PUTNAM ANNIVERSARY VOLUME

ANTHROPOLOGICAL ESSAYS

PRESENTED TO

FREDERIC WARD PUTNAM

IN HONOR OF HIS SEVENTIETH BIRTHDAY, APRIL 16, 1909

BY

HIS FRIENDS AND ASSOCIATES



NEW YORK
G. E. STECHERT & CO., PUBLISHERS
1909

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With the sincere regards of F. W. Putnam

Peabody Museum, Harvard University
Cambridge, Mass., U. S. A.

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J. W. Putnam

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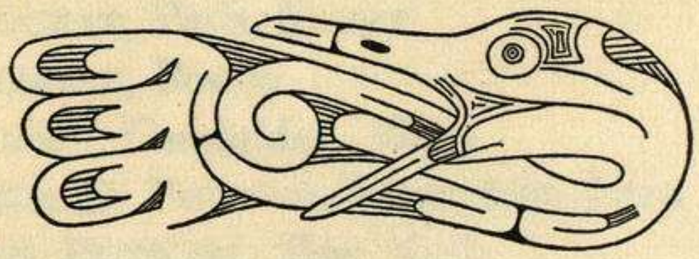

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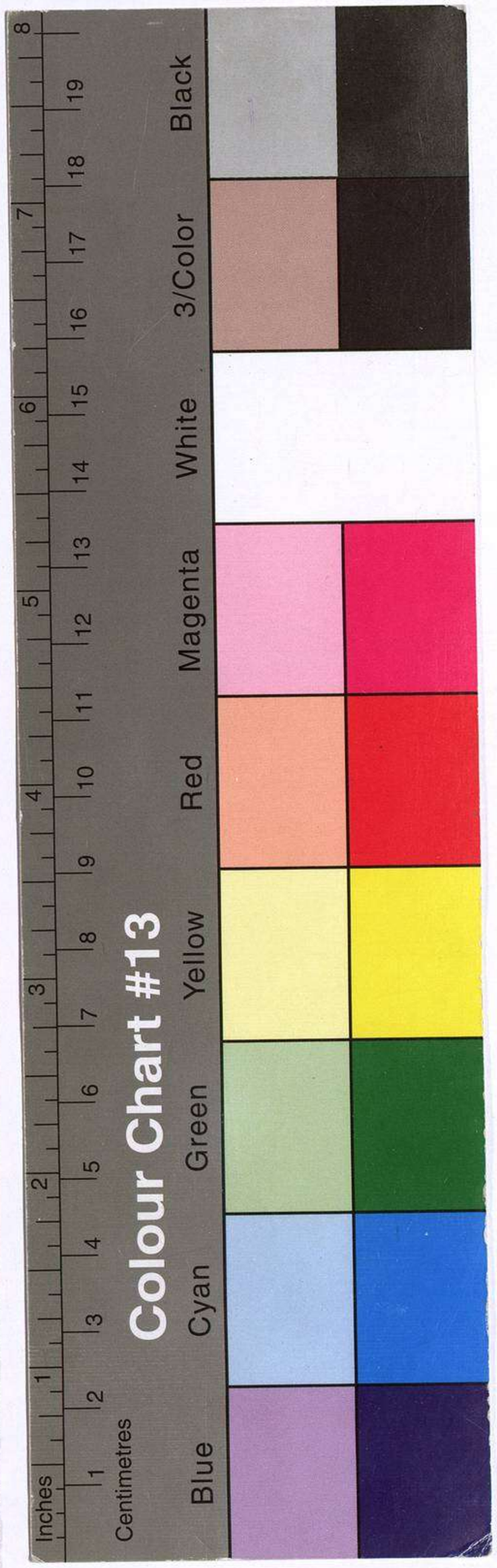

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My dear Professor Putnam:

This day, when you look back upon a life full of love and vigor, of devoted labor and unselfish endeavor, affords to your many friends a welcome opportunity to give voice to their sentiments of gratitude and love, and to express the esteem in which they hold you. By creating and fostering public interest in science, by organizing the work of societies and institutions, and by your own contributions to knowledge, you have liberally contributed to the development of scientific activity in our country. Your achievements will stand as a lasting memorial of your own worth.

It has been the wish of your friends to bear testimony to the power and gentle charm of your personality that have made you our leader. For this reason we have assembled in these pages contributions to science written by those who have been immediately associated with you in work of research or instruction, by those who are carrying on investigations instituted by you, and by friends with whom you have shared for years the pleasures of intimate intercourse, to which each contributes the results of his best thought. Thus the book that is presented to you by the wide circle of your friends and admirers will at the same time be an acknowledgment of the debt of gratitude that your associates owe you, and an expression, however inadequate, of the living force that you have been, and continue to be, in the advancement of anthropology in all parts of our country.

May many years of health and strength be granted you to see the ripening of your plans and the achievements of your younger friends, whose progress has always been a chief pleasure of your life!

With sincere wishes,

Faithfully yours,

FRANZ BOAS,

Chairman Editorial Committee

NEW YORK, *April sixteenth, 1909*

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THE ARCHÆOLOGY OF CALIFORNIA

BY

A. L. KROEBER

THE archæology of California has been even less adequately investigated than was the ethnology until a few years ago. There is only one published work of any size, comprehensiveness, or weight, the only one representing more than a sporadic, local, or specialized effort. This was issued thirty years ago as the seventh volume of the *Wheeler Geographical Survey*, under the editorship and largely from the pen of F. W. Putnam. It is gratifying as well as fitting that the present sketch of what has since become known in literature, in museums, and through exploration, of the archæology of California, should be composed on the occasion of an anniversary volume to Professor Putnam.

The archæology of California, as of many other regions, is concerned primarily with two questions. The one deals with time and origins, the other with prehistory and culture. One problem is to determine the first existence of man in a given region, and to fix the time of this appearance absolutely, so far as such a term may be used in a geological sense. The other problem is to determine the various forms taken by civilization and their succession. It is therefore historical, and is concerned with the factor of time principally in its relative aspect.

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The two problems are equally important, and when more knowledge shall have been amassed will be found to be inseparable, as has been the case in the prehistory of western Europe. One, however, requires geological methods for its satisfactory attack, the other is inseparable from ethnology. Professor Putnam's earlier archæological work in California was of the second phase. In recent years his efforts have been specially directed to a solution of the first problem. As the author's training fits him more adequately for a discussion of the cultural aspects of archæology, the geological aspect of the antiquity of man in California will be touched upon but briefly here in spite of its fundamental importance.

ANTIQUITY OF MAN

The question of the antiquity of man in California, which has received attention in other than scientific spheres since the discovery of the famous Calaveras skull under alleged circumstances of sensational import, has been approached most conspicuously, by workers under the direction of Professor Putnam, along three lines. The quaternary and tertiary gravels of California, especially those that are gold-bearing, have been searched for indubitable or possible human remains, and examined in their geological aspects. Caves, the most famous of which are those in Shasta county, have been explored with a similar object, particularly those that bore abundant animal remains. Finally, surface deposits of unquestionably human origin have been examined for their geological relations. Results of the investigations of gravels have so far been negative. The explorations

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of caves have yielded a rich quaternary fauna and certain objects which have the appearance of being of human manufacture. That these objects were positively made and used by man is, however, not yet generally admitted by those whose opinion is most authoritative, and the question must be regarded as still in suspense. The shell deposits are presumably of more recent geological age than the gravels or caves, but their investigation has led to the rather unexpected and gratifying determination that their beginnings are of greater antiquity than might theoretically be presupposed or than had been assumed. Altogether it may be said that the problem of the antiquity of man in California still awaits its answer. The work is incomplete, the results inconclusive but promising. Personally the writer is of the conviction that however far from positive the results so far may have been, time will demonstrate by indisputable evidence Professor Putnam's belief that man lived in California at a very remote period.

CULTURAL ARCHÆOLOGY

That phase of archæology which aims to unfold culture, and is therefore essentially historical, shows in California one fundamental feature which is usual in the archæology of North America. The civilization revealed by it is in essentials the same as that found in the same region by the more recent explorer and settler. The material dealt with by archæology and ethnology is therefore the same, and the two branches of investigation move closely linked toward the same goal, differing only in their methods. The archæologist's record being always imperfect, particularly in the case of unlettered peoples, his findings

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will be incomplete if not supplemented by ethnology. The ethnologist can obtain a more complete picture; but it is only momentary, a cross-section as it were; and if he wishes to give to his results historical reality, introduce the element of time, and consider the factor of development, he in turn is dependent upon the archæologist.

This dominant characteristic which links so closely in most of the New World the prehistoric past and the historic present, finds expression in California in the fact that neither archæology nor ethnology has yet been able to discover either the presence or the absence of any important cultural features in one period that are not respectively present or absent in the other. Both the archæologist and the ethnologist find California without a trace of native architecture, its peoples making no use of metals, of axes or stone chisels, of pottery except in certain restricted regions; and both declare these peoples to have practised no agriculture and to have been practically devoid of desire or attempt to represent actual objects realistically in any sphere of art. Even the geographical limits of subordinate types of culture, and the distribution of specialized forms of implements, coincide almost absolutely so far as archæology and ethnology have been able to determine. None of the peoples of the state possess any traditions of migration or of foreign origin, and their numerous distinct languages are spoken in such closely adjacent or even compact and continuous areas as to negative any theories as to noteworthy movements of population for a long time past. In the same way archæology at no point gives any evidence of significant changes of culture which might be regarded as an indication of similar supposed movements of people.

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Even such subsidiary differences as appear in the results of archæological and ethnological investigation, usually in the end reflect only more general underlying similarities. If there is one implement which, even on a most superficial view, characterizes the archæology of California, it is the mortar. There is no part of the state in which it is not found, and found usually in the greatest abundance. There can be no question but that the mortar was formerly maufactured and used on a most extensive scale. The living Indians of southern California use mortars of the same type as those found in the ground in their territory. In the remainder of California, however, mortars of the prehistoric type are not used by the Indians, and their purpose is often not understood by them. In the region of the Sierra Nevada the present day mortar consists of a cavity hammered in a clean exposure of granite bedrock, and is therefore immovable. In the Coast Range region, at least north of San Francisco, the substitute for the prehistoric mortar is invariably an almost flat slab, on which is placed a hopper or rim of basketry. The mortars found in northern and central California are usually regarded by the Indians as made by an ancient mythic race of people or animals. They are often looked upon as having been cooking-vessels, and their unquestionable purpose is perhaps most frequently not even suspected. Nevertheless, these differences between the past and present are only differences in detail, involving nothing more than a passing change of fashion in manufacture or in manipulation of the same process. The most important food of the California Indians is the acorn, which is pounded and ground into flour on the basket-rimmed slab or

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in a bedrock cavity today, as it was centuries ago in the portable bowl-shaped mortar of stone.

The close association of the aboriginal past and present of California makes archæology of the utmost importance, even to him whose interest may be more narrowly ethnological, on account of the extinction or civilization of the Indians of certain parts of the state before more than the merest fragments of information concerning their life and manners had been recorded. This is particularly true of the coast region between San Francisco and Los Angeles, and it is fortunate that what has proved to be the richest archæological field in California should comprise the southern part of this area. The ethnologist who wishes to know something of the Indians of the Santa Barbara region must borrow his information from the archæologist; and of how much value this information is to him he will realize only when he turns to the northern half of this same coast stretch, the region from San Francisco to south of Monterey, — which a variety of causes have rendered comparatively unfruitful to the archæologist, —and recognizes that he neither knows nor probably ever will know much of significance concerning the Indians here.

SOUTHWESTERN CULTURE

The Santa Barbara district is noteworthy, not only for its archæological richness but for its civilization. In many ways, on the mechanical and material side of life at least, the finds indicate a distinct and somewhat unique form of culture. The territory covered by this was restricted and essentially maritime. It comprised the six larger islands of the Santa Barbara archipelago that were permanently inhabited, and the immediate coast

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of the adjacent mainland to the north. Of the islands those in the south show perhaps the highest development of the peculiar culture. On the mainland it extended essentially only along that part of the coast fronting the northern islands, from Point Concepcion to Ventura. Beyond Ventura it seems diluted, though occasional discoveries have been made as far to the southeast as Redondo and San Pedro. Most characteristic of the discoveries in this region are the innumerable beads, pendants, and ornaments, most frequently of shell material of various kinds, but also of bone and stone. Disk beads, globular beads, tubular beads, narrow curved pendants, wide pendants, hollow circles, and more elaborate forms, the larger pieces frequently covered with an inlay of shell beads set in asphaltum, as a basis for which even wood has been found, have been discovered at once in the greatest variety and in enormous profusion at favorable points. It is probable that there has taken place an unusual accumulation of material owing to the crowding on small islands and narrow coast sites of a considerable population for many successive generations, and owing to the absence of any practices, such as cremation of the dead, which would tend to hasten the destruction of objects of culture. At the same time there are probably more different varieties of ornaments and ornamented objects found in this small area than in all the remainder of California, so that the existence of an unusually strong development of certain arts must be attributed to this local culture. While the ornamentation, whether of form, of inlay, or of decorative marking, is often rich, it is always simple in pattern and geometric in form.

