaited receptacle. The vessel wall is massive, ½ to ¾ inch thick. Both surfaces are wavy and black with the stain of use, the exterior being polished by much handling. The free rim is 1⅝ inches high and is thinned and rounded at the margin. The clay is very compact and fine-grained and is sparsely tempered with fine shreds of cedarbark.

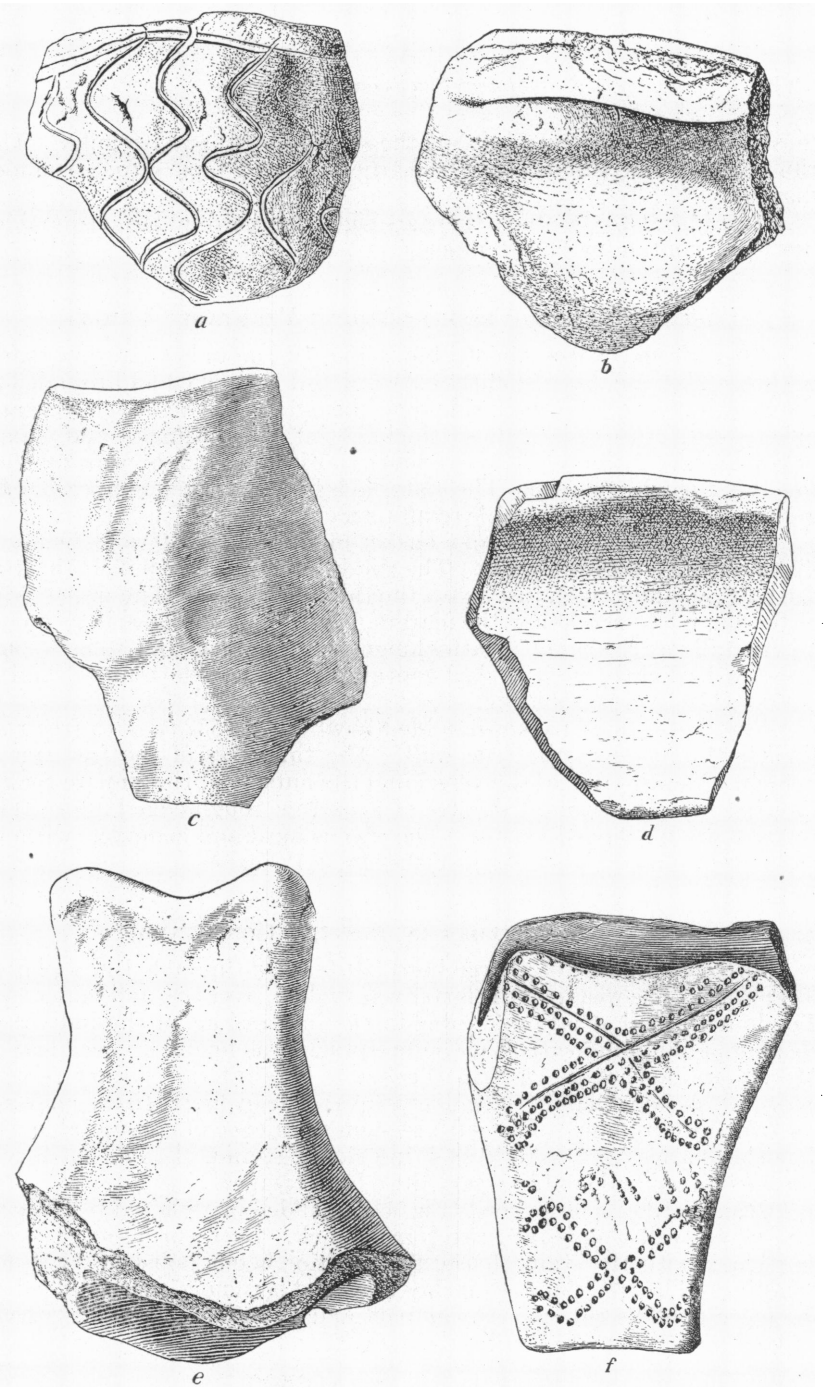


Fig. 6 (29.1–702, 1553*c*, 699, 818*f*, 818*g*, 1594). Sherds and Modeled Objects, Cañon del Muerto; *a*, Prekivà 1; *b*, Mummy Cave; *c*, Prekiva 1; *d-e*, Prekiva 2; *f*, Mummy Cave.

Plain Vessels with Vegetable Temper

Fragment of bowl (29.1–700) of black-brown clay, containing a small amount of finely shredded bark and at least one white quartz pebble 5/16 inch long. The interior surface is uniform and quite smooth, the exterior rough and wavy, checked horizontally to indicate that the walls were built of horizontal strips of clay, 11/16 inch wide. The sherd has an average thickness of a little over 1/4 inch.

Fragment of neck (Fig. 6*a*) of vessel, about 3½ inches in diameter, with slightly incurved top. The light reddish clay contains very little vegetable reinforcement. The thickness is 5/32 to 7/32 inch. Both surfaces are wavy and irregular, the exterior being somewhat checked. The outer surface is decorated with a horizontal incised line slightly below the rim and irregular slightly oblique incised lines extending downward from it.

Sherd (29.1–753*i*) of a good-sized plain bowl of whitish, "rich," very hard clay, heavily tempered with finely shredded bark. Both surfaces are fairly smooth, but wavy, as if daubed with the finger tips. The thickness is quite uniformly 5/16 inch, except toward the rim, which is rounded. Showing on the inner side, 3/8 inch below the rim, is a grain of corn which was mixed in the clay.

Rim sherd (29.1–818*a*) of a deep bowl, 10 to 12 inches in diameter; the interior is a uniform curve, evidently abraded by use. The exterior is irregular and lumpy, but stained dark. The dark gray-brown clay is tempered with chaff, either of corn tassels or grass heads, and also contains a piñon nut shell. The walls become progressively thicker toward the rim, being 1/4 inch thick at the bottom and ½ inch just below the beginning of the rounded margin.

Part of a bowl; 8½ inches of the rim (Fig. 5*a*) and a large sherd from the bottom. Originally, the bowl was about 10½ inches in diameter and more than 5½ inches deep. The extreme bottom was flat outside and curved in, giving the clay a thickness of as much as 3/4 inch at the circumference. Upward from this, the walls vary from 5/16 to 7/16 inch in thickness. The rim is rounded, curving more on the inside than on the out. The interior was originally and still is in places lumpy and irregular, but much of it, especially the bottom portion, has been abraded by use to a grainy smoothness. Toward the rim are visible long strokes of a stick or perhaps a rough-edged scraper. The exterior shows horizontal lines where the junction of the ½ to 7/8 inch bands or coils of which the walls were built were not completely obliterated. The finish of the exterior is very rough. There are bumps and depressions, resulting from the pinching together of the coils and two sets of impressions left by some sort of tool, very possibly a flattened stick. The first smoothing strokes were horizontal and more or less parallel to the rim. The second were diagonal, running on the rim fragment from toward the bottom upward, in a clockwise direction, if the bowl were held in a vertical position. These strokes stopped about two inches from the bottom, below which the surface is extremely rough, a few dauby strokes marking the only attempt toward smoothing. The clay is dark gray, tempered with the chaff of corn

tassels or grass heads. Two granules of red sandstone, of the quality forming the walls of Cañon del Muerto, are also visible.

Two sections composing 11 inches of the rim of a deep bowl, 9½ to 11 inches in diameter (Fig. 1*c*). The vessel wall is relatively thin, 3/16 to ⅜ inch, and was built of bands or coils about ¾ inch wide. The material is dark colored and sparsely tempered with chaff of corn tassels or grass heads. In one edge, the black shell of a small beetle is visible. The exterior is rough, the finger impressions not having been removed. The interior is, on the whole, quite smooth. It is discolored from use and one section bears two parallel diagonal lines in white which forcibly suggest an attempt at painted decoration.

A portion of the side and bottom (29.1–818*e*) of a more or less globular vessel, not over 3 inches in diameter. Both surfaces are extremely rough. The material is a dark clay, so rich that it has checked on the interior. It contains a small amount of chaff tempering. The thickness varies from 5/32 to ¼ inch.

Two fragments (29.1–955) composing 5½ inches of the rim and a detached sherd of a bowl 8 to 10 inches in diameter. The clay is whitish, rich, and very hard, containing a liberal quantity of finely shredded bark. Both surfaces are very irregular. The inner has been rubbed to produce a greater smoothness, but the outer seems not to have been secondarily finished in any way. It is black with smoke and filth. The extremes in thickness are 3/32 and ⅜ inch. The rim is thinned and wavy.

Sherd of a large plain bowl (29.1–1553*b*) bearing a horizontal lug, 1½ inches below the rim. The vessel varies from 3/16 to ⅜ inch in thickness. The lug is 2¼ inches wide at the point of attachment, ¾ inch thick, and extends 1 inch from the vessel wall, sloping slightly downward from a horizontal plane. Both surfaces are fairly smooth and black from use. The clay is brown, friable, and tempered with cedarbark. The margin is thinned to a sharp edge.

Sherd of a large plain bowl (Fig. 6*b*), bearing a horizontal lug ⅞ inch below the rim. The vessel wall is fairly smooth and varies little from ⅜ inch in thickness. The lug is 3 inches wide, 1 inch thick at the point of attachment, and 1⅛ inches long. The top is practically flat, while the bottom curves gradually upward and outward from the vessel wall. The specimen is black from accidental firing. In the broken edge moulds may be seen left by the burned out shreds of vegetable temper.

Five lugs (29.1–1553*d*) from plain bowls or the rims of basket-moulded bowls. These lugs are true to type in all respects: stubby protruberances welded to the vessel wall in the manner previously described. They vary in size from, width 1⅛ inch, thickness, 1 inch, length, 1 inch, to width, 2¾ inches, thickness, 11/16 inch, length 11/16 inch. There is a small amount of vegetable temper in the clay of all of them.

In addition to those individually listed, there are four rim sherds and six fragments of the sides or bottoms of plain bowls, al containing bark temper.

Plain Vessels without Vegetable Temper

Sherd of the neck (Fig. 6*c*) of a pitcher or bottle, with mouth about 2 inches in diameter. The clay is black-brown, fairly fine-grained, with no vegetable reinforcement, ⅛ to 7/32 inch thick. The finish is identically like that of Post Basket Maker pitchers; hence, this may be a fragment of a vessel intended for burning.

Rim section (29.1–818*d*) and detached fragment of a good-sized deep-walled bowl, with thinned and rounded rim. The wall, ⅝ to 13/32 inch thick, was built up of bands or coils ⅜ to 9/16 inch wide. The material is dark gray and very hard, without vegetable reinforcement, but tempered with a considerable amount of sand composed principally of white rounded grains. The interior has been rubbed while green, but is grainy rather than smooth.

Portion of a straight-sided object (Fig. 6*d*), crescent-shaped in cross-section. The concave surface is fairly smooth, having been rubbed longitudinally; the convex surface is quite rough. The greatest thickness is 11/32 inch at the longitudinal center, from which the clay tapers to markedly thinned rims. There is no vegetable temper, but some sand and a few chunks of red sandstone. This object probably was part of the handle of a ladle of the "half gourd" type.

A handle (Fig. 6*e*) from some sort of a vessel, probably a large jug or olla, suggesting in form, the bifurcated tail of a bird. A glance at the illustration will impart a more definite idea of the object than can be gained from verbal description. The vessel walls, where the handle joined the pot, are from 7/16 to ⅝ inch thick. The handle itself is approximately 2 inches long, 1 7/16 inches wide, and 11/16 inch thick at the center. Toward the end, it flares to a width of 1 11/16 inches, the depth of the V between the bifurcations being ¼ inch. Half of a perforation made while the clay was soft is visible in what seems to be the upper edge, ¾ inch to the right of the longitudinal center. There is the suggestion of a similar perforation opposite to this one (Fig. 6*e*). The material is a hard brownish clay containing a small amount of fine sandy temper. The surface is rough, but glossy, as from use.

A handle (29.1–853*a*) essentially similar to Fig. 6*e*. It is more massive, 2⅜ inches long, 1⅞ inches wide at the middle, and 1⅛ inches thick, but is more or less abraded. Apparently the end was rounded instead of bifurcated and there is no indication of perforations like those in the above-mentioned specimen. The clay is b own, hard, fine-grained, but gritty, and although it contains a few sherds of vegetable substance, it was probably not intentionally tempered in this fashion.

Sherd and lug (29.1–853*b*) from the side of a bowl. The vessel wall is ⅜ inch thick, of brown sandy clay in which a very few sherds of bark are visible. The lug is a stubby protruberance, 1⅝ inches wide, 1 inch thick at the base, and ⅞ inch in length. It tapers to an abruptly rounding end and points upward at a slight angle from the horizontal plane of the bowl.

Two pellets of clay (29.1–853*c*) each of which has been pinched between the thumb and fingers, the downward pressure of the former

resulting in a cupped surface, which gives the objects the appearance of miniature bowls. The most symmetrical specimen is 1¼ inches long, 1 inch wide, and ½ inch high. The concavity is 1 inch long, 15/16 inch wide, and ¼ inch deep. The clay of both specimens is hard, "rich," and contains no visible trace of vegetable temper.

Sherd (29.1–853*d*) representing part of side and bottom of very small bowl or the base of a jug-like vessel. It is very hard and thin, 3/16 inch, without vegetable temper.

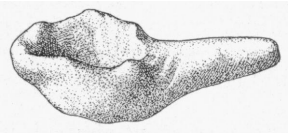


Fig. 7 (29.1–954). A Miniature Ladle of Clay without Vegetable Temper. General Digging, Cave 1, Cañon del Muerto.

A very crude miniature ladle (Fig. 7) 1 13/16 inches in length. The tapering handle is 15/16 inch long. The bowl is ¾ inch long, ⅝ inch wide and ½ inch deep.

Sherd of a large plain bowl (29.1–1553*a*), bearing a horizontal lug, 1½ inches below the rim. Although it is possible that this specimen was part of a vessel of which the base was made in a basket, there is no confirmatory evidence; hence, it is listed as plain. The thickness of the vessel wall varies little from ⅛ inch. The interior is moderately smooth and the exterior rough, but less so than that of most of these mud bowls. Both are blackened by use, and on the interior, spreading over the rim is a thick daub of pitch. The lug is solid, 3¾ inches wide at the point of attachment, ⅞ inch thick, and 1 1/16 inch long. The clay is brown, fine-grained, hard, and tempered with sand, but not with vegetable fiber.

Sherd (29.1–1554*b*) representing 3¾ inches of the side of a bowl, about 8 inches in diameter and 3 inches deep. The clay is sand-tempered and contains no visible trace of vegetable reinforcement. The vessel wall is ¼ inch thick and is thinned from the inside toward the rim. Both surfaces are wavy and rather smooth and blackened from use.

Rim sherd (29.1–1554*c*) of large deep bowl of uniform thickness, 9/32 inch. The clay is sandy and contains no vegetable temper. The interior surface is fairly smooth; the exterior is rough, showing daubs of a narrow rough-edged tool, probably a chip, and one long straight diagonal line incised with a sharp point.

Bottom of a crudely fashioned jug-shaped pot (29.1–1554*d*), about 2⅜ inches in diameter. The clay is 3/16 to 5/16 inch thick and contains no vegetable temper. Besides those described, one sherd of the bottom of a bowl contains no fiber reinforcement.

Cylindrical Object

A roughly cylindrical object (Fig 8*a*) tapering from the center gradually toward the abruptly rounded ends. It is 2 21/32 inches long and 1 1/16 inch thick at the middle. A perforation 3/16 inch in diameter follows what may be called the longitudinal axis for 1 11/16 inches. Evidently this cavity was left by a twig around which the clay was moulded. The object is of very fine-grained clay and although not of perfect contour, is smoothly surfaced. Its function is wholly problematical.

