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## TWO CHACO CANYON PIT HOUSES.<sup>1</sup>

By NEIL M. JUDD,

*Curator, American Archeology, U. S. National Museum.*

[With 7 plates.]

In writing or speaking of the prehistoric habitations of Chaco Canyon<sup>2</sup> one invariably has in mind only the great communal dwellings, such as Pueblo Bonito and Pueblo del Arroyo. This mental discrimination is the natural one, for these ruins of stone-walled, terraced villages are among the best preserved and most impressive of all the ancient structures north of Mexico. They immediately arrest the attention; they convey, in comparison, so colorful a picture of the busy life once carried on within their now silent rooms that the remains of contemporaneous, or even more ancient, settlements near by are usually entirely disregarded.

Lesser house remains, however, exist in large numbers in Chaco Canyon. There are talus pueblos and a few small cliff dwellings at or near the base of the perpendicular cliffs which form the north wall of the canyon; there are literally hundreds of small ruins scattered along the south side of the valley and out in the broad reaches of open country that stretch away from its inclosing mesas. The presence of these latter structures has been known for many years, yet they have received but scant attention from those students of prehistoric cultures who have pursued their investigations in the Chaco Canyon region. In addition to these several types of primitive habitations, two isolated pit houses, vastly more ancient than the stone structures already mentioned, have recently been discov-

<sup>1</sup> Printed with the permission of the National Geographic Society, whose Pueblo Bonito expedition is being directed by Mr. Judd.

<sup>2</sup> That portion of Chaco Canyon most densely inhabited in prehistoric times roughly parallels the boundary between San Juan and McKinley Counties, N. Mex.; the stream course turns northward a few miles to the west of this center of population and joins the San Juan River in the extreme northwestern corner of the State. Eighteen of the major ruins are now included in the Chaco Canyon National Monument, created by presidential proclamation Mar. 11, 1907. The Chaco drainage is semidesert in character, with but little permanent water and few trees except on the higher mesas. Navaho Indians and a half dozen white settlers and traders, with their families, comprise its present inhabitants.

ered and examined by members of the National Geographical Society's Pueblo Bonito Expedition.<sup>3</sup>

#### PIT HOUSE NO. 1.

The first of these pit houses was encountered in 1920 during trenching operations in a burial mound about 100 yards east of Casa Rinconada, a circular ruin surmounting a low knoll on the south side of Chaco Canyon, opposite Pueblo Bonito. A number of stone-walled ruins, each with its own refuse pile, are to be seen in this vicinity. The pit house was discovered, quite unexpectedly, by Zuñi workmen near the lower edge of one such pile, and the fact that ashy earth had gradually worked from the latter down over the former unquestionably accounts for certain intrusive sherds in the collection (p. 403). The writer was absent on reconnaissance duty while the east half of this primitive dwelling was being excavated, but the Indians subsequently pointed out the approximate spot at which each of the specimens discovered was exposed.

This first pit house (fig. 1) examined by the Pueblo Bonito Expedition averaged 3 feet (0.914 m.) in depth and 17 feet (5.182 m.) in diameter; its walls were vertical except at the south, where they flared outward a few inches (pl. 1, fig. 1). The room had been gouged, presumably with stone or wooden implements, from the clayey silt strata which wind and water had deposited throughout the length and breadth of the valley; its original depth may be preserved in the present walls but the superstructure which covered the pit has long since disappeared. That it had some sort of timbered roof goes without saying. (Two short, decayed fragments of logs were exposed on the west side of the room, standing on the floor and resting against the wall of the excavation.) Lacking definite information to the contrary, it may be assumed that the walls and ceiling of this house were shaped after the fashion of those in the dwelling next to be described. It is not unlikely that what is herein referred to as a wall was, in fact, the face of a bench upon which the roof timbers rested.

No trace of applied plaster was present, but the sides of the excavated chamber had been roughly finished by dampening the clay and pounding it to a hard and relatively smooth surface. The not unsatisfactory results of such treatment may be observed in plate 1, figures 1 and 2. As would be expected in so primitive a habitation, the floor, while hard and compact with use, was noticeably uneven.

In its furnishings, this Chaco Canyon pit dwelling illustrates the simple life and the few needs of its former inhabitants. A cir-

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<sup>3</sup> See Smithsonian Misc. Coll., vol. 72, Nos. 6 and 15; also the National Geographic Magazine for June, 1921, and March, 1922.

cular fireplace, 10 inches (25.4 cm.) deep, occupied a favored position near the center of the lodge; its diameter, as measured from the crown of its slightly raised rim, was 36 inches (91.4 cm.) but this was reduced to 22 inches (55.8 cm.) at its own floor level owing to the sharp slope of its adobe sides (pl. 1, fig. 2). The fireplace was filled

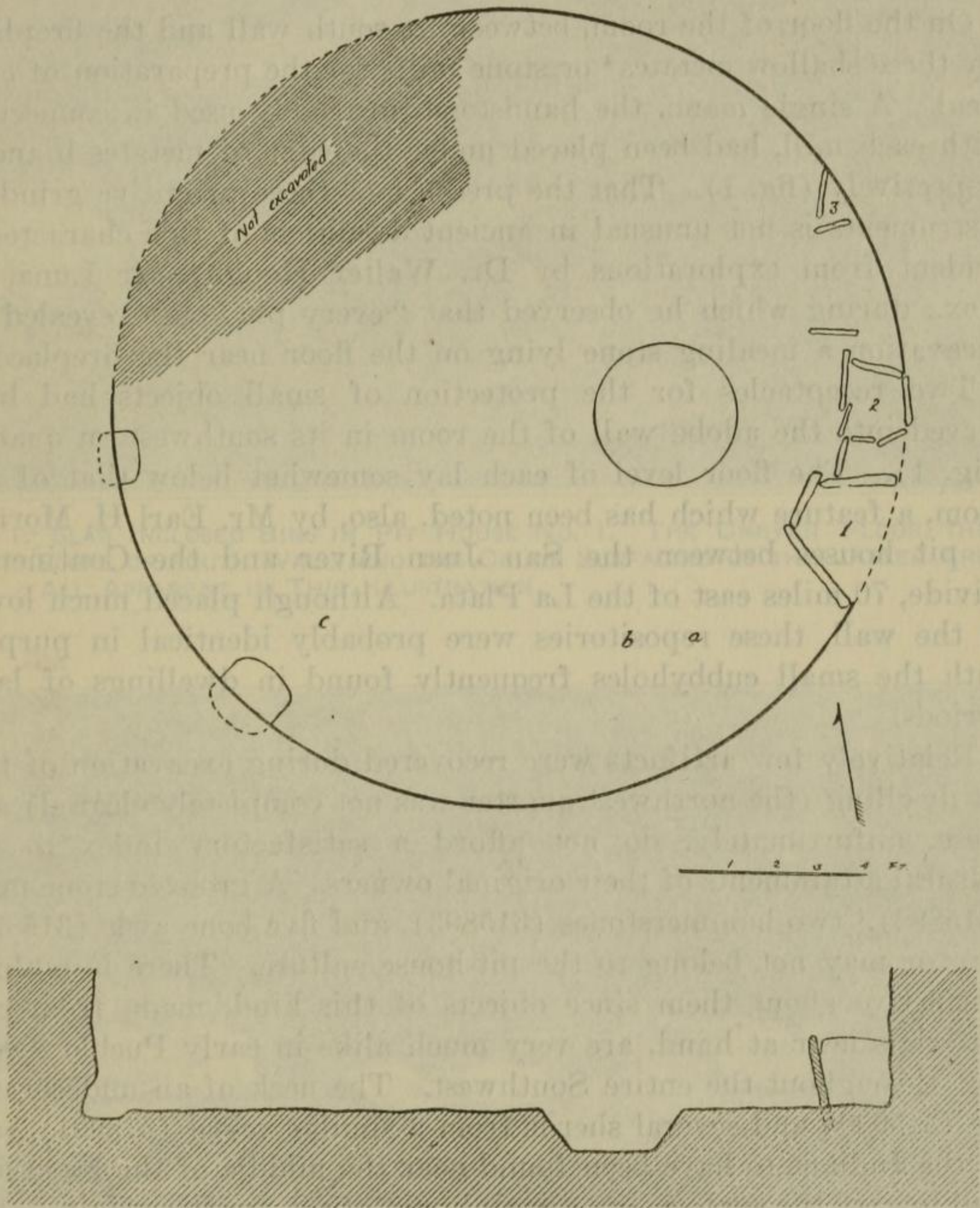


FIG. 1.—Pit House No. 1, ground plan and section, Chaco Canyon.

with coarse ashes in which bits of greasewood predominated. A mere handful of broken deer bones, split for the extraction of marrow, and a few small mammal and bird bones were scattered through the earth which filled the pit; none of these was found in the fireplace.

Against the east wall of the chamber were three bins each formed by upright slabs of sandstone (fig. 1; pl. 1, fig. 1). Two of these

bins were excavated by the expedition; in one were several fragments of an earthenware bowl and a number of small objects probably utilized in pottery making. The chief function of these bins was most likely the storage of corn and other foodstuffs. A discarded metate, worn through, formed one of the inclosing stones on the north side of bin 2.

On the floor of the room, between its south wall and the fireplace, lay three shallow metates<sup>4</sup> or stone mills for the preparation of corn meal. A single mano, the handstone invariably used in connection with each mill, had been placed under the edge of metates b and c, respectively (fig. 1). That the presence of these primitive grinding instruments is not unusual in ancient dwellings of this character is evident from explorations by Dr. Walter Hough near Luna, N. Mex., during which he observed that "every pit house revealed on excavation a mealing stone lying on the floor near the fireplace."<sup>5</sup>

Two receptacles for the protection of small objects had been carved into the adobe wall of the room in its southwestern quarter (fig. 1). The floor level of each lay somewhat below that of the room, a feature which has been noted, also, by Mr. Earl H. Morris<sup>6</sup> in pit houses between the San Juan River and the Continental Divide, 70 miles east of the La Plata. Although placed much lower in the wall, these repositories were probably identical in purpose with the small cubbyholes frequently found in dwellings of later periods.

Relatively few artifacts were recovered during excavation of this pit dwelling (the northwest quarter was not completely cleared) and these, unfortunately, do not afford a satisfactory index to the cultural attainments of their original owners. A grooved stone maul (315892),<sup>7</sup> two hammerstones (315893), and five bone awls (315894) may or may not belong to the pit-house culture. There is nothing distinctive about them since objects of this kind, made from raw materials near at hand, are very much alike in early Pueblo dwellings throughout the entire Southwest. The neck of an undecorated jar (315900) and several sherds from a similar vessel (315901), said by the Indians to have been found near the middle of the room and well toward the surface, are certainly not of pit-dweller origin. The high straight neck (2½ inches) of the former and the lack, in both specimens, of the broad bands so characteristic of pit-house cooking jars is sufficient to connect the fragments with the small-house refuse piles which lie near by and slightly above the pit dwelling. In the

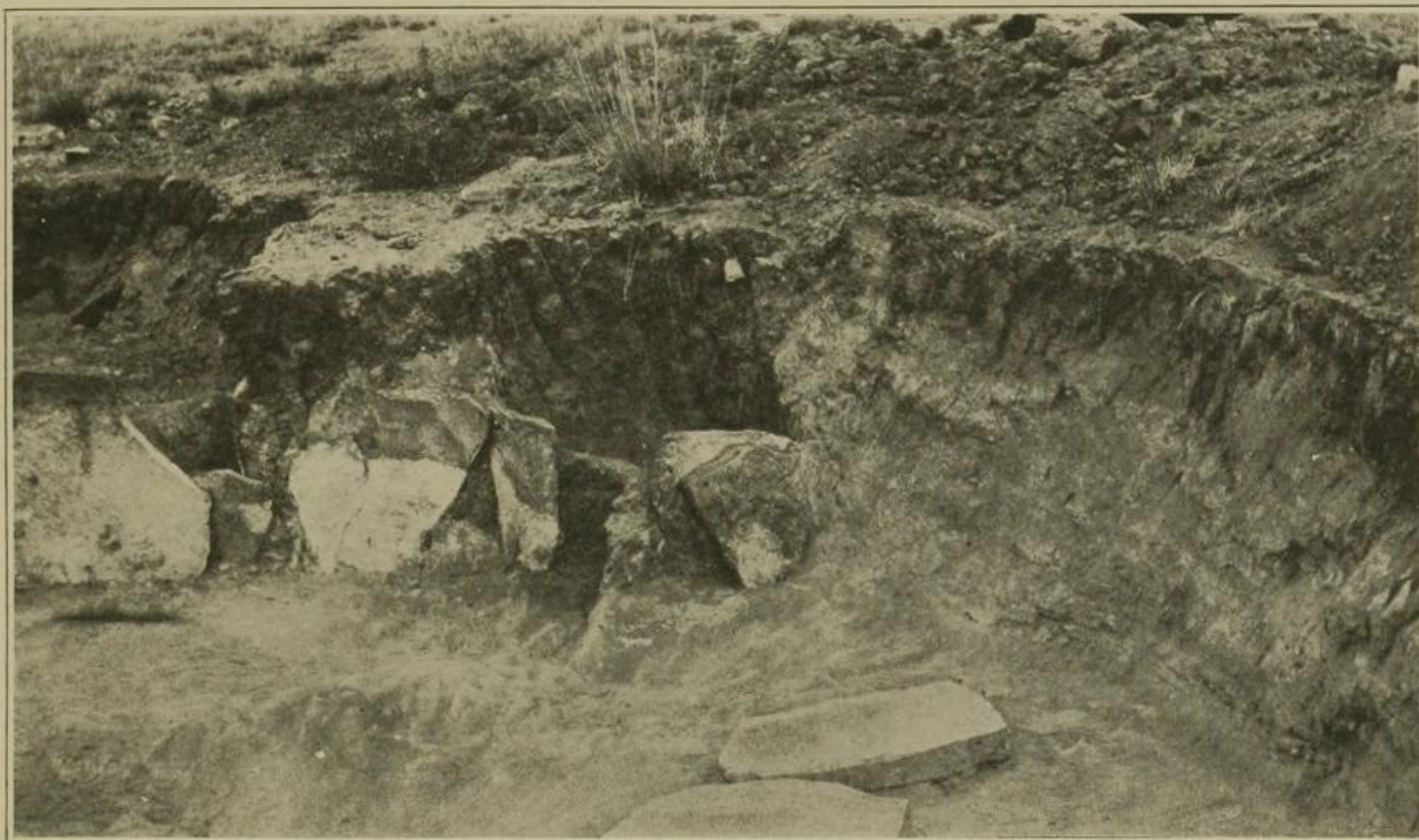
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<sup>4</sup> The three metates averaged 17 by 24 by 2 inches (43.1 by 60.9 by 5.08 cm.).

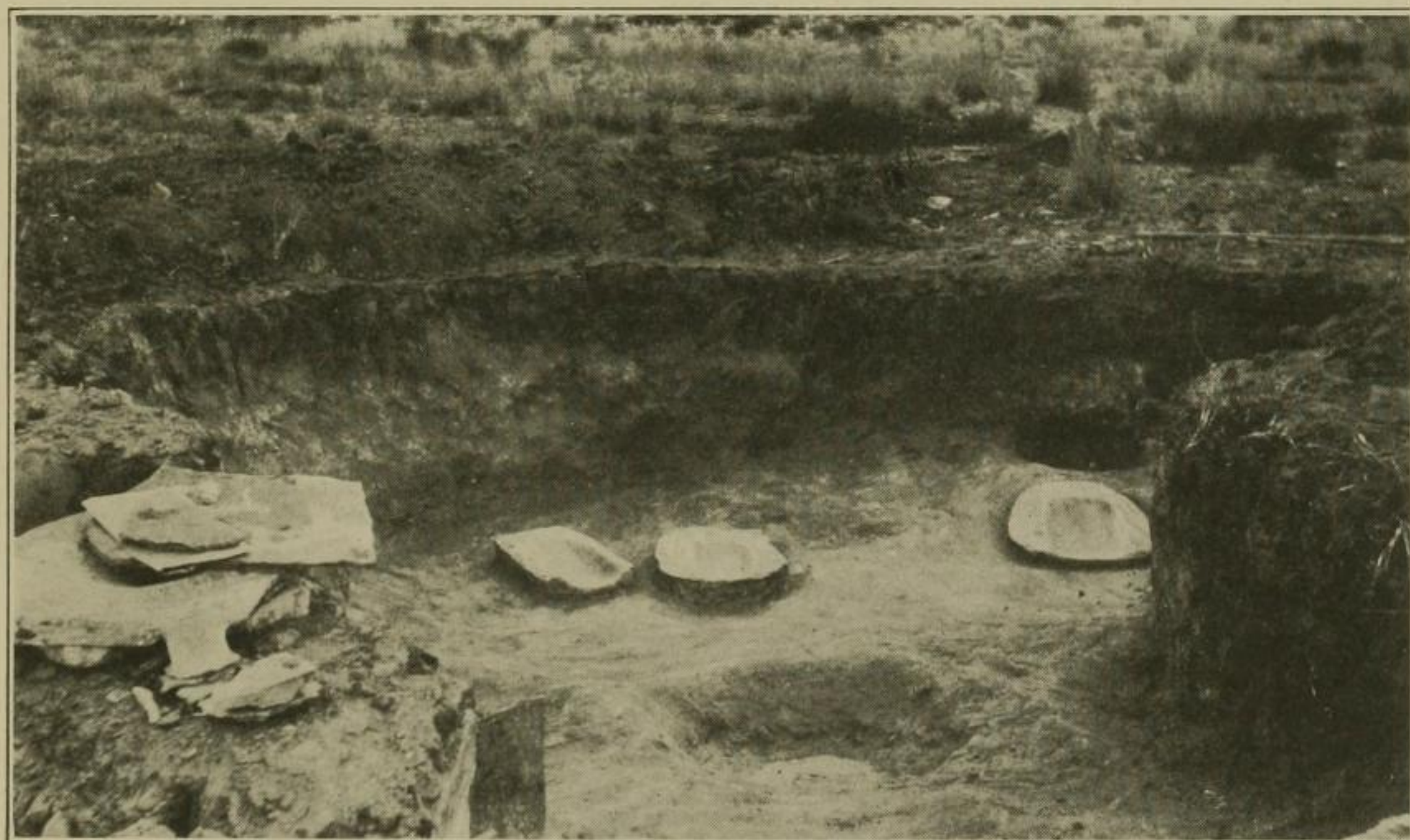
<sup>5</sup> Proc. U. S. Nat. Mus., vol. 55, p. 416.

<sup>6</sup> 33d An. Rep., Bur. Amer. Ethnol., p. 186.

<sup>7</sup> The catalogue numbers given for specimens not figured are those of the United States National Museum, to which the National Geographic Society has presented the collections from the dwellings here described.

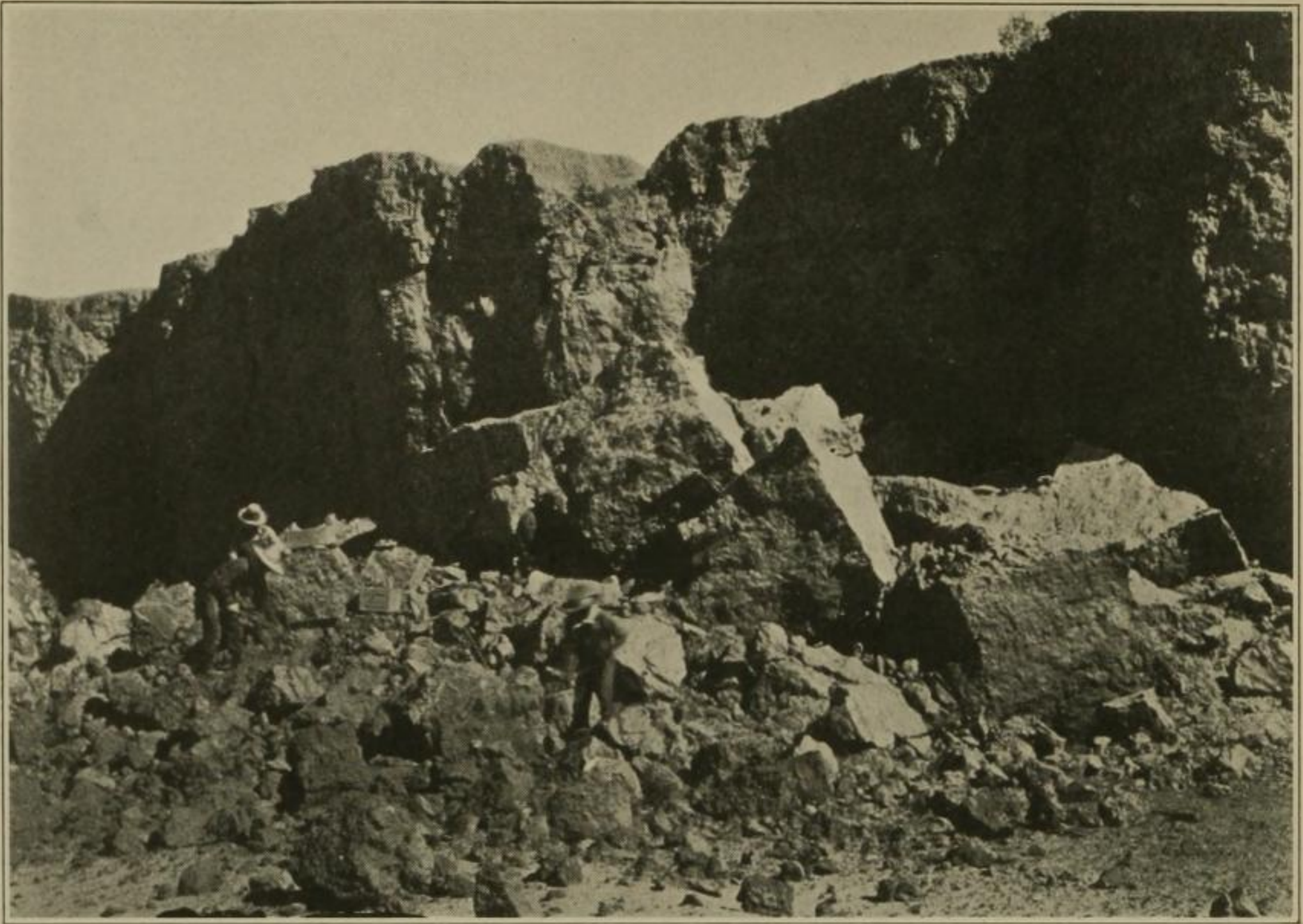


1. SLAB INCLOSED BINS IN PIT HOUSE NO. I. THE UNEVEN FLOOR, THE SLOPE OF SOUTH WALL, AND THE CRUDE SURFACING OF THE LATTER ARE ALL APPARENT IN THIS ILLUSTRATION.