Next in conspicuousness in this southwestern region are objects made of steatite or soapstone, and other soft stone materials,

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which adapt themselves to the manufacture rather of ornamental objects than of practical implements. Steatite bowls, some intended for daily household use and some so elaborately finished as to make it almost certain that their purpose was religious, are abundant and have been of particular interest because of the discovery of the site at which steatite was obtained and many of the vessels manufactured. It was at one time thought that all aboriginal soapstone vessels found in southern California came from the famous quarry on Santa Catalina island. Soapstone is now known to have been quarried elsewhere also, but it is certain that Santa Catalina was an important center of manufacture and distribution for objects made of this material.

Besides bowls or ollas, and flat concave baking-slabs, several classes of objects were made in this region of steatite and other soft stones, of which the shapes as well as the decorative finish render it scarcely conceivable that they could have served any practical purpose, and which are therefore regarded as having been employed in a religious connection. These forms include boat-shaped vessels; peculiar, heavy, wide-edged hooks with a knobbed handle; cylindrical rods with a rounded head, not very different in general appearance from a heavy spike; and heavy stone objects which may be described as scoop or spade shaped. The most distinctive pieces of this group of objects are however representations of cetaceans with erect dorsal fin, together with a few figures of quadrupeds, which mark almost the only attempt at realistic carving found anywhere in California.

Special discussion has more than once been given the rings or perforated stones which have been found in great numbers in the Santa Barbara region. It seems clear that many of them

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were used and probably originally intended as weights for digging-sticks. Their use in the widespread game of hoop and dart has also been alleged, but is doubtful. More perishable materials, which would make a hoop that was at once more readily constructed and more serviceable for the game, are known to have been used, though the employment also of stone rings is not impossible. Many specimens show wear on the outer circumference, which proves unquestionably that they were at some time used for hammering or beating, though such employment may have been entirely secondary. The discovery, finally, in a cave and in association with objects of undoubtedly religious function, of several such perforated stones mounted on wooden handles of insufficient strength and unsuitable shape to permit of any conceivable practical use, renders it certain that some at least of these perforated stones were made use of in shamanistic or other ceremonial processes. This is the more evident from the fact that many of these stones have been found showing a degree of evenness and fine polish which is hard to imagine to have been bestowed on objects intended for so humble a purpose as weighting the rough stick with which an old woman dug roots. The use of perforated stones as net-sinkers and as war-clubs in southern California is negatived by all the evidence available.

While the most distinctive characteristics of the Santa Barbara civilization as it is known to us, are expressed in the artifacts made of the harder organic substances and of ground and polished stone, these ancient people had attained an unusual degree of proficiency in the manufacture of flaked and chipped implements. Obsidian usually lends itself much more readily

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than flint to delicate and regular chipping, and the fine work of northern and central California is almost all done in obsidian. The Santa Barbara region was farther from a supply of obsidian than the more northern parts of the state, and obsidian implements are relatively less numerous and important than in certain regions to the north. The Santa Barbara people, however, fully made up for this comparative natural deficiency by developing to the highest degree attained in California the art of fine and regular working of flint. Long delicate flakes of triangular cross-section are found, as well as arrowheads and other pointed and edged implements. The arrowpoints, while fairly large, show a fineness which is equalled only by those made of obsidian in northern California, and surpassed only by the unusually exquisite implements found in the region of the lower Columbia. In several cases flints have been found which do not adequately answer any conceivable purpose, and whose outline is so suggestive of animal shapes as to recall similar pieces from palæolithic Egypt.

NORTHWESTERN CULTURE

While the southwestern or Santa Barbara region is shown by archæology to have possessed until recently a comparatively unique form of aboriginal civilization, ethnology has revealed a somewhat analogous distinctness in the lives of the Indians of northwestern California, particularly in the region about the lower Klamath river. Very little is known of the archæology of northwestern California, though there are two brief records of explorations on the adjacent coast of southwestern Oregon, which in historic times has been inhabited by people of virtually the same material culture as is found in northwestern California.

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The country is heavily forested and the most favorable sites for prehistoric populations are for the most part still occupied by the surviving Indians. A good many objects have however been brought to light by accident, and it is interesting that with the exception of an occasional bowl-shaped mortar these are all identical with the stone implements used by the Indians of the region in historical times. There is no mistaking this evidence, as this territory is characterized by several unique forms, such as a slender curved adze-handle; a short, broad-based wedge-maul with knobbed or flanged head; a pestle tapering gradually to a point, with a flange near its base; and a perforated stone, often grooved for string attachment, used as a net-sinker.

The fact that in northwestern California native life retained its old forms until but a few years ago, or more recently than elsewhere in the state, has forced upon our knowledge, as it were, several facts of a kind which elsewhere have probably become obscured through less favorable circumstances, and which illustrate once more the close and inseparable connection which obtains and should be observed between archæology and ethnology. Through all of California, bone awls were used by the Indians. In most parts they have been found among prehistoric remains and we have every reason to believe that exploration will discover them where they have not yet been reported. The recent Indians used them but sparingly for sewing, as they had but little to sew. Through the greater part of the state, or wherever coiled basketry was made, an awl was however the indispensable means for the manufacture of this. In aboriginal times bone was the only material that would serve this purpose, and even today it is frequently preferred to steel. In northwestern California, how-

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ever, coiled basketry is unknown, nor is there even a shadow of any evidence that it ever was made. All basketry is in twined weaves, which do not require an awl for their manufacture. The Indians of northwestern California, however, use a pointed bone implement, which, though its characteristic shape frequently varies somewhat from that of the awls of the remainder of California, is on its face and essentially an awl. Its principal function, however, is the piercing, slitting, and preparing of lamprey eels, which are caught in enormous quantities and dried. If the Indians of northwestern California, instead of preparing their eels and twining their baskets even today, had become extinct or completely civilized several generations ago, the natural assumption of the archæologist exploring their village sites would have been that their bone awls served the purpose of making the coiled basketry which is found nearly everywhere else in the state, but which they did not make.

Again, the knife-like implements of chipped stone in northwestern California are remarkable for combining at times extreme size and extreme beauty and regularity of workmanship. Obsidian blades range from a few inches to three feet in length. The shortest pieces are square-edged at one end for hafting. The longer ones are rounded or pointed at both ends. These implements, which have been several times described and discussed, are primarily objects of value and precious heirlooms, used on the one hand in the most important transactions, such as the payment of blood-money and the marriage purchase, and on the other hand displayed on ceremonial occasions. They are never employed for any practical purpose. The knife of these people, which was not made of obsidian but of flint, was not more than

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two or three inches in length, wide and leaf-shaped, and with a flat base for hafting. Spearpoints were not used. The lance was unknown, and the only stabbing implement seems to have been a short-handled wooden dagger with a rough flint point, employed to despatch sea-lions. With all the capacity of these people for chipping a serviceable knife of flint and extraordinarily beautiful blades of obsidian, they possessed no implement for scraping. When hides were to be dressed, large pebbles or small bowlders in the river were split until one broke with a satisfactory edge. All this has become clear from the statements of the present Indians. Without this guide it is scarcely conceivable that the archæologist would have solved correctly all the peculiar uses of the several forms of chipped implements. The obsidian blades, whose purpose is purely ceremonial and monetary, would unquestionably have been in part interpreted as knives, spearpoints, and scrapers.

CENTRAL CULTURE

As compared with the Santa Barbara and Northwestern regions, all other parts of California show much less specialization archæologically, as they do also in ethnology. There are fewer unique types, and less elaborate ones. Archæology has however disclosed several instances of the occurrence of distinctive Santa Barbara forms in central California, on which ethnology, perhaps through the imperfection of its record, is silent. In the vicinity of Tomales bay mortars have been found which in shape and beveled edge recall the finer pieces of southern California. The shellmounds of San Francisco bay contain concave beads made of thin univalve shells, typical of the Santa

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Barbara region, whereas in historical times it seems likely that thicker flat beads may have constituted the normal shell currency of the bay region as they did of the neighboring districts. Similarly a few ornamental pieces showing shell and asphalt inset have been found in the San Francisco bay mounds which are precisely of such a character that their origin might have been Santa Catalina or Santa Rosa island.

A conspicuous and abundant central California form, about which discussion has been held to much the same degree as over the perforated stones of the south, is the plummet-shaped sinker or charmstone. These pieces were often made in most symmetrical shape, well-rounded taper, and high finish. Some are perforated, but those showing the characteristic or elongated pear-shape in its purest form, are not perforated. A considerable proportion of the unperforated pieces reveals traces of asphalt at the upper end, and a number still show marks of string which was here wound around the stone and cemented to it by asphalt. That the pieces were suspended is however no proof that they were used as sinkers, and it is now established that they were used by the recent Indians as shamans' amulets for rain-making or other purposes, were often regarded as animate and self-moving, and at least in central California were particularly employed as charms for hunting and fishing and in this connection frequently either hung over bodies of water or dropped into them. That all specimens of this construction were so used is not certain, but that any of them were used for other purposes is entirely conjectural. It appears likely that the Indians of recent times usually found and did not manufacture their charmstones; whether the pieces were originally made as amulets or for an-

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other purpose, is entirely a matter of speculation. Charmstones are less common in southern than in central California, just as the frequent perforated stone of the south occurs only sporadically in the central part of the state.

A few pieces of the type of charmstones have been found which show some approach to a knob or projection at both ends. Small pieces, usually of steatite, somewhat resembling in outline the shorter charmstones, but marked with several transverse encircling grooves, are occasionally found on San Francisco bay and in the south. There are also one or two charmstone-like pieces that bear so close a resemblance to a fish that it can scarcely be doubted the likeness was intentional.

The one published account of a systematic though partial exploration of a shell-heap on San Francisco bay, upholds the view of a distinct progression and development of civilization having taken place during the growth of the deposit. An independent examination of the material on which this opinion is reared, tends to negative rather than to confirm it. It is true that finely worked objects, and certain specialized types such as charmstones, occur only in the upper and more recent strata of the Emeryville mound, but on the other hand, mortars, pestles, sinkers, and bone implements, differing in no wise from those of more recent period, are found in the very lowest layers. While rough stone fragments predominate in these low layers, the same processes of manufacture, and in the main the same modes of life, as indicated by such implements as the mortar, were followed in the periods represented by the earliest and the latest strata. It does appear that there was some gradual elaboration and refinement of technical processes, but it was a change of

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degree only, and one in no way to be compared even for a moment with a transition as fundamental as that from palæolithic to neolithic. For that matter, no trace of any people in a purely palæolithic stage of cultural development has yet been found anywhere in California. The question as regards the shell-mounds is further complicated by the fact that an examination of one or two heaps cannot be regarded as sufficient to determine problems of development of civilization in a region where deposits of this character exist by hundreds. Finally, while the age of the beginnings of the shell deposits has proved to be greater than would probably have been assumed without evidence, it is yet evidently measured at the outside by only a few thousands of years; and it may be doubted whether in view of the indubitable antiquity of man in America, historically if not geologically, any radical change could be expected in such a time. Particularly where the recent civilization is still so simple as in central California, it is difficult to believe that a few thousand years would comprise a notable development; not because of any assumption that conservatism increases with degree of primitiveness, but because any radically simpler culture than the recent one in central California must have been so extremely rude as to make its existence a short time ago seem more than questionable to anyone impressed with the evident historical antiquity of a fairly well developed civilization elsewhere in America. A priori ideas as to the rapidity of cultural development seem to have been partly responsible for the view that the San Francisco mounds show noticeable development of culture, whereas it is precisely on a priori grounds that such change seems most doubtful.

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Low earth-mounds in the lower San Joaquin valley, in the vicinity of Stockton, are notable for the fine workmanship and polish of the bone implements found in them. They contain also curved obsidian blades of unusual form and extremely regular chipping; occasional narrow, high, cylindrical vessels of steatite; and rude unbaked or partly baked clay balls, some of them ornamentally incised, which may have been sling-balls, but were more likely used for heating water in baskets in the region where stones were scarce or entirely wanting. These forms have not been discovered in other localities, except that curved obsidian blades have been reported in Inyo county.

GROUND STONE IMPLEMENTS

In regard to the ubiquitous mortar, it should be observed that while the usual implement, of ordinary size, presumably served the purpose of milling acorns and other vegetable foods, smaller specimens were undoubtedly also used for other purposes, as the Indians of today, even in regions where globular stone mortars are not now used for acorns, employ smaller ones of this type for crushing bones or meat of small game, for tobacco and medicine, and for paint. It is also likely, judging from analogy with the present, that certain mortars were used ceremonially only. The Maidu of the northern Sierra Nevada regard them as abodes and receptacles of supernatural pain-objects, and the Luiseño and Diegueño of the extreme south of the state kept certain vessels, which were not to be distinguished from mortars except perhaps by their smaller size, solely for use in the toloache or jimsonweed-drinking initiation ceremony. This ceremony was particularly developed in southern California, in

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which region also are found nearly all the large well-made mortars with bevelled and sometimes shell-ornamented edge, and of an even thinness of walls and great smoothness of surface, so that it may be concluded that these pieces were not so much mortars as bowls, used, if not in the jimsonweed rite, at least in some ceremony.

In the central Sierra Nevada region, tall cylindrical mortars are at times found which are about twice as high as wide. Similar forms occur also in northeastern California. In the vicinity of Sonoma county one form is conical, as if it had been set in the ground when used. The material of mortars throughout the state is generally granite or other igneous or metamorphic rock; but in the Santa Barbara region this is frequently replaced by fine or coarse sandstone.