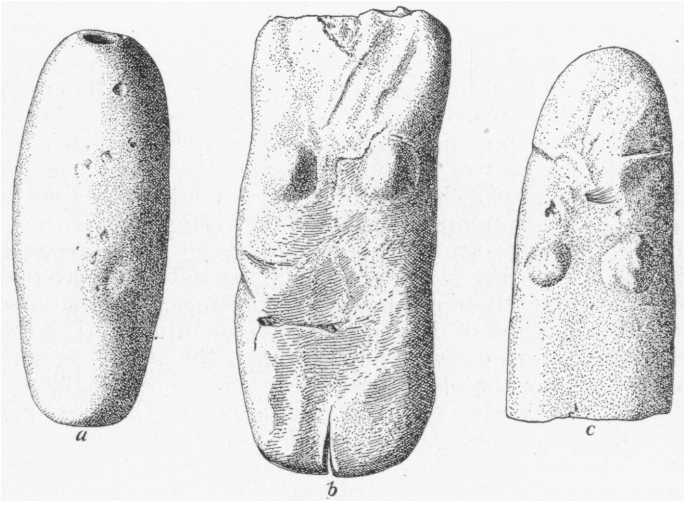


Fig. 8 (29.1–698, 1898, 908). Modeled Objects. *a*, a perforated cylinder, Prekiva 1, Cañon del Muerto; *b*, body of a figurine, Mummy Cave, Cañon del Muerto; *c*, an incomplete figurine, Area 14, Cave 1, Cañon del Muerto.

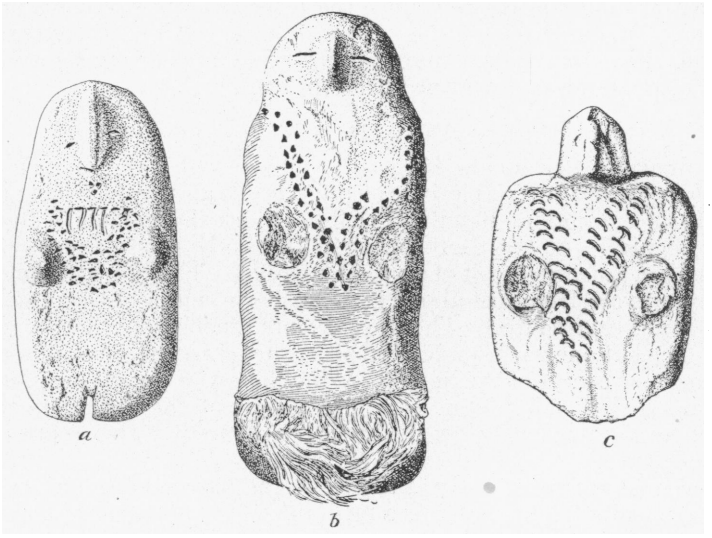


Fig. 9 (29.1–854, 1541, 1897). Female Figurines in Clay. *a*, Cave 1, Cañon del Muerto; *b*, *c*, Mummy Cave, Cañon del Muerto.

Miniature Copy of a Bifurcated Basket

An object suggesting a miniature clay copy of a bifurcated basket (Fig. 6*f*). The rim is not complete at any point. The dimensions are: greatest height, 2 7/16 inches; width, at top, 1 inch; at bottom, 1 1/8 inches; thickness at top, 1/2 inch; at bottom, center 27/32 inches; at side, 1 inch. The lower part of the object is solid, the cavity beginning 1 1/16 inches above the plane of its base. The cavity is dumb-bell shaped in transverse section, owing to compression along the vertical median line. The boundaries of the cavity are 1/8 inch thick. The clay is fine-grained, hard, and although the surface is uneven, rubbed smooth. On what may be considered the front, there are incised decorations. On the lower part there is an X composed of double rows of punctations. The lower extremities of the X turn outward and upward; the upper outward and downward. Crossing the object just above this is a blurred figure which appears to have been a wavy zigzag composed, for the most part, of a double row of punctations. Occupying the upper half of the surface is a second X. The line from the lower left to the upper right was made by a single stroke of a sharp-pointed tool. The other line is not symmetrical. The upper half was made with a single stroke and the lower by a stroke beginning below the end of the first and extending thence downward at a more abrupt angle. Beneath all lines of the X there is a double line of punctatious and above them a single row, except at the upper right, where a second row was begun. Evidently these pits were made with a hollow grass stem since there are the stubs of cores in some of them. On the back of the object is a curved line of punctations dropping from the broken margin with what appears to be a blurred double row extending downward from the center.

Figurines of Human Females

A figurine, 4 13/16 inches high, 1 13/16 inches wide, and 3/4 inch thick (Fig. 9*b*). The clay is friable and the finish crude and rough. The surface is black, as if from long handling. Offsets mark the shoulders, the head portion being 7/16 inches narrower than the body where the two join. The nose is a pinched-on bit of clay in high relief. The eyes are transverse slits cut outward from just above the transverse center of the nose. The mouth is not represented. The breasts were pinched on; hence, in high relief. The left one has been broken off. They were placed at practically the transverse center of the figure. A double row of punctations, incomplete on the left side, extends from the tops of the shoulders to a V between and somewhat below the breast. Apparently this represents a bead necklace.

The sides narrow slightly at the waist and flare again to indicate the curve of the hips. The crotch is a median cleft 3/4 inch deep. The figure wears an apron or breechcloth, such as are found upon the skeletons of females and plentifully in cave rubbish. The waist cord is a twisted string to which are attached at the front many closely placed hanks of separated fiber which pass through the crotch, completely filling the V-like cleft, and fastened to the waist cord at the back.

A tablet-like figurine, length, 2 11/32 inches; width, 1 3/32 inches; thickness, 3/8 inch. The clay is fine-grained, hard, and smoothly finished. The outline is an oval, interrupted by a cleft at the crotch. Nose and breasts are in high relief (Fig. 9*a*). Black bands, the left higher than the right, running outward from the nose, mark the position of the eyes. In each band, adjacent to the nose is a short slit, daubed full of black pigment. These may have been intended to represent the eyes entire or

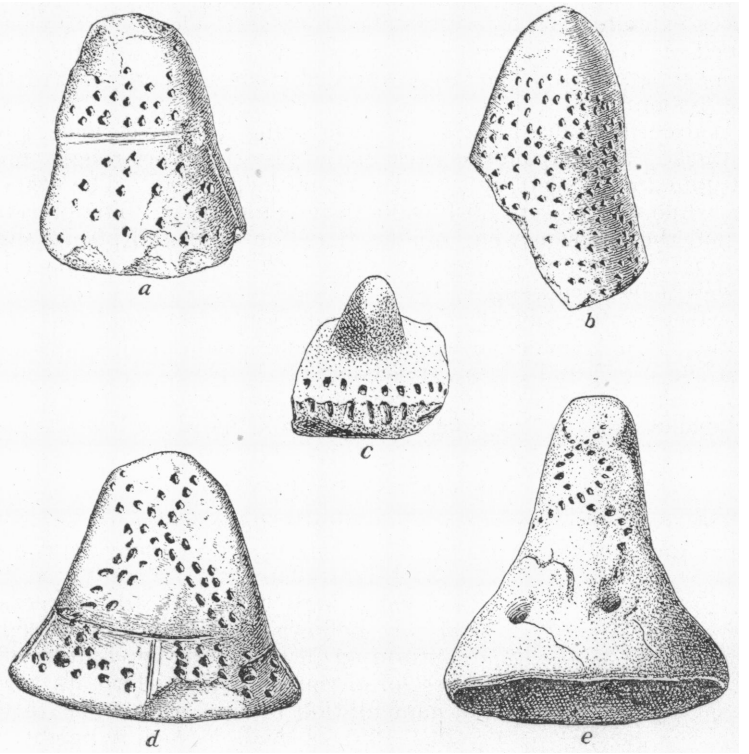


Fig. 10 (29.1–1539, 1900, 909, 1899, 1910). Nipple-Shaped Objects and Fragment of a Figurine. *a*, *b*, *d*, Mummy, Cave, Cañon del Muerto; *c*, Area 14, Cave 1, Cañon del Muerto; *e*, Post Basker Maker, Cañon del Muerto.

may have been intended for the pupils. Three punctations, just below the nose apparently represent the mouth. Beneath these a transverse incised line and four shorter ones run downward at right angles from it. Along the sides and below this device is a series of punctations in the general form of a V with the point between the breasts. Presumably the incised lines represent a pendant and the punctations, strands of beads.

A figurine of rough and poorly finished clay (Fig. 9*c*). The lower end is missing. The remaining portion of the body is 2½ inches long, 2⅛

inches wide, and 9/16 inch thick. In this case an attempt was made to mould the head in fairly true proportion. The occiput is in the same plane as the back, but the entire face stands out beyond the plane of the breast. The breasts, though broken away, were originally in high relief. The V-like necklace is indicated by double rows of incisions, made either by a very small finger nail or an arc from the stem of a reed or similar growth.

An incomplete figurine (Fig. 8*c*), 2½ inches long, 1⅛ inches wide, and 21/32 inch thick. The division between head and body is indicated by grooves extending partly across the front and sides. The breasts are pinched on like those previously described. In this case the necklace was not represented. The face is abraded; hence, its original treatment is not evident.

Body of figurine (Fig. 8*b*), 3⅛ inches long, 1⅜ inches wide, and 23/32 inch thick. The clay on the back of the object is very rough, showing longitudinal marks left by a narrow grainy-edged tool. The other surfaces, while uneven, are fairly smooth in comparison. The breasts are in relief, the left somewhat smaller than the right and placed slightly above it. The crotch is a narrow slit ⅜ inch deep. No necklace is depicted; the face is missing.

A fragmentary object (Fig. 10*c*), apparently the head portion of a figurine. It is ⅝ inches in length, 11/16 inches wide, and ¼ inch thick. Extending horizontally from the center of the top is a conical nose or beak ¼ inch in height. A double row of punctations encircles the object, ¼ inch below the nose, the fracture being in the line of the lower series.

Nipple-Shaped Objects

The collection contains nine nipple-shaped objects, conical in vertical and oval in horizontal cross-section; six of them are complete and three fragmentary, evidently all variants of a single type. In all instances the base is hollowed out, the cavity roughly conforming in shape to the contour of the exterior of the specimen. Two are without ornamentation of any sort. One of these (29.1–1901) is small, 29/32 inch in height, with base 15/16 inch long and ¾ inch wide. The concavity is 1/16 inch deep. The surfaces are smooth and stained as if from much handling. In one edge of the base there is a notch with rounded bottom and sloping sides, evidently of intentional origin. It is 3/32 inch deep.

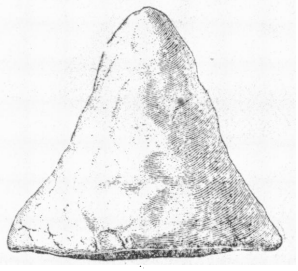


Fig. 11 (29.1–1536). Crude Undecorated Nipple-Shaped Object. Mummy Cave, Cañon del Muerto.

The other undecorated specimen (Fig. 11) is relatively massive, 2 5/16 inches high and 2 3/16 inches by 2⅝ inches at the base. The cavity is 1⅜ inches deep. The workmanship is very crude, suggesting that the object was not completed.

Of the remaining seven examples of this class of objects, only the four unbroken ones will be mentioned individually. The first (29.1–1537) is 1 9/16 inches in height with diameters of 1 11/32 inches and 1 3/16 at the base. The depth of the concavity is 7/16 inch. An irregular wavy line of punctations extends diagonally up one side for a vertical distance of one inch.

The second specimen (Fig. 10*e*) is 1 15/16 inches high with diameters of 1 17/32 inches and 1 29/32 inches at the base. The cavity is 3/4 inch deep. Two perforations pierce the wall of one side of the cavity, 1/2 inch from the margin. Above these perforations, toward the lip of the object, is an incised decoration which may be visualized as two opening V-shaped lines of punctations, the points of which cross to include a diamond-shaped area of plain surface.

The third specimen (Fig. 12*ab*) is more flattened than those previously mentioned. It is 2 5/8 inches high, with basal diameter of 1 7/32 inches and 1 11/16 inches. The cavity is 1/16 inch deep. There are two perforations 3/4 inch apart in one of the flatter sides of the cavity, 5/8 inch from the margin. This object is crudely but plentifully decorated. The surface bearing the perforations is divided into two zones by a horizontal incised line crossing approximately at the center. The lower zone is occupied by an asymmetrical zigzag line of deep punctations, while in the upper a series of three lines of similar pits forms a band, the top of which points leftward of the vertical axis. When the object is reversed, on the end of the base at the right of the observer there is a triangular pattern composed of four lines of punctations. The lower half of the side now visible (Fig. 12*a*) is divided into three blocks by four radiating incised lines, the tip being considered the center of the circle. In each block, 5/8 inch from the margin, is a double horizontal row of incisions. The upper half of this exposure contains a horseshoe-shaped pattern, heel downward, also composed of a double row of punctations.

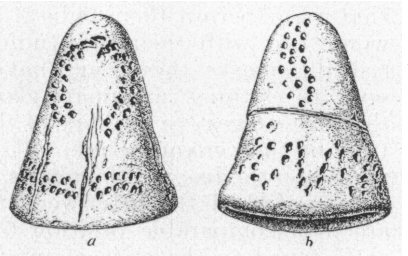


Fig. 12 (29.1–1535). Obverse and Reverse of a Decorated Nipple-Shaped Object. Mummy Cave, Cañon del Muerto.

The fourth specimen (Fig. 10*d*) is very much flattened with a length of 1 11/16 and basal diameters of 1 3/16 and 1 1/8 inches. The cavity is relatively shallow, being only 1/4 inch deep. There are four perforations 1 1/8 inches apart near the margin of one side of the base. The side in which these occur is copiously ornamented with punctations and incised lines in patterns which do not lend themselves to verbal treatment, but may be plainly seen in the drawing (Fig. 12*d*). The opposite side of the object is punctated.

The three incomplete specimens have most of the bases broken away; hence, it is impossible to determine the details in regard to them and

whether or not the pairs of lateral perforations were present. All three have incised decorations as shown by the drawings (Fig. 10*ab*, Fig. 13).

No definite function can be assigned to these nipple-shaped objects. It is plain enough, however, that they had no utilitarian value. Notwithstanding that they are purely speculative, a few suggestions may be worth presenting. The conclusion seems unavoidable that the female figurines described in a previous section were cult objects. The nose and breasts are in high relief, being, in fact, the most conspicuous portions of the figures. Presumably when cult personages appeared in ceremonial regalia or were represented in altar fittings, these same anatomical features would have been stressed. The four specimens of the present series, which were unquestionably completed, seem to represent the type, and are perforated in a manner that would permit them to be attached to a vertical surface so that they would rest with their longitudinal axes in a horizontal plane. Thus, lashed to masks, they would have served very well to depict noses, or sewn to clothing, mammary glands. Again, when held tip downward, they are suggestive in shape of the large carrying baskets in use at the time of their manufacture. To represent these they may have been placed on the backs of manikins, perhaps attached directly to the substances of which the latter were made, by means of the perforations which are in a comparable position to the loops on the baskets themselves, or fastened to the ends of miniature tump lines passing across the foreheads of the figures.[1]

Fig. 13 (29.1–1540). Pattern on Nipple-like Object of Unfired Clay. Mummy Cave, Cañon del Muerto.

Summary and Discussion

The categories of objects, other than containers, described in the foregoing pages seem to have been ancestral to nothing which appears in later culture horizons. From a technologic viewpoint their chief significance is the evidence they afford of the absence of the concept of firing artifacts of clay to render them harder and proof against moisture.

A tabulation of the data relative to clay containers reveals that in the Cañon del Muerto collection there are sherds to represent a minimum of ninety-six unfired vessels. Of these, fifty-four were moulded in coiled baskets and two in plaited receptacles, while forty seem to have been built up without the aid of moulds. Vegetable temper is present in fifty-one basket-moulded specimens; in the two made in plaited moulds; and in twenty-five of the plain specimens, or a total of seventy-eight. Thus there are without vegetable temper, three basket-moulded and fifteen

[1] In the summer of 1926 the writer found in a grave in the Mimbres Valley, together with a typical Mimbres bowl, a crudely fashioned nipple-shaped object exactly like some of those described, except that it had been fired.

plain specimens, or a total of eighteen. The vegetable temper is shredded cedarbark in seventy-four cases, and in the other four instances, the chaff of corn tassels or grass heads. Most, if not all of the specimens without vegetable reinforcement, were tempered with more or less sand. Of the fifteen plain vessels without vegetable temper, three may have been intended to be fired; hence, are not necessarily contemporaneous with the rest.