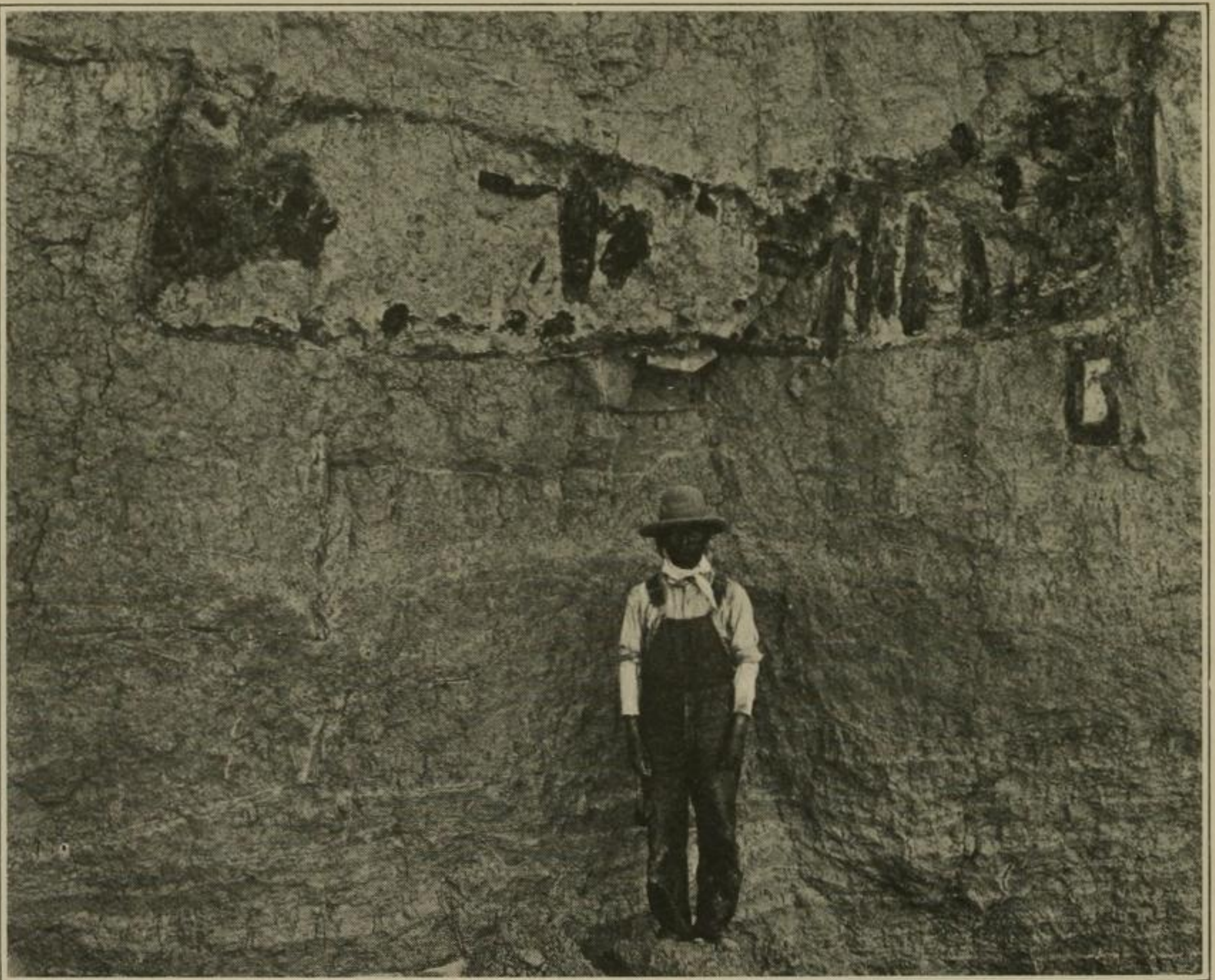


2. PIT HOUSE NO. I, PARTIALLY EXCAVATED. THIS VIEW, TAKEN FROM THE NORTH, SHOWS THE FIREPLACE IN THE MIDDLE FOREGROUND AND BEYOND IT THE THREE METATES AND ONE OF THE SUBWALL REPOSITORIES.

Photos by Neil M. Judd. Courtesy of the National Geographic Society.



1. SEARCHING AMONG THE BLOCKS OF FALLEN ADOBE BELOW PIT HOUSE No. 2 FOR POTSHERDS AND OTHER ARTIFACTS. THE CROSS SECTION OF THE ROOM WILL BE NOTED IN THE SHADOW AT THE RIGHT ABOUT MIDWAY OF THE BANK.



2. IN THIS NEAR VIEW OF PIT HOUSE No. 2, BEFORE EXCAVATION, THE WEST BRANCH WILL BE NOTED AT THE LEFT; THE DIVIDED FIREPLACE APPEARS JUST ABOVE THE INDIAN, AND THE POSTHOLE WHICH MAY HAVE HELD THE LADDER IS SEEN AT THE RIGHT. THE CHARRED REMAINS OF ROOFING TIMBERS WERE BOUND TOGETHER BY EXTREMELY HARD ADOBE AND SAND STRATA.



course of uncounted centuries these intrusive sherds may well have shifted along with the blown sand and lodged on the flat area above the pit.

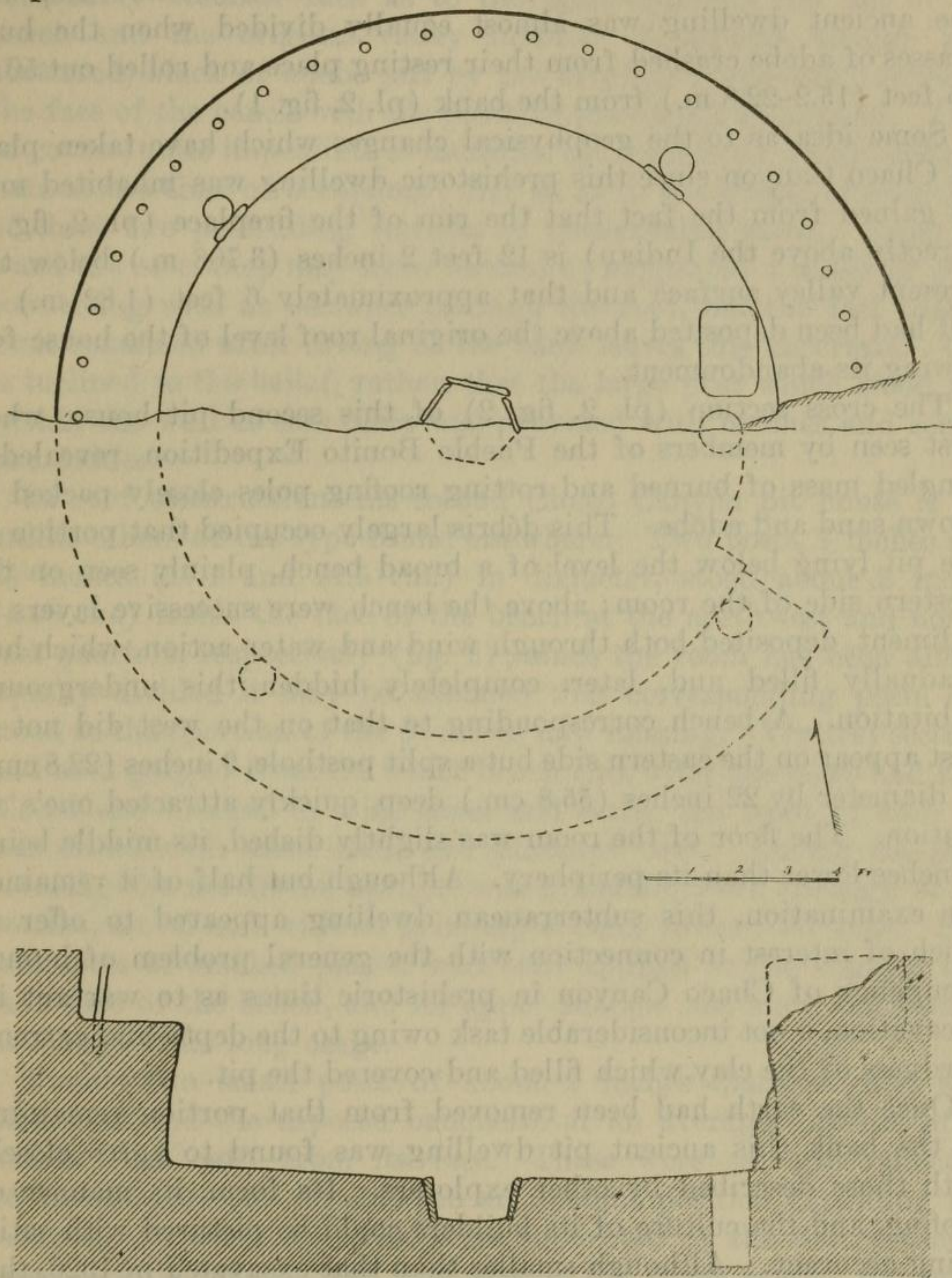


FIG. 2.—Pit House No. 2, Chaco Canyon.

#### PIT HOUSE NO. 2.

A second Chaco Canyon pit house (fig. 2; pl. 2, figs. 1 and 2; pl. 3, fig. 1) which, happily, affords a much clearer estimate than that just described of the degree of cultural advancement reached by its builders, was brought to the writer's attention by one of his Navajo friends early in the spring of 1922. This second ruin stands

about 1 mile (1.60 k.) east of Pueblo Bonito and was exposed by caving of the north arroyo bank during the heavy rains of the previous summer. Here the arroyo is fully 30 feet (9.14 m.) deep and the ancient dwelling was almost equally divided when the huge masses of adobe crashed from their resting place and rolled out 50 or 75 feet (15.2–22.8 m.) from the bank (pl. 2, fig. 1).

Some idea as to the geophysical changes which have taken place in Chaco Canyon since this prehistoric dwelling was inhabited may be gained from the fact that the rim of the fireplace (pl. 2, fig. 2, directly above the Indian) is 12 feet 2 inches (3.708 m.) below the present valley surface and that approximately 6 feet (1.82 m.) of silt had been deposited above the original roof level of the house following its abandonment.

The cross section (pl. 2, fig. 2) of this second pit house, when first seen by members of the Pueblo Bonito Expedition, revealed a tangled mass of burned and rotting roofing poles closely packed in blown sand and adobe. This débris largely occupied that portion of the pit lying below the level of a broad bench, plainly seen on the western side of the room; above the bench were successive layers of sediment, deposited both through wind and water action, which had gradually filled and, later, completely hidden this underground habitation. A bench corresponding to that on the west did not at first appear on the eastern side but a split posthole, 9 inches (22.8 cm.) in diameter by 22 inches (55.8 cm.) deep, quickly attracted one's attention. The floor of the room was slightly dished, its middle being 3 inches lower than its periphery. Although but half of it remained for examination, this subterranean dwelling appeared to offer so much of interest in connection with the general problem of human occupancy of Chaco Canyon in prehistoric times as to warrant its excavation, a not inconsiderable task owing to the depth and extreme hardness of the clay which filled and covered the pit.

Once the earth had been removed from that portion remaining in the bank this ancient pit dwelling was found to agree closely with those described by other explorers. Its form, its manner of roofing, and the culture of its builders could be pictured with satisfying accuracy. Although smaller than that excavated in 1920, this second pit house was likewise round, being 12 feet 9 inches (3.88 m.) in diameter. The middle of its slightly concave floor was occupied by a slab-lined fireplace 9 inches deep by 22 inches in diameter (22.8 by 55.8 cm.). A bench 35 inches (88.9 cm.) high and 26 inches (66 cm.) wide enlarged the room on its northern half, but on the east, only a few inches from the face of the bank, this bench is unexpectedly interrupted by a broken wall of undisturbed adobe which appears to have been not more than 16 inches (4.64 cm.) high.

At this point the banquette had been widened to 36 inches (91.4 cm.) and the height of the outstanding wall of clay probably affords a reasonably accurate idea as to the space between the top of the bench and the original valley surface. A second, though now shattered, block of adobe left by the original excavators connected the face of the bench with the posthole previously mentioned. It is, of course, quite impossible to establish the conditions which obtained here at the time of occupancy, that is, as to the width, or function, of these two protruding sections of unexcavated earth. Being toward the east, they may have formed or supported a series of steps connecting with an entrance through the roof, but the fact that so little remained after caving of the bank leaves this uncertain. One is inclined to the belief, rather, that the large post which stood just within the wall at this place was provided with notches and served as a ladder.

In roof construction this second Chaco Canyon pit house is not unlike others of the type found elsewhere. Two posts, 7 inches and 8½ inches (17.1 and 21.5 cm.) in diameter, stood about 2 inches (5.08 cm.) inside the face of the bench at the northwest and northeast quarters, respectively (fig. 2); since the room has been almost equally divided it may be assumed that corresponding posts also stood in that portion of the dwelling now missing. Vertical sections had been gouged from the adobe bench and, after the posts had been placed and blocked in with stone and earth, the front of each cut was closed with stone slabs and plastered over. Among the slabs covering the northwest upright was a metate, worn through at the bottom, set on end with its grinding surface toward the post. Several coats of smoked plaster had been applied to the slightly concave face of the bench, and its upper surface was hard and smooth as though from long usage.

Twenty-two small posts of about 2 inches diameter had been placed around the exposed banquette at an average distance of 20 inches (50.8 cm.) from its face. These were set approximately 14 inches apart and all stood in an upright position extending and inclining, no doubt, to cross pieces supported by the four principal posts already noted. The presence of the latter carries the inference that that portion of the roof between the posts was flat or nearly so. And it is not unreasonable to assume that the small uprights reaching above the bench originally supported layers of brush and grass, overlaid with loose earth taken from the excavation.

It is to be recalled that the bench in this pit house was approximately 16 inches below the valley surface at the time of construction and that the floor of the dwelling was 35 inches lower. These

combined measurements, however, probably fall considerably short of the actual ceiling height. Just why the ancient artisans deemed it desirable to build a wall of posts and brush above the bench in preference to utilizing the hard adobe face of their excavation is not clear but such practice seems to be characteristic of pit houses in which the bench is present. Kidder and Guernsey<sup>8</sup> describe a pit dwelling in the Monuments district of northeastern Arizona in which roofing poles, driven into a narrow bench at an angle, appeared to have met above the middle of the lodge. Dr. J. W. Fewkes<sup>9</sup> has observed a similar method of construction on the Mesa Verde National Park. Hough,<sup>10</sup> writing of pit villages near Luna, and Morris,<sup>11</sup> reporting on excavations between the San Juan River and the Continental Divide in Colorado, both noted the occurrence of large posts as roof supports but say little or nothing of an encircling bench and lesser timbers reaching from it to the main beams. Dwellings similar to, but seemingly more elaborate than, these circular structures in that the benches were faced with stone slabs and the upper walls were of wattle work, have been discovered in southwestern Utah caves by the present writer.<sup>12</sup>

Several slab-inclosed receptacles, corresponding with those in the other local pit dwelling (p. 401), formerly rested against the south wall of the room, the stone slabs and adobe flooring of such bins having been found among the huge blocks of earth caved from the bank. These bins are, of course, now completely shattered and but little of interest could be gathered from their broken remains. One of the number, a box 29 inches wide and 10 inches deep (73.9 by 25.4 cm.) had been paved with waterworn cobble stones; on its floor lay a quantity of charred vegetable matter among which were corncobs and kernels.<sup>13</sup> Other corncobs and one squash seed were found among the débris.

No traces of subwall depositories, such as those observed in our first pit house (p. 402), were noted in this second structure but a rectangular depression, 15 inches wide by 22 inches long by 3½ inches deep (38.1 by 55.8 by 8.88 cm.), had been scraped from the floor below the eastern end of the bench (fig. 2).

#### MINOR ANTIQUITIES.

The few artifacts of unquestioned pit-house origin taken from the excavations of 1920 were found by the writer on the bottom of bin No. 1 (fig. 1) and consist of a small mass of kaolin (315898), a

<sup>8</sup> Bull. 65, Bur. Amer. Ethnol., p. 44.

<sup>9</sup> Smithsonian Misc. Coll., vol. 72, no. 1, p. 58.

<sup>10</sup> Proc. U. S. Nat. Mus., vol. 55, p. 415.

<sup>11</sup> 33d An. Rep., Bur. Amer. Ethnol., p. 186.

<sup>12</sup> Smithsonian Misc. Coll., vol. 72, no. 1, p. 66, 1919.

<sup>13</sup> A bowl (324806) found beside the fireplace was partially filled with charred, shelled corn.

rubbed piece of red ocher (315895), an unworked bit of compact yellow clay, probably intended for paint, a small ball of impure sandstone (315897), and two disconnected portions of an earthenware bowl (315901). The latter only are of especial interest at this time.

Its fragments show the bowl to have been about 7 inches (17.01 cm.) in diameter and  $3\frac{1}{2}$  inches deep (8.88 cm.) with a thickness of less than three-sixteenths inch. The paste, which is rather coarse and filled with tiny quartz crystals, has been fired to a uniform pinkish yellow. Although its outer surface remains somewhat uneven, the interior exhibits a fine, smooth finish on which a geometric design has been drawn with dark red paint. This design can not be accurately reconstructed from the sherds at hand, but it consists, apparently, of a central decoration of thin, parallel lines with terraced or "cloud" elements, joined to a horizontal band just within the rim by four V-shaped units from which hang solid triangles and within which is a single row of dots inclosing an open triangle. These fragments differ both in paste and decoration from sherds associated with the more recent stone-walled ruins near the pit house and indicate that the inhabitants of the latter were not unskilled in the art of pottery manufacture.

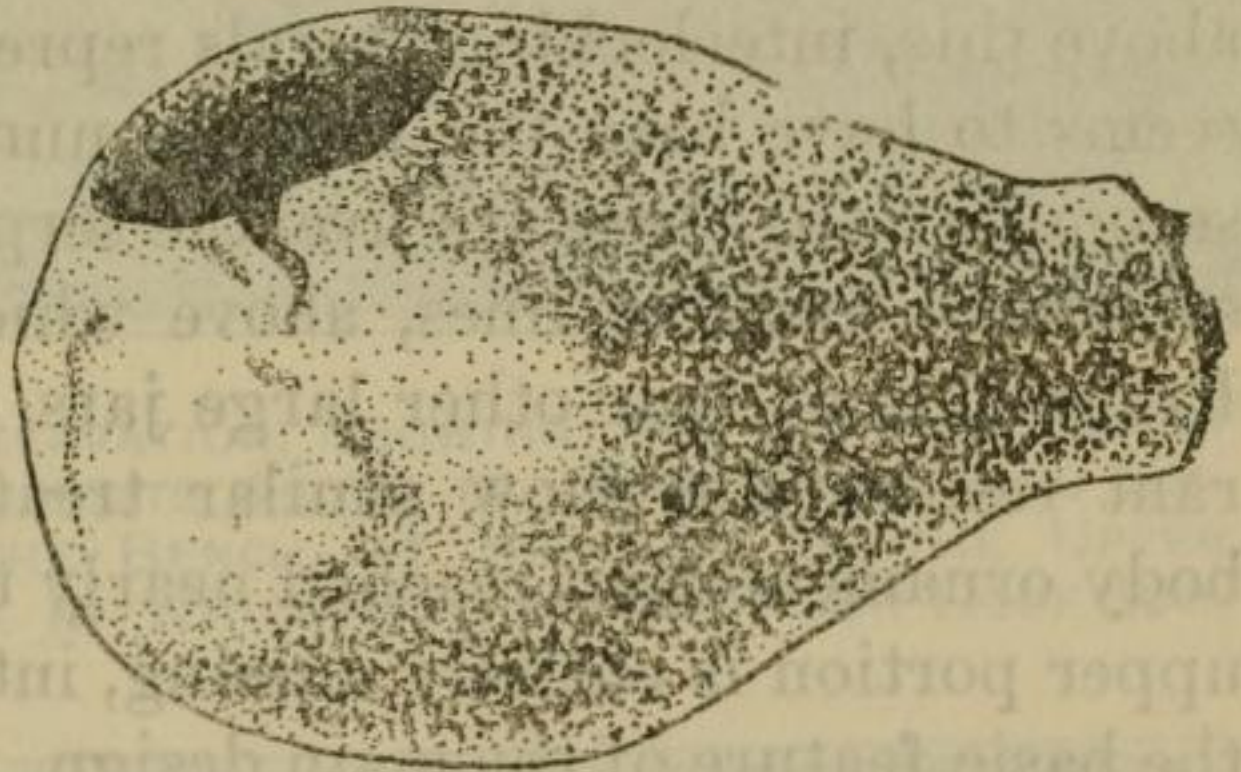


FIG. 3.—Earthenware pipe.