The pestle is naturally cylindrical and of varying length and diameter. In the Sierra Nevada, and at times in the shell-mound region, it is often flattened or squarish in cross-section. Pestles for use in a deep funnel-shaped mortar are pointed, not rounded, at the base, and are found in parts of central California, just as they are used today in the mesquite mortars of the Mohave and Cahuilla of the southern desert. Ornamented pestles usually occur only in the Santa Barbara and Northwestern regions. In the former area, such pestles are decorated with one, two, or even three rings at the top; in the latter, with a ring or flange about one-fourth way up from the base. These rings are purely ornamental and serve no practical purpose of manipulation. In central California pestles with a slightly knobbed top are occasionally found. Pestles of the type with a ring or knob at the top have sometimes been interpreted as phallic, though so far

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as known without any reason. In the vicinity of Mendocino and Lake counties the most typical pestle, ancient and recent, is slender with a suddenly swelled base. Pestles that have been pitted or otherwise put to a secondary use, are not rare.

The metate, or flat milling slab, occurs all through southern California, as through the adjacent Southwest. In central and northern California it occurs chiefly in the interior, being found as far north as the Maidu of the northern Sierra Nevada and the Modoc of the Oregon boundary. It is never provided with legs as in Mexico, and usually is only an irregularly oval, slightly concave, slab of sandstone. Only in the south, as among the Mohave of today, is it made of lava with a flat surface and squared edges.

The rubbing or hand stone of the metate is usually rude, often nothing more than a flattened bowlder. It is squared only where the squared metate is found. The only specialized form of hand-stone at present occurs among the Modoc, who use a peculiar two-horned form of purely local distribution. This is not a recently introduced type, but whether it is of archæological antiquity remains to be ascertained.

The typical sinker of California, when it was not merely an unshaped stone, consisted of a pebble slightly grooved transversely or only notched at opposite edges. Such pieces are found in numbers in the San Francisco bay mounds. In northwestern California, perforated stones are fastened to nets and probably were so used in prehistoric times. The majority of these are not perfectly round, as they would be if made for slipping over a handle, but are slightly asymmetrical, elongated, or grooved for evident suspension. The northwestern people,

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however, also use irregular masses of unshaped rock that possess natural perforations; and in graves of their ancestors they find small oval sinkers with a well-marked transverse groove. It should be added that the heaviest sinkers used in this region, as for sturgeon nets, are oval stones grooved longitudinally. The modern Modoc, in extreme northeastern California, use triangular or heart-shaped sinkers that are perforated or vertically grooved, and large sinkers with an encircling transverse groove. The Santa Barbara region has produced few artifacts that can be identified as sinkers. There are some grooved or notched stones. Perforated stones are abundant but cannot be regarded as having been sinkers. It seems likely that the statement of one of the few surviving Indians of this region is correct, that when a sinker was wanted, a convenient stone was usually picked up from the beach.

Nothing like either a distinctive hammer-stone or club is known to the archæology of California, nor have such implements been found among the Indians. Acorns were constantly cracked, but unworked stones answered this purpose as well as a finished implement. Other requisites of a hammer could have been fulfilled by the ever-present pestle. In northwestern California a short flaring knobbed maul was employed solely for driving elk-horn wedges. In other parts of the state horn wedges or chisels were also used, as their presence in the San Francisco bay mounds testifies; the implement that drove them has not been identified, if indeed it existed as a separate form. The restriction of the maul to northwestern California is no doubt due to the greater development there of working in wood. Stones are frequently mentioned as used by the California In-

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dians in hand-to-hand fighting, but they were stones that came to hand, not clubs. In northwestern California there is some record of short, sword-like stone war-clubs, and a few pieces have been found which seem to answer this description. They are of the general type of the slave-killers and one-piece edged clubs of the Pacific coast farther north, as contrasted with the handled hammer-headed club of the Plains and East.

The usual recent arrow-straightener in the northern half of California is a perforated piece of wood. Such a piece has been found also on one of the Santa Barbara islands. The two-piece grooved sandstone arrow-polisher also occurs in the north, among the Yurok and Maidu, and will probably prove to be of some antiquity. In the southern half of California a combined straightener and polisher is found which has southwestern affiliations. It is usually of steatite or soft-grained stone, rectangular, convex above, and transversely grooved. This form is found in the southern San Joaquin valley and Sierra Nevada, the Santa Barbara region, and southern California. The modern tribes in the same region still use it, and the Mohave replace the stone implement by one of pottery.

In certain parts of the Sacramento valley, notably Butte county, oval stones encircled by a lengthwise groove are found in numbers. These resemble sinkers, but may have been attached to strings for slinging at or around game, thus constituting bolas.

A few rather large crescent-shaped stones have been discovered. In southernmost California, among the Diegueño, these are used in the girls' puberty rite. Single pieces have been

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found also in Los Angeles, Santa Barbara, Kern, and Alameda counties.

The pipe of California is tubular. It usually tapers evenly toward the mouth, but in the north is sometimes concave, in the south convex. In the Santa Barbara region it is often provided with an inset bone mouthpiece. In the southern half of the state it occasionally shows a shoulder near its middle. A tubular pipe of red catlinite has been said to have been found in southern California, which, if authenticable, is of interest as an indication of trade distribution. Variations from the straight tubular form of pipe occur only in the Santa Barbara region and in the extreme northeast. The southern variant is obtuse-angled, the bowl end of the pipe rising from the axis of the mouth end at an angle of from twenty to fifty degrees, the bend coming at the middle of the length. In northeastern California, among the Modoc, a flat circular pipe-bowl, in which a short wooden stem is inserted, is found. It seems, but remains to be determined, that this is an ancient as well as a modern form. The material of the pipe, whose boring was unquestionably one of the most difficult technical achievements of the old Californians, is naturally most generally a stone that is fine-grained and susceptible to polish. Steatite, serpentine, and slaty stones predominate, but in the Santa Barbara region a characteristic rough reddish stone is not infrequent. Decoration on pipes is extremely rare. It is interesting that while the pipe among the Indians of recent generations in many parts of California has been of wood only, ancient stone pipes are found in every portion of the state, and certain modern Indian languages corroborate this by calling the wooden pipe "tobacco-stone." The

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stone pipe is often excessively short, as in the shellmound region, but this is not surprising in view of the fact that the typical recent wooden pipe of the Sierra Nevada is only two or three inches long. Almost everywhere the pipe is also a shaman's implement, especially for sucking; and it seems likely that this was the case in ancient times as well.

The distribution of stone vessels or dishes is rather closely dependent on the occurrence of steatite. The famous aboriginal quarries and work-sites on Santa Catalina island were undoubtedly the source of much of the steatite manufacture of southern California; but steatite is said to occur also near the Santa Maria river. Statements of Indians and the occurrence of vessels make it probable that there existed ledges not far from Fresno county, and the occurrence of vessels in and near Plumas county coincides with a local source near Quincy. In northwestern California steatite is found on the coast of northern Humboldt county, and perhaps elsewhere. It is said to occur in Yuba and Sonoma counties. The typical Santa Barbara vessel was nearly spherical, with mouth smaller than diameter, thin-walled, well-made, sometimes ornamented with striations, and at times large-sized. At least sometimes it was used for cooking, and when broken its concave fragments were used as baking-slabs. The northwestern vessel was elliptical, low, and often irregular. The modern Indians make and use vessels of this type principally for collecting dripping salmon-fat, and depend entirely on baskets for cooking. It is also characteristic that the northwestern Indians make and made almost no use of steatite other than for dishes and pipes, whereas the southwestern people manufactured

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from it also arrow-straighteners, beads, and such ornamental or ceremonial objects as the hooks and whale-carvings that have been mentioned. In the San Francisco mounds and elsewhere in central California, charmstones, pipes, and other small objects are found made of steatite, but no vessels. Steatite here was probably brought from a distance in small pieces.

Labrets are not known to the present California Indians, but they employed ear-plugs, usually of wood ornamented with feathers or shell. The Santa Barbara remains contain nothing that could be positively determined as ear-plugs, but several soft stone specimens have been found in the San Francisco shell-mounds and elsewhere in central California. A large, beautifully rounded, and highly polished piece of obsidian of ear-plug shape from Sonoma county, is remarkable not only for being perhaps the largest specimen of this form yet found in California, but for being one of the very few instances of ground and polished obsidian. A specimen from Tuolumne county, of soft stone, is slightly smaller.

Quartz crystals, probably shamanistic in import, are found in both the San Francisco and Santa Barbara regions. One from the Emeryville mound is painted red and ornamented with shell beads set in asphalt; several from Santa Rosa island were hafted in long bone handles. The modern Luiseño Indians of southern California use quartz crystals ceremonially, and it seems that they are employed by shamans elsewhere in the state.

Mica is rarely found, but there are specimens from the San Francisco mounds. It is perforated and cut, but not into elaborate shapes.

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CHIPPED STONE IMPLEMENTS

Implements of chipped stone are characterized and conditioned by the occurrence of obsidian, whose nature causes it to be preferred to flint, at least for most purposes, wherever it is obtainable. Obsidian is known to occur in at least three parts of California, and it is clear that for a long time back no section of the state has been without at least a moderate supply of the material or of objects made from it. One field is in northern California, in Shasta county or northward. This is evidently a southward extension of the important Oregon field. From this source comes the obsidian from which the extremely large blades of the lower Klamath river were manufactured. The modern Indians know that their obsidian was brought down the Klamath. A second field is in Lake and Napa counties. While no ledges are known here, fragments of obsidian occur in abundance. A third field is in Mono county. The material from this source is stated by the Indians to have been carried across the Sierra Nevada. Table Mountain near Oroville, in the Sacramento valley, is mentioned by one authority as a source of obsidian, by another of flint.

Generally speaking, the presence of obsidian undoubtedly contributed to the art of chipping. Some of the finest flaking ever successfully carried out anywhere, and some of the largest perfect artifacts of obsidian, are found in southwestern and northwestern California. The Santa Barbara blades are smaller than those of the lower Klamath, but both are larger and on the whole considerably finer than those found in other parts of California. In central California the larger blades are often quite roughly made. The coast region north of San Francisco bay, to which

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the Lake and Napa field supplied an abundant source of material, possesses a particular abundance of arrowpoints and smaller blades of obsidian, which in some districts are usually serrated. The peculiar curved obsidian blades of the vicinity of Stockton have been mentioned. With one or two exceptions there are no known instances of ground or polished obsidian.

The most delicate flint chipping is found in the Santa Barbara region, whether on account of the advantage of superior material or from a general higher development of industrial arts, is not yet certain. The Santa Barbara arrowpoints are, however, on the whole neither so small nor so thin as the smaller specimens found in northern and central California, some of which rival the celebrated ones of the Columbia river. In northern California and in parts of central California the arrowpoint usually bears two well-marked notches just above its base, which serve to tie it to the arrow. This feature is, however, at least in part, dependent upon the size of the implement, being almost always present in small pieces and rare in larger ones. Many of the latter which are customarily classed as arrowpoints may in reality not have been such, thus accounting for the difference.

We know something positive of the aboriginal flint knife of California through finds of hafted implements made in graves in the Santa Barbara region, and through similar pieces found in the possession of the modern Indians of the northwest. The former are triangular, with the entire base set in a wooden handle; the latter leaf-shaped. In both cases it is clear that the finest material for chipping was not used, and the work is characterized by a roughness and irregularity which contrasts de-

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cidedly with the best work done in both regions. Very little is known of the typical scraper of California, and there are but few implements that may with any certainty be identified as having been intended primarily as such implements. The preparation of skins was less important to the California Indians than to most others. There is as yet no evidence of the existence of scraper-shaped knives, blades with a handle opposite and parallel to the edge.

Flint picks and drills have been found in abundance on the Santa Barbara islands. They vary greatly in size and weight. Most of the specimens collected seem to have been used as picks rather than as drills. Very thin slender pointed flakes of triangular cross-section are found in the Santa Barbara region, usually in considerable numbers in one burial. These would unquestionably have been serviceable as drills or scratchers, but their actual use is still undetermined, though it is asserted on Indian authority that they were shamans' scarificators.

BONE IMPLEMENTS

The most abundant implement of bone is the awl, which while capable of a variety of uses, and undoubtedly thus employed, was indispensable in the making of coiled basketry. Bone needles are much less common, though they are hardly rare. They are of such a thickness that they must have been less serviceable for such sewing of skins as was done, than the sharp pointed awl. They were probably used more largely in textile processes, such as the sewing together of bulrushes into mats.

Barbed arrowpoints of bone are uncommon and known chiefly from the Stockton earth-mounds.

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Bone whistles of various sizes are found in all parts of the state, just as they appear to have been used nearly everywhere by the recent Indians. Whistles of bird bone are most frequent, but larger bones occur occasionally. The stop in whistles is usually produced by a flat incision not far from the middle of the bone tube, asphalt, pitch, or gum being built up in the opening thus produced.

In the Santa Barbara region bone was considerably used for ornamental purposes. There are flat bone pendants and disks, and bone beads and tubes, some of the latter with shell and asphalt inlay. Rude tubular beads of bird bone have been found in one of the San Francisco bay mounds. In the south, flat spatula-shaped and flat pointed implements of bone occur. The purpose of these and of allied forms, including long slender rods lacking a sharp point, and large flat pieces of whale's bone, is uncertain. In the San Francisco shellmounds a characteristic implement which has not been discovered elsewhere consists of the thick portion of the shoulder-blade, usually of a deer, of which one side has been notched so as to present a saw-like edge. This edge is thin and fragile and no satisfactory explanation has yet been given of a use to which it could have been put.