The origin of clay vessels may be found in contemporary architecture. It would be more fact than exaggeration to say that mud was the cement which held together the material culture existent when unfired vessels made their first appearance. In all sorts of construction, it was a more indispensable element than stone or wood. Invariably, cedarbark, reed leaves, corn refuse, or grass stems were mixed with it to the extent that when dry it was tough and durable almost beyond belief. It was used to bind the bases of walls to sloping cliff faces; to seal the cracks and to form the jug-like necks of slab cysts; and to chink and coat the sides and roofs of post houses. Hundreds of cubic yards of chunks and slabs of mud from fallen and dismantled structures compose a large proportion of the rubbish in the caves. In toughness and resistance the individual pieces are practically as obstinate as plaster of paris reinforced with hemp. Frequently, this mud was carried in baskets from where it was mixed to the point at which it was to be used. Almost from force of necessity, the stubbornness of the crust which would dry and adhere to the basket would eventually suggest to someone the possibility of applying a uniform coat of it to impart further usefulness to worn-out baskets in themselves no longer serviceable.[1] Probably in the first place the mud coating was only a lining, but in the end the practice developed of freeing the casts from the moulds and using them as independent containers. In proof of this point is the black stain of use which is as dense on the basket-marked portions of most of the specimens as upon the interiors. These marks of use could not have accumulated had the surfaces been protected by a basketry shell.

As long as the vessels were not to be fired, the vegetable reinforcement was more satisfactory than any other sort, not only because it prevented the clay from cracking as it dried, but because it was toughened and made somewhat resilient rather than brittle under a blow. But, in firing, the use of vegetable reinforcement would have been disastrous, leaving holes through, or cavities in the walls where it burned out, if indeed the gases generated did not burst or at least blister the clay.

[1]Cushing, Frank Hamilton, "A Study of Pueblo Pottery as illustrative of Zuñi Culture Growth' (*Fourth Annual Report, Bureau of Ethnology*, Washington, 1886), 485.

Whether or not there was conscious effort toward the production of a blend that would not check in drying and could thereafter be subjected to fire is, of course, uncertain; but the fact remains that eventually sand temper began to be used and became progressively more common. Confirmatory evidence of this sequence of events is contained in the proportions revealed by the Cañon del Muerto collection. Of fifty-four basket-moulded specimens only three are tempered with sand, while, omitting the uncertain cases, of thirty-seven plain specimens, twelve are sand-tempered. Thus the ratio increases from seventeen vegetable-tempered to one sand-tempered among the basket-moulded specimens, to approximately two vegetable-tempered to one sand-tempered among the plain ones.

The lugs appearing on the rims of the bowls appear to have been suggested by a previously existent device. On vertical cyst walls and abruptly sloping cave floors, mud protruberances of exactly the same shape, but of greater size, were stuck on to the rock to serve as steps. These were frequently observed, and because of the identity of material and shape, it may be assumed that the character of the first handles to be placed upon clay vessels was determined by a transfer of a concept from architecture to ceramics.

Although true corrugated ware did not appear before the art of pottery-making was well advanced, it is evident that the coiling process was in use almost from the beginning, as shown by the unobliterated horizontal bands traceable in the construction of the free rims of some of the basket-moulded vessels, and the entire walls of some of the plain ones.

As to the range of distribution of unfired vessels, not much can be said at the present time. At sites in the open, and, in fact, wherever moisture has penetrated, all such specimens have returned to earth and left no trace of their existence. So caves must be depended upon to yield the only evidence in regard to this particular industry. They have thus far provided data to indicate that the making of mud vessels was not restricted to Cañon del Muerto. Kidder and Guernsey record the finding of part of a bark-tempered, basket-moulded vessel in Segi Cañon and they describe sherds of two untempered plain bowls taken by Nusbaum from a cave in Kane County, Utah.[1] Also Doctor Kidder has given me permission to state that he has seen unfired sherds in Step House on the Mesa Verde. These finds give an established range for mud vessels of two hundred miles east and west by one hundred miles north and south, but there is every reason to suppose that future observation will greatly extend these limits.

[1]Nusbaum, *ibid.*, 138–144.

FIRED WARES OF THE POST BASKET MAKER PERIOD

Regardless of age, the true pottery of the region in question may be divided into two major classes, dependent upon function; namely, culinary and non-culinary vessels. The former may be plain-surfaced, banded, or corrugated, and are usually black. The latter, as a whole, may be characterized as smooth vessels bearing painted ornamentation. This class is separable into one principal and two subordinate varieties. The principal one is the well known black-on-white ware, that is, the ground color is some tone of gray and the decoration some shade of black. Black-on-red ware constitutes one subordinate variety, while the other is composed of vessels that are shiny black on the inside and gray-brown to red on the exterior. There are occasional variations and hybrids, but these do not invalidate the general classification.

Post Basket Maker wares, exemplifying the earliest true ceramics of the region, have been found practically all over the San Juan area. Although there is local variation, the distinctive features remain sufficiently the same to leave no question as to the constancy of types and the validity of their identifications. The specimens used for study in the preparation of this paper fall into age relations revealed by the headings under which they will be discussed, namely: The Standard Complex, Late Developments, and Additional Forms.

The Standard Complex

The clay in vessels of the standard complex is a fine-grained variety, which, under proper firing, became a light gray or even a fairly clear white. As in every such series there are variations which swing in both directions from the norm, as exemplified by occasional dishes of leaden hue and others of unusually brilliant white. When finely reduced and thoroughly mixed, the clay became a homogeneous mass, but under opposite conditions it left the vessel wall checked and granular in internal structure. The use of a clean white sand for tempering material seems to have had the widest distribution. In the present series, it is found in vessels from as far east as Pueblo Bonito (Fig. 14*b*) and as far west as Cañon del Muerto (Fig. 14*a*). However, there is local variation in this matter. About nine-tenths of the vessels from the La Plata Valley, Colorado, contain a ground temper, dark gray in color, apparently an igneous rock.[1] This predominance may be due to the fact that the soil of the locality is clayey; hence, the right sort of grit would have been hard to obtain, or

[1]Morris, "Preliminary Account of the Antiquities of the Region between the Mancos and La Plata Rivers in Southwestern Colorado" (*ibid.*), 195.

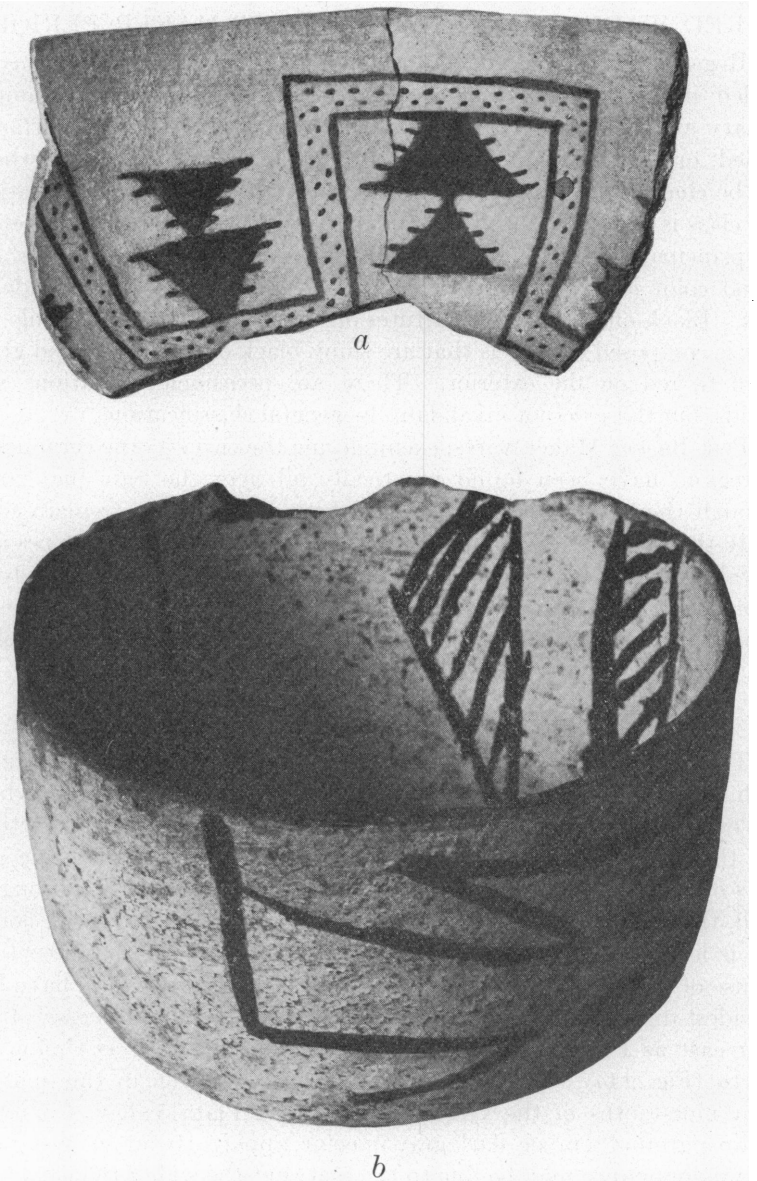


Fig. 14 (29.1–1694, H-11138). Examples of Decorated Fired Ware. *a*, Tseahatso, Cañon del Muerto; *b*, Pueblo Bonito.

again, by the time these wares were made, it may have been recognized that ground temper under average conditions would produce a firmer pottery than sand. At any rate, the few La Plata vessels of which the latter is a component are the crudest of the lot.

The hardness and relative excellence of an individual specimen is dependent, first, upon the proportion of clay and temper; and, second, upon the success with which it was fired. If the temper is fine and not too plentiful, and the fire was of sufficient intensity, the paste is hard and compares very favorably with that of San Juan pottery in general. If the temper is coarse and used in great quantity, regardless of the firing, the paste is granular and friable. With the normal amount of firing, the clay component of the paste became the same color throughout, while under firing left a dark streak at the center, and over firing imparted a yellowish or pinkish cast.

Post Basket Maker pottery, on the whole, is relatively thin, the observed extremes being ⅛ and 7/16 inch and the average less than ¼ inch. The surface finish is usually dependent upon the fineness of the temper. Although the vessels were rubbed to a greater or less degree, the creamy film of clay thus brought to the surface did not completely hide or cover the granules beneath, thus leaving a grainy surface relatively smooth, if the temper were fine, and relatively rough, if it were coarse. Very frequently the grains of temper protruding above or visible through the finish, impart an irregularly stippled appearance, highly characteristic of Post Basket Maker wares. No specimen thus far observed has borne a true slip. These generalizations concerning the structure seem equally applicable both to culinary and non-culinary vessels.

CULINARY VESSELS

Cooking vessels without necks may be described as depressed-spherical, or elongated-spherical in form. Probably the shape was suggested by antecedent receptacles made from the shells of gourds or squashes from which, in each case, a disk surrounding the stem was cut out to provide an aperture or mouth. In size the available specimens vary from diameter, 4 inches, height 3½ inches, to diameter 10⅝ inches, height, 9 inches. Usually these vessels are without handles or attachments of any sort (Fig. 15*a*). Occasion-

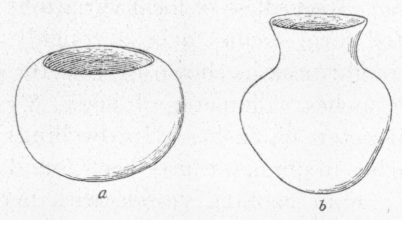


Fig. 15. Types of Culinary Vessels from the La Plata Valley.

ally, however, they are provided with opposite pairs of perforations near the rim, through which cords might be passed, and more rarely they bear lugs on opposite sides, each pierced vertically for the reception of a cord or thong. (Fig. 16*f*.) Two without these features are shown in Figs. 16*t* and 16*s*. The latter is a typical specimen. It is 9 inches high, 10⅜ inches in diameter, with a slightly oval mouth, 4¾ by 5⅜ inches. The bottom is somewhat conical, the top flattened, the finish smooth, and the thickness of the walls averages 5/32 inch. If they have been used for their intended purpose, these pots are smoked black and often caked with soot. The one described is mottled from black to red-brown, as the result of unequal exposure to the fire which destroyed the room in which it was found. Smaller vessels of this variety are found in graves, but the large ones come to light only in dwellings or caches.[1] Presumably these open-mouthed spherical pots were earlier in point of origin than cooking vessels with necks.

Culinary vessels with necks consist of roughly spherical bodies rising into slightly inward-sloping, vertical, or outcurved margins. Three typical examples, without handles, are shown in Figs. 16*m*, *p*, and *k*. These vessels, all from graves, are small, the largest being 5¼ inches in diameter and 6¼ inches in height, 1½ inches of this being the altitude of the rim.

From the La Plata Valley there are specimens with narrow necks and pronouncedly recurved rims (Figs. 15*b*, Fig. 16*l*); some with flattened bottoms and walls sloping sharply inward above the girdle to the base of narrow recurved rims, Fig. 16*j* and others with egg-shaped bodies merging into low straight (Fig. 16*o*) or slightly recurved margins, Fig. 16*n*. Regardless of local variations the most typical and widely distributed form seems to be a roughly spherical body with a wide almost straight neck as shown by Fig. 16*r* of which the dimensions are: height, 8¾ inches; diameter of body, 8½ inches; height of neck, 2 inches, diameter, 6¾ inches. In dwellings fragments of such vessels up to 11 inches in diameter have been found.

Four cooking vessels with necks, provided also with handles are shown in Figs. 16*g*, 16*h*, 17*l*, 17*b*. In Fig. 17*l* the vertical loop handle is a curved strap of clay, its upper end attached to the rim of the pot, and its lower extremity to the incurve of the body. The handle of Fig. 17*b* is essentially similar except that it is composed of two parallel ropes of clay. Fig. 16*g* illustrates a vessel with lugs on opposite sides of the incurve which extend upward on to the base of the neck. They are

[1]Kidder and Guernsey, "Archæological Exploration in Northeastern Arizona" (*ibid.*), 144.

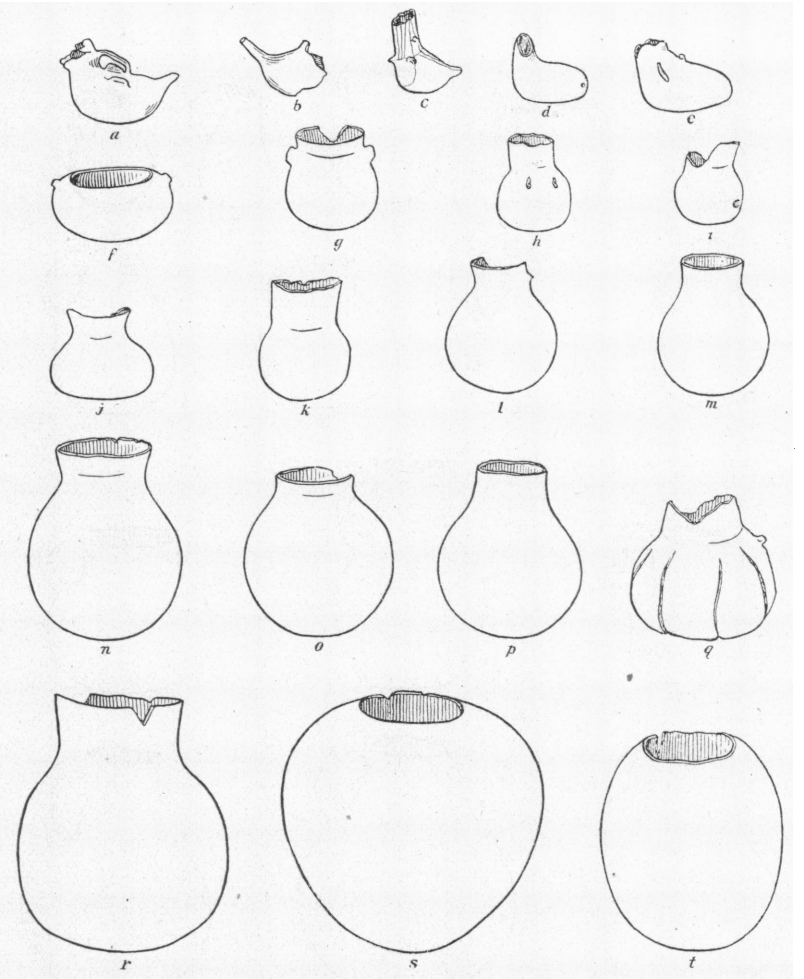


Fig. 16 (29.1–3284, 3269, 2933, 2955, 2604, 2655, 2987, 2925, 2951, 3245, 2640, 3248, 2932, 3236, 3240, 3005, 2942, 3273, 912, 963). Pottery Forms in Fired Wares of the Post Basket Maker Period. *a*, Site 26, La Plata Valley; *b*, Grave 26, La Plata Valley; *c*, Grave, 142, Site 6, Navajo Reservation; *d*, Grave 155, Navajo Reservation; *e*, Mound 5, Burial 31, Mitten Rock; *f*, Mound 5, Burial 68, Mitten Rock; *g*, Grave 195, Site 6, Navajo Reservation; *h*, Grave 136, Navajo Reservation; *i*, Grave 153, Navajo Reservation; *j*, Grave 10, Site 22, La Plata Valley; *k*, Mound 5, Burial 49, Mitten Rock; *l*, Grave 11, Site 22, La Plata Valley; *m*, Grave 142, Site 6, Navajo Reservation; *n*, Grave 3, Site 22, La Plata Valley; *o*, Grave 8, Site 22, La Plata Valley; *p*, Grave 205, Site 6, Navajo Reservation; *q*, Grave 146, Site 6, Navajo Reservation; *r*, Site 23, La Plata Valley; *s*, Area 14, Cave 1, Cañon del Muerto; *t*, high cave north side of first east branching cañon below, Mummy Cave, Cañon del Muerto.