An earthenware pipe of rather unusual shape (fig. 3) was found on the floor of the room between the fireplace and the slab bins. Its bowl resembles a miniature jar with a constricted opening and with one side drawn out to form a round stem, now broken; its surface is roughly smoothed and bears no trace of ornamentation. The stem had been perforated by pushing a coarse straw from the bit toward the bowl while the clay was yet plastic. The specimen is  $1\frac{1}{4}$  inches high by  $1\frac{1}{2}$  inches wide by  $2\frac{1}{4}$  inches long (3.12 by 3.81 by 5.71 cm.) with a three-fourths inch orifice; no evidence of use is to be seen.

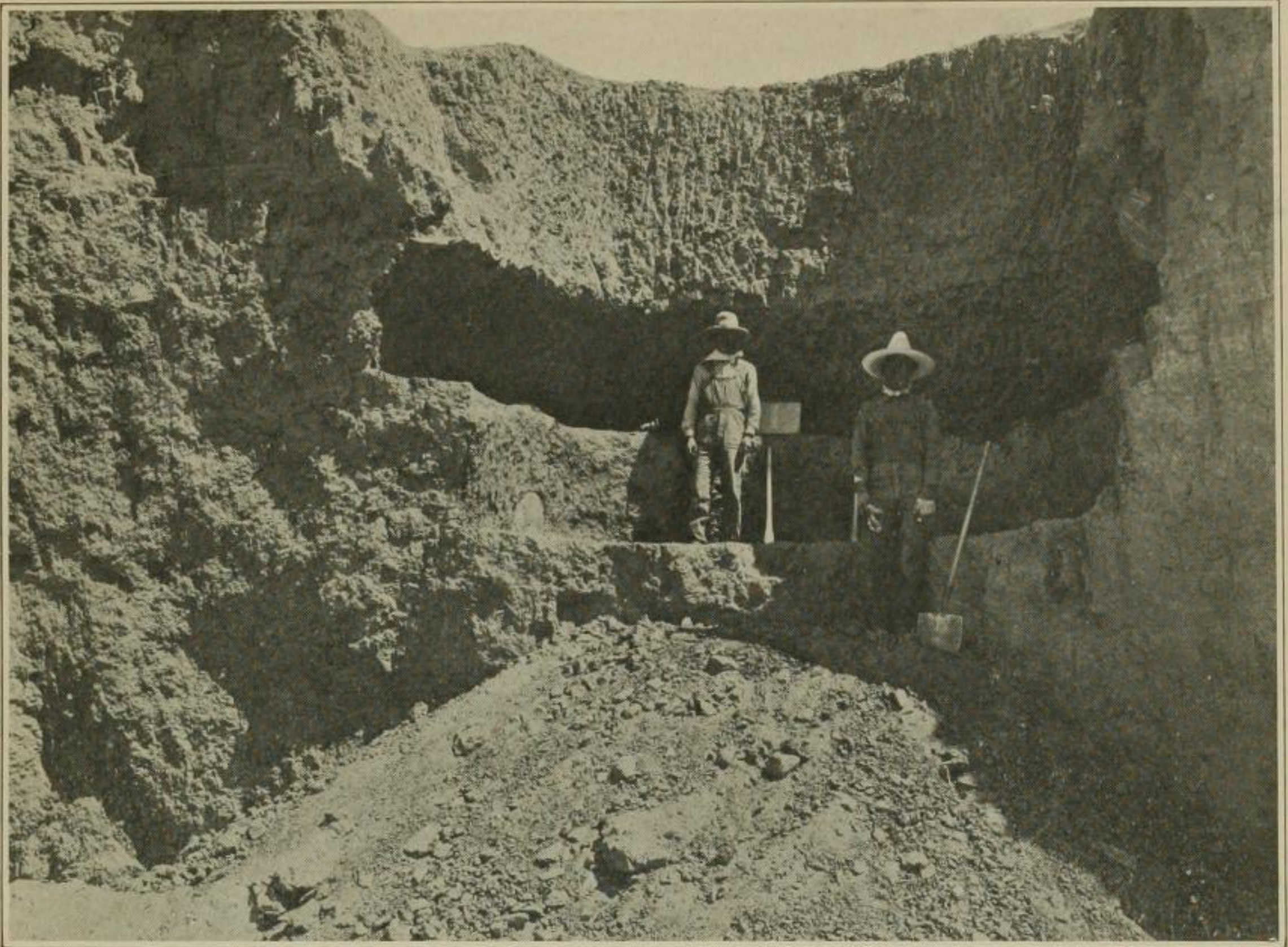
The really abundant material recovered at the site of the second pit house, excavated in 1922, happily balances the paucity of specimens from the first. Among the heavy blocks of clay which had crashed down into the arroyo (pl. 2, fig. 1) and in the silty deposits which filled that half of the ancient pit house not destroyed were numerous potherds and other artifacts abandoned by the one-time inhabitants. Several jars had been left in or adjacent to the slab bins

which formerly stood against the south wall; their impressions were plainly visible in some of the larger adobe masses and their scattered sherds were recovered in considerable quantities. Altogether, 11 earthenware jars and 8 bowls have been restored from the pottery fragments collected at this site (pl. 3, fig. 2).

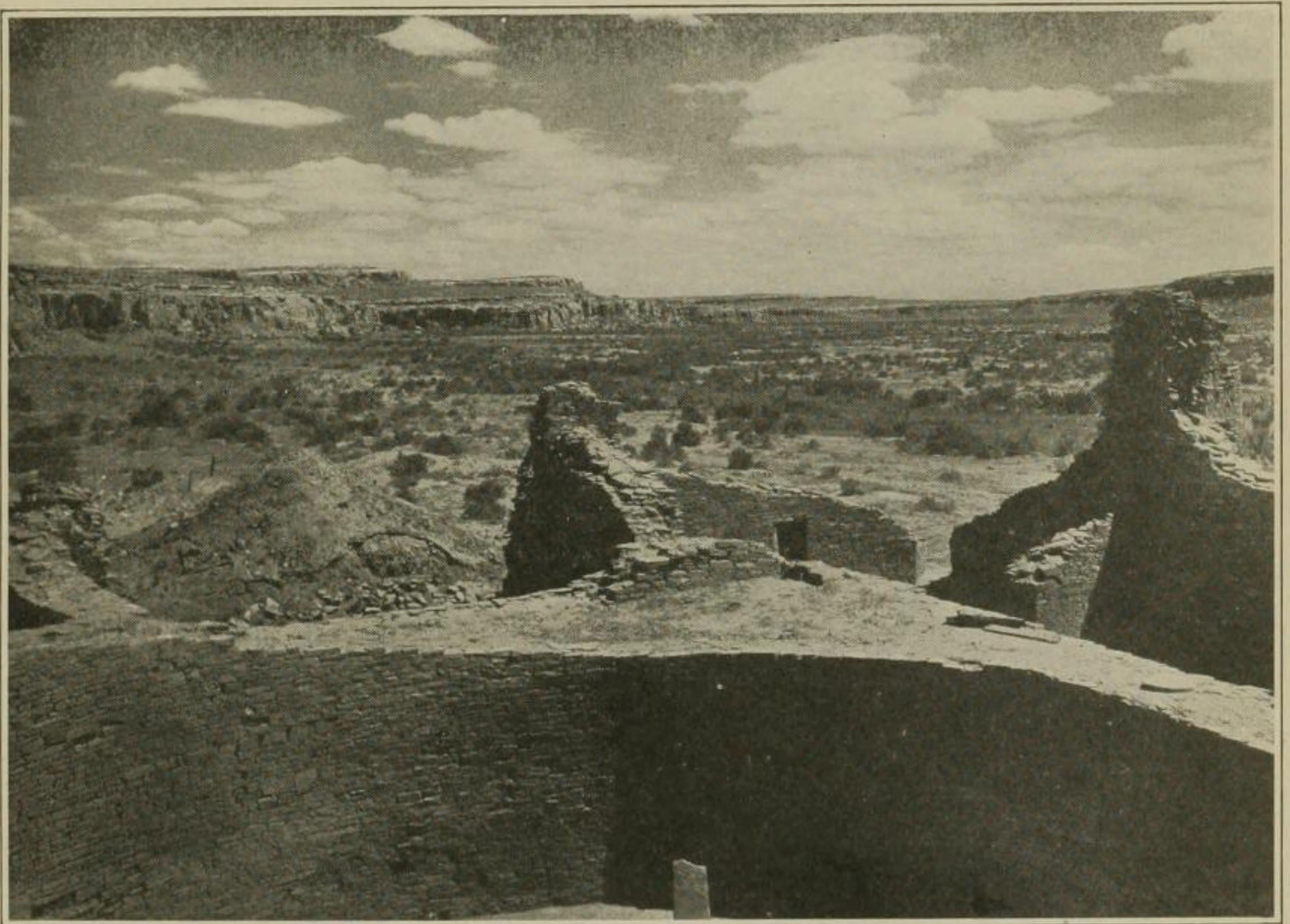
Certainly the most noteworthy of these vessels are the two large black-on-white water jars shown in plate 4. One (a) stands  $16\frac{1}{2}$  inches (41.1 cm.) in height and has a diameter of  $13\frac{1}{2}$  inches (34.2 cm.); its orifice is oval in shape,  $2\frac{3}{4}$  inches wide by 4 inches long (6.78 by 10.2 cm.). A crack running downward from each end of the opening indicates a slight unintentional misshaping, perhaps due to pressure early in the firing process. The second jar (b) is  $17\frac{3}{4}$  inches (45 cm.) high by  $14\frac{1}{2}$  inches (36.8 cm.) in diameter; its mouth, also oval, is  $2\frac{3}{4}$  inches wide by 4 inches long (6.98 by 10.1 cm.). In both vessels the body is decorated by an elaborate geometric pattern and, above this, interlocking spirals representing plumed serpents. Three seems to have been the favorite number for such spirals but in the second jar (b) there are five, the serpents being represented by single, somewhat angular lines, above which is an encircling, zigzag line. Fragments of four other large jars, not sufficiently complete to warrant restoration, show similar treatment but, on one of these, the body ornamentation reached nearly to the rim and on another, whose upper portion is entirely missing, interlocking plumed serpents form the basic feature of the main design. In all six specimens the exterior surface has been washed with a thin white slip as a background for the black paint of the design. None of these water jars was provided with handles or the outflaring rim so typical of later pre-Pueblo ollas.

One small jar (pl. 5, fig. 1) has this noticeable difference from the larger vessels: A constricted shoulder permits a more direct approach to the rim and provides the specimen with what might be called a neck. A reddish-brown body decoration has wholly disappeared except in one limited area; the upper portion shows three horizontal, wavy lines adjacent to the rim.

Three of the eight bowls recovered have interior decorations, drawn with black pigment over a white slip (pl. 6); the rim edge of each has been flattened by rubbing and carries a black line, a characteristic feature of bowls from the principal Chaco Canyon culture. One specimen (324805), rather cruder in workmanship and more straight-sided than the others, is ornamented with four horizontal bands crossed at intervals by two or four vertical lines. This

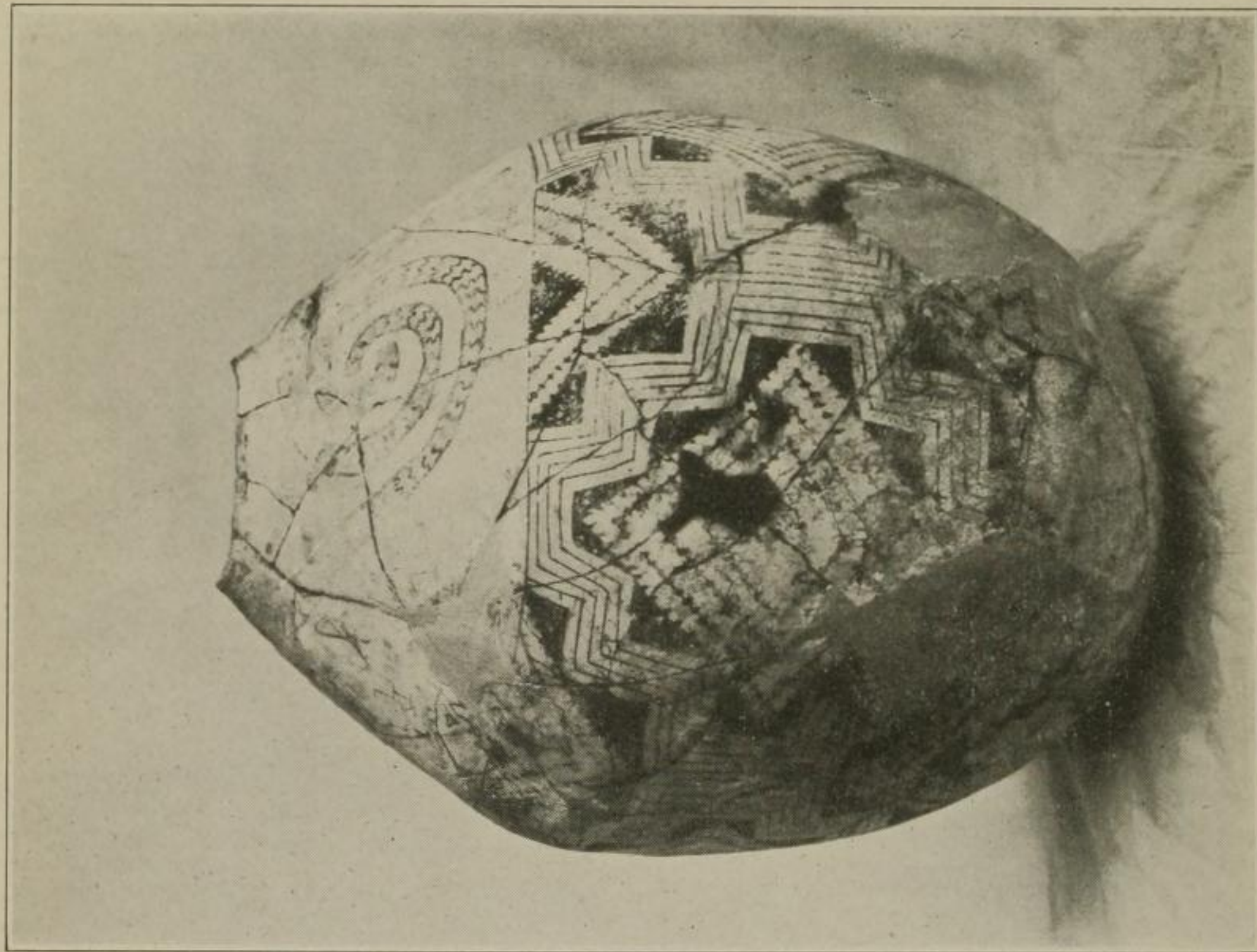


1. PIT HOUSE No. 2 AFTER EXCAVATION, SHOWING THE EXPOSED BENCH AND DEPTH OF THE SILTY DEPOSITS ABOVE IT. THE STONE SLAB EMBEDDED IN THE FRONT OF THE BENCH, AT THE LEFT OF THE UPPER INDIAN, COVERS THE GROOVE IN WHICH ONE OF THE FOUR ROOF SUPPORTS HAD STOOD.



2. CHACO CANYON AS SEEN FROM THE SOUTHEAST CORNER OF PUEBLO BONITO. PIT HOUSE No. 2 WAS FOUND NEAR THE ARROYO BANK INDISTINCTLY SEEN IN THE MIDDLE DISTANCE, ABOUT MIDWAY BETWEEN THE TWO HIGHEST PORTIONS OF THE NEAR-BY WALLS AND DIRECTLY ABOVE THE OLD DOOR.

Photos by Neil M. Judd. Courtesy of the National Geographic Society.



a



b

WATER JARS. FROM PIT HOUSE NO. 2.