HORN IMPLEMENTS

Horn appears to have been of much less importance than either bone or shell. Numerous points of deer antlers are found in the mounds of the San Francisco and Stockton regions. Their use is entirely unknown. The San Francisco mounds contain also wedges of deer and elkhorn. That these pieces were actually used as wedges is made practically certain by the occur-

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rence of identical pieces among the modern Indians of northwestern California. While perhaps also used as chisels by these Indians, their principal function is the splitting of wood. Besides wedges, the northwestern Indians make money-boxes, spoons, netting shuttles, and net mesh-measures of elk antler. Systematic exploration of the archæology of their habitat may reveal that these forms were made also in antiquity. They can hardly be expected to show a wider distribution, as their manufacture in recent times was limited to this one corner of the state.

SHELL OBJECTS

Implements of shell are hardly encountered in California archæology, shell objects belonging either to the category of beads or to that of ornaments. There are several types of beads, the principal of which are each mainly confined to one region.

In northwestern California manufactured beads are almost entirely absent, and the standard shell currency has consisted, as farther north on the Pacific coast, of dentalia, to the longest specimens of which extraordinary value was attached. This was the case, however, only in the region immediately about the lower Klamath. While dentalia were known in the districts to the south and east, they were much less esteemed, and consequently, it seems, less frequently imported. The dentalia of northwestern California all came from the north, the northern species of Pacific coast dentalium not growing south of the Puget Sound region and the southern form no farther north than southernmost California. The northwestern Indians usually ornamented their dentalia with a wrapping or covering of snakeskin. They also occasionally incised them with geometric

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ornaments. When the archæology of the region is more fully known, it will be of interest to learn whether the use of dentalia characterized northwestern California in antiquity as at present, or whether the introduction of this form of currency from the north was of comparative historical recency. The southern California species of dentalium was sparingly used in the Santa Barbara region, chiefly as a bushing in the perforation through tubular beads.

The standard currency of the greater part of central California consists of strings of disk beads of about the size of a small coin, but several times thicker. These disk beads are always white and are all made from a species of clam of the genus *Saxidomus*, which, in recent times at least, is gathered only in the vicinity of Bodega bay. The territory about this bay is in the possession of the coast division of the Indians of Miwok or Moquelumnan family, but the neighboring Pomo have been wont to make frequent trips to this point for the purpose of collecting this material so valuable to them. The Pomo and, before their practical extinction, the coast Miwok, seem to have been the distributors of the beads, and in some cases perhaps of the unworked shells, to the tribes of the Sacramento valley to the east. From there the currency reached the Indians to the north and south. Beads of this type are usually well rounded and sometimes highly polished at the edges. While they were made in varying sizes and their value seems to have depended rather upon their thickness than their diameter, the beads on one string were uniform in size. Archæological discoveries disclose this type of bead to have been used in former times over the same territory as more recently.

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A third form of bead currency is southern. It consists also of perforated disks, which were strung and measured. It differs from the central Californian type in that the disks are thin and concave, being made of a small univalve shell, *Olivella biplicata*, instead of from the thick clam. While often well rounded, these curved beads are at other times irregular in outline, and sometimes but little attempt seems to have been made to grind them to a circular form from the irregular polygons in which they were first cut out. Beads of this kind are exceedingly abundant in the Santa Barbara region. They are also found on the mainland of southern California. They are characteristic also of the shellmounds of San Francisco bay, though these are usually poor in beads of any kind. Whether their occurrence in the San Francisco bay mounds indicates a change from ancient to recent times is not certain, as has been indicated above, because it is not positively established whether the Indians of San Francisco bay at the time of discovery used the thick flat beads employed by their neighbors in central California or were at that time still using the thin concave bead typical of the south. A few square beads have been discovered in the San Francisco and Stockton regions. A large clam, *Pachydesma* or *Tivela*, was used for ornaments and flat beads in the Santa Barbara region, but did not enter into competition with the curved olivella bead as a standard form of currency measured on strings.

A fourth type of bead, characteristic of the south, is the long tube, usually made of the columella of *Siphonalia* or large univalves. This is frequent in the Santa Barbara region. The recent Indians of the San Joaquin valley prize these and similar

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beads highly and they may therefore have been of considerable value also in the region of their manufacture.

Beads consisting of entire olivella or other small univalve shells, with merely a perforation for stringing, were used in all parts of California, but they were regarded as of but slight value and comparatively little esteemed for decorative purposes.

In the Santa Barbara region beads of other material than shell are also abundant. There are spherical, cylindrical, and tubular beads, large and small, of steatite, of colored and translucent stone, and of bone, some rudely made, but others well formed, highly polished, and decorated. These do not seem to have experienced any considerable distribution to other parts of the state. In central California one type of bead of other material than shell was made. This was occasionally disk-shaped or spherical, but usually cylindrical, and sometimes of considerable size. It was made of whitish magnesite, which on baking assumes beautifully mottled shades of white, orange, and terra-cotta red. So far as known the source of supply of this material is on Cache creek near Clear lake, where the modern Indians still collect and manufacture it. The making of these cylindrical beads was therefore in the hands of approximately the same people as those that manufactured the thick disk currency, and both its ancient and modern distribution seems to have coincided closely with that of this type of shell bead.

Haliotis or abalone occurs on the entire California coast, as far north as about Cape Mendocino. It is, however, more abundant in the south than in the north. Its qualities are such that its use by all primitive people who can obtain it is obvious. It is most employed and most elaborately worked in the Santa

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Barbara region, where pendants of many shapes, both large and small, were made from it. A frequent form is a hollow circle with a projection at one end for a perforation. Characteristic curved hooks of haliotis are also abundant. These have been interpreted both as fishhooks and as ornaments. There were no currency or any regularly shaped beads of haliotis. Large curved strips or fragments from the lip of the shell, sometimes incised but often unornamented, were much used as pendants. These forms, whose shape and curvature are given by the shell, are perhaps the most frequent type of haliotis pendant or ornament in the San Francisco bay shellmounds. Other forms are oval or irregular. The frequency of irregular or indeterminate shapes of haliotis ornaments is noteworthy. The recent Pomo Indians have used haliotis as pendants on basketry and ceremonial regalia. The northwestern Indians employ it chiefly as attachments on women's dresses and ear ornaments.

The species of shells composing the refuse deposits in different parts of the state have not been determined in their relative importance. The mussel seems to have furnished the bulk of the food, and the greater volume of the mounds, on San Francisco bay. The same seems to be true to an even greater degree of the less striking but unexplored deposits of the coast to the north, and perhaps for some distance to the south. The proportionate frequency of various species in the deposits and remains of the Santa Barbara region does not seem to have been reported.

IMPLEMENTS OF WOOD AND FIBER

Implements of wood, textiles of fibers, and ornaments of feathers or hair have occasionally been well preserved, but do

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not possess the relative significance for the archæology of California that their intrinsic importance might warrant. One reason for this circumstance is the fact that all such remains that have been discovered resemble closely corresponding implements used in recent times. While such a correspondence of archæological and ethnological data is of interest even though the lapse of time involved may not be greater than a few centuries, it is not of the same significance as a noteworthy difference between the two classes of records would be. Nor can the archæological data be looked upon as quite as valuable as if ethnological information were entirely wanting. So far as implements of wood are concerned, the evidence of archæology is particularly incomplete, because in the regions where wood underwent the greatest number of processes of manufacture, it has been, on account of a humid climate, least preserved. It is in the comparatively arid south, where culture depended less on wood than on other materials, that the principal remains occur. The most important of these are a few wooden bowls and ceremonial sword-shaped objects. Some of the latter are inlaid. Considerable fragments of basketry, both coiled and twined, are preserved in the Santa Barbara region through having been coated with asphalt. Even where the textile fiber itself has decayed, its impression may remain intact. A number of complete objects of basketry, together with feather-work and objects of religious use, have been found in the caves of the south. A spear-thrower, of which a single specimen attributed to the Santa Barbara region is the sole representative from California, is made more doubtful than even its uncorroborated ethnological status leaves it, by the entire

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failure of archæology to discover an implement that could be so interpreted.

POTTERY

It has often been believed and sometimes asserted that the native civilization of California is and was without pottery. It is now well established that in recent times two types of pottery were made and used in two parts of the state, and while a high antiquity for these two industries cannot yet be asserted, there is every indication that they may have flourished for at least a considerable time past.

In southern California as far north as the San Bernardino range, and along the Colorado river to a somewhat higher latitude, a thin, light, brittle, porous, red pottery was manufactured, identical with that made at the present time by the Luiseño and Mohave, and somewhat similar to the ware manufactured by the Pima and their ancestors in the Gila valley. It seems that the pottery of the Seri Indians of Sonora, whose culture shows many affiliations with that of the tribes of Yuman family, of which the Seri were at one time believed to have formed part, was of the same type. The pottery of the Colorado river, both past and present, is usually decorated with paintings in yellow oxide of iron, which burns to a dull red. The pottery of the part of southern California farther removed from Arizona is in most cases undecorated, though its material, forms, and technical processes are identical. Most of the ancient pottery preserved in this part of the state has been found in the mountain region of San Diego county, and consists either of jars in which ashes of the dead have been preserved or of vessels in which food was hidden for storage. North of the San Bernardino

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range and west of Los Angeles, pottery does not seem ever to have been manufactured, nor imported from the south except possibly in occasional stray pieces.

The second and less important area in which the California Indians made pottery is in the southern end of the San Joaquin valley and adjacent portions of the Sierra Nevada. The pottery here is grayish black, undecorated except occasionally by a few incisions, and exceedingly crude. It possesses little strength, the forms are unusually irregular, and in general it is but poorly and roughly made. It seems to have been constructed primarily for the purpose of cooking. It has been made, up to the present day, by the southern Yokuts and the Shoshoneans of the southern Sierra. That it was not an art of primary importance among these people is made clear by the fact that their basketry is fully equal in technique as well as in variety of forms to that of neighboring tribes who do not use pottery. There are no explicit records that any ancient pieces of this type of pottery have been found, but it seems that such is the case.

PICTOGRAPHS

Pictographs, either carved or painted, are comparatively scarce in California except in the region east of the Sierra Nevada occupied by Shoshonean tribes, and in such other parts of the state as have in historical times been either held by Shoshoneans or by tribes living sufficiently in their proximity to have come under their influence. The typical non-Shoshonean petrograph in California is executed in several colors.

In Inyo county, east of the Sierra, there are a number of well-made rock-carvings. On the California side of this great

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range the most northerly pictographs recorded are near Summit station in Placer county. A petroglyph is also reported in Calaveras or Tuolumne county not far from Sonora. There is a record of another on the upper Tuolumne river. There are two sites in the foothills of Tulare county, one near Lindsay, the other on Tule River reservation above Porterville. The latter shows unusually fine painting, applied without any incisions in the rock, and in part is well preserved. Red-painted rocks are recorded as in a canyon on Mt San Antonio, on the boundary between Los Angeles and San Bernardino counties. Other sites, some of which are in need of verification and some of which are well-known and have even been defaced, are in Azusa canyon, Los Angeles county; in a cave in the Santa Susanna mountains in Ventura county; four miles northeast from Santa Barbara; twelve miles northwest from Santa Barbara; near San Marcos Pass, in the Santa Inez mountains, in Santa Barbara county; at Fisher's peak near San Luis Obispo; and a large and well-preserved group of paintings on an isolated rocky hill in the desert Carriso plains, also in San Luis Obispo county. In the southernmost parts of the state, granite bowlders can still be seen covered with geometrical paintings in red, which were executed in comparatively recent times by the Luiseño and Diegueño Indians in connection with their puberty ceremonies. On the Santa Barbara islands several rude pictographs, incised in narrow lines, have been found on implements and small slabs of soft stone. For northern California there are but few records. There is said to be a figured rock in Siskiyou county not far from Yreka. On the edge of the Klamath river, a short distance below the mouth of the Trinity, is a large bowlder, on one of the smooth surfaces

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of which are pecked many simple geometrical figures, whose character recalls the decorative motives used in the art of the modern Indians of northwestern California. It is prehistoric so fas as the modern Indians are concerned, and is declared by them to be the only object of the kind known to them. In southern Humboldt or northern Mendocino county there are one or two rocks carved with rude and simple figures of circles and lines. Altogether the scarcity of rock-carvings and rock-paintings in California, which is in entire accord with the lack of symbolic and representative spirit shown by the California Indians, constitutes a striking difference from the abundance of such records throughout the Great Basin and Plateau region to the east.

PROBLEMS AND CONCLUSIONS

Such are the principal traits of the archæology of California in its cultural aspect and as seen by one whose acquaintance was originally with the ethnology of the state. Such being the results to date, it remains to consider the principal problems now before the archæology of California, and the methods of attack which are most promising.