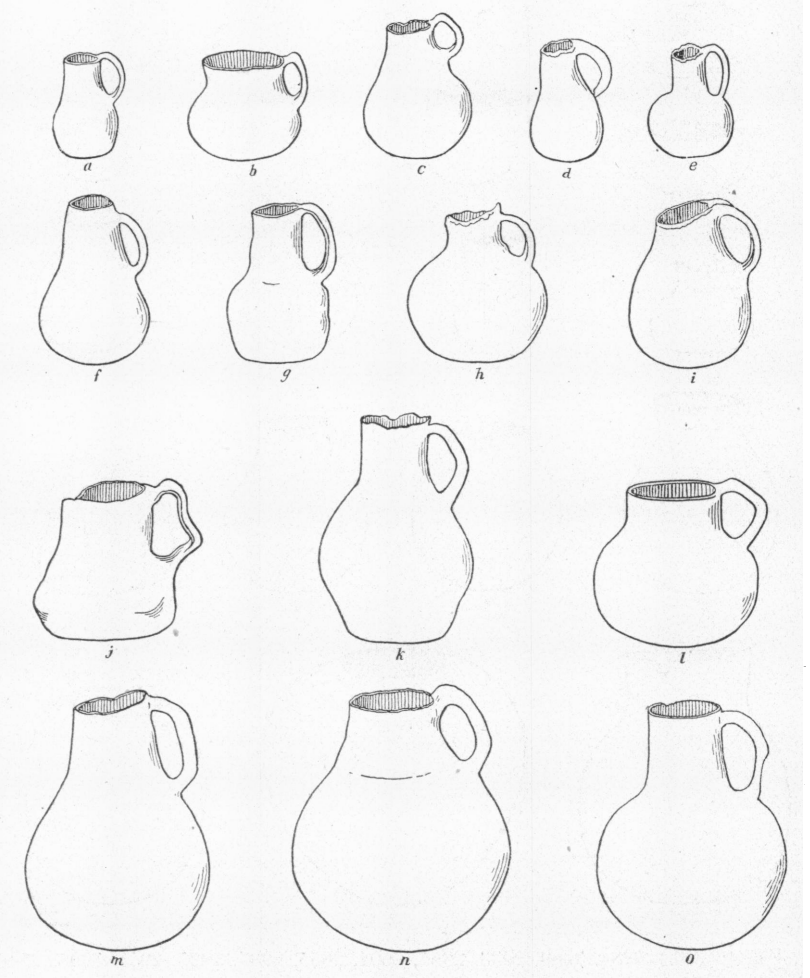


Fig. 17 (29.1–2316, 2971, 1909, 2622, 2520, 2992, 3264, 3272, 919, 2626, 3251, 2973, 2924, 2995, 2958). Pottery Forms in Fired Wares of the Post Basket Maker Period. *a*, Site 24, Grave 127, Group 6, Navajo Reservation; *b*, Grave 174, Site 6, Navajo Reservation; *c*, Cañon del Muerto; *d*, Mound 5, Burial 42, Mitten Rock; *e*, Newcomb's Mesa; *f*, Grave 198, Site 6, Navajo Reservation; *g*, Grave 24, La Plata Valley; *h*, Grave 28, La Plata Valley; *i*, Burial 2, Cañon del Muerto; *j*, Mound 5, Burial 43, Mitten Rock; *k*, Site 23, La Plata Valley; *l*, Grave 177, Site 6, Navajo Reservation; *m*, Grave 136, Site 6, Navajo Reservation; *n*, Grave 200, Site 6, Navajo Reservation; *o*, Grave 157, Site 6, Navajo Reservation.

vertically perforated. The pot shown in Fig. 16*h* once bore a horizontal loop handle attached to one side of the body at the beginning of the incurve. Handles have not been observed to occur on large cooking vessels.

Cooking pots of the early complex are characteristically plain-surfaced, without bands or corrugations or any embellishment whatever except the handles already noted. The writer had observed but one exception either in pot or sherd. This occurs in the vessel shown in Fig. 16*q* which is a lop-sided pitcher-like pot 6¼ inches in diameter. Part of the neck and the vertical loop handle were broken off long before the vessel ceased to be used. The base is fluted, the seven grooves, some nearly vertical, others oblique, presumably were intended to represent the divisions between the segments of the shell of some variety of squash.

NON-CULINARY VESSELS

The non-culinary vessels assignable to the Post Basket Maker Period may be grouped under the following types: pitchers, water jars, bird-shaped vessels, vessels with lateral spouts, and bowls.

Pitchers. Crudeness both of form and finish may be named as the outstanding characteristic of the pitchers of the early complex. In general, they are even more roughly finished than the cooking pots. The bodies are globular and in most cases merge gradually into tapering necks. The resemblance to gourds, of which the tips bearing the stems have been removed, is usually quite close. Six typical specimens appear in Figs. 17*a*, 17*c*, 17*i*, 17*m*, 17*n*, 17*f*. Each vessel is equipped with a vertical loop handle. The upper extremity is usually attached to the extreme margin, but occasionally to the neck, slightly below the rim (Fig. 17*f*). The lower end rises from some point on the incurve, but does not extend very far down upon the body. In cross-section the handles are commonly circular, occasionally oval, but seldom flattened to a marked degree; that is, they are more cylindrical than band-like. One of the present series is double (Fig. 17*i*) being composed of two parallel strands. The dimensions of the extremes of this series are: height, 3$\frac{3}{16}$ inches, diameter of body, 2½ inches, of the neck, 1$\frac{5}{16}$ inches; height, 6$\frac{11}{16}$ inches, diameter of body, 6 inches, of the neck, 3⅛ inches.

The three pitchers from the La Plata (Figs. 17*h*, 17*g*, 17*k*) are somewhat more specialized in form and have flattened bottoms which permit them to stand upright. The smallest (Fig 17*h*) is 5⅛ inches high, the largest (Fig. 17*k*), 6¼ inches.

Two pitchers, in which the line of demarcation between the body and the neck is more than usually distinct, appear in Figs. 17*e*, 17*o*. The

smaller one, Fig. 17*e*, is 3 7/16 inches high with a body diameter of 2 11/16 inches. The neck is 1½ inches high and 1⅛ inches in diameter. The larger one exemplifies the finest workmanship the writer has observed among pitchers of the early complex. The specimen is graceful and pleasingly symmetrical with a height of 7 inches, the body being 5⅞ inches in diameter and the neck, 3 inches. The walls are 5/32 inch thick, the paste is fine-grained, and the exterior surface well smoothed.

The base of the pitcher illustrated in Fig. 17*j* is quadrangular in horizontal section at the point of greatest diameter. The rather strap-like handle is also unusual. The vessel is asymmetrical when viewed from any possible angle and is an epitome of crudeness. It is 4½ inches high and about 3/16 inch thick. The specimen is listed in the standard complex principally because of its inferiority. However, the temper, which, instead of sand, is a dark granular substance, suggests that it may be an example of careless workmanship at a somewhat later date.

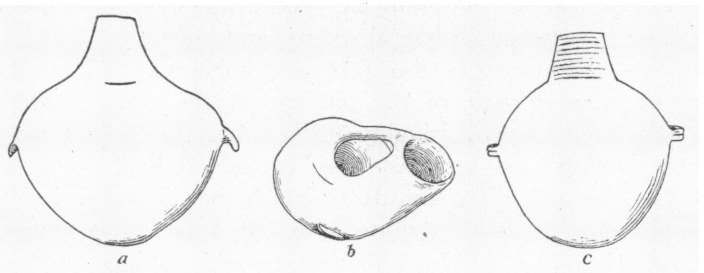


Fig. 18. La Plata Forms. *a* and *c*, water jars; *b*, a ring-bottomed pitcher.

Water Jars. No collection gathered wholly from graves is completely representative of San Juan pottery of any period, because the great jars were almost never used as mortuary accompaniments. Since the material at hand for this study was taken from cemeteries, it will be necessary to draw upon the collection in the University of Colorado Museum, much of which was found in house sites, to provide certain types.

Water jars of the early complex resemble in general form those well known from later ruins. However, aside from the lack of ornamentation upon the former, there are distinctive differences. In highly evolved black-on-white ware the bodies of the water jars approach a spherical form. In the upper hemispheres the inward curving walls maintain their true arcs to the base of the neck which rises thence vertically, or is slightly recurved. Post Basket Maker jars preserve the spherical contour up to the girdle, but thence upward they are generally flattened for

a distance, then turn upward to form a tapering neck which is a continuation of the vessel wall rather than a distinct element. Hence, the early jars are more or less pear-shaped, the neck representing the stem end. The one shown as a type (Fig. 18*a*) is 19 inches in diameter and is the largest the writer has seen. The handles are exactly similar to the lugs on the mud bowls previously described (Fig. 3) except that they point downward, i.e., are inverted. While it is not certain that horizontal loop handles do not occur among the standard complex, these solid ones with the down-turned tips are the most common variety.

The similarity in contour between this type of vessel and the water basket figured by Kidder and Guernsey[1] is so close that it cannot be overlooked. The clay vessel is merely the basket inverted. The handles on the former are in the same position as the loops on the latter; while the opening in the basket is in the base and that of the jar in the slender end, such a change of position would be almost necessary both to facilitate transportation and to avoid breakage.

Bird-Shaped Vessels. Bird-shaped vessels were by no means common among the early complex. The only complete vessel observed by the writer is shown in Fig. 16*c*. It is 4 inches high. The plump body is surmounted by a disproportionately large neck which at one time bore a vertical loop handle like those upon the pitchers previously described. At the proper place there is a protruberance for the tail, one on either side, where the wings should attach, and a fourth at the center of the breast. The clay, tempered with unusually coarse sand, is very roughly finished. Both neck and body are decorated with straight lines, as may be seen in the illustration. The clay is yellow and the ornamentation red-brown as the result of over-firing.

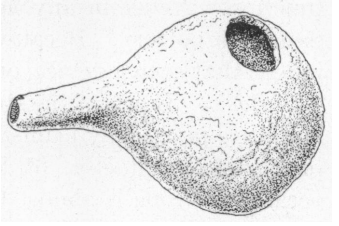


Fig. 19 (29.1–910). Globular Vessel with Lateral Spout. Area 14, Cave 1, Cañon del Muerto.

Vessels with Lateral Spouts. The incomplete vessel shown in Fig. 16*b* is a representative of a type, rather than a product of individual caprice, as one might suppose from the unusualness of the form. It is from the La Plata Valley, a locality which has yielded others;[2] another (Fig. 19) is from Cañon del Muerto, Arizona, and fragments have been found in intermediate sites.

The body of the specimen (Fig. 19) is essentially globular, but slightly flattened at the top and elongated at one side to meet the base

[1]Kidder and Guernsey, "Archæological Exploration in Northeastern Arizona" (*ibid.*), pl. 78.
[2]Morris, Earl H., "Preliminary Account of the Antiquities of the Region between the Mancos and La Plata Rivers in Southwestern Colorado" (*ibid.*), pl. 71e.

of the spout. The latter is attached just below the point of greatest diameter and points somewhat downward from the horizontal plane of the body. The very roughly finished body is 2 7/16 inches high and 2 3/16 inches in diameter. The opening in the top, although probably intended to be circular, is oval, with diameters of 13/16 inch and 1 inch. The spout is 13/16 inch in diameter at the base, 9/16 inch at the tip, and 1¼ inches long, with an internal diameter of 15/64 inch.

The fragmentary example (Fig. 16*b*) exhibits better workmanship in all respects than that just described. The paste is hard and firm, the surface is smooth, and the form well controlled. Apparently the vessel was oval instead of circular in transverse section, being considerably elongated on the side which bears the spout. The body is 2 11/16 inches in transverse diameter, 2⅞ inches high, and was at least 3½ inches long. The bottom is flattened and the sides of the orifice in the top were curved upward sufficiently to create a low neck. The spout, which points upward at an angle of about 40 degrees from the plane of the base, is attached more than half way up the side. It is 1⅝ inches long, ¾ inch in diameter at the base, and ⅞ at the tip, with a bore 9/32 inch in diameter.

In the earlier description, it was suggested that the object in question might have been a lamp because the tip of the spout was burned and disintegrated. Specimens subsequently exhumed do not confirm this belief; moreover, it is not probable that such vessels were fat-bowled pipes because they are neither caked nor blackened around the openings in the tops. Thus far, there is no evidence to clear up the question of function. Never in any later period does the hollow spout appear in San Juan pottery. Because of its many possible uses, it seems singular indeed that such a device, once originated, should not have been retained.

Bowls. Bowls of the standard complex are deep rather than shallow. Some are practically hemispherical; others are too deep to maintain this proportion—diameter, 6¾ inches, depth 4⅛ inches (29.1–2986), while occasionally one is almost flat-bottomed and straight-walled (Fig. 14*b*). Pronouncedly incurved or recurved rims have not been observed. Characteristically, the vessel walls are slightly thinned for a short distance below the margin which is rounded in cross-section. In the majority of cases the rims are wavy and uneven, but in a few of the best made specimens, if the vessels were inverted upon a flat surface, they would touch along most of their circumference. Invariably, the interior is much smoother than the exterior, the field which was to be ornamented with patterns having been rubbed and polished to the neglect of the one that was not to be so treated.

A series of twelve bowls from the country south of the San Juan is given in Figs. 20, 21, 22*a*, 23*a*, 23*b*, 23*c*, 23*f*, 23*e*, 23*d*, 14*b*, 24*a*, 24*b*. These specimens range in size from a diameter of 2⅞ inches and depth of

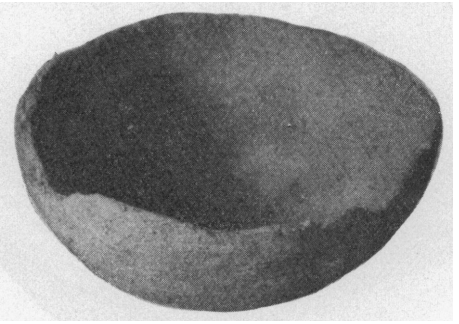


Fig. 20 (29.1–2968). An Undecorated Bowl. Grave 171, Site 6, Navajo Reservation.

Fig. 21 (29.1–2718). A Decorated Bowl. Pre-Pueblo site; 1 mile west of Mitten Rock Group.

1⅜ inches (Fig. 20) to a diameter of 8⅛ inches and a depth of 4 inches (Fig. 23*c*). In the collection from this region there are no examples of bowls moulded in baskets or fitted with handles.

The bowls from the La Plata exhibit on the whole better workmanship than those from the south side of the San Juan. They are also larger

Fig. 22 (29.1–2936, 3252). Decorated Bowls. *a*, Grave 144, Site 6, Navajo Reservation; *b*, Grave 14, Site 22, La Plata Valley.

Fig. 23 (29.1–2923, 2985, 2986, 2976, 2940, 2941). Types of Decorated Bowls. *a*, Grave 136, Site 6, Navajo Reservation; *b*, Grave 191, Site 6, Navajo Reservation; *c*, Grave 195, Site 6, Navajo Reservation; *d*, Grave 179, Site 6, Navajo Reservation; *e*, Grave 146, Site 6, Navajo Reservation; *f*, Grave 146, Site 6, Navajo Reservation.