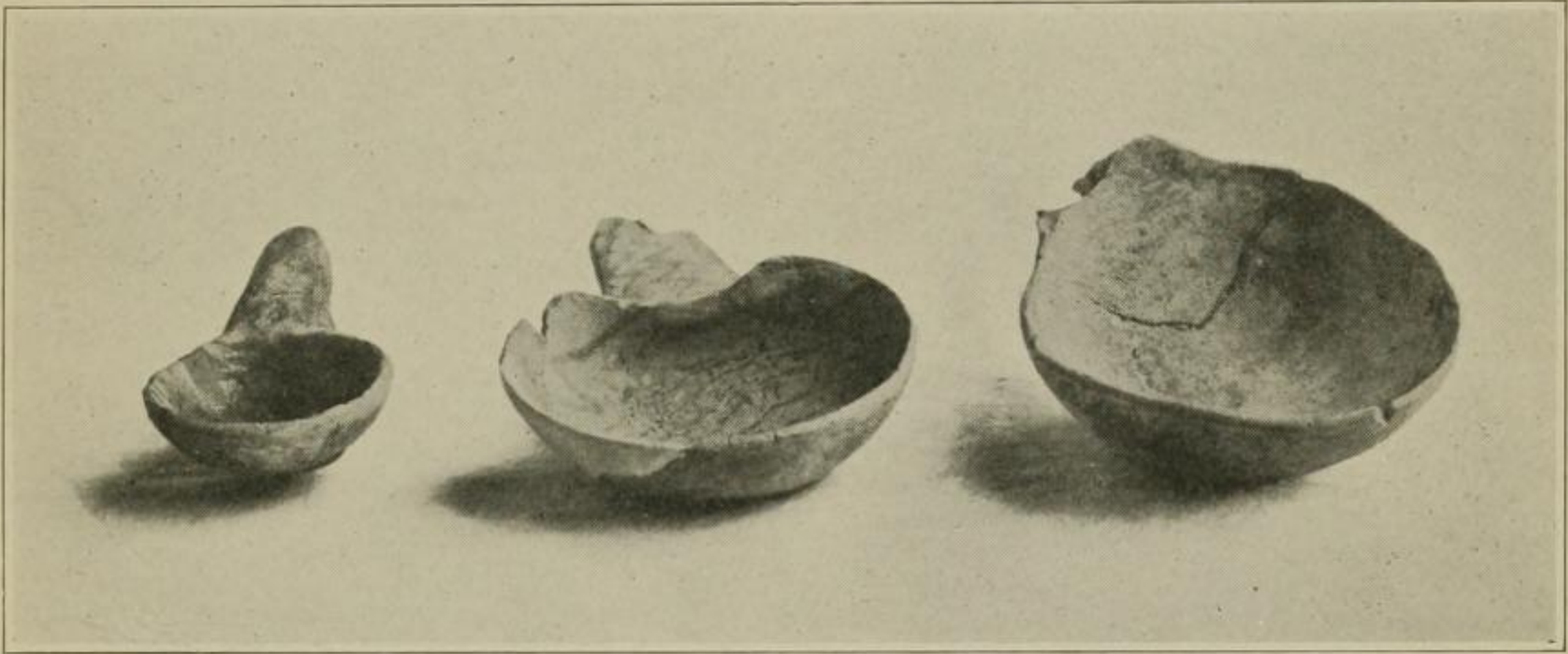
a

b

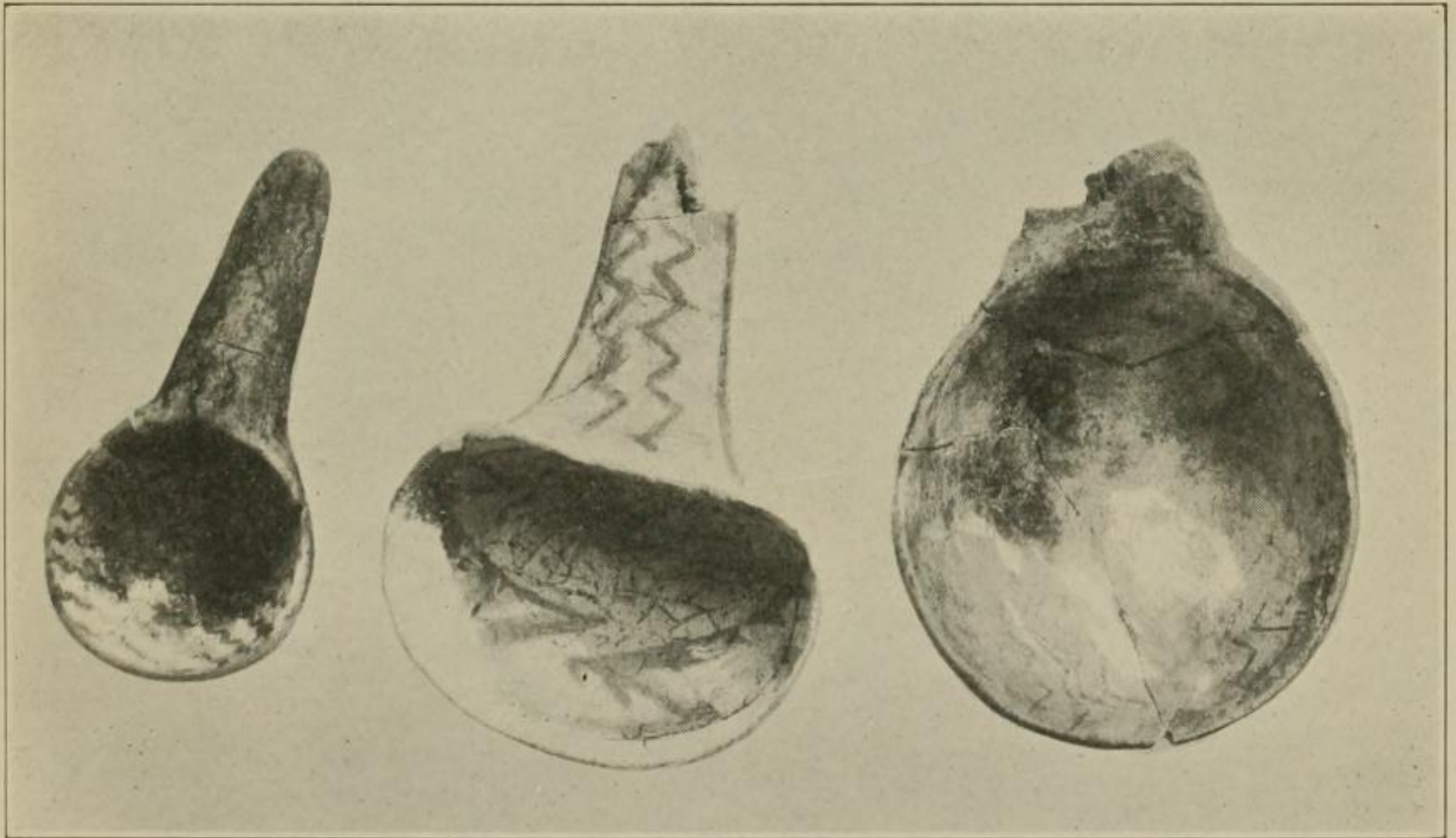
c

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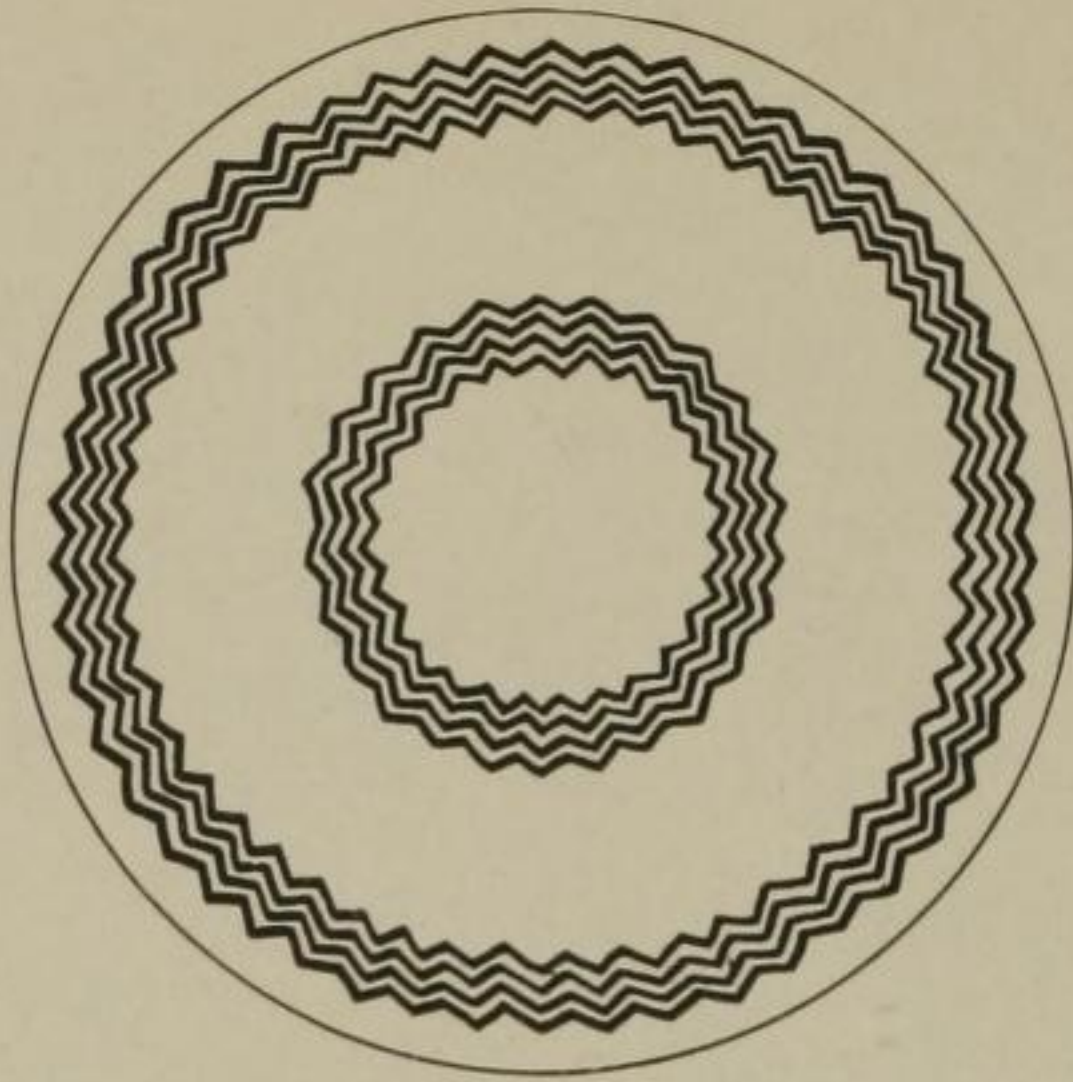
1. EARTHENWARE JARS AND COOKING POTS, PIT HOUSE No. 2.



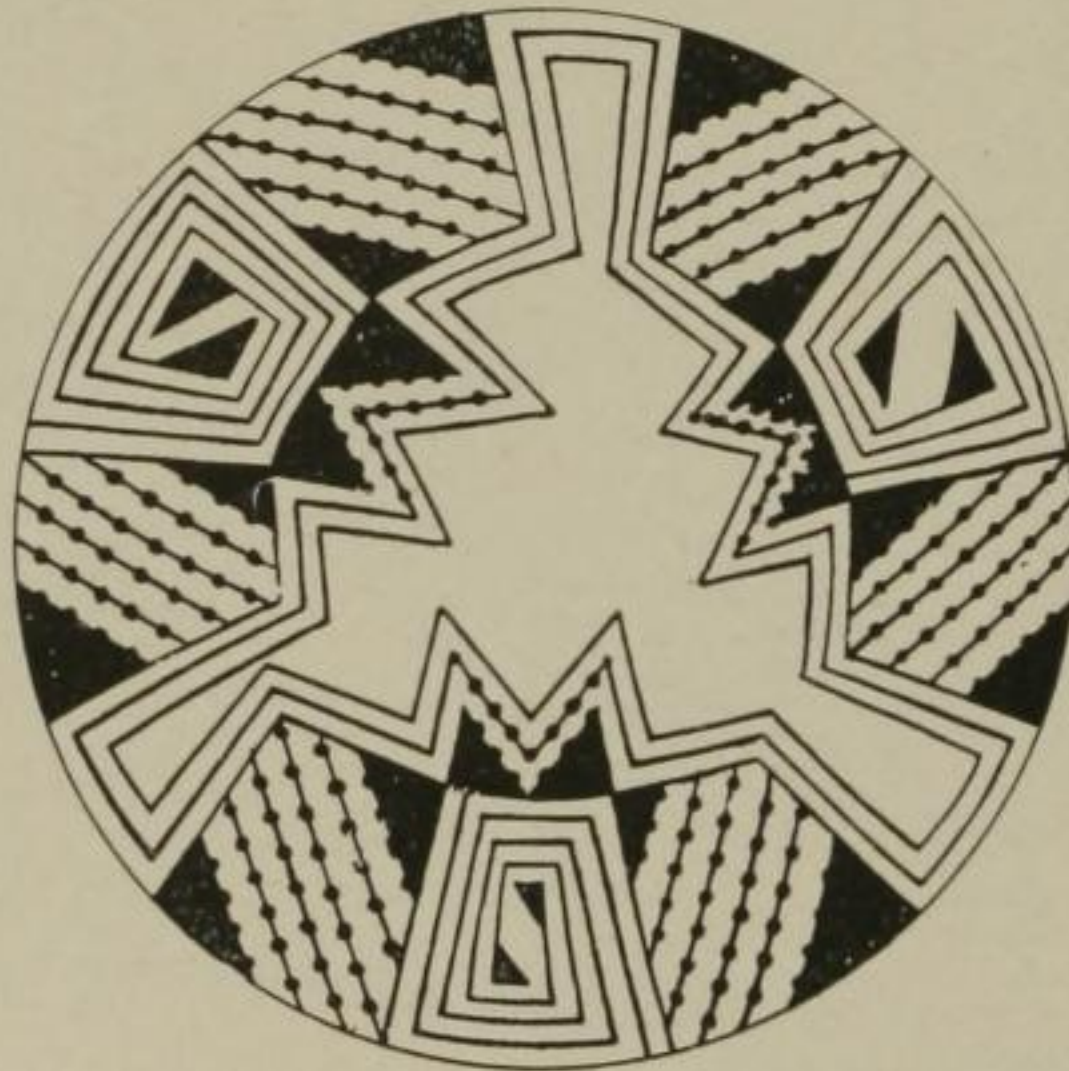
2. EARTHENWARE LADLES, PIT HOUSE No. 2.



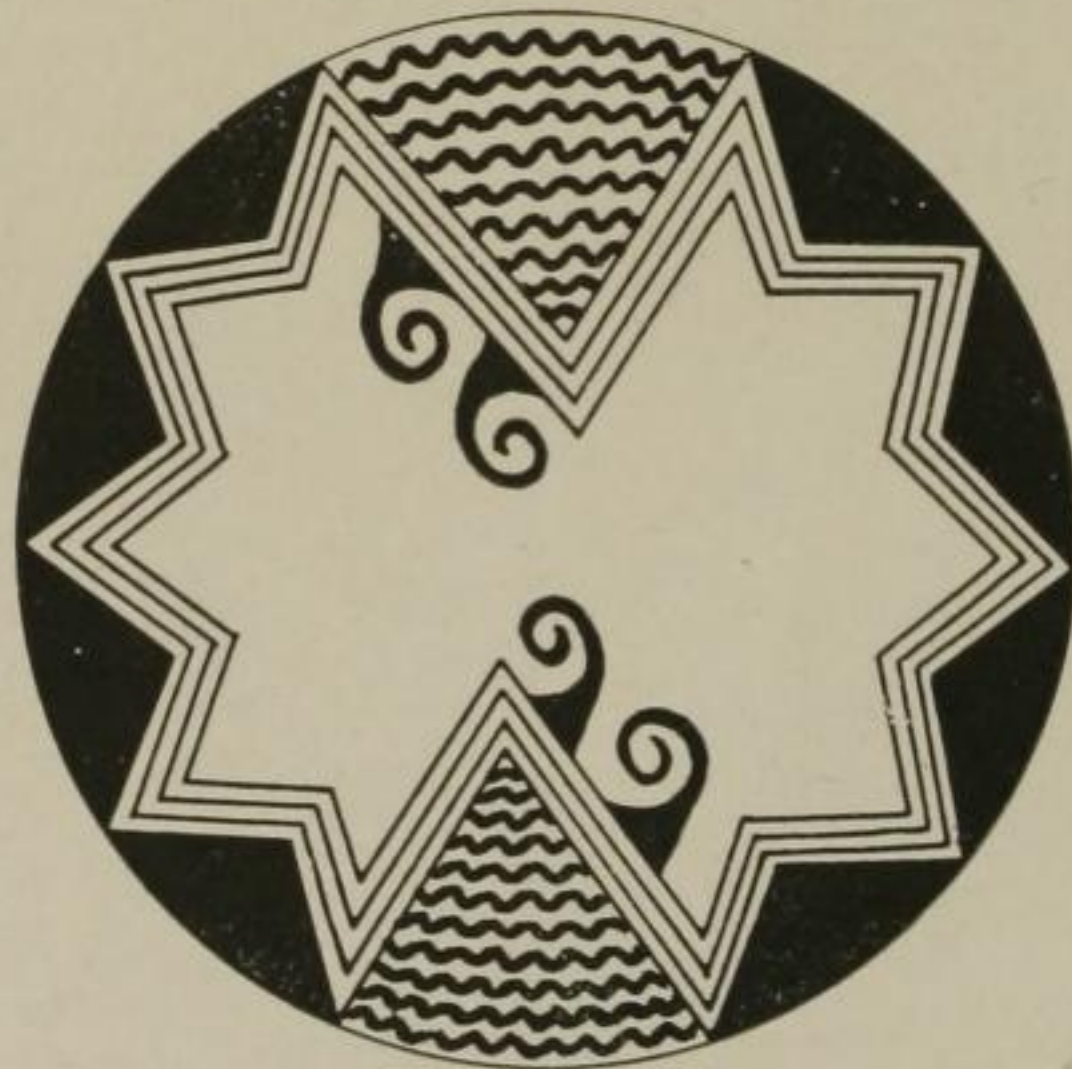
3. EARTHEN LADLES (INSIDE VIEW OF FIGURE ABOVE).



1



2

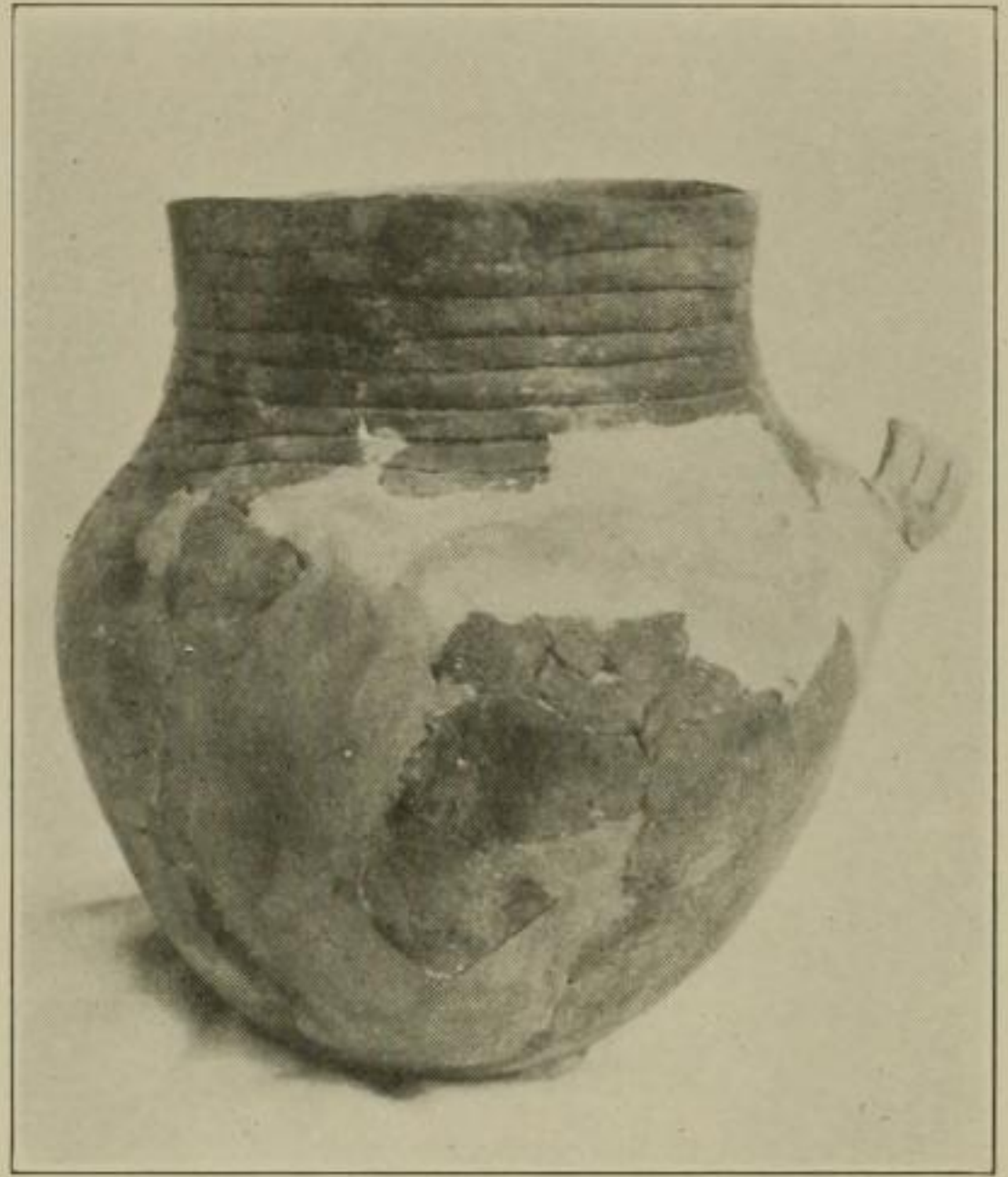


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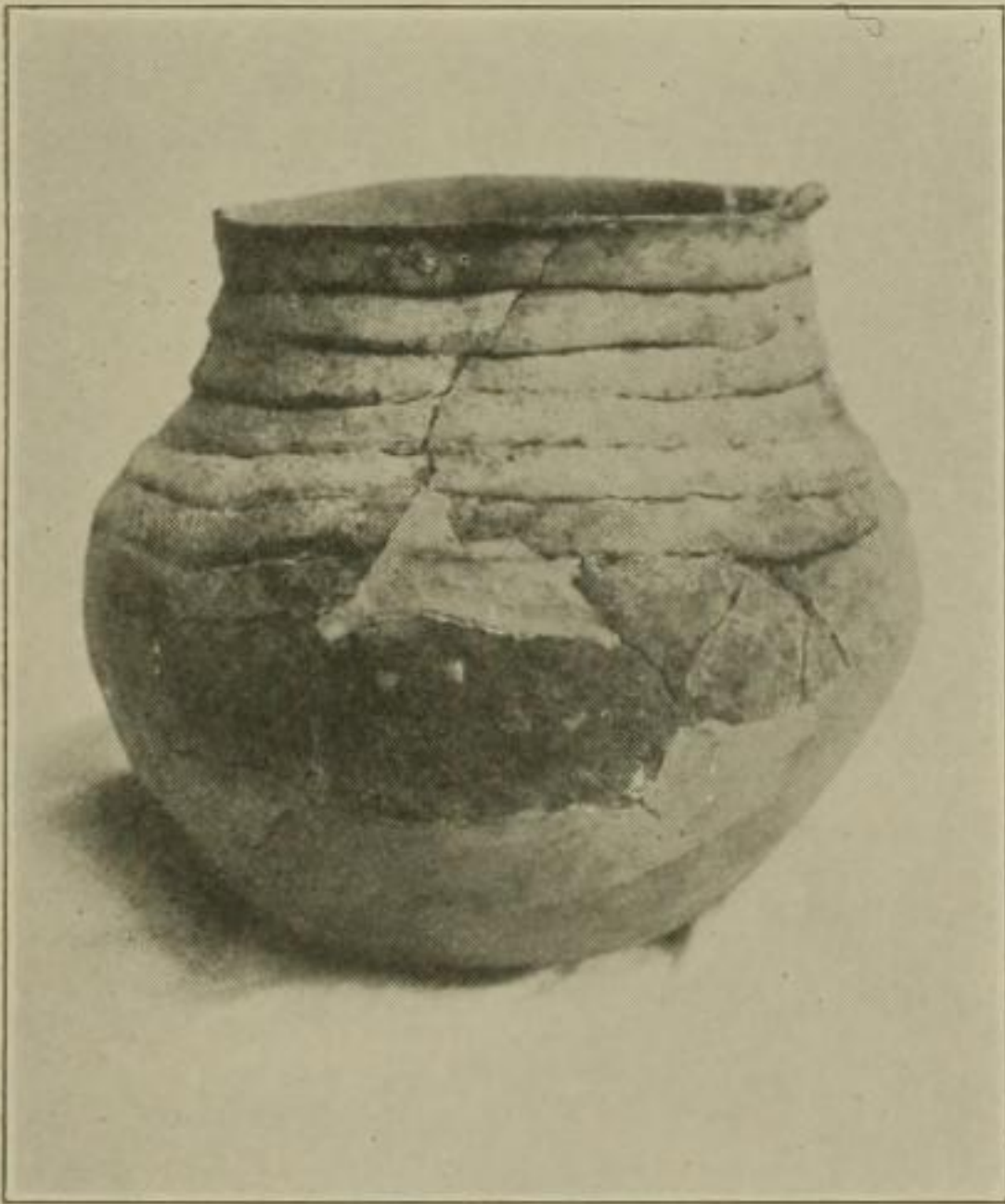
1, 2, 3. DECORATION OF INTERIOR OF BOWLS.