The single problem of greatest importance is undoubtedly that concerning the origin and early antiquity of man. The final answer to this is likely to bear on the question of the origin of man in general and to be of more than regional or ethnographical interest. The greatest opportunity for the discovery of evidence on this question seems to lie in the exploration of caves. The gravel deposits so far have yielded negative results, and the shellmounds, while their antiquity is great from a historical point of view, are almost certainly too recent to throw much

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light on the first appearance of man in the region. If man existed in California in quaternary times, the chances are greater that he inhabited the country in late epochs of this period than in earlier ones. While the search in caves dating to the early or middle quaternary accordingly promises more fundamental and more sensational results, if positive results are obtained, the question, if not of the origin, at least of the geological antiquity of man in western America, is likely to be sooner answered by investigation of caves that are somewhat more recent.

The value of the exploration of shell deposits, particularly those on San Francisco bay, lies especially in the fact that these mounds go back to an age which is measurable in terms of geology. They present, therefore, one of the few instances as yet found in North America of a field of exploration in which there is hope that relations of time not only among the remains themselves, but in comparison with remains elsewhere, can be determined. Many of the mounds have partly or wholly disappeared, and they are daily undergoing destruction through the agencies of civilization. Many of the questions as to their antiquity, and as to the development of culture which the implements contained in them may show, depend for a satisfactory answer on the accumulation of a large mass of material. While something has been done, it has served to show how problems much more fundamental may be solved if a greater quantity of data can be amassed. The further and extensive exploration of these mounds on a systematic scale is therefore not only a desideratum but an urgent need.

The mounds of the interior valley, which consist more largely of earth than of shell deposits, are on the whole less readily

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productive either of collections or of data than the shell deposits of the coast. The results obtained in the vicinity of Stockton, however, show that an entirely uniform type of culture did not by any means exist throughout central California in former periods, and promise to make the information obtained by a more thorough exploration of the sites in the valley qualitatively important in proportion as the material finds may be quantitatively insignificant.

The entire hilly and mountainous portion of the central part of the state, both near the coast and in the interior, whose topography afforded but little opportunity for the accumulation of actual mounds, has never been systematically explored. The remains in such regions are so much more scattered than in a district containing mounds, that exploration is much more difficult and likely to be less productive from the museum standpoint. There are, however, many ancient village sites, and some that have been more recently abandoned, the locations of which are known, and which should be investigated. Most of these are in locations particularly favorable for either agriculture or mining and therefore in imminent danger of partial or complete destruction before they can be properly examined. Almost all that we know of the archæology of the central region of California other than the mound districts, comprising the greater part of the state, is through the collection and description of implements that have been found on the surface or have been unintentionally uncovered by the miner or agriculturist.

The coast region of central and northern California is also almost entirely unexplored, both north and south of San Francisco bay. The precipitous shores which characterize the great-

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er part of the coast on both sides of this bay are not so favorable to considerable accumulations containing remains of culture as the lower and sheltered inland shores of the bay. There are, however, parts of the coast, such as the bay of Monterey and Humboldt bay, in which conditions approximating those of San Francisco bay exist, and for which the prediction can safely be made that archæological exploration cannot under any circumstance be entirely fruitless. Even the less promising parts of the coast will probably show more records than is now anticipated. Explorations on the northernmost coast of California will be of particular importance because they will determine whether the specialized modern aboriginal civilization of this region is ancient or recent, and if recent are likely to make clear its development.

In southern California the Santa Barbara region, after all that has been removed or destroyed, still offers fruitful opportunities in material to the collector, though the cream has undoubtedly been skimmed, largely by collectors without serious interest other than in possession. The ancient culture of this region is, however, so much better known than that of others parts of California, that from a scientific point of view its further exploration is at present much less desirable than systematic work almost anywhere else. What there is need of in the Santa Barbara region is not the miscellaneous gathering in of specimens, of which there has been only too much, but systematic examination of the deposits in which these specimens occur, along the lines of the work recently done on the San Francisco bay mounds, with a view to acquiring information as to cultural and chronological relations.

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Southern California outside of the islands and the immediate Santa Barbara region, has proved to be a much less productive field for collecting and is therefore much less known. Many of the remains are of the Santa Barbara type, but there are also elements, such as pottery, which are foreign to the Santa Barbara culture. The nature and distribution of these, as well as the extent of the relations with the culture of the islands, are in need of determination. The coast south of Los Angeles has never been carefully explored. Some important discoveries are probably also to be made in the caves and canyons of the chain of mountains extending eastward and then southward from Santa Barbara county to San Diego county.

We have begun to be able to form some estimate of the civilization of the ancient inhabitants of California, and we have just commenced to obtain a glimpse of the chronological and historical relations of this culture. What progress has been made has shown, however, in even greater measure what we do not know than what we do know, and emphasizes above all the importance of what we can hope to learn through careful, systematic, unprejudiced, and extended investigation.

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ANCIENT ZUÑI POTTERY

BY

J. WALTER FEWKES

INTRODUCTION

ALTHOUGH considerable progress has been made during the last two decades toward increasing our knowledge of the character of prehistoric Pueblo pottery and the decipherment of its decorative symbolism, the subjects are still more or less obscure. This obscurity is due in part to a paucity in observations bearing on the geographical distribution of ancient ceramics. There still remain several Pueblo areas concerning the prehistoric pottery of which we are profoundly ignorant, as no specimen of undoubtedly prehistoric ware therefrom has yet been described. A knowledge of the localities from which ancient pottery is obtained is necessary if the specimens are to be used in scientific studies. The locality of the individual ruin from which ceramic objects have been collected must be known before we can arrive at an accurate interpretation of the lessons they teach.

Considering the many years that have been devoted by zealous students to the archæology, history, and ethnology of the Zuñi Indians, it is strange that nothing of great moment has yet been published on prehistoric Zuñi pottery.[1] Several old

[1] It is very desirable that one of the great ruins illustrative of prehistoric Zuñi culture be excavated and repaired to serve as a "type ruin" of this region.

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vessels in the form of ancient heirlooms have been gathered from households of this pueblo, but none of these can be regarded as more than a few generations old. Prehistoric Zuñi pottery is practically undescribed, notwithstanding this is one of the most important Pueblo areas with which the ethnologist is familiar. The relations of the prehistoric people of the Zuñi valley to those of other regions of the Southwest and to those now inhabiting the pueblo that has given name to the valley, cannot be accurately determined unless we have exact knowledge of culture objects from ruins in this region. As pottery furnishes some of the best data from which to obtain a knowledge of prehistoric culture, it is important in this connection to study objects of this character.

From the autumn of 1888 until the spring of 1889, the Hemenway Archæological Expedition, of which Mr F. H. Cushing was then director, made extensive excavations at two ruins in the Zuñi valley, called Halona and Heshotauthla, the former situated just across the river from the present Zuñi pueblo, the latter about fifteen miles to the eastward, near the road from Zuñi to Nutria and Pescado. In the course of these excavations [1] there was obtained a collection of prehistoric pottery, now in the Peabody Museum of Harvard University, which has never been described or figured. This collection forms the basis of the present article.

The antiquities from the ruins were placed in the writer's hands for study in the winter of 1889 by Mrs Mary Hemenway,

[1] The excavations at Halona were conducted under Mr. Cushing's personal supervision, and the work at Heshotauthla was also initiated by him; but departing for the East in October, 1888, Mr Cushing assigned the continuation of the task to Mr F. W. Hodge, with Mr E. P. Gaston in immediate charge of the laboring force. Mr Hodge made frequent visits to the excavations from the Expedition headquarters at Zuñi, surveyed and mapped the pueblo, and submitted to Mr Cushing full reports on the progress of the work, until deep snows compelled its abandonment.

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whose death a few years later practically closed the field work of her expedition. Accompanying the collection was a large number of water-color drawings made by Miss Margaret W. Magill (now Mrs F. W. Hodge), and a map of the ruin of Heshotauthla prepared by Mr Hodge.[1] Years ago the author likewise had access to a card catalogue of the objects exhumed in the course of the excavations at the latter ruin. This catalogue is now in the Peabody Museum of American Archæology and Ethnology at Cambridge.

After a study of this material the author visited[2] Heshotauthla in the summer of 1890, and made further notes on its general appearance, together with a few photographs of different parts of the ruin as an aid to his studies.

As it was not the author's good fortune to be present when the excavations were made, he cannot present more than a general account of the major antiquities of these ancient Zuñi pueblos, but it has seemed well to give a description of the ruins as an introduction to a study of their pottery and other objects. Since this article was written, the author has greatly enlarged his knowledge of Pueblo archæology, and is now better equipped to interpret the collection than in 1890, when a novice in this field.

The collection of prehistoric Zuñi pottery here considered[3]

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[1] For a reproduction of this ground-plan, see *Journal of American Ethnology and Archæology*, I, 1891.

[2] The author made his first visit to the ruins of Halona and Heshotauthla in the summer of 1889, at which time he remained at the place only a few hours, having no intention of writing anything about it. His second visit, in the following summer, was likewise a brief one, insufficient to make any extended observations on the excavations. As the author has conducted no archæological investigations on the Zuñi reservation, this article, treating of work done many years ago by others, necessarily lacks the element of personal observation which would have greatly enhanced its value.

[3] The majority of the specimens (all of those having catalogue numbers) are from Heshotauthla. The specimens of pottery without catalogue numbers may have been obtained at Halona.

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is the most complete one illustrative of this culture area ever made, and is believed to include the most important types of archæological objects in this region. The study of these remnants of an older people is of great interest from a comparative standpoint, a fact which has led the author to publish the results as a contribution to future archæological work in this valley.

RUIN OF HESHOTAUTHLA

The ruin of Heshotauthla lies on a slight elevation, at the base of a hill of moderate height. A fairly deep arroyo extends along the southern edge of the pueblo, cutting the mounds on the side toward the road.

From a distance the ruin appears as a simple mound; none of the old walls stand above the surface. The surface of the mound is strewn with small stones and covered with clumps of the scrubby sage-brush so common to the region. Although the neighboring hills have many small cedars, there are no large trees, and the dry soil bears little vegetation. At the time of the writer's second visit the place bore a deserted appearance, not even an Indian house relieving the monotony of the surrounding desert. Much débris covered the walls of the old settlement, whose mounds rise fifteen or twenty feet above the plain.

The walls revealed by the extensive excavations of this ruin, carried on in the fall and winter of 1888 by the Hemenway Expedition, were easily traceable in 1890, so that at that time the general form of the pueblo could be made out with fair accuracy. It was thought by Mr Cushing, who planned the work, that excavations at Heshotauthla would shed much light on the culture of the ancient inhabitants of the Zuñi valley,

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for this pueblo belongs to the type of ancient circular ruins only a few of which exist in the neighborhood. The circular form of ruin, like the circular kiva, is very old in the Pueblo area.

On visiting this locality one is impressed by the great amount of débris seen all about the ruins. This débris is largely fallen masonry, which is so great in amount that the rooms are completely filled and most of the walls covered. It consists not only of small flat stones such as were used in the construction of the houses, but also of soil, adobe, ashes, fragments of pottery, and other materials. The amount of this débris would lead one to suppose that the former height of the pueblo was considerable.

The cause of the destruction of the pueblo is one which has not been satisfactorily explained. The ruin is situated so far from inhabited pueblos that it can hardly be supposed that the walls were torn down by the Zuñi people for later buildings, nor does it seem probable that they would have been overturned by forces other than human. Zuñi itself is too far away (about fifteen miles), and there are ruins nearer their home which the inhabitants of this place could have demolished if they needed building materials, even if quarries were not near at hand. Many of the walls of modern Zuñi, as of the neighboring Halona, are built of adobe.

General Features of Heshotauthla. — The ruin of Heshotauthla covers about an acre and a half. The chambers average about ten feet square; but there is little uniformity in their dimensions, some of the rooms being not more than three or four feet square. The distance from the bank of the river to the arroyo is about thirty-five feet. Although the general shape of

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the ruin is circular[1] (a section of which is best seen in the southeastern part), there are evidences that there was a rectangular wall on the northern and western sides, thus forming a right angle at the northwestern corner. A row of rooms excavated at this point have their walls intact, and present some very interesting examples of the style of architecture of the rows of old pueblos. On the southeastern and eastern sides, where the outline is the arc of an oval, several of the rooms which were excavated show instructive features of early Pueblo architecture. There are also evidences of rooms in the southwestern section. Walls of a number of chambers were brought to light on the northern border of the town. From the above-mentioned excavations one can gain a fair idea of the shape of the ruin, the arrangement of the chambers, and their general characteristics. On the southern side of the mound the pueblo rises like a bluff from the Rio Zuñi; from excavations made at this point one may suppose that here was a dumping-place not unlike that overlooking the river on the southern side of the present pueblo of Zuñi. At this point are situated certain structures, identified as "ovens," which will later be described.

The section of the river-bank just east of the "ovens" shows that the bluff at this point is composed of alternating layers of wood-ashes, charcoal, broken pottery (mostly corrugated), and fragments of bones. On the northern side of the pueblo, the mound covering the ruins rises more gradually than on its southern side, the summit being only a few feet above the road. From the arrangement of hillocks of earth on the northeastern corner it would seem that the whole ruin was formerly sur-

[1] Although common east and north of Zuñi, circular ruins are lacking in the territory west of that pueblo.

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rounded by a simple wall; for outside of the outer row of rooms there is a depression, as if the remains of a moat, enclosed within an elevated ridge composed of the débris from the wall. This surrounding wall was traced, along the northern rim, to the western border of the ruin. On the southern side of the ruin it forms the back of the "ovens" which were uncovered at that point, while on the southeastern border it is obscurely indicated by walls of rooms the interiors of which were excavated.