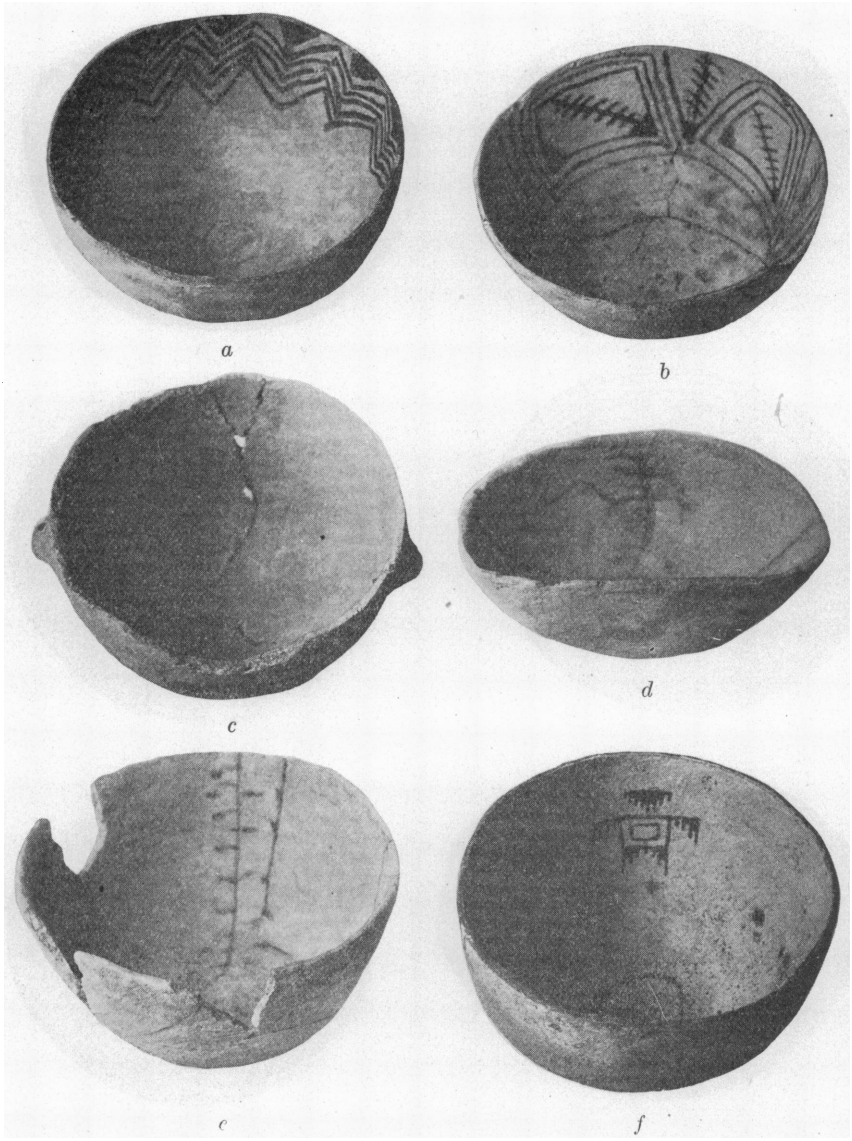


Fig. 24 (H-16343, 16323, 29.1–3242, 3244, 3261, 3235). Types of Decorated Bowls. *a*, Pueblo Bonito; *b*, Pueblo Bonito; *c*, Grave 9, Site 22, La Plata Valley; *d*, Grave 10, Site 22, La Plata Valley; *e*, Grave 22, Site 23, La Plata Valley; *f*, Grave 2, Site 22, La Plata Valley.

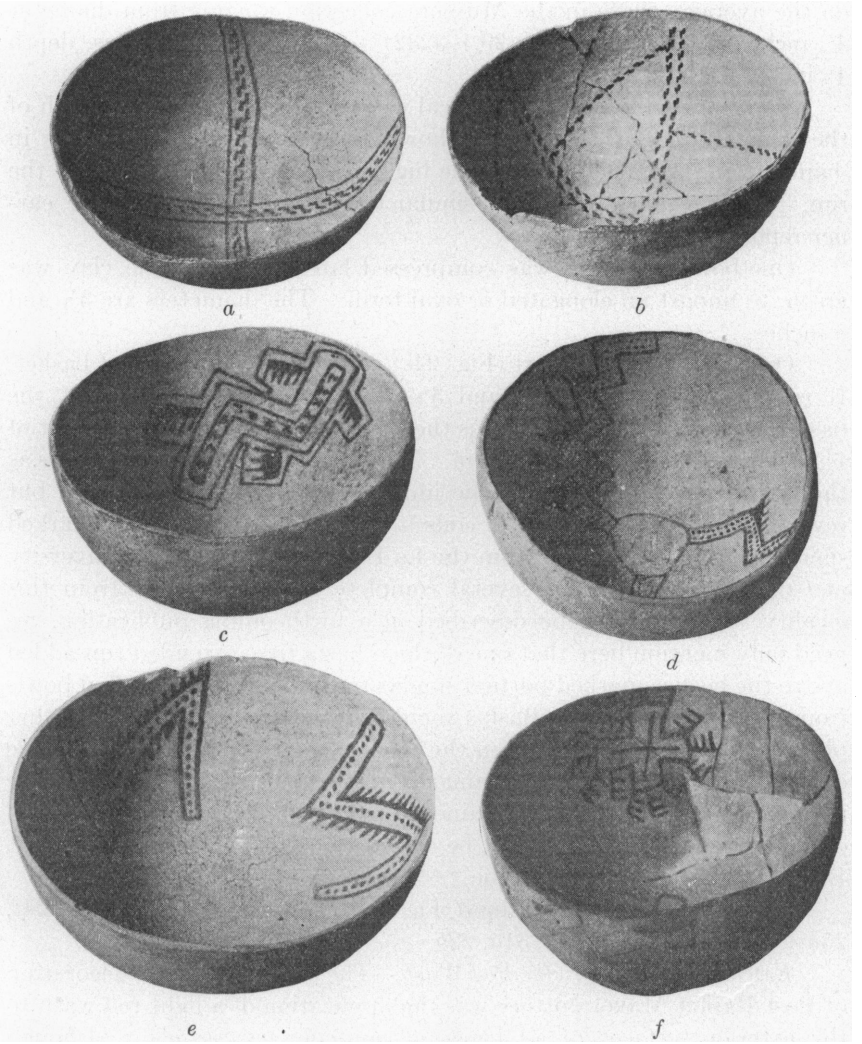


Fig. 25 (29.1–3266, 3243, 3259, 3237, 3239, 3241). Types of Decorated Bowls from the La Plata Valley. *a*, Grave 26, Site 23, La Plata Valley; *b*, Grave 10, Site 22, La Plata Valley; *c*, Grave 10, Site 23, La Plata Valley; *d*, Grave 4, Site 22, La Plata Valley; *e*, Grave 7, Site 22, La Plata Valley; *f*, Grave 9, Site 22, La Plata Valley.

on the average, those in the Museum collection ranging from diameter 4¾ inches, depth 2¾ inches (29.1–3232) to diameter 9¼ inches, depth 4⅞ inches (29.1–3238).

A very deep bowl with a conical vertically perforated lug at each of the extremities of a diameter is shown in Fig. 24*c*. It is 5 inches in diameter and 3⅛ inches deep. The lugs are situated 7/16 inch below the rim. Another bowl, essentially similar to this one is figured in the earlier report (Fig. 39*a*).

One bowl (Fig. 24*d*) was compressed laterally, while the clay was green, to impart an elongated or oval form. The diameters are 3¾ and 6 inches.

One flat-bottomed bowl (Fig. 24*e*) was moulded in a coiled basket. It is 6⅛ inches in diameter and 3⅜ inches deep. The depth of the basket was only 1⅝ inches. Thus the vessel wall was built to a height of 1¾ inches above the basket margin. This part is of the same thickness as the basket-marked portion. The impression of the mould is dim, but reveals a very good weave with coils 5/16 inch wide. Some basket-marked sherds have been gathered from the La Plata sites and in the University of Colorado Museum are several complete moulded vessels from this locality. As they will be described in a forthcoming publication, we need only mention here that one of them has a free, extended rim added above the basket-marked portion similar to those upon the unfired bowls from Cañon del Muerto. Basket-moulded sherds are to be found rather plentifully around early sites in the Gobernador region well toward the eastern end of the San Juan drainage. Thus it would appear that while it is localized, having been retained in some places and abandoned in others, basket moulding should be considered a definite element of Post Basket Maker pottery technique.

A series of nine of the finest La Plata bowls is given in Figs. 24*f*, 25*a*, 25*b*, 25*c*, 25*d*, 25*e*, 25*f*, 31*a*, 22*b*.

Exterior Decoration: the Red Wash. The most distinctive decoration of Post Basket Maker pottery was the application of a light red wash to the exterior surfaces of all types of non-culinary vessels. Although analyses have not been made, it is evident that the pigment is an iron oxide. It was applied after firing and as a consequence the color is not fast. Whenever vessels or sherds bearing it are found near the surface, that is, within the limit of penetration of rain and melting snow, the "fugitive red," has not uncommonly been completely leeched away or remains as a faint tint only on the spots where it was originally thickest. It is also acted upon chemically by the products of body decay, as is revealed

by specimens found in dry cave burials, of which the portion touching or near the body is natural clay color while the remainder retains the red stain. In those instances where soil moisture has deposited a coating of lime upon the vessels, the red has not uncommonly been temporarily fixed, rather than removed. In cleaning such specimens, unless one is aware that the wash is to be expected, it is more than likely to be removed without being recognized. After treatment with the acid bath, if a brush is used to scrub off the film of dissolved material, the red will come with it. However, the acid may be used with safety, providing the subsequent cleaning be confined to a gentle rubbing with the hand while the vessel is immersed or held in running water.

In any collection the red wash will be noticed more upon the bowls than elsewhere, merely because of the preponderance of numbers. The sherds from relatively deep excavations, however, whether from bowls, pitchers, or water jars, are almost invariably coated with it.

Fired-in designs which in wares of the standard complex, occur almost exclusively upon bowl interiors, will be discussed later.

Late Developments and Additional Forms

The most marked structural change in late Post Basket Maker wares was the utilization of a different tempering material. It is a greenish black igneous rock apparently of a kind which occurs in dike formations over most of the eastern part of the San Juan basin. Just when it first came into use is uncertain, but by the end of the period it was used much more frequently than sand. Inasmuch as a slip was not applied, the more fine-grained the paste, the greater the possibility of a smoothly finished vessel. While in many instances it is coarse, the black rock incorporated in some of the late vessels is so finely ground that their surfaces were rubbed to a smoothness resembling a polish. Apparently because of better cohesion between the clay matrix and the angular grains of ground temper than there is between the former and the rounded sand grains, the paste is less friable than that of the earlier wares.

CULINARY VESSELS

The principal change to be observed among cooking vessels toward the close of the period is the appearance of bands upon the necks. But few of the pots were thus embellished; the chief importance of the new departure lies in the fact that it marks the beginning of the technique which was to produce the corrugated ware of later times. Typical specimens are shown in Figs. 26*a* and *b*. The former is 5 inches in

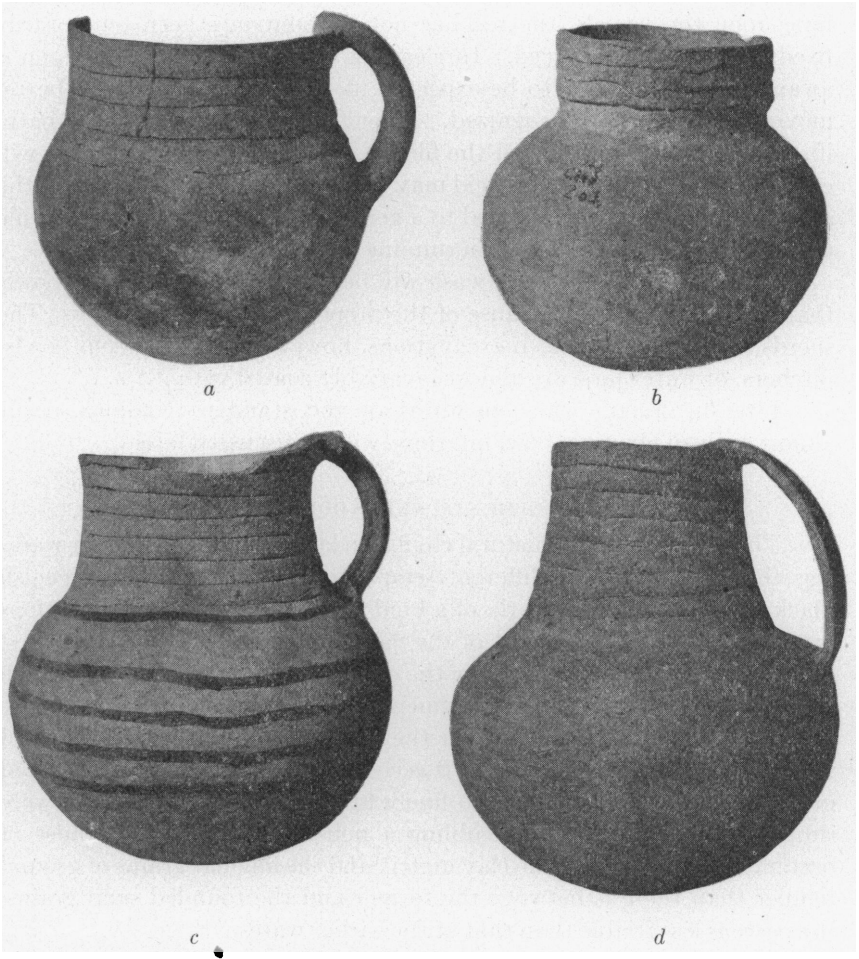


Fig. 26 (29.1–2960, 2972, 2961, 2646). Banded Necked Vessels. *a*, Grave 162, Site 6, Navajo Reservation; *b*, Grave 176, Site 6, Navajo Reservation; *c*, Grave 162, Site 6, Navajo Reservation; *d*, Grave 149, Site 6, Navajo Reservation.

diameter and 5¼ inches high, with a diameter of 3¼ inches at the mouth. The vertical loop handle consists of two strands of clay each about 5/16 inch in diameter. The neck is composed of four horizontal bands, 3/8 to 15/32 inch in width. The thickness of the walls averages about 5/32 inch. This specimen contains ground rock temper. The other (Fig. 26*b*) is 5¼ inches high and 5⅜ inches in diameter, with a mouth 3¼ inches in width. The vertical neck is 1⅜ inches high. The basal 7/16 inch is plain, the remainder consisting of three uneven horizontal bands. The sand-tempered walls are 3/16 inch in average thickness.

NON-CULINARY VESSELS

Pitchers. Among the late pitchers are a few exhibiting very graceful forms and a symmetry and quality of workmanship which do not appear among the earlier specimens. The latter, together with the appearance of bands upon the necks of a few, is the ranking point of difference. Two of the best examples are given in Figs. 26*d* and 26*c*. The former is 8⅛ inches in height and 7 inches in diameter at the girdle. The tapering neck is 3¼ inches in height and 3½ inches in diameter at the mouth. Eight horizontal bands in low relief compose the neck. The vertical loop hand is strap-like, 15/16 inch wide and 7/32 inch in thickness. The rock tempered paste is very hard and slightly less than 3/16 inch in thickness. The vessel is fairly smooth and mottled light to dark gray in color. The base is slightly flattened to enable the pitcher to stand upright, which because of rounding bottoms, few of the earlier ones will do.

The other figure (Fig. 26*c*) is 6 inches high, 5⅝ inches in diameter at the girdle, and 3⅜ inches at the mouth. The re-curved neck is 2⅛ inches high and is composed of seven horizontal bands. The ends were joined in the line of the handle and were not completely blended as shown by a vertical crack which formed at their junction. The rock-tempered paste is very hard and thin and the finish good. The handle is a vertical loop composed of two strands of clay, one of which has been broken off. The base is very slightly concave. Of particular interest are the rim line and five horizontal lines, in dull brown, encircling the body, since they mark the spreading of painted ornamentation from bowls to other forms of vessels.

Water Jars. The same generalizations given in connection with pitchers hold for water jars; greater symmetry, better workmanship, and the appearance of bands upon the necks. The one shown as a type is 17 inches in height (Fig. 18*c*). The handles are horizontal loops each composed of two strands of clay. The loop handles were becoming pro-

gressively more common, to the eventual exclusion of the solid lugs. The latter, however, occur in occasional instances as late as the Chaco period.