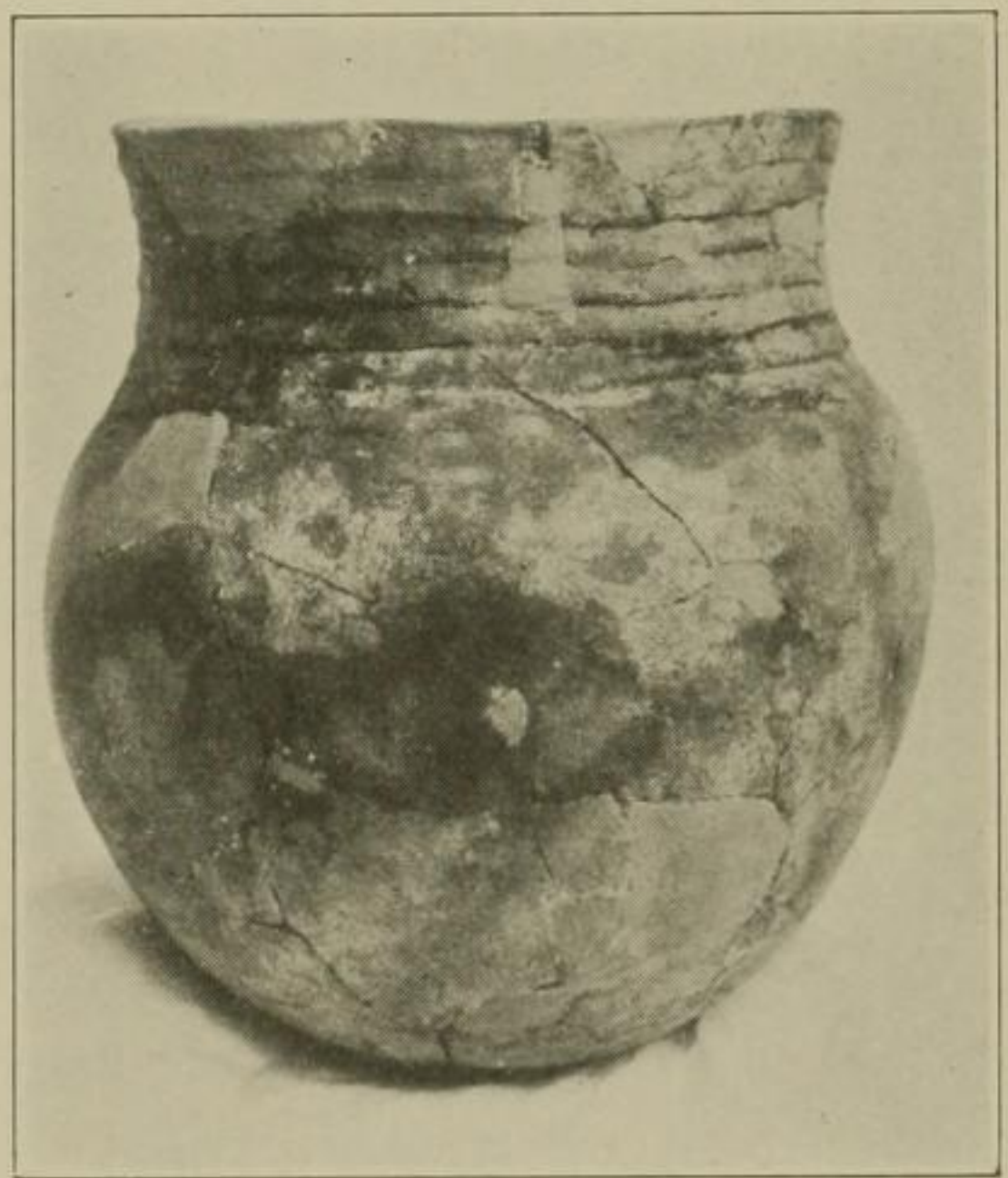
1



2

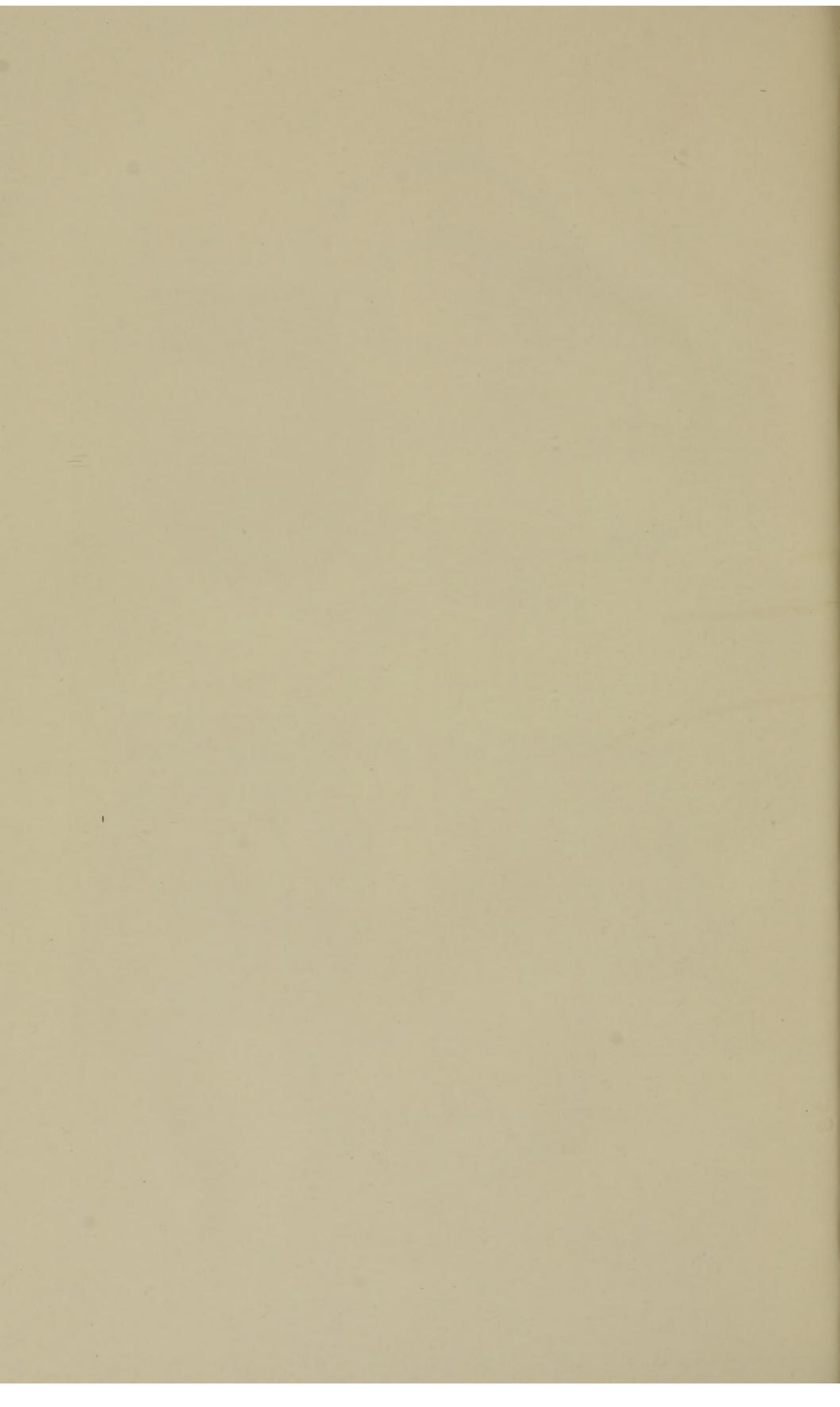


3



4

EARTHENWARE COOKING POTS. PIT HOUSE No. 2.



design was painted with a reddish-brown pigment<sup>14</sup> upon a slate-colored wash; the evident lack of skill both in modeling and in decorating this particular bowl suggests the possibility of its being the work of a beginner. One of the bowls has a slightly incurving rim; in all the others the edge is reached directly, i. e., without apparent incurve or outcurve. The relatively thin rim in a majority of the vessels is rather carelessly rounded and noticeably uneven. In the specimens at hand, ornamentation was restricted to the polished interior of the bowls; the outside surface was not carefully smoothed and evidently did not receive the customary slip. Two bowls and a small cuplike vessel were not decorated in any manner; handles do not appear on any of the bowls in the collection.

In paste, in decoration, and in general workmanship these vessels from the Chaco Canyon pit house are characteristic of that phase of prehistoric culture in our southwestern United States commonly recognized as "pre-Pueblo." Fewkes, Kidder, Morris, and others have described the ware in their several reports of explorations throughout the San Juan drainage; almost identical specimens are figured by Hough in his important contribution on the Luna pit houses. Certain decorative elements on the pottery from this ancient Chaco Canyon structure, namely, the combination of thin, straight lines with areas of solid black, are suggestive of, but entirely distinct from, the designs on pottery from such great communal dwellings as Pueblo Bonito. The closely hachured designs so characteristic of the latter do not occur in pit houses so far as known.

Cooking pots, as represented in the collection (pl. 7), are typical of the pit-house culture as identified elsewhere. They present, indeed, one of its most distinguishing features. In shape they are globular with wide orifices; their rims are approached with little, if any, outflare. That portion of the jar between the shoulder and mouth is built up of broad bands of clay, one-fourth to three-fourths of an inch wide. These, however, are not true coils as in the case of the corrugated ware of the cliff dwellers and other prehistoric peoples; rather, each band has been added separately, overlapping that next below and the union of its ends carefully obliterated.

The paste from which these culinary vessels were shaped is coarser and more granular than that employed in manufacture of the bowls and decorated water jars previously described. It is noted, also, that although both inner and outer surfaces have been smoothed—the marks of tools are usually in evidence—no attempt

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<sup>14</sup> Two brown bowls (324807, 324808), nicely smoothed on the inside, seem also to have been decorated with red paint, but this has so faded that the original color can not be ascertained with certainty; a small, light-colored cup (324809) has no ornamentation whatever.

has been made to improve the appearance of the vessel by application of a slip or surface wash.

Handles are present on five of the eight pots in this series. In one specimen (pl. 7, fig. 3) a single handle, consisting of three rolls of clay pressed together, was attached horizontally at the shoulder; in another instance (pl. 5, fig. 1) a handle of similar construction connects the shoulder with the edge of the orifice. Two vessels (pl. 7, fig. 2, and pl. 5, fig. 1a) are provided with flattened lugs, attached to opposite sides of the rim, whose under surfaces are gently curved to fit the finger. Dissimilar handles occur on the fifth specimen (pl. 5, fig. 1d), a thin, flat lug  $1\frac{1}{4}$  inches long and five-eighths inch wide being attached vertically just below the rim on one side, while its opposite is a round lug with a slight downward curve. The latter handle, now largely missing, probably came to a blunt point about three-fourths of an inch from the side of the vessel. It should be noted that this is the only cooking pot in the collection whose outer surface is plain, the usual broad neckbands having been entirely effaced.

Three earthenware ladles (pl. 5, figs. 2 and 3),<sup>15</sup> restored from fragments gathered at this site, are so interesting as to merit brief description. In both form and ornamentation they are quite unlike. The smallest of the three has a round bowl and a handle which is slightly convex both above and below; the bowl of the largest is somewhat oval in appearance, due chiefly to its open or concave handle.<sup>16</sup> This second specimen is still further unique in that the near right-hand quarter of the bowl rim (as held in the hand) is one-half inch (1.27 cm.) lower than the remainder. The third ladle differs from the other two both in the shape of its bowl, which is considerably wider than it is long, and in the fact that its thick handle (flat on top and convex below) is attached to the bowl one-half inch below the rim of the latter. Perhaps as an additional decorative feature half of this upstanding portion of the rim has been cut away in a shallow curve, clearly shown in plate 5, figure 2. Each of these three ladles is decorated with black paint over a whitish slip applied to both inner and outer surfaces; in the second and third specimens a thin black line has been drawn around the rim edge.

Two additional earthenware objects from this second Chaco Canyon pit house should be mentioned. One of these (fig. 4) is a pipe made apparently from a portion of the handle of a gourd-shaped bottle.<sup>17</sup> Both ends have been rubbed smooth; the hole at the bit

<sup>15</sup> The only complete specimen is  $5\frac{5}{8}$  inches long by  $2\frac{3}{4}$  inches wide (14.2 by 6.98 cm.)

<sup>16</sup> So far as the author is aware this type of ladle handle, so closely associated with the culture of Pueblo Bonito, has not previously been noted from pit houses.

<sup>17</sup> See Morris: 33d An. Rep., Bur. Amer. Ethnol., fig. 5, p. 197.

end has been gouged through with a flint drill. The larger opening shows unmistakably the use to which the object was put.

The second of these two specimens (324823) is a portion of what appears to have been the hollow handle of a ladle, reworked perhaps for intended use as a pipe. The smaller end has been carefully smoothed, while the fractured face of the opposite end shows but slight rubbing. A certain doubt arises in connection with this particular fragment, for its superior paste, its white slip, and its style of ornamentation all tend to place it with a culture later than that of the pit dwellers. There is no question, however, but that it was found in direct association with the other artifacts here described.

Several charred fragments of a small, finely woven coiled basket, gathered from among the débris in the arroyo, obviously add to the importance of this collection. The technique is "two rod and splint," as described by O. T. Mason.<sup>18</sup> Of still further interest are the charred remains of a pair of remarkably thin sandals found on the bench at the west side of the room. In these the weft is a twisted thread of a fine, unidentified fiber woven over parallel-warp cords of yucca which are arranged after the fashion of those in a cliff-dweller sandal figured by Kidder and Guernsey.<sup>19</sup> One may judge of the exceptional fineness of the weave in these specimens by the fact that there are no fewer than 9 warp and 32 weft strands to the inch. The importance of these fragments lies in the fact that, from the very nature of the dwellings, pit-house sandals and basketry are extremely rare. Discovery of these charred specimens, however, encourages the belief that other, perhaps more perfect, examples will be found as investigation of pit-house remains progresses.

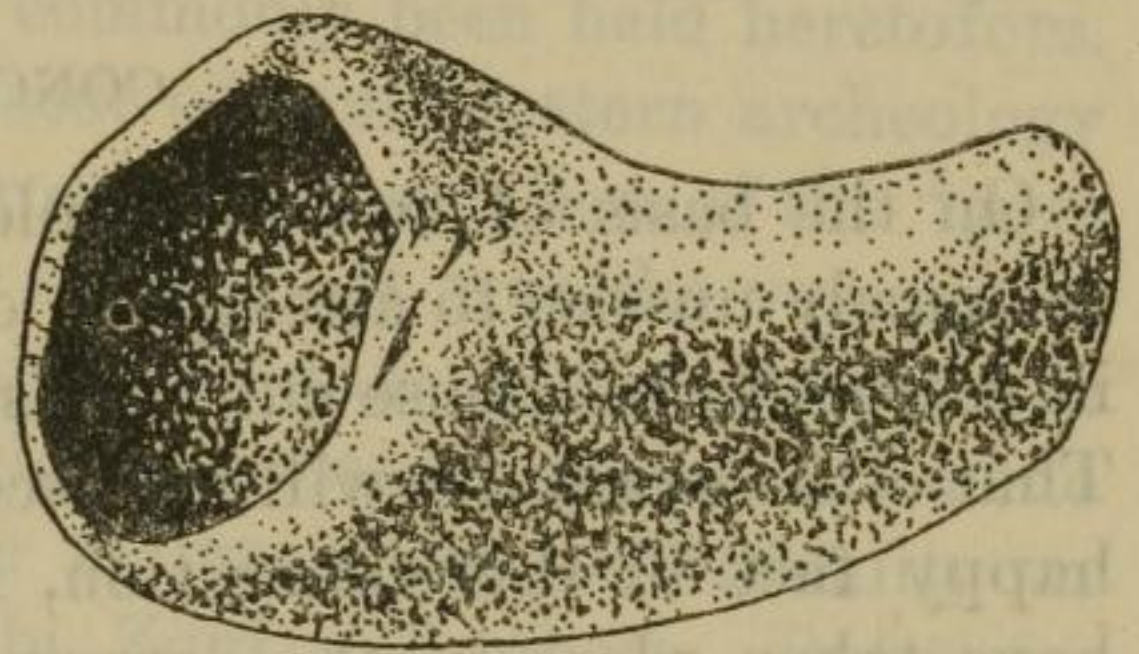


FIG. 4.—Earthenware pipe.

In addition to the artifacts already mentioned, the collection includes two incomplete bone awls (324824), a reworked fragment of a shell bracelet (324825), two flint knives or scrapers (324826), and several stone hammers, manos, etc. Three broad, thin metates and a number of smoothing and grinding stones, recovered from the mass of fallen adobe (pl. 2, fig. 1), were not included in the material brought to Washington.

Lying upon the floor of the room between the fireplace and the west bench, its head to the northwest, was the incomplete skeleton of a young female. Caving of the arroyo bank had torn away all the

<sup>18</sup> An. Rep., U. S. Nat. Mus., 1902, p. 246.

<sup>19</sup> Bull. 65, Bur. Amer. Ethnol., fig. 38, p. 104.

leg bones; those of the trunk were mostly crushed by the weight of the roof poles and clay which had collected above them. All available fragments were preserved, however, for further study. The chief result of this subsequent examination<sup>20</sup> was the positive determination that the skull had been subjected to cradle-board pressure, resulting, in occipital flattening. Such artificial deformation, so characteristic of crania from cliff dwellings and other early Pueblo ruins, was scarcely to have been expected in a skull from a pit house in Chaco Canyon. From our meager knowledge of the pit dwellers (few adult skeletons have been found) we have rather assumed that they were a long-headed or dolichocephalic people, an assumption which has been drawn, perhaps, on too scanty information. As we become more intimately acquainted with the pit people through future exploration and as the character of their culture becomes more firmly established, it is not unlikely that these early conceptions will merit revision.

#### CONCLUSION.

On the basis of two incomplete dwellings only it would appear extremely unwise to attempt to draw any definite or final conclusion in respect to pit-house culture as found in the Chaco Canyon region. That other examples will be discovered seems almost certain; the unhappy fact in this connection, however, is that such vast changes have taken place in the canyon since arrival of these pioneer settlers as to preclude the possibility of identifying the sites of their subterranean homes through examination of the present valley surface. From preference the pit people seem to have constructed their shelters in open or exposed places, and these unprotected areas naturally have been subjected to the most intense leveling influence of the elements.

Perhaps the greatest contribution to American archeology which can be claimed for these two Chaco Canyon pit houses is the connecting link they afford between similar structures in localities so widely separated as Luna, N. Mex., the Mesa Verde National Park, Colo., and the Monuments district of northern Arizona. Their discovery increases the number of known pit dwellings and tends to draw them into one distinct group. Of scarcely less interest is the fact that finding an improvised pipe and basketry and textiles exhibiting extraordinary skill in weaving adds appreciably to previous knowledge of pit-house culture and strengthens its suspected close relationship with that of subsequent periods.

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<sup>20</sup> The fragments have been examined by Dr. Aleš Hrdlička, Curator of Physical Anthropology, U. S. National Museum, whose report is incorporated in the above paragraph. It could not be learned, owing to its shattered condition, whether the skull was dolichocephalic or brachycephalic.



In his "Chronology of the San Juan area," Morris<sup>21</sup> assigns to the "pre-Pueblo" period dwellings both of the type herein considered and those of wattled construction in which upright slabs were occasionally incorporated in the basal portion of the wall. Such classification appears to be justified on the basis of ceramic remains only, and, indeed, the slight difference in architecture may prove to be merely a result of environment or the growth of a clan system, for "slab houses" are found in groups more frequently than are pit dwellings. But Morris observes that a majority of the crania from pre-Pueblo sites is dolichocephalic, although some skulls with occipital flattening, possibly brachycephalic, have been recovered. It remains to be seen, therefore, whether this peculiar custom of artificial deformation is identified with pit houses only or with both types of pre-Pueblo habitations equally; whether it is early evidence of the adoption of a rigid type of cradle board or the immigration of a separate people, as has commonly been held heretofore.

Surely one of the most pressing needs of southwestern archeology to-day is a clearer definition and a broader appreciation of the "pre-Pueblo" stage in our chronological system. It was the very germ of that widely distributed culture which found its greatest prehistoric development in such marvels of aboriginal creative genius as Pueblo Bonito and which still struggles to maintain its individuality in modern pueblos such as Walpi, Oraibi, Zuñi, and others. But these needs may be realized only through painstaking labor in crude, ill-defined ruins, often difficult of access and, be it said with regret, so unpromising that they are rarely left solely to the choice of the student of ancient history.

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<sup>21</sup> Proc. Nat. Acad. Sci., vol. 7, no. 1, p. 20, 1921.

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Scarcely one of the most pressing needs of southwestern archeology to-day is a clearer definition and a broader appreciation of the "pre-Pueblo" stage in our chronological system. It was the very source of the widely distributed culture which found its greatest historic development in such marvels of aboriginal creative genius as Pueblo Bonito and which still struggles to maintain its individuality in modern pueblos such as Hualpi, Oraibi, Kuntz, and others. But these needs may be realized only through painstaking labor in crania, the defined ruins, often difficult of access and, as it is said with regard to antiquities that they are rarely left solely to the choice of the student of ancient history.