Extensive excavations were made slightly to the east of the center of the ruin. Those made on the extreme eastern end brought to light stone walls, but other trenches nearer the center revealed no such walls, indicating a plaza or open space in that part of the pueblo. Holes dug in the course of this work, from fifteen to twenty feet deep, showed on their sides successive layers of charcoal, ashes, many potsherds, and fragments of bone.

From the map of the ruin it appears that the largest number of rooms was found in the northern side of the ruin, a conclusion not unlike what one should expect from the character of similar circular pueblos in other parts of New Mexico.

Character of Walls. — The walls of Heshotauthla and of the different chambers are built of small, apparently dressed stones, laid in adobe mortar. Fallen masonry is scattered all about the ruin, some of the building stones occurring at a considerable distance from the mound. At certain points the walls were pierced by square openings [1] a few inches in diameter, made by the omission of one of the component stones in its row; these apparently served as windows.

[1] Similar openings occur in the rectangular ruin on the hill between Ramah and Pescado, and in the well-preserved walls of Archeotekopa, in the Zuñi region.

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The arrangement, shape, and size of the rooms vary considerably in different sections of the ruin. No rooms identifiable as kivas were uncovered. As a rule the rooms at the northeastern corner are square, and arranged in single rows; those on the southwestern side form a double row and in shape are uniformly square. Elongated wedge-shaped and rectangular rooms occur in greatest numbers in the southeastern section of the ruin. It seems as if the builders of this pueblo were obliged to construct wedge-shaped rooms at intervals to complete the oval, leaving many of the rooms rectangular.

Passageway. — On the easternmost side there is a narrow passageway, a few feet wide, with high walls on each side. It is not impossible that before its destruction this passageway was roofed over, and somewhat resembled similar alleys seen in Zuñi at the present day. Apparently, however, the passageway in Heshotauthla did not lead from outside the walls into an open plaza, or from one lane to another, but ended blindly in a chamber walled up on three sides. Just south of this passageway is a large room having an oblique rectangular form. Diminutive rooms, not more than half the size of the majority, occur on the eastern end of the northern series of chambers in the northwestern corner. A construction resembling a flue, or air-shaft, is found in the first room of the northwestern corner of the western series of rooms. This structure is built of stone set against the southeastern wall. There are two other vertical flues having rounded walls plastered with adobe, built side by side. Whether these shafts should be regarded as kiva ventilators is not evident. It would seem from their position and general structure that they were chimneys, but their external openings being ab-

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sent, and no sign of a fireplace or of smoke being apparent, their meaning is not determinable. A similar flue occurs in the northern series in the second room from the northwestern corner.

In examining the rooms excavated at Heshotauthla one is impressed by their small size. That these chambers were dwelling-rooms, traces of fire on the walls would seem to bear witness, but they are so diminutive that it would be difficult for a man to extend himself on these floors at full-length. Many of these rooms are not smaller than some of the older rooms in the modern pueblo of Zuñi, especially those at the covered entrances to the "sacred dance plaza." Although somewhat larger than the smallest chambers in Heshotauthla, modern Zuñi rooms are often very small.[1]

The small size of the rooms in Pueblo ruins, as those of the Chaco canyon, has been commented on by other observers. In many of the cliff-ruins, where the rooms are of diminutive size, the evidence that they were inhabited is scanty, although traces of smoke often appear on the walls. These rooms could hardly be living-rooms, but rather are storerooms or sleeping-places. The rooms excavated in other Zuñi ruins, as Halona, are likewise very small, not larger than those at Heshotauthla.[2]

Ovens. — Just outside the south wall of Heshotauthla there is a cluster of pits, identified as communal ovens. They consist of a number of well-built stone structures, situated contiguous to

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[1] The oldest rooms in the Hopi pueblos and the cliff-dwellings are also very small.

[2] In the adobe of certain of these ancient small chambers there are found impressions of corn, indicating that they were storage places. Similar chambers exist in modern Zuñi, and every provident Hopi family can show bushels of corn piled up in stacks in the lower rooms of their dwelling. Some of the Hopi corn is several years old, but, however ancient, is repeatedly overhauled, freed from weevils, and again stored away for future use.

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the pueblo wall, their component stones being cut into more or less irregular cubes, laid in adobe, with flat faces inward. In most places they had been covered by débris. Their walls are curved, rounded, or irregularly oval. At the bases of these structures there are flat stones set in the sides.

These fire-holes are not unlike ovens at Walpi and modern Zuñi; but in most of the pueblos of the Rio Grande the ovens are conical, and are built on the roofs of the houses, as well as on the ground. Similar communal ovens existed in the ancient pueblos along the Little Colorado and in southern Arizona; but these must be distinguished from the immense pits in which mescal was roasted.

POTTERY OBJECTS

Although the prehistoric pottery from Heshotauthla has a distant likeness to modern Zuñi ware, its symbolism is radically different. Moreover, while not characteristic of pottery now made in the Zuñi valley, it is closely related to that obtained from ruins along the Little Colorado, of which the Zuñi river is a tributary. The various forms of pottery, and its symbolism, that occur in the Little Colorado ruins, appear also at Heshotauthla. Among these are jars, bowls, ladles, cups, and other forms, food-bowls predominating. The food-bowls, as a rule, are shallow, with rounded lips and depressions in the bottom; the ladles are heavy, and are provided with handles some of which have holes in a row along the upper side.

The predominating colors of ancient Zuñi pottery, as well brought out in plates II - V, are generally red, with white or brown figures. No glazing over the whole surface was seen,

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Miss M. Magill, pxt. ANCIENT ZUÑI OBJECTS OF STONE, BONE, AND CLAY B. Meisel, lith. Boston.

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although a superficial gloss, resembling a glaze, sometimes appears over some of the brown and black figures. Yellow-brown and whitish pottery sometimes occurs, but no instance of a true black-and-white ware is figured. This kind of ware, so characteristic of the modern Zuñi and found so constantly in cliff-dwellings, is supposed to be intrusive or of late introduction into the Zuñi valley.

Corrugated Ware. — The collection of pottery found at Heshotauthla contains many examples of corrugated or coiled ware. This variety of earthenware is similar to that from other ancient pueblos, and is mentioned by Bandelier, Cushing, Stevenson, Holmes, and other writers. It would appear from the oldest historical references to Pueblo ceramics that the modern painted and smooth ware is more recent than the indented or corrugated type. Mr Bandelier was assured by Señor Vijil that this kind of ware was rarely "met with over New Mexico except at old pueblo ruins or by digging," and he feels "justified in assuming it to have been the manufactured ware of a people distinct from the Pecos tribe or the Pueblo Indians of New Mexico in general, and their predecessors in point of time." The discovery of corrugated ware in association with the smooth painted variety, in the ruins of the Zuñi valley, would seem to imply that they were used together. Prof. W. H. Holmes says, "It is my impression, as already stated, that the coiled form may be the most archaic of the ancient Pueblo pottery."

Smooth Decorated Ware. — The symbols on ancient Zuñi pottery are characteristic, but for the greater part are geometrical in character. A few life forms exist.[1] The manufacture

[1] Unfortunately the colored plates accompanying this article do not include vessels bearing certain important symbols, especially life forms.

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of coiled indented ware of the kind found in the cliff-dwellings appears to have ceased in modern times.

Ladle with Dance Figures. — A black-and-white ware ladle with a life figure is one of the most instructive and interesting found by the Hemenway Expedition at Heshotauthla. Its bowl is much broken, but bears on its surface the representation of a dance figure, which is entire. This is represented as having a large head; two eyes; two arms, each with three fingers; two legs, each foot terminating in three toes. An imitation of a fox-skin hangs in the rear from the waist, reminding one of a figure of a dancer. The head of the figure is so placed that it is opposite the handle. The interior of the bowl is encircled by three black lines — a broad band in the middle with a smaller one on each side. Upon the middle black band there are drawn white diamonds, each having a central black spot. There is no decoration on the exterior of the bowl, which is of uniform light-gray color. The end of the handle is unfortunately broken where there seems to have once been an opening for suspension. The upper part of the handle is decorated with a black band in which are drawn white squares and triangles, each of which has a curved line extending irregularly through it. The meaning of this decoration is not clear, but its resemblance to a serpent is suggestive. One would be tempted to associate this ladle with a snake ceremony, or with serpent worship, if this cult[1] had once existed among the inhabitants of the Zuñi valley, an interpretation to which the outline of the dance figure, as well as the figure of the serpent, both point.

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[1] Whenever in the Southwest we find Snake clans, we are sure to find traces of a serpent cult.

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Professor Holmes figures, from a ruin near St George, Utah, a bowl decorated with two human figures with extended elbows.[1] These figures have nothing corresponding to the fox-skin decoration of the dancers, but in them the head is surrounded by what might be called a halo. The same authority figures another bowl from Tusayan (Canyon de Chelly?) with two small human figures on the bottom of the bowl. He writes that the "marked peculiarities of the ornamentation and color of these bowls give rise to the idea that they may have been intended for some special service of a ceremonial character." While the general design of the decoration of the bowl figured by him is the same as that on the bowl from Heshotauthla, the details are carried out somewhat differently, and there are striking differences in their colors.

Similar figures representing dance images are found elsewhere, as on the plastered walls of prehistoric cliff-dwellings. In his account of the wonderful Cliff Palace[2] in the Mesa Verde National Park, Mr F. H. Chapin represents a figure of a dancer painted on a wall of a room, recalling similar figures found on certain Zuñi jars, although somewhat different from that found at Heshotauthla. The figure from the Mesa Verde ruin is represented as blowing an instrument not unlike the flutes used by the Flute priests of Walpi. An elaborate nine-days festival, called the Flute Dance, occurs biennially in the Hopi pueblos; and the pictograph from Canyon de Chelly, representing three figures with flutes, may refer to a similar ceremony at Lenyanobi, a Hopi ruin where the Flute clans once lived.

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[1] Pottery of the Ancient Pueblos, *Fourth Report, Bureau of Ethnology*, fig. 266.

[2] No such figure is now visible on the walls of this ruin.

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The decoration of the ruin with rows of dots or bands occurs frequently in bowls from ancient Colorado, but this is rare as a decorative motive on bowls from Heshotauthla.

Butterfly Figure. — A symbol identified as a butterfly appears on two whole vessels from Heshotauthla, and, possibly in a very much conventionalized form, on a potsherd. One of

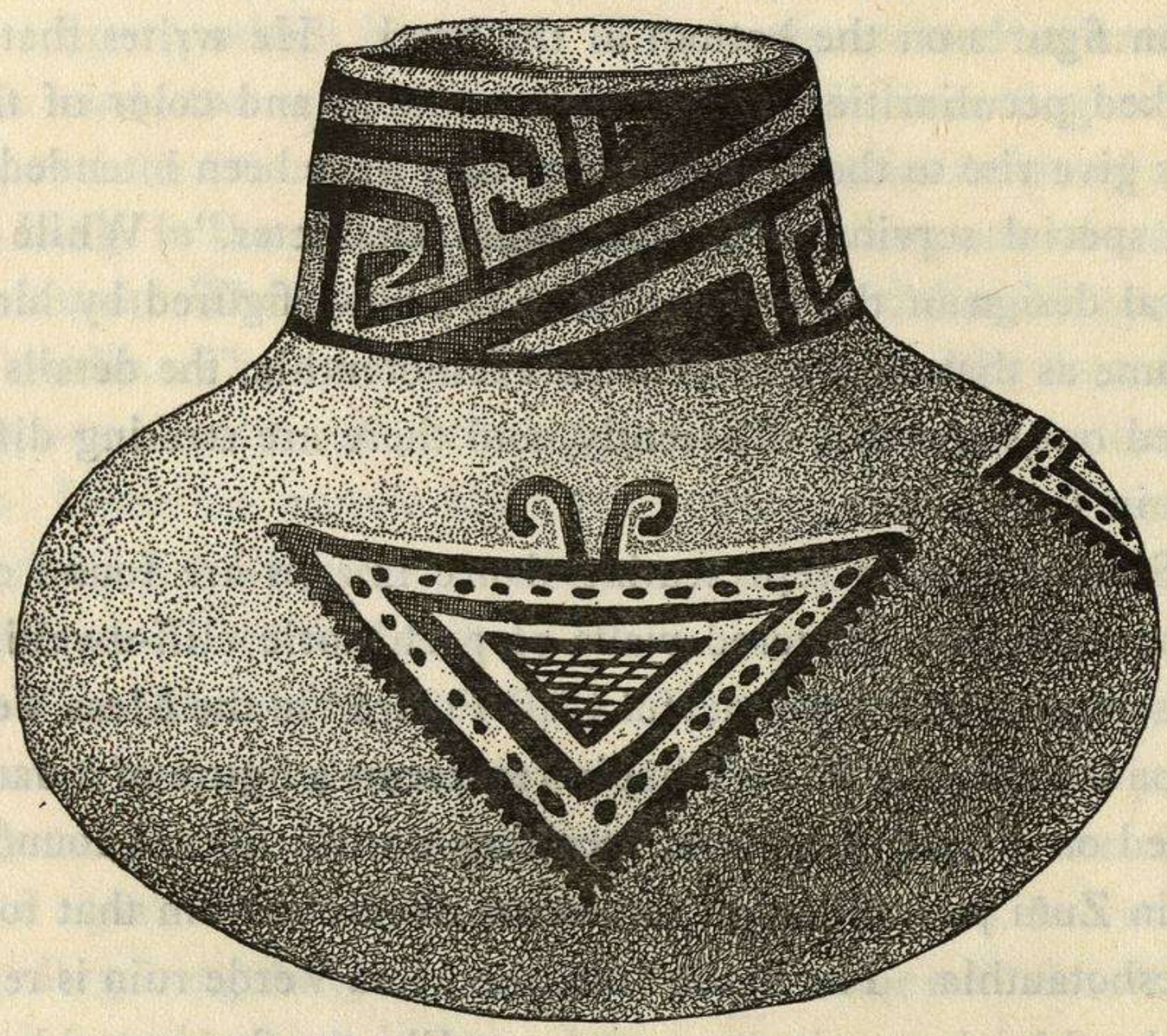

FIG. 1—Butterfly Vase. (Diameter 6¾ inches)

these vessels (plate V, 3) is a flat dish with this symbol on the inside; the other (fig. 1), a broad-mouthed jar with perpendicular neck, has three of these figures on the outside. The fragment of another vessel has a triangular figure, the most conventionalized symbol of the butterfly.