Bird Form Vessels. No diagnostic changes are evident in the late Post Basket Maker bird-form vessels. The protruberances indicating tail and wings are perhaps the most characteristic features of this type of vessels for the entire period. The one shown in Fig. 16*e* will be discussed in another connection. Another example appears in Fig. 16*a*. It is 5⅜ inches long, 4⅜ inches high, and 3½ inches in greatest width. The tail and wing protruberances are present. In addition, at either side of the base of the neck, are two conical knobs, concave as if made by pressing out the vessel wall from the inner side. The loop handle, which curves from the middle of the back to the neck, consists of two parallel strands. On the neck-breast region was a design in red, now almost obliterated.

Vessels with Lateral Orifices. Vessels with lateral orifices seem to have assumed the function, whatever it may have been, of the previous ones with lateral spouts. Typically they are small receptacles resembling in shape the plump body of a bird, with either wide or narrow openings, as if at the base of the severed neck. In addition, there is a circular perforation in the tail comparable in position, if we follow the bird topography, to the anus. The one illustrated (Fig. 16*d*) is 4⅜ inches long, 3⅝ inches wide at the breast, and 3 inches high. The mouth is oval, with diameter of 1¼ inches by 2⅜ inches. The lateral orifice is 7/16 inch in diameter. The clay is rock tempered, but poorly fired and friable, with a very rough finish.

Occasionally other sorts of vessels were modified to possess the essential features of this type. The tail of the bird in Fig. 16*e* was ground off until the tip of the cavity was reached and the hole reamed out to a diameter of ⅜ inch. In the small cooking pot illustrated in Fig. 16*i* a hole of about the same diameter was drilled in one side, a short distance below the girdle. It is altogether possible that bone tubes were set with pitch in these openings to take the place of the clay spouts on the prototypes.

Gourd-Shaped Vessels. While presumably the shape of the first pitchers was suggested by the gourd, that the true "gourd effigies" which were to become a ranking shape in the next period made their initial appearance among Post Basket Maker wares is evidenced by the crude specimen illustrated in Fig. 17*d*. It is 3⅜ inches in height and 2½ inches in diameter. Beginning at one side of the neck a curved handle, circular in cross-section, tapers to a point which touches, but is not

attached to the body. This feature is essentially like the vertical loop handles, but in tapering to a point not joined to the vessel, it completes the topography of the curve-necked gourd which was to be much more skilfully copied in Pre-Pueblo pottery. The double canteen shown in Fig. 27 may also be a derivation of the gourd form. The writer has seen but one other early specimen of this shape. The globular bodies which touch, but are not joined, taper upward and inward, and merge into the respective ends of a horizontal tube which connects them at the top.

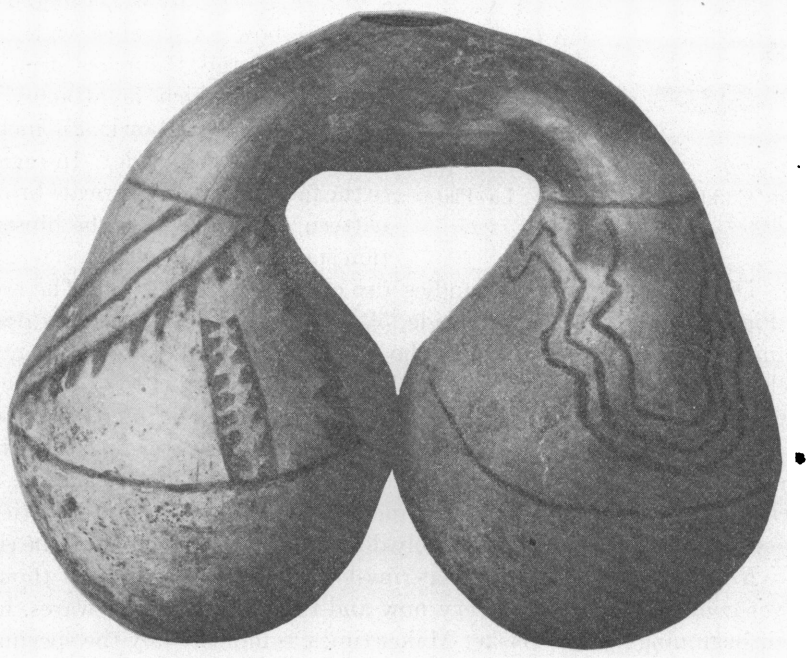


Fig. 27 (29.1–2660). Vessel of Double Canteen Form, probably derived rom the Gourd Form. Mound 5, Burial 70, Mitten Rock Group.

The mouth is an oval opening in the center of the upper surface of the tube, ¾ inch wide and 1¼ inches long. The vessel is 7¾ inches in height and 9½ inches long. On the whole, it is skilfully made, but the painted decoration was a failure; the pattern consisting of many wavy zigzag lines turned brown in some places, and faded out in others, presumably in the course of firing.

Dippers and Ladles. No complete specimen or sherd of any sort of dipper or ladle has been observed by the writer in the pottery of the

standard complex. However, by the end of the period, such forms were in use to a limited extent. Two which seem to be of the most primitive type appear in Figs. 28*ab*. These may be styled two compartment vessels, each consisting of a roughly circular bowl separated by a partition from the longer trough-like handle. These specimens are under 5 inches in length. Another similar one may be seen in Fig. 30*b*. It is composed of an oval bowl, 4¾ inches wide, 5⅝ inches long, and 1⅜ inches deep, to one end of which is attached a smaller shallower bowl, 2¾ inches long and 3½ inches wide. In regard to the faded and very intricate brown pattern, it is best to let the illustration speak for itself.

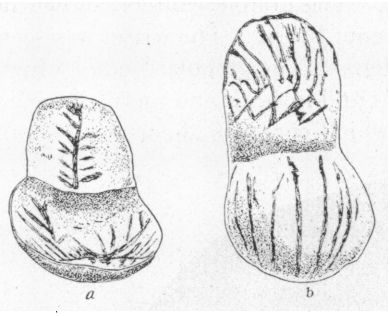


Fig. 28. Decorated Dippers of the Two Compartment Type. La Plata Valley.

Dippers with solid flat handles also occur (Figs. 30*a*, 29). The bowl of Fig. 30*a* is oval, 4¾ inches wide, 5⅛ inches long, and 1⅜ inches deep. Joining one end, ⅝ inches below the rim is a handle, 3½ inches long, 1½ inches wide, and ½ inch thick. Its longer axis is parallel to the plane of the rim. Hollow handles and solid handles, circular in cross-section, have not been observed. Fig. 29 is 3½ inches in diameter and 1⅜ inches deep. Attached a short distance below the rim is a paddle-like handle, 2⅞ inches long, 1⅞ inches wide, and 5/16 inch thick. It is slightly crescentic in cross-section and points considerably downward from the plane of the rim.

Ring-Bottomed Pitcher That ring-bottomed pitchers, which though never common, are found every now and then in some later wares, had their beginning in Post Basket Maker times, is indicated by the specimen illustrated in a previous paper and reproduced here (Fig. 18*b*).

Bowls. Toward the close of the period relatively shallow bowls are not uncommon. The one illustrated in Fig. 31*b* is 9⅛ inches in diameter and 2¾ inches deep. It is symmetrical and very well made, the hard, well smoothed walls being 3/16 inch thick. The black-brown pattern consists of two series of three lines dividing the field into quadrants, in the upper right hand corner of each of which is a solid area bearing fringed pendant lines. An unusual feature is the incised spiral occupying the center of the exterior surface.

The bowl in Fig. 31*c* is 6¼ inches in diameter and 1¾ inches deep. The bottom plainly shows the impression of the potsherd mould in

Fig. 29 (29.1–2999). Decorated Dipper with Flat Paddle-Like Handle. Site 6, Navajo Reservation.

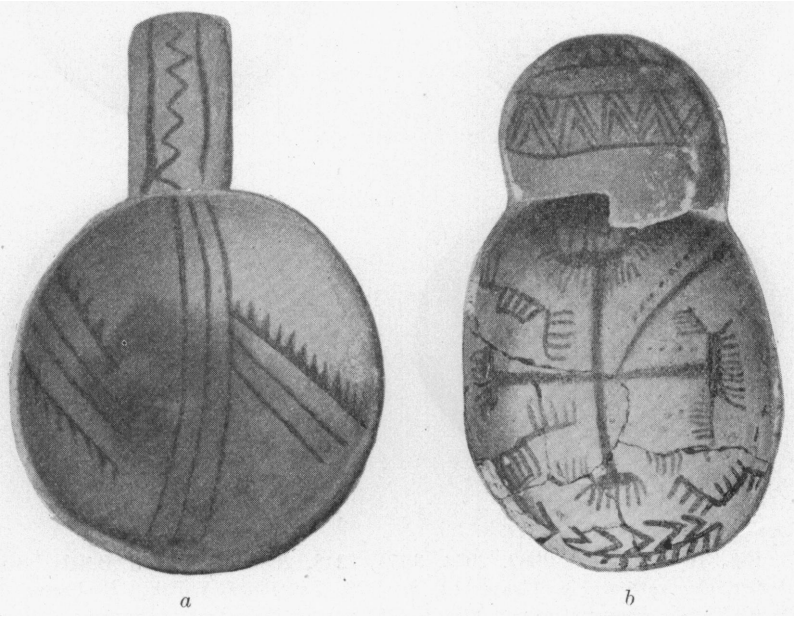


Fig. 30 (29.1–2939, 2969). Decorated Dippers. *a*, with solid flat handle, near Grave 144, Site 6, Navajo Reservation; *vb*, two compartment type, Grave 173, Site 6, Navajo Reservation.

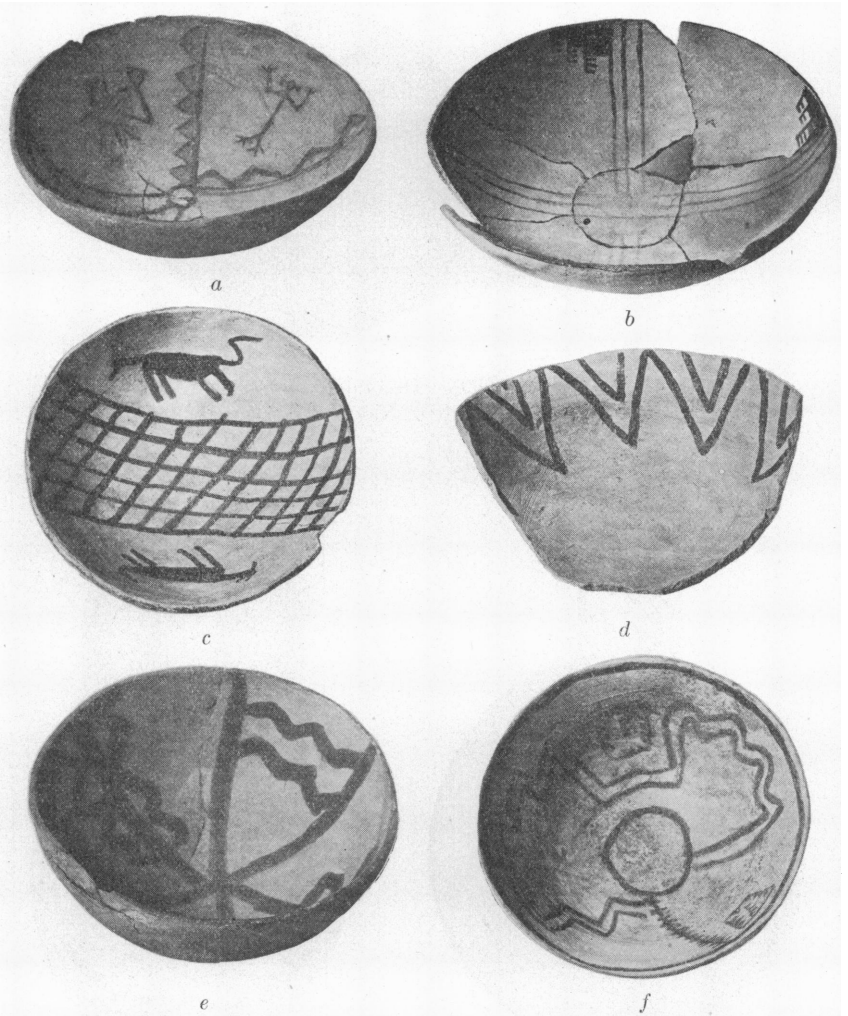


Fig. 31 (29.1–3250, 2962, 2954, 3054, 2948, 2659). Shallow Bowls bearing Interior Decoration. *a*, Grave 12, Site 23, La Plata Valley; *b*, Grave 162, Site 6, Navajo Reservation; *c*, Grave 155, Site 6, Navajo Reservation; *d*, Grave 248, Site 6, Navajo Reservation; *e*, Grave 151, Site 6, Navajo Reservation; *f*, Mound 5, Burial 70, Mitten Rock Group.

which it was formed. From the edges of the mould upward, the walls were rubbed obliquely in a clockwise direction, if the bowl is inverted, with a narrow rounding tool which produced a rough faintly grooved surface. The rim of the bowl is uneven and the interior only fairly smooth. Aside from the blackened rim, the decoration consists of a band composed of six parallel lines drawn directly across the bowl, with

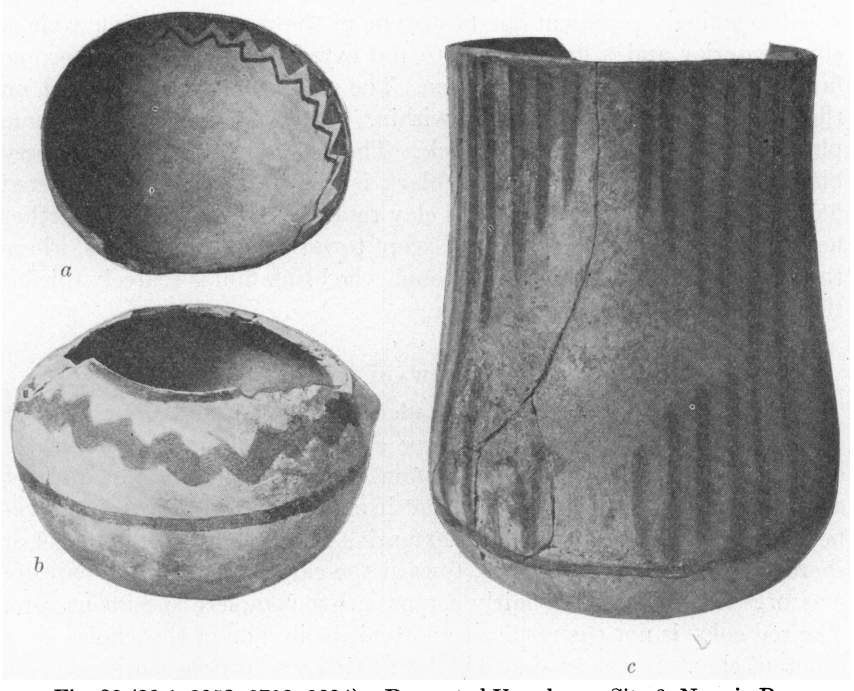


Fig. 32 (29.1–2953, 2708, 2694). •Decorated Vessels. *a*, Site 6, Navajo Reservation; *b*, Mound 8, Burial 107, Mitten Rock Group; *c*, Mound 6, Burial 91, Mitten Rock Group.

oblique lines connecting the outer ones, thus dividing the included plain area into diamonds. On either side of this band is depicted a quadruped, apparently in full flight.

The exterior of a portion of a bowl (29.1–3054), originally about 9½ inches in diameter and 3 inches deep, was moulded in a coiled basket, the margin of which produced a constriction in the vessel wall, at a distance varying from ¾ to 1¼ inches below the rim. While obliterated elsewhere, the marks of the basket may be plainly seen in the constriction.

A bowl originally circular, but pinched together from opposite sides, while still green to produce an oval or elongated receptacle, is shown in Fig. 34*a*.

Four other bowls, which seem not to demand comment at this time appear in Figs. 31*f*, 32*a*, 31*e*, 34*f*.

Black Shiny Ware. In two or three instances there have been found, in graves containing typical Post Basket Maker vessels, shattered bowls which seemingly represent the prototype of the ware possessing a black shiny interior and a gray-brown to red exterior which was to become fairly plentiful at a much later time. The one at hand is very rough on the outside, but highly polished within. The exterior is gray in some places and in others smoked black. The interior is a uniform glossy black over its entire area. This black is due to firing in a smothered flame so managed that the porous clay retained the carbon that further heating would have burned out. Except toward the thinned rims, where the paste is smoked all the way through, the black film is scarcely thicker than a sheet of heavy writing paper.