*Pre-Pueblo Crania*

As a result of the numerous excavations of pre-Pueblo dwellings and the consequent discovery of many crania, it has been found that the general character of crania varies within certain limits between similar structures in localities as widely separated as Mesa Verde National Park, Colorado, and the Monumental District of northern Arizona. Their distribution is somewhat irregular but it is known that the general type of crania in the latter region is of the dolichocephalic type. Of course, the crania of the latter region are not as numerous as those of the former, but the evidence is sufficient to indicate that the crania of the latter region are of the dolichocephalic type. The crania of the latter region are of the dolichocephalic type, and the crania of the former region are of the dolichocephalic type.

The crania of the latter region are of the dolichocephalic type, and the crania of the former region are of the dolichocephalic type. The crania of the latter region are of the dolichocephalic type, and the crania of the former region are of the dolichocephalic type.

The following text is generated from uncorrected OCR or manual transcriptions.

[Begin Page: Page 399]

TWO  
CHACO  
CANYON  
PIT  
HOUSES.  
1

By  
Neil  
M.  
Judd,

Curator,  
American  
Archeology,  
U.  
8.  
National  
Museum.

[With  
7  
plates.]

In  
writing  
or  
speaking  
of  
the  
prehistoric  
habitations  
of  
Chaco

Canyon  
2  
one  
invariably  
has

in  
mind  
only  
the  
great  
communal

dwellings,  
such  
as  
Pueblo  
Bonito  
and  
Pueblo  
del  
Arroyo.  
This

mental  
discrimination  
is  
the  
natural  
one,  
for  
these  
ruins  
of  
stone-

walled,  
terraced  
villages  
are  
among  
the  
best  
preserved  
and  
most

impressive  
of  
all  
the  
ancient  
structures  
north  
of  
Mexico.  
They

immediately  
arrest  
the  
attention;  
they  
convey,  
in  
comparison,  
so

colorful  
a  
picture  
of  
the  
busy  
life  
once  
carried  
on  
within  
their  
now

silent  
rooms  
that  
the  
remains  
of  
contemporaneous,  
or  
even  
more

ancient,  
settlements  
near  
by  
are  
usually  
entirely  
disregarded.

Lesser  
house  
remains,  
however,  
exist  
in  
large

numbers  
in  
Chaco

Canyon.  
There  
are  
talus  
pueblos  
and  
a  
few  
small  
cliff  
dwellings

at  
or  
near  
the  
base  
of  
the  
perpendicular  
cliffs  
which  
form  
the  
north

wall  
of  
the  
canyon  
;  
there  
are  
literally  
hundreds  
of  
small  
ruins  
scat-

tered  
along  
the  
south  
side  
of  
the  
valley  
and

out  
in  
the  
broad  
reaches

of  
open  
country  
that  
stretch  
away  
from  
its  
inclosing  
mesas.  
The

presence  
of  
these  
latter  
structures  
has  
been  
known  
for  
many  
years,

yet  
they  
have  
received  
but  
scant  
attention  
from  
those  
students  
of

prehistoric  
cultures  
who  
have  
pursued  
their  
investigations  
in  
the

Chaco  
Canyon  
region.  
In  
addition  
to  
these  
several  
types  
of  
primi-

tive  
habitations,  
two  
isolated  
pit  
houses,  
vastly  
more  
ancient  
than

the  
stone  
structures  
already  
mentioned,  
have  
recently  
been  
discov-

1  
Printed  
with  
the  
permission  
of  
the  
National  
Geographic  
Society,  
whose  
Pueblo  
Bonito

expedition  
is  
being  
directed



by  
Mr.  
Judd.

"That  
portion  
of  
Chaco  
Canyon  
most  
densely  
inhabited  
in  
prehistoric  
times  
roughly

parallels  
the  
boundary  
between  
San  
Juan  
and  
McKinley  
Counties,  
N.  
Mex.  
;  
the  
stream

course  
turns  
northward  
a  
few  
miles  
to  
the  
west  
of  
this  
center  
of  
population  
and  
joins

the  
San

Juan  
River  
In  
the  
extreme  
northwestern  
corner  
of  
the  
State.  
Eighteen  
of  
the

major  
ruins  
are  
now  
included  
in  
the  
Chaco  
Canyon  
National  
Monument,  
created  
by  
presi-

dential  
proclamation  
Mar.  
11,  
1907.  
The  
Chaco  
drainage  
is  
semidesert  
in  
character,  
with

but  
little  
permanent  
water  
and  
few  
trees  
except  
on  
the  
higher

mesas.  
Navaho  
Indians

and  
a  
half  
dozen  
white  
settlers  
and  
traders,  
with  
their  
families,  
comprise  
its  
present

inhabitants.

399

**[Begin Page: Page 400]**

400  
ANNUAL,  
REPORT  
SMITHSONIAN  
INSTITUTION,  
1922.

ered  
and  
examined  
by  
members  
of  
the  
National  
Geographical  
So-

ciety's  
Pueblo  
Bonito  
Expedition.  
3

PIT  
HOUSE  
NO.  
1.

The  
first  
of  
these  
pit  
houses  
was  
encountered  
in  
1920  
during

trenching  
operations  
in  
a  
burial  
mound  
about  
100  
yards  
east  
of  
Casa

Rinconada,  
a  
circular  
ruin  
surmounting  
a  
low  
knoll  
on  
the  
south

side  
of  
Chaco  
Canyon,  
opposite  
Pueblo  
Bonito.  
A  
number  
of  
stone-

walled  
ruins,  
each  
with  
its  
own  
refuse  
pile,  
are  
to  
be  
seen  
in  
this

vicinity.  
The  
pit  
house  
was  
discovered,  
quite  
unexpectedly,  
by  
Zufii

workmen  
near  
the  
lower  
edge  
of  
one  
such  
pile,  
and  
the  
fact  
that  
ashy

earth  
had  
gradually  
worked  
from  
the  
latter  
down  
over  
the  
former

unquestionably  
accounts  
for  
certain  
intrusive  
sherds  
in  
the  
collec-

tion  
(p.  
403).  
The  
writer  
was  
absent  
on  
reconnaissance  
duty  
while

the  
east  
half  
of  
this  
primitive  
dwelling  
was  
being  
excavated,  
but  
the

Indians  
subsequently  
pointed  
out

the  
approximate  
spot  
at  
which

each  
of  
the  
specimens  
discovered  
was  
exposed.

This  
first  
pit  
house  
(fig.  
1)  
examined  
by  
the  
Pueblo  
Bonito  
Expe-

dition  
averaged  
3  
feet  
(0.914  
m.)  
in  
depth  
and  
17  
feet  
(5.182  
m.)  
in

diameter;  
its  
walls  
were  
vertical  
except  
at  
the  
south,

where  
they

flared  
outward  
a  
few  
inches  
(pi.  
1,  
fig.  
1).  
The  
room  
had  
been

gouged,  
presumably  
with  
stone  
or  
wooden  
implements,  
from  
the

clayey  
silt  
strata  
which  
wind  
and  
water  
had  
deposited  
throughout

the  
length  
and  
breadth  
of  
the  
valley  
;  
its  
original  
depth  
may  
be  
pre-



served  
in  
the  
present  
walls  
but  
the  
superstructure  
which  
covered  
the

pit  
has  
long  
since  
disappeared.  
That  
it  
had  
some  
sort  
of  
timbered

roof  
goes  
without  
saying.  
(Two  
short,  
decayed  
fragments  
of  
logs

were  
exposed  
on  
the  
west  
side  
of  
the  
room,  
standing  
on  
the  
floor  
and

resting

against  
the  
wall  
of  
the  
excavation.)  
Lacking  
definite  
in-

formation  
to  
the  
contrary,  
it  
may  
be  
assumed  
that  
the  
walls  
and

ceiling  
of  
this  
house  
were  
shaped  
after  
the  
fashion  
of  
those  
in  
the

dwelling  
next  
to  
be  
described.  
It  
is  
not  
unlikely  
that  
what  
is  
herein

referred  
to

as  
a  
wall  
was,  
in  
fact,  
the  
face  
of  
a  
bench  
upon  
which  
the

roof  
timbers  
rested.

No  
trace  
of  
applied  
plaster  
was  
present,  
but  
the  
sides  
of  
the  
exca-

vated  
chamber  
had  
been  
roughly  
finished  
by  
dampening  
the  
clay  
and

pounding  
it  
to  
a  
hard  
and

relatively  
smooth  
surface.  
The  
not  
un-

satisfactory  
results  
of  
such  
treatment  
may  
be  
observed  
in  
plate  
1,

figures  
1  
and  
2.  
As  
would  
be  
expected  
in  
so  
primitive  
a  
habitation,

the  
floor,  
while  
hard  
and  
compact  
with  
use,  
was  
noticeably  
uneven.

In  
its  
furnishings,  
this  
Chaco  
Canyon

pit  
dwelling  
illustrates

the  
simple  
life  
and  
the  
few  
needs  
of  
its  
former  
inhabitants.  
A  
cir-

»  
See  
Smithsonian  
Misc.  
Coll.,  
vol.  
72,  
Nos,  
6  
and  
15  
;  
also  
the  
National  
Geographic

Magazine  
for  
June,  
1921,  
and  
March,  
1922.

PIT  
HOUSES  
—  
JUDD.

401

cular  
fireplace,  
10  
inches  
(25.4  
cm.)  
deep,  
occupied  
a  
favored

position  
near  
the  
center  
of  
the  
lodge;  
its  
diameter,  
as  
measured  
from

the  
crown  
of  
its  
slightly  
raised  
rim,  
was  
36  
inches  
(91.4  
cm.)  
but  
this

was

reduced  
to  
22  
inches  
(55.8  
cm.)  
at  
its  
own  
floor  
level  
owing  
to  
the

sharp  
slope  
of  
its  
adobe  
sides  
(pi.  
1,  
fig.  
2).  
The  
fireplace  
was  
filled

Fig.  
1.  
—  
Pit  
House  
No.  
1,  
ground  
plan  
and  
section,  
Cliaco  
Canyon.

with  
coarse  
ashes  
in  
which  
bits

of  
greasewood  
predominated.  
A

mere  
handful  
of  
broken  
deer  
bones,  
split  
for  
the  
extraction  
of  
mar-

row,  
and  
a  
few  
small  
mammal  
and  
bird  
bones  
were  
scattered  
through

the  
earth  
which  
filled  
the  
pit;  
none  
of  
these  
was  
found  
in  
the  
fire-

place.

Against  
the



east  
wall  
of  
the  
chamber  
were  
three  
bins  
each  
formed

by  
upright  
slabs  
of  
sandstone  
(fig.  
1;  
pi.  
1,  
fig.  
1).  
Two  
of  
these

**[Begin Page: Page 402]**

402  
ANNUAL,  
REPORT  
SMITHSONIAN  
INSTITUTION,  
1922.

bins  
were  
excavated  
by  
the  
expedition;  
in  
one  
were  
several  
frag-

ments  
of  
an  
earthenware  
bowl  
and  
a  
number  
of  
small  
objects

probably  
utilized  
in  
pottery  
making.  
The  
chief  
function  
of  
these

bins  
was  
most  
likely  
the  
storage  
of  
corn  
and  
other  
foodstuffs.  
A  
dis-

carded  
metate,  
worn  
through,  
formed  
one  
of  
the  
inclosing  
stones  
on

the  
north

side  
of  
bin  
2.

On  
the  
floor  
of  
the  
room,  
between  
its  
south  
wall  
and  
the  
fireplace,

lay  
three  
shallow  
metates  
4  
or  
stone  
mills  
for  
the  
preparation  
of  
corn

meal.  
A  
single  
mano,  
the  
handstone  
invariably  
used  
in  
connection

with  
each  
mill,  
had  
been  
placed  
under

the  
edge  
of  
metates  
b  
and  
c,

respectively  
(fig.  
1).  
That  
the  
presence  
of  
these  
primitive  
grinding

instruments  
is  
not  
unusual  
in  
ancient  
dwellings  
of  
this  
character  
is

evident  
from  
explorations  
by  
Dr.  
Walter  
Hough  
near  
Luna,  
N.

Mex.,  
during  
which  
he  
observed  
that  
"  
every  
pit  
house  
revealed

on

excavation  
a  
mealing  
stone  
lying  
on  
the  
floor  
near  
the  
fireplace."  
5

Two  
receptacles  
for  
the  
protection  
of  
small  
objects  
had  
been

carved  
into  
the  
adobe  
wall  
of  
the  
room  
in  
its  
southwestern  
quarter

(fig.  
1).  
The  
floor  
level  
of  
each  
lay  
somewhat  
below  
that  
of

the

room,  
a  
feature  
which  
has  
been  
noted,  
also,  
by  
Mr.  
Earl  
H.  
Morris  
6

in  
pit  
houses  
between  
the  
San  
Juan  
River  
and  
the  
Continental

Divide,  
70  
miles  
east  
of  
the  
La  
Plata.  
Although  
placed  
much  
lower

in  
the  
wall,  
these  
repositories  
were  
probably  
identical  
in  
purpose

with  
the  
small  
cubbyholes  
frequently  
found  
in  
dwellings  
of  
later

periods.

Relatively  
few  
artifacts  
were  
recovered  
during  
excavation  
of  
this

pit  
dwelling  
(the  
northwest  
quarter  
was  
not  
completely  
cleared)  
and

these,  
unfortunately,  
do  
not  
afford  
a  
satisfactory  
index  
to  
the

cultural  
attainments  
of  
their

original  
owners.  
A  
grooved  
stone  
maul

(315892)

,  
7  
two  
hammerstones  
(315893),  
and  
five  
bone  
awls  
(315894)

may  
or  
may  
not  
belong  
to  
the  
pit-house  
culture.  
There  
is  
nothing

distinctive  
about  
them  
since  
objects  
of  
this  
kind,  
made  
from  
raw

materials  
near  
at  
hand,  
are  
very  
much  
alike  
in



early  
Pueblo  
dwell-

ings  
throughout  
the  
entire  
Southwest.  
The  
neck  
of  
an  
undecorated

jar  
(315900)  
and  
several  
sherds  
from  
a  
similar  
vessel  
(315901).  
said

by  
the  
Indians  
to  
have  
been  
found  
near  
the  
middle  
of  
the  
room  
and

well  
toward  
the  
surface,  
are  
certainly  
not  
of  
pit-dweller  
origin.  
The

high  
straight  
neck  
(2  
inches)  
of  
the  
former  
and  
the  
lack,  
in  
both

specimens,  
of  
the  
broad  
bands  
so  
characteristic  
of  
pit-house  
cooking

jars  
is  
sufficient  
to  
connect  
the  
fragments  
with  
the  
small-house  
refuse

piles  
which  
lie  
near  
by  
and  
slightly  
above  
the  
pit  
dwelling.  
In  
the

\*The  
three  
metates  
averaged  
17  
by  
24  
by  
2  
inches  
(43.1  
by  
60.9  
by  
5.08  
cm.).

5  
Proc.  
U.  
S.  
Nat.  
Mus.,  
vol.  
55,  
p.  
416.

a  
33d  
An.  
Rep.,  
Bur.  
Amer.  
Ethnoi.,  
p.  
186.

7  
The  
catalogue  
numbers  
given  
for  
specimens  
not

figured  
are  
those  
of  
the  
United  
States

National  
Museum,  
to  
which  
the  
National  
Geographic  
Society  
has  
presented  
the  
collections

from  
the  
dwellings  
here  
described.

**[Begin Page: Plate 1]**

Smithsonian  
Report  
1922.  
—  
Judd

Plate  
I.

I.  
Slab  
Inclosed  
Bins

in  
Pit  
House  
No.  
I.  
The  
Uneven  
Floor,  
the

Slope  
of  
South  
Wall,  
and  
the  
Crude  
Surfacing  
of  
the  
Latter  
Are

All  
Apparent  
in  
This  
Illustration.

.  
Pit  
House  
No.  
I,  
Partially  
Excavated.  
This  
View,  
Taken  
from

the  
North,  
Shows  
the  
Fireplace  
in  
the  
Middle

Foreground  
and

Beyond  
It  
the  
three  
Metates  
and  
One  
of  
the  
Subwall  
Reposi-

tories.

Photos  
by  
Neil  
M.  
Judd.  
Courtesy  
of  
the  
National  
Geographic  
Society.

**[Begin Page: Plate 2]**

Smithsonian  
Report  
1922.  
—  
Judd.

Plate  
2.

Searching  
Among  
the  
Blocks  
of  
Fallen  
Adobe  
Below  
Pit  
House

No.  
2  
for  
Potsherds  
and  
Other  
Artifacts.  
The  
Cross  
Section  
of

the  
Room  
Will  
Be  
Noted  
in  
the  
Shadow  
at  
the  
Right  
About  
Midway

of  
the  
Bank.

2.  
In  
this  
Near  
View  
of  
Pit

House  
No.  
2,  
Before  
Excavation,  
the

West  
Branch  
Will  
Be  
Noted  
at  
the  
Left;  
the  
Divided  
Fireplace

Appears  
Just  
Above  
the  
Indian,  
and  
the  
Posthole  
Which  
May  
Have

Held  
the  
Ladder  
is  
Seen  
at  
the  
Right.  
The  
Charred  
Remains  
of

Roofing  
Timbers  
Were  
Bound  
Together  
by  
Extremely  
Hard  
Adobe



and  
Sand  
Strata.

Photos  
by  
Neil  
M.  
Judd.  
Courtesy  
of  
the  
National  
Geographic  
Society.

**[Begin Page: Page 403]**

PIT  
HOUSES  
—  
JUDD.

403

course  
of  
uncounted  
centuries  
these  
intrusive  
sherds  
may  
well  
have

shifted  
along

with  
the  
blown  
sand  
and  
lodged  
on  
the  
flat  
area  
above

the  
pit.

\  
r>

&  
%<sup>f</sup>ffl/ffi  
fflfi^\

”  
l

wmmmWMmw/s/,7.  
\

Wflwm

Fig.  
2.  
—  
Pit  
House  
No.  
2,  
Chaco  
Canyon.

PIT  
HOUSE  
NO.  
2.

A  
second  
Chaco  
Canyon  
pit  
house  
(fig.  
2;  
pi.  
2,  
figs.  
1  
and  
2;

pi.  
3,  
fig.  
1)  
which,  
happily,  
affords  
a  
much  
clearer  
estimate  
than

that  
just  
described  
of  
the  
degree  
of  
cultural  
advancement  
reached  
by

its  
builders,

was  
brought  
to  
the  
writer's  
attention  
by  
one  
of  
his

Navajo  
friends  
early  
in  
the  
spring  
of  
1922.  
This  
second  
ruin  
stands

**[Begin Page: Page 404]**

404  
ANNUAL  
REPORT  
SMITHSONIAN  
INSTITUTION,  
1922.

about  
1  
mile  
(1.60  
k.)  
east  
of  
Pueblo  
Bonito  
and  
was  
exposed  
by

caving  
of  
the  
north  
arroyo  
bank  
during  
the  
heavy  
rains  
of  
the  
pre-

vious  
summer.  
Here  
the  
arroyo  
is  
fully  
30  
feet  
(9.14  
m.)  
deep  
and

the  
ancient  
dwelling  
was  
almost  
equally  
divided  
when  
the  
huge

masses  
of  
adobe  
crashed  
from  
their  
resting  
place  
and  
rolled  
out  
50  
or

75  
feet  
(15.2-22.8  
m.)  
from  
the  
bank  
(pi.  
2,  
fig.  
1).

Some  
idea  
as  
to  
the  
geophysical  
changes  
which  
have  
taken  
place

in  
Chaco  
Canyon  
since  
this  
prehistoric  
dwelling  
was  
inhabited  
may

be  
gained  
from  
the  
fact  
that  
the  
rim  
of  
the  
fireplace  
(pi.  
2,  
fig.  
2,

directly  
above  
the  
Indian)  
is  
12  
feet  
2  
inches  
(3.708  
m.)  
below  
the

present  
valley  
surface  
and  
that  
approximately  
6  
feet  
(1.82  
m.)  
of

silt  
had  
been  
deposited  
above  
the  
original  
roof  
level  
of  
the  
house  
fol-

lowing  
its  
abandonment.

The  
cross  
section  
(pi.  
2,

fig.  
2)  
of  
this  
second  
pit  
house,  
when

first  
seen  
by  
members  
of  
the  
Pueblo  
Bonito  
Expedition,  
revealed  
a

tangled  
mass  
of  
burned  
and  
rotting  
roofing  
poles  
closely  
packed  
in

blown  
sand  
and  
adobe.  
This  
debris  
largely  
occupied  
that  
portion  
of

the  
pit  
lying  
below  
the  
level  
of  
a



broad  
bench,  
plainly  
seen  
on  
the

western  
side  
of  
the  
room;  
above  
the  
bench  
were  
successive  
layers  
of

sediment,  
deposited  
both  
through  
wind  
and  
water  
action,  
which  
had

gradually  
filled  
and,  
later,  
completely  
hidden  
this  
underground

habitation.  
A  
bench  
corresponding  
to  
that  
on  
the  
west  
did  
not  
at

first  
appear  
on  
the  
eastern  
side  
but  
a  
split  
posthole,  
9  
inches  
(22.8  
cm.)

in  
diameter  
by  
22  
inches  
(55.8  
cm.)  
deep,  
quickly  
attracted  
one's  
at-

tention.  
The  
floor  
of  
the  
room  
was  
slightly  
dished,  
its  
middle  
being

3  
inches  
lower  
than  
its  
periphery.  
Although  
but  
half  
of  
it  
remained

for  
examination,  
this  
subterranean  
dwelling  
appeared  
to  
offer  
so

much  
of  
interest  
in  
connection  
with  
the  
general  
problem  
of  
human

occupancy  
of  
Chaco  
Canyon  
in  
prehistoric  
times  
as  
to  
warrant  
its

excavation,  
a  
not  
inconsiderable  
task  
owing  
to  
the  
depth  
and  
extreme

hardness  
of  
the  
clay  
which

filled  
and  
covered  
the  
pit.