Two jars bearing this symbol were found in the excavations at Halona. One is a double, the other a single vessel. It appears

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that figures of butterflies and moths were favorite ones among ancient potters, and have not passed out of use among modern Pueblos.

In Mr James Stevenson's illustrated catalogue[1] of pottery, labeled "Moki," some objects noted in which are really from Zuñi, there is a prayer-basket made of clay with the figure of a butterfly on the inside. This symbol is triangular in shape, and has rows of dots on the edge and two curved projections midway of one side.

The decoration found on a fragment of another vessel somewhat resembles the butterfly ornament described above, consisting of a simple triangular figure, within which is a second; and on the sides are represented small blocks corresponding with the dots, which do not occur on the outer line. The two anterior appendages are replaced by a cross, the longer shaft of which occupies the median line of the triangle. The resemblance of this figure to a butterfly is very distant, so highly conventionalized is the symbol.

A similar butterfly decoration occurs on two jars from Halona. On one of these, which is double, the butterfly figure is found on the upper portion.

The writer identifies the above figure as conventionalized symbols of the butterfly, from their rude resemblance to this insect with outspread wings; but this identification is partly vitiated by the fact that birds are sometimes represented in ancient Pueblo pottery by like symbols.

One of the jars from Halona is more rounded and graceful in its lines than those above mentioned, and is without a zigzag

[1] *Second Report, Bureau of Ethnology*, 1884.

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decoration about the neck. This figure is in this case replaced by three triangular symbols similarly situated but differently colored. The outlines of the butterfly in this instance are drawn in black. The head is indicated by two extensions on the side of the triangle that is without serrations.

The middle line of the triangle, extending from midway of one side to the opposite angle, is crossed by two black lines to each of which are added black terrace figures edged with white lines. There are three of these triangular figures on the surface of a vessel from Halona. Alternating with the same are three rectangular figures, with no resemblance to the triangular except in a very distant way. All the figures on this specimen are painted on a brick-red ground. It is the only vessel in which the round head of the so-called butterfly is represented.

Nos. 5128 and 5129 in the collection have also the butterfly pattern, which in the latter differs considerably from that last described. An important point of difference is the separation of the two component parts of the triangle along the median line, and the existence of a middle line between them. There is no enlargement of the line representing the head, and the outlines of the wings are in black on a red ground. The step-like figure on the outer border of the sides is more evident and the indentations are less numerous.

A pictograph copied by Mr G. K. Gilbert[1] at Oakley Springs, Arizona, was identified by Tuba, an Oraibi chief, as a butterfly. This pictograph closely resembles the butterfly ornament on a bowl from Heshotauthla, except that the wings, which

[1] See Mallery, Picture-Writings of the North American Indians, *First Report, Bureau of Ethnology*, 1880, p. 47.

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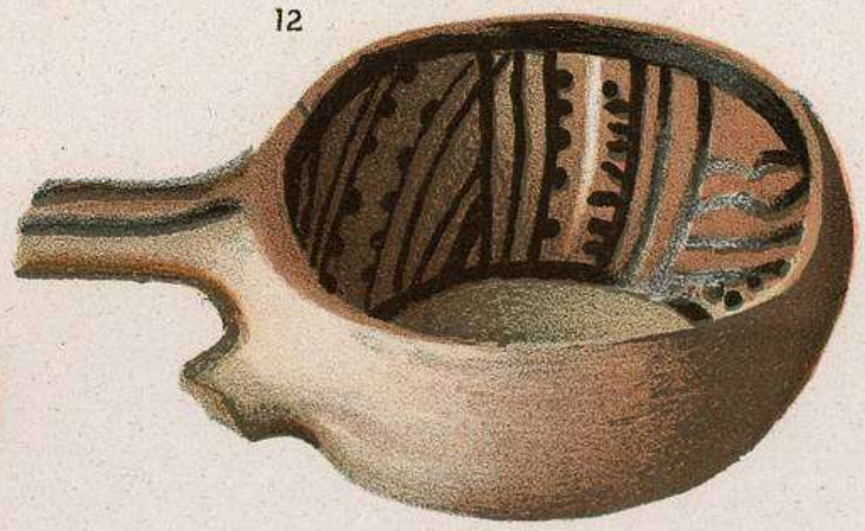

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Miss M. Magill, pxt.

ANCIENT ZUÑI POTTERY

B. Meisel, lith. Boston.

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are crossed by lines of dots, are incised, and the posterior part of the body is prolonged into a triangle.

Mr F. H. Cushing[1] figures two paintings of the "sacred butterfly" of Zuñi. As both of these representations are somewhat different from those seen by the writer on the prehistoric pottery brought from Heshotauthla and Halona, it is believed that they are more modern in character. A striking difference between them is that four slender wings are represented, as in the pictograph at Oakley Springs. One of Mr Cushing's figures (No. 560) somewhat resembles the so-called conventionalized "dragon-flies" found on modern pottery. Paintings of birds also closely resemble the figures on ancient pottery which are ascribed to the butterfly; but, in these highest forms of decoration, symbolism and conventionalism predominate.

A large spherical amphora (plate III, 6) has a small, slightly raised neck, and two small, knob-like, perforated handles. Its color is brick-red, with faint black decoration consisting of triangles, parallel lines, and terraces. There are also large compound patterns of rectangular shape, with steps within and a central coil.

A broken though complete red-ware eating-bowl (No. 5232) is decorated on the inside with the usual black triangles and their variants, with black and white lines on the outside. This specimen was found at the head of a skeleton (No. 5231)[2] in the southeastern excavation of Heshotauthla.

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[1] Pueblo Pottery as Illustrative of Zuñi Culture Growth, *Fourth Report, Bureau American Ethnology*, 1886, figs. 559, 560.

[2] It will be seen from this and future references that the pottery here treated is chiefly mortuary, and that the dead were interred inside the rooms, generally under the floors. The materials studied showed no evidence of cremation.

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A small decorated vessel of dark ware (No. 5234, plate II, 8) has the form of a fowl; its head and tail are broken; a painted scroll decorates the sides. Around the rim extends a painted decoration consisting of a series of rectangles, each with a central dot. Interesting features of this vessel are the rude character of the vessel and of the scroll decoration. The rim is thick; its lower part is blackened; on one side the figures are colored black instead of reddish brown. The scroll on the anterior side, under the head of the supposed bird, is double and s-shaped. The interior is without decoration. The rows of dots along the wings remind one of similar dots on the edge of the wings of the so-called butterfly figures, already discussed.

A vase (No. 5235) containing beads and pendants was found at the skull of a child. It was accompanied by vessels Nos. 5236 and 5237 (plate III, 8), and was found in the southeastern part of Heshotauthla.

Numerous beads (plate I, 32-36) and pendants (No. 5235a) of shell and stone were found in vessel No. 5234, above mentioned.

The small decorated red-ware cup (No. 5237), with a handle, is ornamented on its interior surface with wavy white lines. It was found with No. 5234 (plate II, 8), near the head of a much decayed skeleton, in the southeastern excavation.

No. 5251 (plate II, 17), a small toy drinking-cup of light-colored ware, crudely decorated on the interior in light maroon, was likewise found in the southeastern excavation.

A small red-ware eating-bowl (No. 5252), decorated on the inside with black triangles, was found at the head of a much decayed skeleton in the southeastern excavation.

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Fragments of a large vase of light ware (No. 5254) are elaborately decorated in black triangles, checkerwork, and parallel straight and curved lines. These were found at the head of a skeleton in the southeastern excavation.

A bowl of medium size (plate IV, 7) is decorated inside with black triangles. It was found near a human skull.

The small, handled toy vessel shown in plate III, 5 (No. 5258), is in the form of the body of a water-fowl. Its decoration is in black. It was found in the excavation on the western side of Heshotauthla. This piece of pottery somewhat resembles the moccasin-like ware of modern Zuñi, figured by Mr Stevenson. Its decoration consists of chevron-shaped figures in white and colored lines over a black ground. There are also parallel lines in black on the body and the handle. The body is crossed by transverse parallel lines with pendants.

A toy (No. 5260), made of concentric circles of clay in imitation of basketry, was found in the western excavation.

No. 5261 is a tablet, made from a decorated potsherd, from the same excavation.

A large fragmentary yellow-ware eating-bowl (No. 5265, plate V, 4) bears terraces and similar designs painted black. It was found at the skull of a much decayed skeleton, in company with vase No. 5266.

The fragment of a small yellow-ware eating-bowl (No. 5267) was found with a skeleton in the southern excavation. This fragment is decorated with a portion of a human figure having extended arms and legs, and with the representation of a fox-skin tail hanging from the loins. The decoration on the sides of the interior of the bowl consists of zigzag lines and

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terraces. On the exterior there are encircling lines, which become rude, irregular, and serrated near the rim.

A corrugated vase (No. 5271) contained the fragmentary skeleton of an infant. It was accompanied by a cup (No. 5272).

A red-ware eating bowl (No. 5277) was found with skeleton No. 5276. It is decorated in solid black, with light intervening spaces taking the forms of zigzags, triangles, and bars. On the inside there is a symbolic figure in black, while the outside of the vessel is decorated with symbolic figures in white, representing rain-clouds. The black figure closely resembles that on the outside of figure 1, which may possibly be a conventionalized figure of the butterfly. There are projections from the black figures on the inner decoration of the bowl, which extend toward a figure centrally placed on the inside. Near one of these there is a round black spot. The rain-cloud designs on the outside are five in number, from each of which extend four or more parallel white lines.

A small eating-bowl (No. 5280), decorated with black circles and zigzags, was found in the southeastern part of the ruin.

A dipper (No. 5284) has a portion of its bowl and a complete handle. The noteworthy feature of this specimen is that its short handle has a bifurcated tip, the two bifurcations forming divergent prongs, rounded at their tips, and curving slightly upward. The surface of the handle is crossed by faint broad bands of light paint. The surface of the dipper is smooth, and bears every appearance of having been well polished.

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A decorated dipper (plate II, 6) was found at the head of skeleton No. 5301, in the plaza near the southeastern excavation. Its inside is ornamented, the outside is plain. The decoration consists of squares, or of diagonals formed of lines in squares, each line ending in the well-known terrace pattern. The handle is broken, and portions of the rim are absent. On the inner rim there is a light-colored line, which is duplicated at the junction of the sides and the bottom. The color of this specimen is dark brown.

A finely decorated red-ware dipper of medium size (No. 5316, plate II, 1) was found with a skeleton in the southeastern excavation.

A small, decorated, handled, red-ware ladle (No. 5322, plate II, 10) was found, with No. 5323, at head of skeleton No. 5321. The decorations are in black, and take the form of transverse bars and right-angle triangles. The decoration of the handle of this ladle is more elaborate than that of many others from Heshotauthla. As a rule, as seen in specimens Nos. 5349a (plate II, 9), 5456 (plate II, 5), and 5466a (plate II, 14), the ladle handles are crossed by parallel and longitudinal black bars, arranged in twos or threes according to the design. In this dipper, however, we have an association of these longitudinal and transverse bars in geometrical patterns, to which are added step-like decorations, thus making a compound figure similar to that occurring on the outside of other bowls.

A medium-sized, slightly decorated, light-ware ladle (No. 5323) was found, with Nos. 5324, 5325, and 5322, at the head of a child's skeleton (No. 5321), in the southeastern excavation.

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The two ladle bowls shown in plate II, 3, 11, are of red-ware without decoration on the outer surface, but with triangular designs and parallel lines on the interior.

Plate II, 10 (No. 5322), shows a fine, large, elaborately decorated ladle, found, with Nos. 5321, 5322, and 5323, in the plaza of the southeastern excavation. The skeleton with which it was found was that of a child, buried with the head toward the south. In addition to the drinking-cup, or ladle, and the eating-bowl, there were uncovered lower down in the grave a number of bird (turkey?) skeletons. This ladle is ornamented with elaborate designs; its handle has a zigzag black band continuous with a terrace ornamentation. The tip of the handle is so bent as to form an opening. The interior of the bowl is decorated with diagonal, parallel black lines which fill the spaces between the four shaded areas, each one of which is occupied by a design consisting of a square crossed by three diagonal parallel lines. In the angle of each square there is represented a bird, so drawn that the heads of all four point in the same direction. In these bird-like designs occur representations of head, neck, body, and three darker lines for a tail. The handle of this ladle is hollow, and contains a stone tinkler. It has two small openings on the upper surface. The tip of the bowl is crossed by three or four bands arranged in groups as in some other bowls.