Redware

It is doubtful if redware was made at all until quite late in the Post Basket Maker period. Two or three sherds were found in rubbish of apparently a very early date in Cañon del Muerto, but these do not seem enough to invalidate the fact that in more than one hundred pottery-bearing graves, scattered over an extensive region, not one red vessel or sherd was exhumed. However, toward the close of the period, redware was present, sherds being fairly common, but complete specimens rare. The red color is not the result of an applied slip, nor of the choice of a different clay. It was produced by long firing, and consequently, there is considerable variety in the result, some specimens being yellow-brown and others a fairly good red. The few nearly intact specimens at hand will be described in detail.

Fig. 34*e* represents a hemispherical bowl 7½ inches in diameter and 3¼ inches deep. Both surfaces are quite smooth. The exterior is predominantly red, but mottled with dark spots where it touched something while being burned. The interior is a uniform light red, through which tiny flecks of the tempering material show and sparkle like crystals under the proper light. A black line covers all that remains of the rim and two faded black "radiating spiral" elements occupy the concave field. The thickness of the vessel wall is a minute fraction less than 5/16 inch. The paste is liberally tempered with finely ground rock. A gray streak

remains in the center of the wall where insufficient heat penetrated to produce the red color.

The depressed spherical vessel in Fig. 32*b* is 4$\frac{5}{16}$ inches in diameter and 3$\frac{1}{8}$ inches in height, with a diameter of 2$\frac{7}{16}$ inches at the mouth. In color it is a mottled smoky gray to orange, the over-firing having been slight. The paste is rock-tempered and very firm. There are two bluntly conical lugs on opposite sides about 1 inch from the margin. One would expect the perforations to pass through these vertically in the plane of the outer surface of the wall, but on the contrary, they go down through the upper edges of the lugs and pierce the vessel walls so that the lugs have no utilitarian function. The cord bail was attached just as it would have been in cases where wall perforations were the only provision for suspension as in Fig. 32*c*. The pattern is in brown, consisting of a line encircling the orifice, one passing around the girdle, and a broad wavy one occupying the center of the space between.

Fig. 33 (29.1-2605). A Slender Redware Bottle. Mound 5, Burial 35, Mitten Rock Group.

Fig. 33 illustrates a slender bottle of 4$\frac{7}{16}$ inches high, the body 2$\frac{1}{2}$ inches in diameter, and the neck 1 inch. Toward the base, which is concave, the color is gray-brown, which changes to a clear red just above the girdle. The straight line pattern shades from brown to black The paste is very hard and tempered with extremely fine sand.

The bowl in Fig. 34*b* is 5$\frac{1}{4}$ inches in diameter and 2 inches deep. It is light brown in color and decorated with a rim line and two broad wavy lines dividing the field into quadrants. Ground rock is the tempering material. This bowl, the one shown in Fig. 34*d*, the pitcher in Fig. 26*d*, and half of an undecorated gray bowl were in the same grave.

Fig. 34*d* is a bowl 5$\frac{3}{8}$ inches in diameter and 2$\frac{3}{8}$ inches deep. The interior is a uniform red brown; the exterior is mottled, dark gray to red. The pattern of dark brown shows plainly in the illustration. The walls are very well smoothed and of uniform thickness, about $\frac{5}{32}$ inch. Sand is the tempering material.

The bowl shown in Fig. 34*c* is 6$\frac{5}{8}$ inches in diameter and 2$\frac{3}{8}$ inches deep. The heavily rock-tempered paste is rather coarse, with a thickness

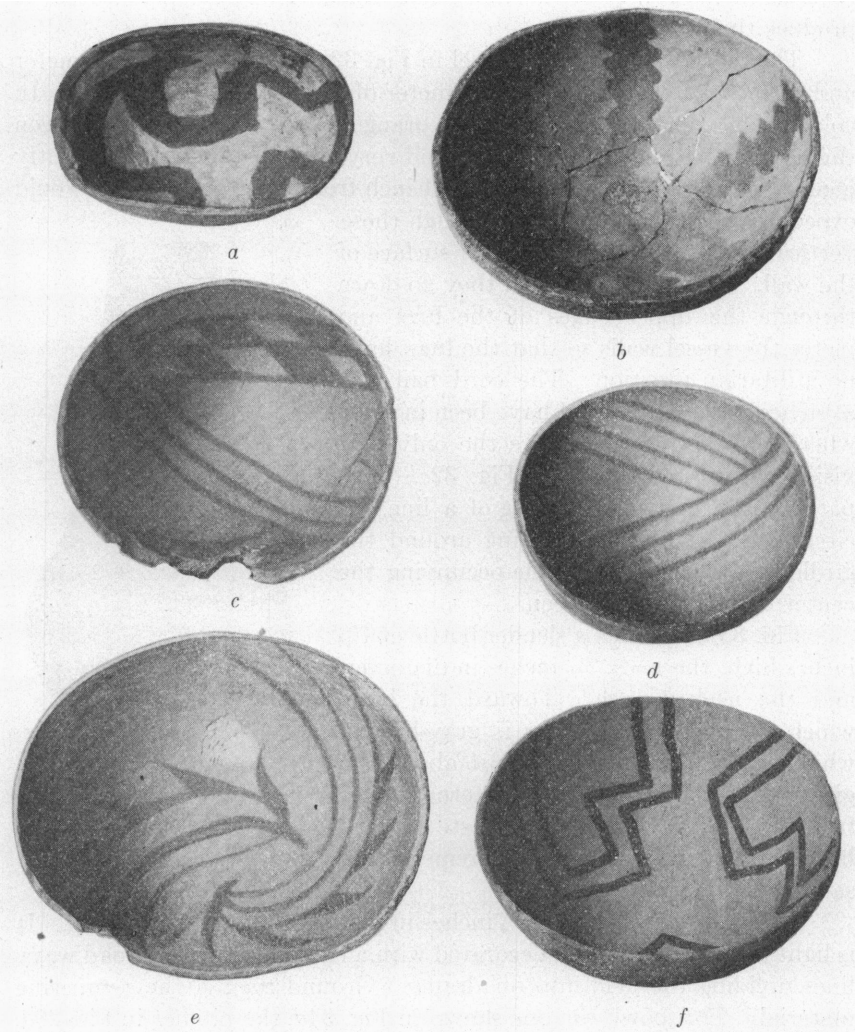


Fig. 34 (29.1–3057, 2644, 2693, 2645, 2996, 3000). Interior Decorations. *a*, Grave 250, Site 6, Navajo Reservation; *b*, Mound 5, Burial 52, Mitten Rock Group; *c*, Mound 6, Burial 91, Mitten Rock Group; *d*, Mound 5, Burial 52, Mitten Rock Group; *e*, Grave 201, Site 6, Navajo Reservation; *f*, Grave 202, Site 6, Navajo Reservation.

of ¼ inch. The interior is a uniform, relatively deep red, while the exterior is considerably blotched and mottled. The decoration is black where the pigment is thick, brown where it is thin.

A wide-mouthed cylindrical vase (Fig. 32*c*) was found with Fig. 34*c*. The rounded base curves outward, reaching the point of greatest diameter, 4½ inches, in a rise of 1½ inches. Thereafter the walls curve very gradually inward and then flare almost imperceptibly to the mouth, at which point the vessel is 4 inches in diameter. The total height is 6⅛ inches. This vessel, the only nearly complete one of the kind that the writer has seen, is a remarkably fine specimen from all points of view. The color is a uniform brown-red, excepting a few smoky blotches on the bottom, and the pattern is in dark brown. The exterior is highly polished and without depressions or irregularities. The sand-tempered walls are 1/16 to 5/32 inch thick and almost as hard as porcelain. On opposite sides, ¼ inch between the rim, are pairs of perforations 5/32 inch in diameter, 3/16 inch apart. These were made while the clay was green.

Fired-in Designs

While it is not an altogether binding generalization, for practical purposes, it may be said that fired-in designs occur only upon bowls of the standard complex. Furthermore, with one noted exception, these appear only upon the interiors. Late in the period, a few meager and experimental patterns are found upon ladles, pitchers, and other forms of non-culinary vessels. However, the true character of Post Basket Maker pottery decoration is revealed by the designs upon bowls; hence, only bowl patterns will be considered in the brief discussion of design in this paper.

In color, the decorations vary from a deep black to red, there being a greater proportion in the red-brown class than is to be found within the limits of later San Juan black-on-white wares. The chemical nature of the pigment has not been determined, but one may safely conclude that it is a mineral rather than a vegetable stain. Apparently it was the same in all cases, the differences in ultimate tone being the result of firing and to a lesser degree of the success with which the pigment was mixed. What was expected to be black was altered to brown, if over-firing was slight, or to red if it was intense.[1] These variations bespeak a lack of control of the firing process which continued to some extent through all periods, but was most prevalent in this early, more or less formative stage.

[1]The statement in the earlier paper that red and black were produced by different pigments was an error.

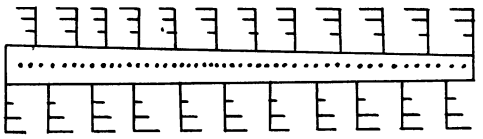


Fig. 35. Geometric Design on a Bowl from the La Plata Valley.

A minority of the bowls bear no designs whatever. While realistic designs do occur upon bowls, the ornamentation is predominantly geometric and rectilinear. The concave field is treated in various ways. In some cases it is divided into halves by straight lines or a more complicated device passing across the center (Figs. 22*a*, 23*d*, 31*c*, 14*b*, 39*b*, 35). Of six instances, two bowls have no decoration aside from the rim line, while four have additional designs at the center of each hemisphere.

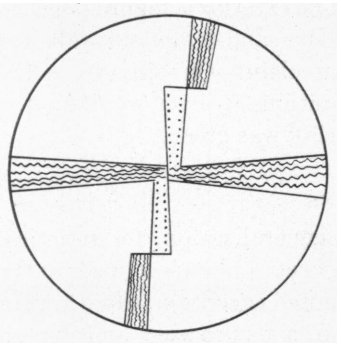


Fig. 36. Quadrilateral Design on Interior of La Plata Bowl.

In seven cases the field is divided into quadrants by a second transverse band at right angles to the first. In five of these the bands are alike as shown by Fig. 25*a* and in two quite different as in Fig. 36. Of the seven examples, the quadrants remain plain in five cases and contain further decoration in two (Figs. 31*a* and *b*). As a complication of this plan is the division roughly into quadrants of which an opposite pair is filled in, while the other is plain (Fig. 23*a*) or all four are more or less covered with decoration (Figs. 31*e*, 23*c*).

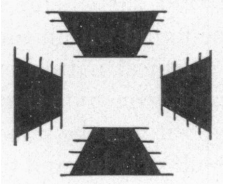


Fig. 37. A Quadrilateral Design in a Bowl from the La Plata Valley.

Panels may occupy opposite sides of the bowl. In such case there is usually a small circle in the center of the bottom. Of four examples the panels are alike in three as shown by Fig. 25*f* (29.1–3241) and different in one (Fig. 38*a*). In one instance, there are four panels, all alike, placed in the centers of the quadrants (Fig. 37).

Another decorative plan consists of "spiral radii," beginning at or near the central circle and running toward the rim (Figs. 39*d*, 38*b*). A tripartite division of the field also occurs, consisting of three spiral radii

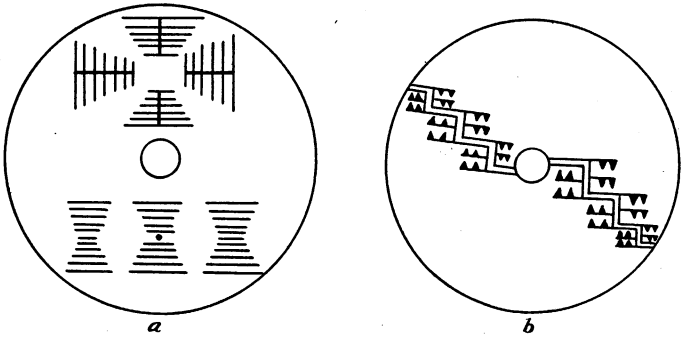


Fig. 38. Geometric Designs in Bowls from the La Plata Valley.

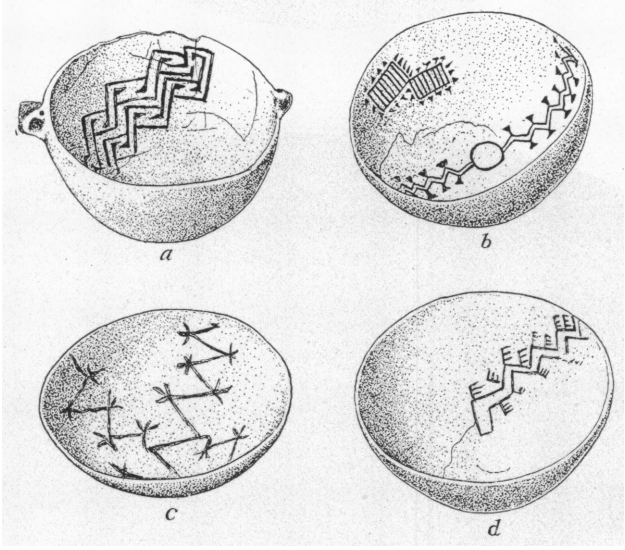


Fig. 39. Typical Designs from La Plata Bowls.

as in Fig. 25*d* or of a panel or device three times repeated at intervals of 120 degrees (Figs. 25*e*).

Another arrangement consists of a more or less complex figure occupying the center of the bowl, with panels in the quadrants extending from the rim downward toward it (Fig. 23*f*). These panels may be enlarged

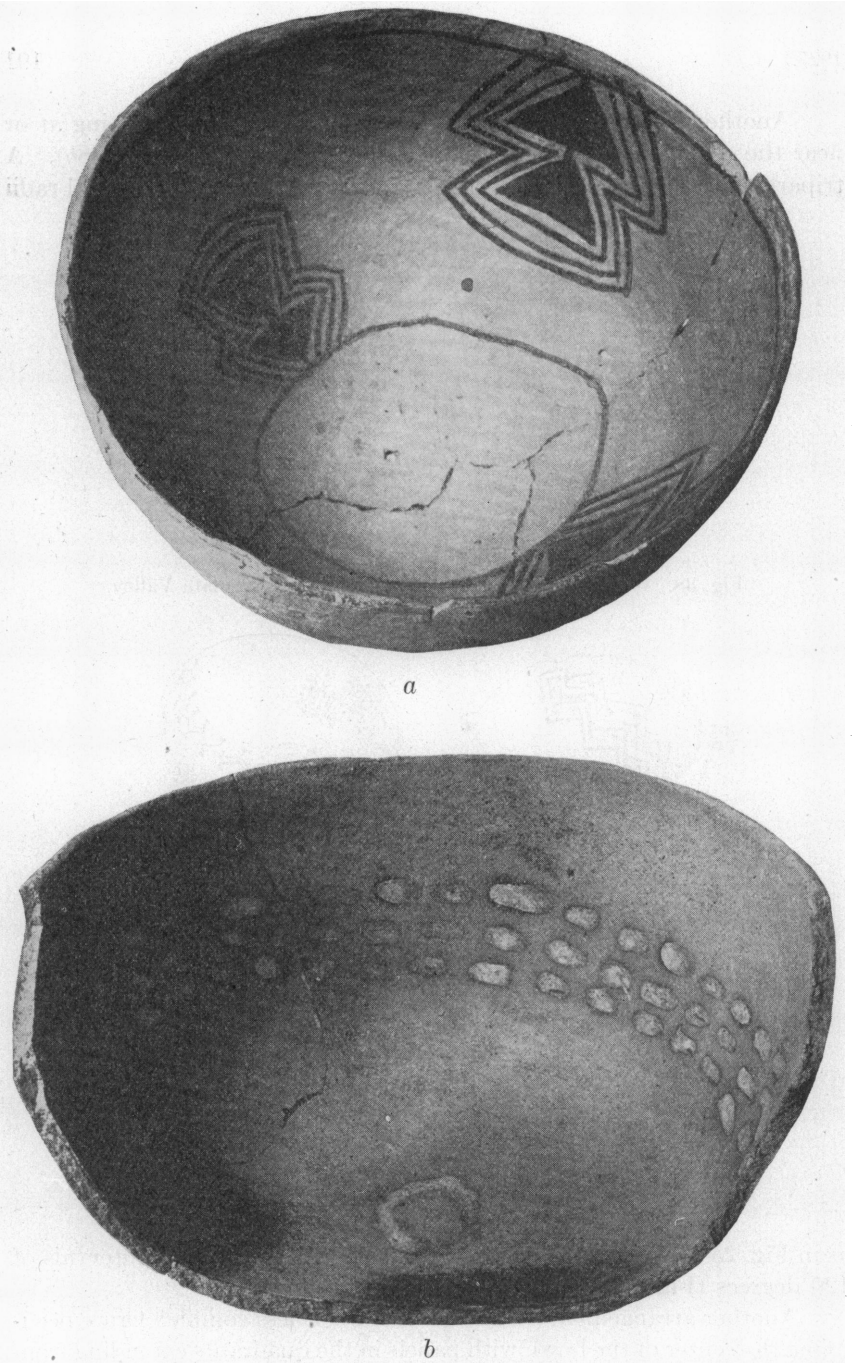


Fig. 40 (29.1–2950, 3253). Panel and Band Designs as presented on Bowls. *a*, Grave 153, Site 6, Navajo Reservation; *b*, Grave 14, Site 22, La Plata Valley.

sufficiently to come close enough to one another to form a continuous band (Fig. 23*e*). The continuous band of panels may occur independently of the central element (Fig. 24*b*) or there may be an encircling band placed near to (Fig. 24*a*) or considerably beneath the rim (Figs. 14*a*, 22*b*, 40*b*). Also there are cases of like figures rising in the line of a diameter from the central circle, with two more of the same units occurring in opposite quadrants in inverted position, as if suspended from an encircling line placed a short distance below the rim (Fig. 40*a*). As a variant of this same plan, a series of triangular elements may be based on the central circle, with others inverted and pendant from the rim line occupying the spaces between them (Fig. 41).