Once  
the  
earth  
had  
been  
removed  
from  
that  
portion  
remaining

in  
the  
bank  
this  
ancient  
pit  
dwelling  
was  
found  
to  
agree  
closely

with  
those  
described  
by  
other  
explorers.  
Its  
form,  
its  
manner  
of

roofing,  
and  
the  
culture  
of  
its  
builders  
could  
be

pictured  
with  
satis-

fyng  
accuracy.  
Although  
smaller  
than  
that  
excavated  
in  
1920,  
this

second  
pit  
house  
was  
likewise  
round,  
being  
12  
feet  
9  
inches  
(3.88  
m.)

in  
diameter.  
The  
middle  
of  
its  
slightly  
concave  
floor  
was  
occupied

by  
a  
slab-lined  
fireplace  
9  
inches  
deep  
by  
22  
inches  
in  
diameter

(22.8  
by  
55.8  
cm.).  
A  
bench  
35  
inches  
(88.9  
cm.)  
high  
and  
26

inches  
(66  
cm.)  
wide  
enlarged  
the  
room  
on  
its  
northern  
half,  
but

on  
the  
east,  
only  
a  
few  
inches  
from  
the  
face  
of  
the  
bank,  
this  
bench

is  
unexpectedly  
interrupted  
by  
a  
broken  
wall  
of  
undisturbed

adobe

which  
appears  
to  
have  
been  
not  
more  
than  
16  
inches  
(4.64  
cm.)  
high.

**[Begin Page: Page 405]**

PIT  
HOUSES  
—  
JUDD.  
405

At  
this  
point  
the  
banquette  
had  
been  
widened  
to  
36  
inches  
(91.4  
cm.)

and  
the  
height  
of  
the  
outstanding  
wall

of  
clay  
probably  
affords  
a

reasonably  
accurate  
idea  
as  
to  
the  
space  
between  
the  
top  
of  
the

bench  
and  
the  
original  
valley  
surface.  
A  
second,  
though  
now

shattered,  
block  
of  
adobe  
left  
by  
the  
original  
excavators  
connected

the  
face  
of  
the  
bench  
with  
the  
posthole  
previously  
mentioned.  
It  
is,



of  
course,  
quite  
impossible  
to  
establish  
the  
conditions  
which  
obtained

here  
at  
the  
time  
of  
occupancy,  
that  
is,  
as  
to  
the  
width,  
or  
function,

of  
these  
two  
protruding  
sections  
of  
unexcavated  
earth.  
Being  
to-

ward  
the  
east,  
they  
may  
have  
formed  
or  
supported  
a  
series  
of  
steps

connecting  
with  
an  
entrance  
through  
the  
roof,  
but  
the  
fact  
that  
so

little  
remained  
after  
caving  
of  
the  
bank  
leaves  
this  
uncertain.  
One

is  
inclined  
to  
the  
belief,  
rather,  
that  
the  
large  
post  
which  
stood  
just

within  
the  
wall  
at  
this  
place  
was  
provided  
with  
notches  
and  
served

as

a  
ladder.

In  
roof  
construction  
this  
second  
Chaco  
Canyon  
pit  
house  
is  
not

unlike  
others  
of  
the  
type  
found  
elsewhere.  
Two  
posts,  
7  
inches  
and

8-J  
inches  
(17.1  
and  
21.5  
cm.)  
in  
diameter,  
stood  
about  
2  
inches

(5.08  
cm.)  
inside  
the  
face  
of  
the  
bench  
at  
the

northwest  
and  
north-

east  
quarters,  
respectively  
(fig.  
2)  
;  
since  
the  
room  
has  
been  
almost

equally  
divided  
it  
may  
be  
assumed  
that  
corresponding  
posts  
also

stood  
in  
that  
portion  
of  
the  
dwelling  
now  
missing.  
Vertical  
sections

had  
been  
gouged  
from  
the  
adobe  
bench  
and,  
after  
the  
posts  
had  
been

placed  
and  
blocked  
in  
with  
stone  
and  
earth,  
the  
front  
of  
each  
cut

was  
closed  
with  
stone  
slabs  
and  
plastered  
over.  
Among  
the  
slabs

covering  
the  
northwest  
upright  
was  
a  
metate,  
worn  
through  
at  
the

bottom,  
set  
on  
end  
with  
its  
grinding  
surface  
toward  
the  
post.  
Sev-

eral  
coats  
of  
smoked  
plaster  
had  
been  
applied  
to  
the  
slightly  
con-

cave  
face  
of  
the  
bench,  
and  
its  
upper  
surface  
was  
hard  
and  
smooth

as  
though  
from  
long  
usage.

Twenty-two  
small  
posts  
of  
about  
2  
inches  
diameter  
had  
been

placed  
around  
the  
exposed  
banquette  
at  
an

average  
distance  
of  
20

inches  
(50.8  
cm.)  
from  
its  
face.  
These  
were  
set  
approximately

14  
inches  
apart  
and  
all  
stood  
in  
an  
upright  
position  
extending  
and

inclining,  
no  
doubt,  
to  
cross  
pieces  
supported  
by  
the  
four  
principal

posts  
already  
noted.  
The  
presence  
of  
the  
latter  
carries  
the  
infer-

ence  
that  
that  
portion  
of  
the  
roof  
between  
the  
posts  
was  
flat  
or

narly  
so.  
And  
it  
is  
not  
unreasonable  
to  
assume  
that  
the  
small

uprights  
reaching  
above  
the  
bench  
originally  
supported  
layers  
of

brush  
and  
grass,  
overlaid  
with  
loose  
earth  
taken  
from  
the  
excava-

tion.



It  
is  
to  
be  
recalled  
that  
the  
bench  
in  
this  
pit  
house  
was  
approxi-

mately  
16  
inches  
below  
the  
valley  
surface  
at  
the  
time  
of  
construc-

tion  
and  
that  
the  
floor  
of  
the  
dwelling  
was  
35  
inches  
lower.  
These

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ANNUAL  
REPORT  
SMITHSONIAN  
INSTITUTION,  
1922.

combined  
measurements,  
however,  
probably  
fall  
considerably  
short

of  
the  
actual  
ceiling  
height.  
Just  
why  
the  
ancient  
artisans  
deemed

it  
desirable  
to  
build  
a  
wall  
of  
posts  
and  
brush  
above  
the  
bench  
in

preference  
to  
utilizing  
the  
hard  
adobe

face  
of  
their  
excavation  
is

not  
clear  
but  
such  
practice  
seems  
to  
be  
characteristic  
of  
pit  
houses

in  
which  
the  
bench  
is  
present.  
Kidder  
and  
Guernsey  
8  
describe  
a

pit  
dwelling  
in  
the  
Monuments  
district  
of  
northeastern  
Arizona  
in

which  
roofing  
poles,  
driven  
into  
a  
narrow  
bench  
at  
an

angle,  
ap-

peared  
to  
have  
met  
above  
the  
middle  
of  
the  
lodge.  
Dr.  
J.  
W.

Fewkes  
9  
has  
observed  
a  
similar  
method  
of  
construction  
on  
the  
Mesa

Verde  
National  
Park.  
Hough,  
10  
writing  
of  
pit  
villages  
near  
Luna,

and  
Morris,  
11  
reporting  
on  
excavations  
between  
the  
San  
Juan  
River

and  
the  
Continental  
Divide  
in  
Colorado,  
both  
noted  
the  
occurrence

of  
large  
posts  
as  
roof  
supports  
but  
say  
little  
or  
nothing  
of  
an  
en-

circling  
bench  
and  
lesser  
timbers  
reaching  
from  
it  
to  
the  
main

beams.  
Dwellings  
similar  
to,  
but  
seemingly  
more  
elaborate  
than,

these  
circular  
structures

in  
that  
the  
benches  
were  
faced  
with  
stone

slabs  
and  
the  
upper  
walls  
were  
of  
wattle  
work,  
have  
been  
discovered

in  
southwestern  
Utah  
caves  
by  
the  
present  
writer.  
12

Several  
slab-inclosed  
receptacles,  
corresponding  
with  
those  
in  
the

other  
local  
pit  
dwelling  
(p.  
401),  
formerly  
rested  
against  
the

south

wall  
of  
the  
room,  
the  
stone  
slabs  
and  
adobe  
flooring  
of  
such  
bins  
hav-

ing  
been  
found  
among  
the  
huge  
blocks  
of  
earth  
caved  
from  
the  
bank.

These  
bins  
are,  
of  
course,  
now  
completely  
shattered  
and  
but  
little  
of

interest  
could  
be  
gathered  
from  
their  
broken  
remains.  
One

of  
the

number,  
a  
box  
29  
inches  
wide  
and  
10  
inches  
deep  
(73.9  
by  
25.4  
cm.)

had  
been  
paved  
with  
waterworn  
cobble  
stones;  
on  
its  
floor  
lay  
a

quantity  
of  
charred  
vegetable  
matter  
among  
which  
were  
corncobs

and  
kernels.  
13  
Other  
corncobs  
and  
one  
squash  
seed  
were  
found



among  
the  
debris.

No  
traces  
of  
subwall  
depositories,  
such  
as  
those  
observed  
in  
our

first  
pit  
house  
(p.  
402),  
were  
noted  
in  
this  
second  
structure  
but  
a  
rec-

tangular  
depression,  
15  
inches  
wide  
by  
22  
inches  
long  
by  
3½  
inches

deep  
(38.1  
by  
55.8  
by  
8.88

cm.),  
had  
been  
scraped  
from  
the  
floor  
be-

low  
the  
eastern  
end  
of  
the  
bench  
(fig.  
2).

#### MINOR ANTIQUITIES.

The  
few  
artifacts  
of  
unquestioned  
pit-house  
origin  
taken  
from  
the

excavations  
of  
1920  
were  
found  
by  
the  
writer  
on  
the  
bottom  
of  
bin

No.

1  
(fig.  
1)  
and  
consist  
of  
a  
small  
mass  
of  
kaolin  
(315898),  
a

8  
Bull.  
65,  
Bur.  
Amer.  
Ethnol.,  
p.  
44.

»  
Smithsonian  
Misc.  
Coll.,  
vol.  
72,  
no.  
1,  
p.  
58.

">  
Proc.  
U.  
S.  
Nat  
Mus.,  
vol  
55,  
p.  
415.

u  
33d  
An.  
Rep.,  
Bur.  
Amer.

Ethnol.,  
p.  
186.

u  
Smithsonian  
Misc.  
CoU.,  
vol.  
72,  
no.  
1,  
p.  
66,  
1919.

14  
A  
bowl  
(324806)  
found  
beside  
the  
fireplace  
was  
partially  
filled  
with  
charred,  
shelled

corn.

**[Begin Page: Page 407]**

PIT  
HOUSES  
—  
JUDD.

407

rubbed  
piece  
of  
red  
ocher  
(315895),  
an  
unworked  
bit  
of  
compact

yellow  
clay,  
probably  
intended  
for  
paint,  
a  
small  
ball  
of  
impure

sandstone  
(315897),  
and  
two  
disconnected  
portions  
of  
an  
earthen-

ware  
bowl  
(315901).  
The  
latter  
only  
are  
of  
especial  
interest  
at  
this

time.

Its  
fragments  
show  
the  
bowl  
to  
have  
been  
about  
7  
inches  
(17.01

cm.)  
in  
diameter  
and  
3½  
inches  
deep  
(8.88  
cm.)  
with  
a  
thickness  
of

less  
than  
three-sixteenths  
inch.  
The  
paste,  
which  
is  
rather  
coarse

and  
filled  
with  
tiny  
quartz  
crystals,  
has  
been  
fired  
to  
a  
uniform  
pink-

ish  
yellow.  
Although  
its  
outer  
surface  
remains  
somewhat  
uneven,

the  
interior  
exhibits  
a  
fine,  
smooth  
finish  
on  
which  
a  
geometric  
de-

sign  
has  
been  
drawn  
with  
dark  
red  
paint.  
This  
design  
can  
not  
be  
ac-

curately  
reconstructed  
from  
the  
sherds  
at  
hand,  
but  
it  
consists,  
ap-

parently,  
of

a  
central  
decoration  
of  
thin,  
parallel  
lines  
with  
terraced

or  
"  
cloud  
"  
elements,  
joined  
to

a  
horizontal  
band  
just  
within

the  
rim  
by  
four  
V-shaped  
units

from  
which  
hang  
solid  
tri-

angles  
and  
within  
which  
is  
a

single  
row  
of  
dots  
inclosing  
an



open  
triangle.  
These  
frag-

ments  
differ  
both  
in  
paste  
and

decoration  
from  
sherds  
associ-

ated  
with  
the  
more  
recent

stone-  
walled  
ruins  
near  
the  
pit

house  
and  
indicate  
that  
the  
inhabitants  
of  
the  
latter  
were  
not  
un-

skilled  
in  
the  
art  
of  
pottery  
manufacture.

An  
earthenware  
pipe  
of  
rather  
unusual  
shape  
(fig.  
3)  
was  
found  
on

the  
floor  
of  
the  
room  
between  
the  
fireplace-  
and  
the  
slab  
bins.  
Its

bowl  
resembles  
a  
miniature  
jar  
with  
a  
constricted  
opening  
and  
with

one  
side  
drawn  
out  
to  
form  
a  
round  
stem,  
now  
broken

;  
its  
surface  
is

roughly  
smoothed  
and  
bears  
no  
trace  
of  
ornamentation.  
The  
stem

had  
been  
perforated  
by  
pushing  
a  
coarse  
straw  
from  
the  
bit  
toward

the  
bowl  
while  
the  
clay  
was  
yet  
plastic.  
The  
specimen  
is  
1½  
inches

high  
by  
1½  
inches  
wide  
by  
2  
½  
inches  
long

(3.12  
by  
3.81  
by  
5.71  
cm.)

with  
a  
three-fourths  
inch  
orifice  
;  
no  
evidence  
of  
use  
is  
to  
be  
seen.

The  
really  
abundant  
material  
recovered  
at  
the  
site  
of  
the  
second

pit  
house,  
excavated  
in  
1922,  
happily  
balances  
the  
paucity  
of  
speci-

mens  
from  
the  
first.  
Among

the  
heavy  
blocks  
of  
clay  
which  
had

crashed  
down  
into  
the  
arroyo  
(pi.  
2,  
fig.  
1)  
and  
in  
the  
silty  
deposits

which  
filled  
that  
half  
of  
the  
ancient  
pit  
house  
not  
destroyed  
were  
nu-

merous  
potherds  
and  
other  
artifacts  
abandoned  
by  
the  
one-time  
in-

habitants.  
Several  
jars  
had  
been

left  
in  
or  
adjacent  
to  
the  
slab  
bins

Fig.  
3.  
—  
Earthenware  
pipe.

**[Begin Page: Page 408]**

408  
ANNUAL  
REPORT  
SMITHSONIAN  
INSTITUTION,  
1922.

which  
formerly  
stood  
against  
the  
south  
wall  
;  
their  
impressions  
were

plainly  
visible  
in  
some  
of  
the  
larger

adobe  
masses  
and  
their  
scattered

sherds  
were  
recovered  
in  
considerable  
quantities.  
Altogether,  
11

earthenware  
jars  
and  
8  
bowls  
have  
been  
restored  
from  
the  
pottery

fragments  
collected  
at  
this  
site  
(pi.  
3,  
fig.  
2).

Certainly  
the  
most  
noteworthy  
of  
these  
vessels  
are  
the  
two  
large

black-on-white

water  
jars  
shown  
in  
plate  
4.  
One  
(a)  
stands  
16-J-

inches  
(41.1  
cm.)  
in  
height  
and  
has  
a  
diameter  
of  
13|  
inches  
(34.2

cm.)  
;  
its  
orifice  
is  
oval  
in  
shape,  
2|  
inches  
wide  
by  
4  
inches  
long

(6.78  
by  
10.2  
cm.)  
.  
A  
crack  
running  
downward  
from  
each  
end  
of



the

opening  
indicates  
a  
slight  
unintentional  
misshaping,  
perhaps  
due  
to

pressure  
early  
in  
the  
firing  
process.  
The  
second  
jar  
(b)  
is  
17|  
inches

(45  
cm.)  
high  
by  
14|  
inches  
(36.8  
cm.)  
in  
diameter;  
its  
mouth,  
also

oval,  
is  
2f  
inches  
wide  
by  
4  
inches  
long  
(6.98  
by  
10.1  
cm.).

In  
both

vessels  
the  
body  
is  
decorated  
by  
an  
elaborate  
geometric  
pattern  
and,

above  
this,  
interlocking  
spirals  
representing  
plumed  
serpents.  
Three

seems  
to  
have  
been  
the  
favorite  
number  
for  
such  
spirals  
but  
in  
the

second  
jar  
(b)  
there  
are  
five,  
the  
serpents  
being  
represented  
by  
single,

somewhat

angular  
lines,  
above  
which  
is  
an  
encircling,  
zigzag  
line.

Fragments  
of  
four  
other  
large  
jars,  
not  
sufficiently  
complete  
to  
war-

rant  
restoration,  
show  
similar  
treatment  
but,  
on  
one  
of  
these,  
the

body  
ornamentation  
reached  
nearly  
to  
the  
rim  
and  
on  
another,  
whose

upper  
portion  
is  
entirely  
missing,  
interlocking  
plumed

serpents  
form

the  
basic  
feature  
of  
the  
main  
design.  
In  
all  
six  
specimens  
the  
exterior

surface  
has  
been  
washed  
with  
a  
thin  
white  
slip  
as  
a  
background  
for

the  
black  
paint  
of  
the  
design.  
None  
of  
these  
water  
jars  
was  
provided

with  
handles  
or  
the  
outflaring  
rim  
so  
typical

of  
later  
pre-Pueblo

ollas.

One  
small  
jar  
(pi.  
5,  
fig.  
1)  
has  
this  
noticeable  
difference  
from

the  
larger  
vessels:  
A  
constricted  
shoulder  
permits  
a  
more  
direct

approach  
to  
the  
rim  
and  
provides  
the  
specimen  
with  
what  
might  
be

called  
a  
neck.  
A  
reddish-brown  
body  
decoration

has  
wholly  
disap-

oared  
except  
in  
one  
limited  
area;  
the  
upper  
portion  
shows  
three

horizontal,  
wavy  
lines  
adjacent  
to  
the  
rim.

Three  
of  
the  
eight  
bowls  
recovered  
have  
interior  
decorations,

drawn  
with  
black  
pigment  
over  
a  
white  
slip  
(pi.  
6)  
;  
the  
rim  
edge  
of

each  
has  
been  
flattened  
by  
rubbing  
and  
carries  
a  
black  
line,  
a  
char-

acteristic  
feature  
of  
bowls  
from  
the  
principal  
Chaco  
Canyon  
cul-

ture.  
One  
specimen  
(324805),  
rather  
cruder  
in  
workmanship  
and

more  
straight-sided  
than  
the  
others,  
is  
ornamented  
with  
four  
hori-

zontal  
bands  
crossed  
at  
intervals  
by  
two

or  
four  
vertical  
lines.  
This

**[Begin Page: Plate 3]**

Smithsonian  
Report  
1922.  
—  
Judd.

Plate  
3.

I.  
Pit  
House  
No.  
2  
After  
Excavation,  
Showing  
the  
Exposed  
Bench

and  
Depth  
of  
the  
Silty  
Deposits  
Above  
It.  
The  
Stone  
Slab  
Em-



bedded  
in  
the  
Front  
of  
the  
Bench,  
at  
the  
Left  
of  
the  
Upper

Indian,  
Covers  
the  
Groove  
in  
Which  
One  
of  
the  
Four  
Roof  
Sup-

ports  
Had  
Stood.

Chaco  
Canyon  
as  
Seen  
from  
the  
Southeast  
Corner  
of  
Pueblo

Bonito.  
Pit  
House  
No.  
2  
Was  
Found  
Near  
the

Arroyo  
Bank  
Indis-

tinctly  
Seen  
in  
the  
Middle  
Distance,  
About  
Midway  
Between

the  
Two  
Highest  
Portions  
of  
the  
Near-by  
Walls  
and  
Directly

Above  
the  
Old  
Door.

Photos  
by  
Neil  
M.  
Judd.  
Courtesy  
of  
the  
National  
Geographic  
Society.

**[Begin Page: Plate 4]**

**[Begin Page: Plate 5]**

Smithsonian  
Report  
1922.

—

Judd.

Plate  
5.

a  
b  
c  
d

1.  
Earthenware  
Jars  
and  
Cooking  
Pots,  
Pit  
House  
No.  
2.

2.  
Earthenware  
Ladles,  
Pit  
House  
No.  
2.

3.  
Earthen  
Ladles

(Inside  
View  
of  
Figure  
Above).

**[Begin Page: Plate 6]**

Smithsonian  
Report  
1922.—  
Judd.

Plate  
6.

1,  
2,  
3.  
Decoration  
of  
Interior  
of  
Bowls.

**[Begin Page: Plate 7]**

Smithsonian  
Report  
1922.  
—  
Judd.

Plate

7.

3

4

Earthenware

Cooking

Pots.

Pit

House

No.

2.

**[Begin Page: Blank]**

**[Begin Page: Page 409]**

PIT

HOUSES

—

JUDD.

409

design  
was  
painted  
with  
a  
reddish-brown  
pigment  
14  
upon  
a  
slate-

colored  
wash

;  
the  
evident  
lack  
of  
skill  
both  
in  
modeling  
and  
in  
deco-

rating  
this  
particular  
bowl  
suggests  
the  
possibility  
of  
its  
being  
the

work  
of  
a  
beginner.  
One  
of  
the  
bowls  
has  
a  
slightly  
incurving  
rim  
;

in  
all  
the  
others  
the  
edge  
is  
reached  
directly,  
i.  
e.,  
without  
apparent

incurve  
or  
outcurve.  
The  
relatively  
thin  
rim  
in  
a  
majority  
of  
the

vessels  
is  
rather  
carelessly  
rounded  
and  
noticeably  
uneven.  
In  
the

specimens  
at  
hand,  
ornamentation  
was  
restricted  
to  
the  
polished  
in-

terior  
of  
the  
bowls;  
the  
outside  
surface  
was  
not  
carefully  
smoothed

and  
evidently  
did  
not  
receive

the  
customary  
slip.  
Two  
bowls  
and  
a

small  
cuplike  
vessel  
were  
not  
decorated  
in  
any  
manner;  
handles  
do

not  
appear  
on  
any  
of  
the  
bowls  
in  
the  
collection.

In  
paste,  
in  
decoration,  
and  
in  
general  
workmanship  
these  
vessels

from  
the  
Chaco  
Canyon  
pit  
house  
are  
characteristic  
of



that  
phase

of  
prehistoric  
culture  
in  
our  
southwestern  
United  
States  
commonly

recognized  
as  
"

pre-Pueblo."  
Fewkes,  
Kidder,  
Morris,  
and  
others

have  
described  
the  
ware  
in  
their  
several  
reports  
of  
explorations

throughout  
the  
San  
Juan  
drainage;  
almost  
identical  
specimens  
are

figured  
by  
Hough  
in  
his  
important  
contribution  
on

the  
Luna  
pit

houses.  
Certain  
decorative  
elements  
on  
the  
pottery  
from  
this  
an-

cient  
Chaco  
Canyon  
structure,  
namely,  
the  
combination  
of  
thin,

straight  
lines  
with  
areas  
of  
solid  
black,  
are  
suggestive  
of,  
but  
en-

tirely  
distinct  
from,  
the  
designs  
on  
pottery  
from  
such  
great  
com-

munal  
dwellings

as  
Pueblo  
Bonito.  
The  
closely  
hachured  
designs

so  
characteristic  
of  
the  
latter  
do  
not  
occur  
in  
pit  
houses  
so  
far  
as

known.

Cooking  
pots,  
as  
represented  
in  
the  
collection  
(pi.  
7),  
are  
typical

of  
the  
pit-house  
culture  
as  
identified  
elsewhere.  
They  
present,  
in-

deed,  
one

of  
its  
most  
distinguishing  
features.  
In  
shape  
they  
are

globular  
with  
wide  
orifices;  
their  
rims  
are  
approached  
with  
little,

if  
any,  
outflare.  
That  
portion  
of  
the  
jar  
between  
the  
shoulder  
and

mouth  
is  
built  
up  
of  
broad  
bands  
of  
clay,  
one-fourth  
to  
three-fourths

of  
an  
inch  
wide.  
These,  
however,

are  
not  
true  
coils  
as  
in  
the  
case  
of

the  
corrugated  
ware  
of  
the  
cliff  
dwellers  
and  
other  
prehistoric  
peo-

ples;  
rather,  
each  
band  
has  
been  
added  
separately,  
overlapping  
that

next  
below  
and  
the  
union  
of  
its  
ends  
carefully  
obliterated.

The  
paste  
from  
which  
these  
culinary  
vessels

were  
shaped  
is

coarser  
and  
more  
granular  
than  
that  
employed  
in  
manufacture  
of

the  
bowls  
and  
decorated  
water  
jars  
previously  
described.  
It  
is  
noted,

also,  
that  
although  
both  
inner  
and  
outer  
surfaces  
have  
been

smoothed

—  
the  
marks  
of  
tools  
are  
usually  
in  
evidence

—  
no  
attempt

"Two  
brown  
bowls  
(324807,  
324808),  
nicely  
smoothed  
on  
the  
inside,  
seem  
also  
to  
have

been  
decorated  
with  
red  
paint,  
but  
this  
has  
so  
faded  
that  
the  
original  
color  
can  
not  
be

ascertained  
with  
certainty  
;  
a  
small,  
light-colored  
cup  
(324809)  
has  
no  
ornamentation

whatever.

[Begin Page: Page 410]

410  
ANNUAL  
KEPOKT  
SMITHSONIAN  
INSTITUTION,  
1922.

lias  
been  
made  
to  
improve  
the  
appearance  
of  
the  
vessel  
by  
applica-

tion  
of  
a  
slip  
or  
surface  
wash.

Handles  
are  
present  
on  
five  
of  
the  
eight  
pots  
in  
this  
series.  
In

one  
specimen



(pi.  
7,  
fig.  
3)  
a  
single  
handle,  
consisting  
of  
three  
rolls

of  
clay  
pressed  
together,  
was  
attached  
horizontally  
at  
the  
shoulder;

in  
another  
instance  
(pi.  
5,  
fig.  
1)  
a  
handle  
of  
similar  
construc-

tion  
connects  
the  
shoulder  
with  
the  
edge  
of  
the  
orifice.  
Two  
vessels

(pi.  
7,  
fig.  
2,

and  
pi.  
5,  
fig.  
la)  
are  
provided  
with  
flattened  
lugs,

attached  
to  
opposite  
sides  
of  
the  
rim,  
whose  
under  
surfaces  
are

gently  
curved  
to  
fit  
the  
finger.  
Dissimilar  
handles  
occur  
on  
the  
fifth

specimen  
(pi.  
5,  
fig.  
ld)  
,  
a  
thin,  
flat  
lug  
1½  
inches  
long  
and  
five-eighths

inch

wide  
being  
attached  
vertically  
just  
below  
the  
rim  
on  
one  
side,

while  
its  
opposite  
is  
a  
round  
lug  
with  
a  
slight  
downward  
curve.

The  
latter  
handle,  
now  
largely  
missing,  
probably  
came  
to  
a  
blunt

point  
about  
three-fourths  
of  
an  
inch  
from  
the  
side  
of  
the  
vessel.  
It

should  
be

noted  
that  
this  
is  
the  
only  
cooking  
pot  
in  
the  
collection

whose  
outer  
surface  
is  
plain,  
the  
usual  
broad  
neckbands  
having  
been

entirely  
effaced.

Three  
earthenware  
ladles  
(pi.  
5,  
figs.  
2  
and  
3),  
15  
restored  
from

fragments  
gathered  
at  
this  
site,  
are  
so  
interesting  
as  
to  
merit

brief

description.

In  
both  
form  
and  
ornamentation  
they  
are  
quite  
unlike.

The  
smallest  
of  
the  
three  
has  
a  
round  
bowl  
and  
a  
handle  
which  
is

slightly  
convex  
both  
above  
and  
below;  
the  
bowl  
of  
the  
largest  
is

somewhat  
oval  
in  
appearance,  
due  
chiefly  
to  
its  
open  
or  
concave

handle.  
18  
This  
second  
specimen  
is  
still  
further  
unique  
in  
that  
the

near  
right-hand  
quarter  
of  
the  
bowl  
rim  
(as  
held  
in  
the  
hand)  
is

one-half  
inch  
(1.27  
cm.)  
lower  
than  
the  
remainder.  
The  
third  
ladle

differs  
from  
the  
other  
two  
both  
in  
the  
shape  
of  
its  
bowl,  
which  
is

considerably  
wider  
than  
it  
is  
long,  
and  
in  
the  
fact  
that  
its  
thick

handle  
(flat  
on  
top  
and  
convex  
below)  
is  
attached  
to  
the  
bowl  
one-

half  
inch  
below  
the  
rim  
of  
the  
latter.  
Perhaps  
as  
an  
additional  
deco-

rative  
feature  
half  
of  
this  
upstanding  
portion  
of  
the  
rim

has  
been

cut  
away  
in  
a  
shallow  
curve,  
clearly  
shown  
in  
plate  
5,  
figure  
2.

Each  
of  
these  
three  
ladles  
is  
decorated  
with  
black  
paint  
over  
a

whitish  
slip  
applied  
to  
both  
inner  
and  
outer  
surfaces;  
in  
the  
second

and  
third  
specimens  
a  
thin  
black  
line  
has  
been  
drawn



around  
the

rim  
edge.

Two  
additional  
earthenware  
objects  
from  
this  
second  
Chaco  
Can-

yon  
pit  
house  
should  
be  
mentioned.

One  
of  
these  
(fig.  
4)  
is  
a  
pipe

made  
apparently  
from  
a  
portion  
of  
the  
handle  
of  
a  
gourd-shaped

bottle.  
17  
Both  
ends  
have  
been  
rubbed

smooth;  
the  
hole  
at  
the  
bit

16  
The  
only  
complete  
specimen  
is  
5i  
inches  
long  
by  
2J  
inches  
wide  
(14.2  
by  
6.98  
cm.)

18  
So  
far  
as  
the  
author  
is  
aware  
this  
type  
of  
ladle  
handle,  
so  
closely  
associated  
with  
the

culture  
of  
Pueblo  
Bonito,  
has  
not

previously  
been  
noted  
from  
pit  
houses.

17  
See  
Morris:  
33d  
An.  
Rep.,  
Bur.  
Amer.  
Ethnol.,  
fig.  
5,  
p.  
197.

**[Begin Page: Page 411]**

PIT  
HOUSES  
—  
JUDD.  
411

end  
has  
been  
gouged  
through  
with  
a  
flint  
drill.  
The  
larger  
opening

shows

unmistakably  
the  
use  
to  
which  
the  
object  
was  
put.

The  
second  
of  
these  
two  
specimens  
(324823)  
is  
a  
portion  
of  
what

appears  
to  
have  
been  
the  
hollow  
handle  
of  
a  
ladle,  
reworked  
perhaps

for  
intended  
use  
as  
a  
pipe.  
The  
smaller  
end  
has  
been  
carefully

smoothed,  
while

the  
fractured  
face  
of  
the  
opposite  
end  
shows  
but

slight  
rubbing.  
A  
certain  
doubt  
arises  
in  
connection  
with  
this  
par-

ticular  
fragment,  
for  
its  
superior  
paste,  
its  
white  
slip,  
and  
its  
style

of  
ornamentation  
all  
tend  
to  
place  
it  
with  
a  
culture  
later  
than  
that

of  
the  
pit  
dwellers.

There  
is  
no  
question,  
however,  
but  
that  
it  
was

found  
in  
direct  
association  
with  
the  
other  
artifacts  
here  
described.

Several  
charred  
fragments  
of  
a  
small,  
finely  
woven  
coiled  
basket,

gathered  
from  
among  
the  
debris  
in  
the  
arroyo,  
obviously  
add  
to  
the

importance  
of  
this  
collection.  
The  
technique

is  
"  
two  
rod  
and  
splint,"

as  
described  
by  
O.  
T.  
Mason.  
18  
Of  
still  
further  
interest  
are  
the

charred  
remains  
of  
a  
pair  
of  
re-

markably  
thin  
sandals  
found  
on

the  
bench  
at  
the  
west  
side  
of  
the

room.  
In  
these  
the  
weft  
is  
a

twisted  
thread  
of  
a  
fine,  
uniden-

tified  
fiber  
woven  
over  
paral-

lel-warp  
cords  
of  
yucca  
which

are  
arranged  
after  
the  
fashion  
of

those  
in  
a  
cliff-dweller  
sandal

n  
..  
,  
.  
—  
∧  
Fia.  
4.  
—  
Earthenware  
pipe.

figured  
by



Kidder  
and  
Guern-

sey.  
19  
One  
may  
judge  
of  
the  
exceptional  
fineness  
of  
the  
weave  
in

these  
specimens  
by  
the  
fact  
that  
there  
are  
no  
fewer  
than  
9  
warp

and  
32  
weft  
strands  
to  
the  
inch.  
The  
importance  
of  
these  
fragments

lies  
in  
the  
fact  
that,  
from  
the  
very

nature  
of  
the  
dwellings,  
pit-house

sandals  
and  
basketry  
are  
extremely  
rare.  
Discovery  
of  
these  
charred

specimens,  
however,  
encourages  
the  
belief  
that  
other,  
perhaps  
more

perfect,  
examples  
will  
be  
found  
as  
investigation  
of  
pit-house  
remains

progresses.

In  
addition  
to  
the  
artifacts  
already  
mentioned,  
the  
collection  
in-

cludes  
two  
incomplete  
bone  
awls  
(324824),  
a  
reworked  
fragment  
of

a  
shell  
bracelet  
(324825),  
two  
flint  
knives  
or  
scrapers  
(324826),  
and

several  
stone  
hammers,  
manos,  
etc.  
Three  
broad,  
thin  
metates  
and  
a

number  
of  
smoothing  
and  
grinding  
stones,  
recovered  
from  
the  
mass

of  
fallen  
adobe  
(pi.  
2,

fig.  
1),  
were  
not  
included  
in  
the  
material

brought  
to  
Washington.

Lying  
upon  
the  
floor  
of  
the  
room  
between  
the  
fireplace  
and  
the

west  
bench,  
its  
head  
to  
the  
northwest,  
was  
the  
incomplete  
skeleton  
of

a  
young  
female.  
Caving  
of  
the  
arroyo  
bank  
had  
torn  
away  
all

the

"

An.  
Rep.,  
U.  
S.  
Nat.  
Mus.,  
1902,  
p.  
246.

»

Bull.  
65,  
Bur.  
Amer.  
Ethnol.,  
fig.  
38,  
p.  
104.

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412  
ANNUAL  
REPORT  
SMITHSONIAN  
INSTITUTION,  
1922.

leg  
bones;  
those  
of  
the  
trunk  
were  
mostly

crushed  
by  
the  
weight

of  
the  
roof  
poles  
and  
clay  
which  
had  
collected  
above  
them.  
All

available  
fragments  
were  
preserved,  
however,  
for  
further  
study.

The  
chief  
result  
of  
this  
subsequent  
examination  
20  
was  
the  
positive

determination  
that  
the  
skull  
had  
been  
subjected  
to  
cradle-board

pressure,  
resulting,  
in

occipital  
flattening.  
Such  
artificial  
deforma-

tion,  
so  
characteristic  
of  
crania  
from  
cliff  
dwellings  
and  
other  
early

Pueblo  
ruins,  
was  
scarcely  
to  
have  
been  
expected  
in  
a  
skull  
from  
a

pit  
house  
in  
Chaco  
Canyon.  
From  
our  
meager  
knowledge  
of  
the

pit  
dwellers  
(few  
adult  
skeletons  
have  
been  
found)  
we

have  
rather

assumed  
that  
they  
were  
a  
long-headed  
or  
dolichocephalic  
people,  
an

assumption  
which  
has  
been  
drawn,  
perhaps,  
on  
too  
scanty  
informa-

tion.  
As  
we  
become  
more  
intimately  
acquainted  
with  
the  
pit

people  
through  
future  
exploration  
and  
as  
the  
character  
of  
their

culture  
becomes  
more  
firmly  
established,



it  
is  
not  
unlikely  
that  
these

early  
conceptions  
will  
merit  
revision.

CONCLUSION.

On  
the  
basis  
of  
two  
incomplete  
dwellings  
only  
it  
would  
appear

extremely  
unwise  
to  
attempt  
to  
draw  
any  
definite  
or  
final  
conclusion

in  
respect  
to  
pit-house  
culture  
as  
found  
in  
the

Chaco  
Canyon  
region.

That  
other  
examples  
will  
be  
discovered  
seems  
almost  
certain  
;  
the  
un-

happy  
fact  
in  
this  
connection,  
however,  
is  
that  
such  
vast  
changes

have  
taken  
place  
in  
the  
canyon  
since  
arrival  
of  
these  
pioneer  
set-

tlers  
as  
to  
preclude  
the  
possibility  
of  
identifying  
the  
sites  
of

their

subterranean  
homes  
through  
examination  
of  
the  
present  
valley  
sur-

face.  
From  
preference  
the  
pit  
people  
seem  
to  
have  
constructed  
their

shelters  
in  
open  
or  
exposed  
places,  
and  
these  
unprotected  
areas  
nat-

urally  
have  
been  
subjected  
to  
the  
most  
intense  
leveling  
influence  
of

the  
elements.

Perhaps  
the  
greatest  
contribution  
to  
American  
archeology  
which

can  
be  
claimed  
for  
these  
two  
Chaco  
Canyon  
pit  
houses  
is  
the  
con-

necting  
link  
they  
afford  
between  
similar  
structures  
in  
localities  
so

widely  
separated  
as  
Luna,  
N.  
Mex.,  
the  
Mesa  
Verde  
National  
Park,

Colo.,  
and  
the  
Monuments  
district

of  
northern  
Arizona.  
Their  
dis-

covery  
increases  
the  
number  
of  
known  
pit  
dwellings  
and  
tends  
to  
draw

them  
into  
one  
distinct  
group.  
Of  
scarcely  
less  
interest  
is  
the  
fact  
that

finding  
an  
improvised  
pipe  
and  
basketry  
and  
textiles  
exhibiting  
ex-

traordinary  
skill  
in  
weaving  
adds  
appreciably  
to  
previous  
knowl-

edge  
of  
pit-house  
culture  
and  
strengthens  
its  
suspected  
close  
rela-

tionship  
with  
that  
of  
subsequent  
periods.

20  
The  
fragments  
have  
been  
examined  
by  
Dr.  
Aleš  
Hrdlička,  
Curator  
of  
Physical  
An-

thropology,  
TJ.  
S.  
National  
Museum,  
whose  
report  
is  
incorporated  
in  
the  
above  
paragraph.

It  
could

not  
be  
learned,  
owing  
to  
its  
shattered  
condition,  
whether  
the  
skull  
was  
dolicho-

cephalic  
or  
brachycephalic.

**[Begin Page: Page 413]**

PIT  
HOUSES  
—  
JUDD.  
413

In  
his  
"  
Chronology  
of  
the  
San  
Juan  
area,"  
Morris  
21  
assigns  
to  
the

"  
pre-Pueblo  
"  
period

dwelling  
both  
of  
the  
type  
herein  
considered

and  
those  
of  
wattled  
construction  
in  
which  
upright  
slabs  
were  
oc-

asionally  
incorporated  
in  
the  
basal  
portion  
of  
the  
wall.  
Such

classification  
appears  
to  
be  
justified  
on  
the  
basis  
of  
ceramic  
remains

only,  
and,  
indeed,  
the  
slight  
difference  
in  
architecture  
may  
prove



to

be  
merely  
a  
result  
of  
environment  
or  
the  
growth  
of  
a  
clan  
system,

for  
"  
slab  
houses  
"

are  
found  
in  
groups  
more  
frequently  
than  
are

pit  
dwellings.  
But  
Morris  
observes  
that  
a  
majority  
of  
the  
crania

from  
pre-Pueblo  
sites  
is  
dolichocephalic,  
although  
some  
skulls  
with

occipital  
flattening,  
possibly  
brachycephalic,  
have  
been  
recovered.

It  
remains  
to  
be  
seen,  
therefore,  
whether  
this  
peculiar  
custom  
of

artificial  
deformation  
is  
identified  
with  
pit  
houses  
only  
or  
with

both  
types  
of  
pre-Pueblo  
habitations  
equally;  
whether  
it  
is  
early

evidence  
of  
the  
adoption  
of  
a  
rigid  
type  
of  
cradle  
board

or  
the  
immi-

gration  
of  
a  
separate  
people,  
as  
has  
commonly  
been  
held  
heretofore.

Surely  
one  
of  
the  
most  
pressing  
needs  
of  
southwestern  
archeology

to-day  
is  
a  
clearer  
definition  
and  
a  
broader  
appreciation  
of  
the  
"  
pre-

Pueblo  
"  
stage  
in  
our  
chronological  
system.  
It  
was  
the

very  
germ

of  
that  
widely  
distributed  
culture  
which  
found  
its  
greatest  
prehistoric

development  
in  
such  
marvels  
of  
aboriginal  
creative  
genius  
as  
Pueblo

Bonito  
and  
which  
still  
struggles  
to  
maintain  
its  
individuality  
m

modern  
pueblos  
such  
as  
Walpi,  
Oraibi,  
Zufii,  
and  
others.  
But  
these

needs  
may  
be  
realized

only  
through  
painstaking  
labor  
in  
crude,  
ill-

defined  
ruins,  
often  
difficult  
of  
access  
and,  
be  
it  
said  
with  
regret,  
so

unpromising  
that  
they  
are  
rarely  
left  
solely  
to  
the  
choice  
of  
the

student  
of  
ancient  
history.

Proc.  
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