Since they came from a single cluster of sites within the radius of a mile, the La Plata bowls afford a satisfactory group for numerical treatment. Of a total of twenty-four, four bowls are without ornamentation. Fifteen have a rim line or a line immediately beneath the rim on the inside. The edges are too badly abraded to enable one to determine whether the lines were continuous or broken. The small central circle is present in thirteen cases and may have been in two others. Panels on opposite sides occur in five cases, two "spiral radii" in three cases; a tripartate division in three cases, one of them being three spiral radii, the other two of panel-like devices. Five are divided into quadrants which in three instances remain plain and are decorated in two. Four have an encircling band considerably below the rim. These figures include only the La Plata material in the Museum.

Fig. 41 (29.1–3008*d*). Triangular Design Elements. Site 6, Navajo Reservation.

Realistic Decorations

In the available series of bowls, five have realistic patterns. There are two groups of three figures, those on the ends holding the hands of the central one, occupying opposite sides of the bowl shown in Fig. 22*a*. The general treatment of the human form is plainly seen in the illustration. The headdress is the same on the central figure of each group. It would appear that the hair was done into thick wads or bobs at each side of the head. The two terminal members of one group have what may

have been intended to be a large plume rising from the vicinity of the left ear and curling upward and over the head. In the other group one end figure has a large oval mass attached at its base to the right side of the head, while the other has a long tapering object extending obliquely upward from the left side of the crown.

On opposite sides of the bowl shown in Fig. 31*c* are drawings of a long-tailed quadruped, evidently in full flight. This and the preceding specimen, are from the south side of the San Juan. The three other life patterns are from the La Plata Valley. On the bowl in Fig. 22*b* there is a brown concentric line about halfway between the tiny central circle and the rim. Encircling the bowl, as if standing upon this line, is a row of eighteen figures. Two of these are elongated triangular objects of uncertain identity. The remaining sixteen are standing human figures, holding hands. The one at the left of the triangle is 1½ inches high; the altitude of the others decreases progressively to a height of 1 inch for the other terminal member. Presumably these figures represent dancers or participants in some ceremony. The two triangles may depict the garb or robed figures of females, but obviously these opinions are purely conjectural. Very crude workmanship is the outstanding feature of the technique, both in the drawing of the figures and the control of the pigment, which is pale brown and almost faded out in many places.

Speculation as to what the complicated pattern upon the bowl in Fig. 31*a* was meant to represent would be fruitless. However, in one quadrant there is what appears to be a human figure, with hair arranged like the squash blossom whorls of the Hopi maiden and arms vertically elevated from the elbows.

The careless drawing on all of these specimens is in sharp contrast to the well-executed conventionalized figures which occur on opposite sides of the bowl in Fig. 24*f*. These are faithful copies of basketry or textile patterns, their treatment being exactly that imposed upon the decorator by the limitation of the possibilities of rod-splint or warp-weft manipulation. Doubtless they were copied directly from a basket, or perhaps from a piece of cloth. In the opinion of the writer they represent human figures. The bodies are rectangular panels such as occur upon contemporary baskets; the head is a "stitch-fringed" terrace or double right-angled triangle, and the arms and legs are "stitch-fringed" single triangles.

Judging from their frequency in the present series, life patterns are of more frequent occurrence upon Post Basket Maker pottery than upon any of the later phases of San Juan black-on-white ware.

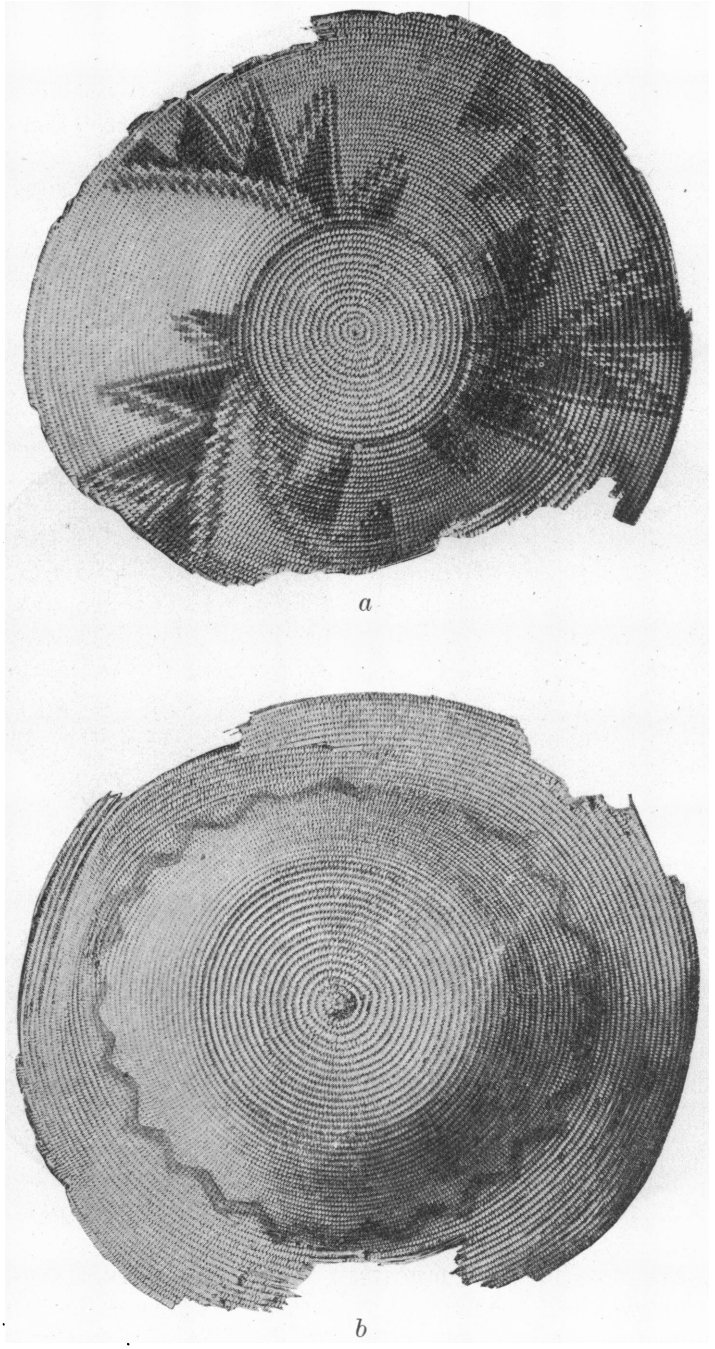


Fig. 42 (29.1–1660, 1712). Forerunners of Pottery Designs on Basketry. *a*, *b*, Tseahatso, Cañon del Muerto.

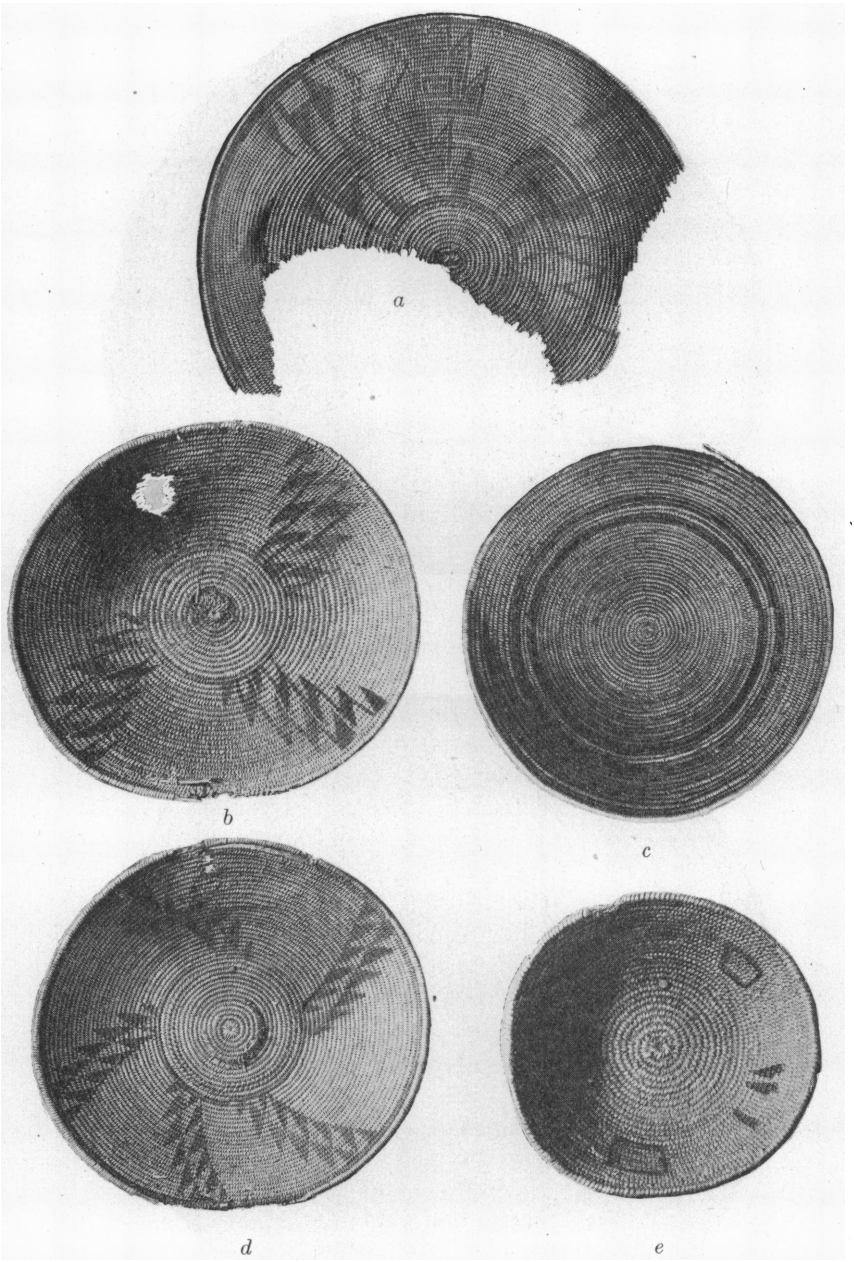


Fig. 43 (29.1–858, 1658, 1634, 1659, 1735). Types of Basketry Designs analogous to those found on Pottery. *a*, Cave 2, Cañon del Muerto; *b*, Tseahatso, Cañon del Muerto; *c*, Tseahatso, Cañon del Muerto; *d*, Tseahatso, Cañon del Muerto; *e*, Tseahatso, Cañon del Muerto.

Black shiny ware has not been observed to bear painted designs. In black-on-red ware the broad wavy line to be seen on Figs. 34*b*, 32*b* and the fringed triangles upon Fig. 32*c* seem from the specimens at hand to be the most common decorative elements. It would appear that from the very beginning or very soon thereafter, there was a specialization of designs for use upon redware, as can be more clearly indicated in a discussion of the red pottery of later periods.

Origin of Pottery Designs

Clearly enough, in the decoration of their wares, the first potters were strongly influenced by the antecedent and more familiar art of basketry. Naturally enough, when we have but a few score of the tens of thousands of specimens once in existence, exact duplication of patterns upon the two types of containers cannot be cited, but nevertheless the similarity is convincing. In the first place, the treatment of the field was the same. The central circle and the rim line have their counterparts in the darkened coils similarly situated in the baskets (Figs. 43*b*, 42*a*). Panels in the quadrants, the opposite ones alike, appear in Fig. 43*e*. The spiral radii upon Figs. 39*d* and 25*d* have their analogues occurring in threes, fours, and fives on the baskets in Figs. 43*b*, 43*d*, 42*a*. The encircling band is present in simple form on Fig. 43*c* and in more complicated patterns upon Figs. 42*a* and *b*.

As to elements, the concentric line has its origin in the darkened coil. The straight vertical line is to be found upon the baskets as shown in Fig. 43*d*. In this basket may also be seen the stitch-fringed line which appears as the cross-barred line in the panels of the bowl in Fig. 24*b*. The vertical or oblique broken lines on Fig. 25*e* are a derivative of basket stitches and the rows of dots forming the enclosed elements of the pattern on Fig. 25*b* are also stitch derivative. The framing lines, as exemplified by this same pattern, also occur on the baskets as may be seen in the elaborate decoration in Fig. 43*a*.

The single mindedness with which the potters brought over basketry treatment to the new art is evidenced by their failure to draw upon the richest field of design at their disposal. Upon slightly earlier and contemporary sandals there is a profusion of colored ornamentation, constituting, regardless of the medium of expression, the most elaborate and artistic decoration ever produced in the San Juan country. The writer has seen but two instances of designs traceable to sandal patterns rather than to basketry. These are in the bottoms of Figs. 23*e*, *f*, the enclosed cross being a common sandal motive.

SUMMARY

Concerning the beginning of pottery-making in the San Juan country, the following are the facts at our disposal: The earliest occupants of the region of whom traces have been found, had no containers of clay whatever, but used a great deal of mud reinforced with vegetable fiber in the construction of their dwellings and storage bins. Somewhat later they augmented their range of domestic utensils with vessels made of exactly the same sort of reinforced mud, shaped by moulding in coiled baskets. Later still, they produced fiber tempered vessels without the use of moulds and began to replace the vegetable reinforcement with sand. Eventually, in association with unburned vessels in dwellings identically like the earlier ones, and constructed by a people a considerable proportion of whom had a skull form apparently the same as that of the stock which had baskets only, true sand-tempered pottery makes its appearance. Were it not for conflict with theory, in the light of this evidence, an unbiased mind could scarcely deny to pottery-making the rank of an indigenous art. It would be too daring a step to postulate that this marginal area was the point of origin of ceramics for the entire Western Hemisphere. Presumably the hypothesis which places the origin of pottery-making somewhere in Middle America, whence it spread both to the north and to the south, in conformity with the usual tendencies of culture-trait diffusion, is, in major outline, correct. Nevertheless, regardless of possible relationships and the course of events elsewhere, the concrete fact remains that in the San Juan area pottery-making has been traced back to and almost beyond its beginnings with a definiteness which has not been paralleled or even approached anywhere else on the continent.

The first pottery was crude, limited in range of form, and sparsely decorated with designs for the most part taken over from basketry. As time passed, better workmanship was achieved, the range of form was amplified, and fired-in ornamentation spread to all forms of vessels except cooking pots. By the end of the Post Basket Maker period, all types of San Juan pottery indigenous in the area under consideration, had passed their point of origin. Black-on-white ware was well on its way, black-on-red ware and black shiny ware had begun to be manufactured, and corrugated ware, while not actually represented, was present in embryo in the banded necked pots. At this point, the tracing of the sequence will be resumed in a future paper.