Plate V, 2, represents a red food-bowl elaborately decorated on the interior surface with black designs and having on the exterior a series of N-shape figures.

The large red-ware eating-bowl (No. 4329a) has the interior colored black, and the outside decorated with sym-

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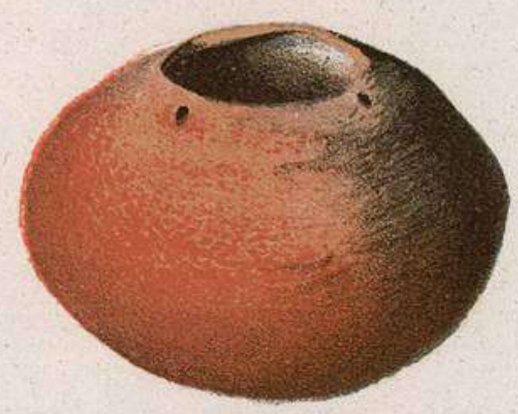

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bolic (?) figures in white. It was found with a smaller bowl (No. 5329b) at the head of skeleton No. 5329. The decoration on the outside of this bowl shows beautiful spiral forms combined with the parallel lines, a unique pattern of this type. The spiral is believed by some ethnologists to represent the whirlwin, and if the parallel lines represent rain, — as supposed by some students, and as seems to be accepted by some Pueblo people, — we have here a good example of wind symbols accompanied with a representation of rain falling from the clouds.

Mr Stevenson illustrates (fig. 686) an ancient bowl from the Canyon de Chelly with three rows of knobs on the exterior of the bowl. There seems to be evidence that this feature is an ancient one, and not unknown in modern Pueblo pottery. The same author figures a pitcher-shaped vessel, which he describes as a "teapot of red micaceous ware, with handle, a row of projecting points around the middle, one-half of these (those on one side) having the tips notched. There is a triangular spout in front, the opening through it being through numerous small round holes forming a strainer." His description of this vessel would seem to refer it to modern patterns, and his figure is highly suggestive in this particular. But the custom of decorating ancient bowls with raised figures, scrolls, animals, and other figures in relief, is an ancient one in some areas, but extremely rare in northern Arizona. In some modern pueblos we see this carried to an extreme, as in the canteens decorated with frogs and other devices, sold by the Rio Grande and other Pueblos.

A small cup (No. 5330a) made of rough paste, undecorated, was found with an adult skeleton (No. 5330). This cup is singular in having a circular sculptured or knobbed

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base. There are several small cups in the collection, the form of which is similar to this, but none of these has the same form of base. The vessel was found in the plaza in the southeastern excavation.

The fragments of a corrugated vase (No. 5342) show on the periphery relief decorations ending in scrolls. This method of decorating coiled ware was practised also by cliff-dwellers.[1] Although the whole of this vase was not found, the sherds recovered show that this style of ornament is probably ancient in the Zuñi valley. One of the fragments exhibits a double, the other a single scroll.

A small red-ware vessel (No. 5347; plate III, 2) has a contracted rim, in the upper periphery of which there are four perforations for suspension by a cord. It was found in the central excavation.

Plate III, 10 (No. 5348), represents a trilobed paint-pot or salt receptacle.

A medium-sized, long-handled, decorated ladle of yellow-ware (No. 5340a) was found, with No. 5349 b, c, at the skull of No. 5349. This object was decorated with uniform black terraces and bar designs.

No. 5357 (plate I, 2) is a handle of a ladle in the form of a dog (?); this specimen was found in the central excavation. It is a remarkable form of handle, and is the only one in the collection that bears this modification. Possibly in the specimen with a pair of projections at the extremity we may recognize a conventionalized animal form, but the resemblance is distant. In the

[1] Specimens similar to this are figured by Nordenskiöld from the cliff-dwellings of the Mesa Verde, Colorado.

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case of the specimen shown in plate I, 4, however, there is no doubt that here is the representation of some animal, since it has projections which occupy the positions of the forelegs, the ears, and the snout. The ladle is colored red both inside and outside, and faint indications of decoration in black occur on the inside.

A large light-ware ladle (No. 5361; plate II, 15) was found at the head of a fragmentary skeleton of a child, with vessels No. 5362 and No. 5363 (plate III, 11). Although the handle is broken, it shows that its end originally had the form of a loop. This vessel is decorated on the inside with an open diamond pattern painted black, with a figure of a bird's foot within its borders. The figures of four arrows in the middle of the bowl of this ladle are arranged in pairs, two of them pointing one way and two in an opposite direction. The former are accompanied with dots, the one at the end of the shaft, the other near the lateral inner barb. The other two arrows are without dots. A fifth figure is so obscure that it is difficult to decipher. On the side of certain "medicine-pots," from Halona, we have a similar arrow-like decoration of unknown meaning. The arrangement of the diagonals and upright lines shown in the figure is in fives, alternating with one another.

Plate III, 9, is a fragment of a vase with a disc-like knob on one side of the neck.

A light-ware eating-bowl (plate V, 6), although fragmentary, is complete. This specimen was found, with Nos. 5361 and 5368, at the head of a few bones of the skeleton of a child. It is decorated on the inside with black ornamentation, and was discovered in the eastern excavation.

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Plate III, II (No. 5365), is a light-red vase found at the head of a skeleton of a child, with Nos. 5361 and 5362. It is decorated on the outside in brilliant black, the figure being scalloped with open, diamond design. It was found in the eastern excavation.

Plate III, 12, represents a globular vase of yellow-ware decorated with brown figures.

A small, long, and round stone toy (No. 5465a) was found in the western excavation with portions of the skeleton of a child.

A small plain vase (No. 5480a; plate III, 3) has a rim perforated for suspension. It was found, with No. 5380, and the broken cup, No. 5380b, in the western excavation.

A large red-ware eating-bowl, plate V, 8 (No. 5383a), is decorated on the inside in black and on the outside in white geometrical figures. It is mortuary in character, having been found at the head of skeleton No. 5383, in the western excavation.

A large fragmentary red-ware eating-bowl, plate III, 1 (No. 5389a), has black figures on the inner surface. Together with a bowl and a cup (No. 5398b, c), it accompanied a skeleton (No. 5389).

No. 5398b is a large, irregularly oval bowl, with straight neck, the sides of which incline slightly inward. The ground-color is brick-red, which however is unequally burnt in places on the sides. The decoration of the neck of this vessel consists of zigzag black lines or bands running irregularly about it, accompanied by compound step-like figures and elongated bands. The most interesting and exceptional feature in its ornamentation is the introduction on the outer surface of three triangular

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figures in black and yellow. These triangular figures are outlined with black bands placed at regular intervals, with one of the angles pointing toward the base. The external rim of the two sides is bordered with black dots or indentations, which are confined to two sides of the triangle. From the upper side there rise two hook-like projections with crooks turned outward. These projections, like the triangles, are painted black, edged with yellow. The external boundary of the triangle is parallel with that of a second triangle, somewhat smaller; the intermediate zone is colored yellow, and spotted with black dots of irregular size, more or less unevenly distributed. The interior of the figure is occupied by a small triangle filled with black bands. This triangle is separated from the one last mentioned by a broad band of yellow, without spots. The adjoining angles of the ornamentation found on the outside of the bowl are a little more than an inch apart. These figures are slightly irregular. The pot was discolored in firing.

A large ladle, plate II, 13 (No. 5389c), has a broken handle, which was probably hollow. Its outer surface is without decoration, and its color is a uniform brown. The interior is decorated with diagonal lines painted on a black ground, accompanied with rows of squares containing black dots. The vessel has encircling lines near the base and rim.

No. 5390a is a fragmentary red-ware eating-bowl decorated in black. It was with skeleton No. 5390.

A fragmentary, decorated, white-ware eating-bowl (No. 5395b) was found with skeleton No. 5395, and with specimens No. 5395a, c.

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Plate III, 7 (No. 5409a), is a mug with a handle. Its rim is slightly turned outward, but there is no ornamentation on the body or the handle. The neck is small and quite narrow. Its color is dark, almost black.

A decorated eating-bowl, plate IV, 8 (No. 5412a), containing corncobs and remains of textile fabrics, accompanied No. 5412b and skeleton No. 5412, in the western excavation.

No. 5414b is a small red-ware eating-bowl found with cup No. 5414a. It is painted white on the outtside, and black on the inside.

There is also in the collection a shallow, undecorated stone saucer, half an inch high and four inches in diameter, with a depression of about one-fourth of an inch in the middle. The surface of the saucer (No. 5415a) is very smooth, and its form regular. This vessel was found at the side of an adult skeleton (No. 5415), the head of which lay toward the southeast. Both skeleton and saucer were found in the western excavation.

A small food-bowl (No. 5435a), ornamented on both exterior and interior, is open-mouthed, and light brown to white in color. The ware is very evenly fired, and the bowl is entire, with the exception of a large break on one side. Its exterior decoration consists of horizontal and vertical lines alternating in threes. There are six series of horizontal and six series of vertical black bands. Around the rim of the bowl there are eight sets of markings, seven of which have six marks and one has seven, the seventh being obscure. The interior decoration is crossed by zigzag lines with broad bands and small parallel markings. The broad black band on the inner side of the lip narrows at one point into a thread-like line. The figures

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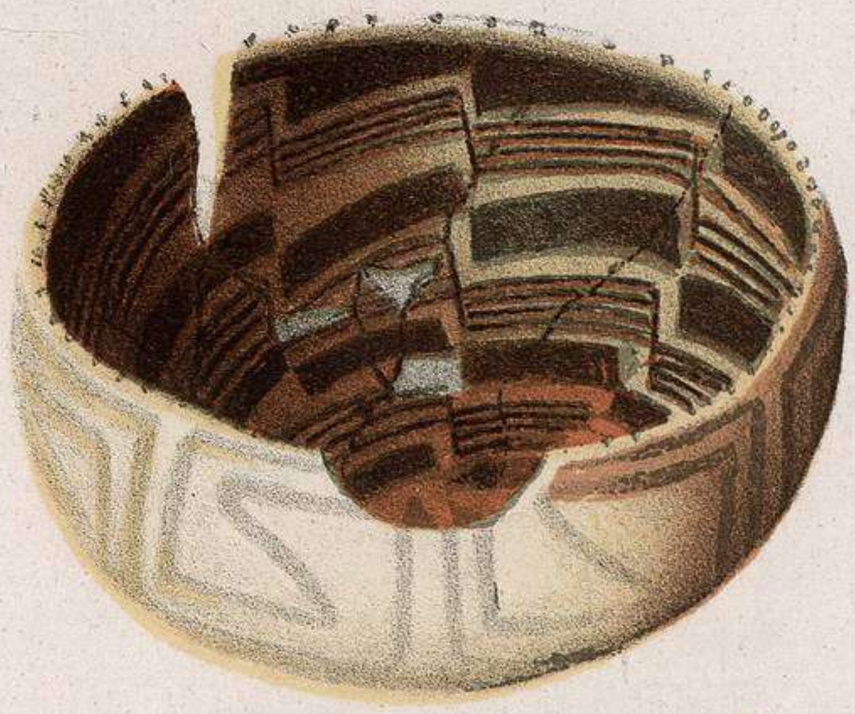

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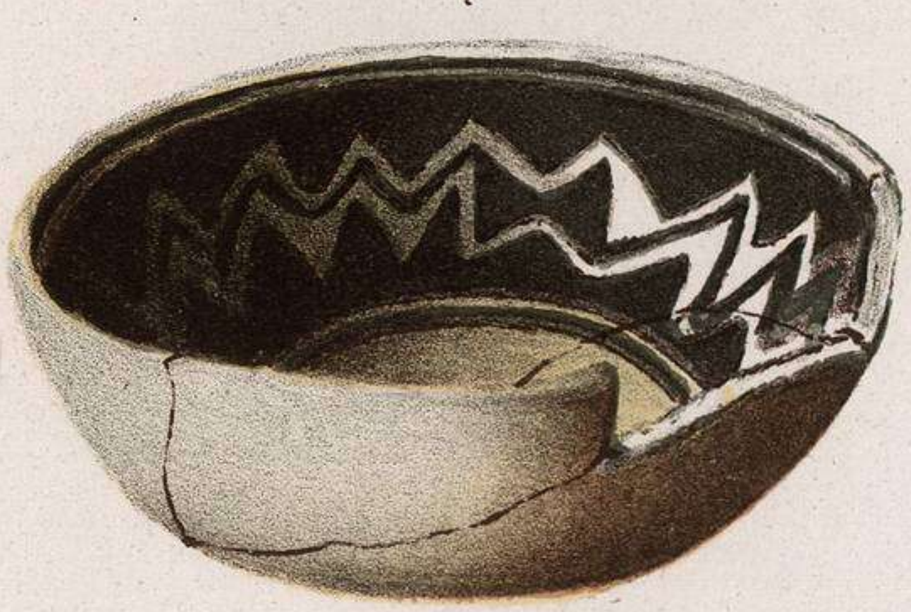

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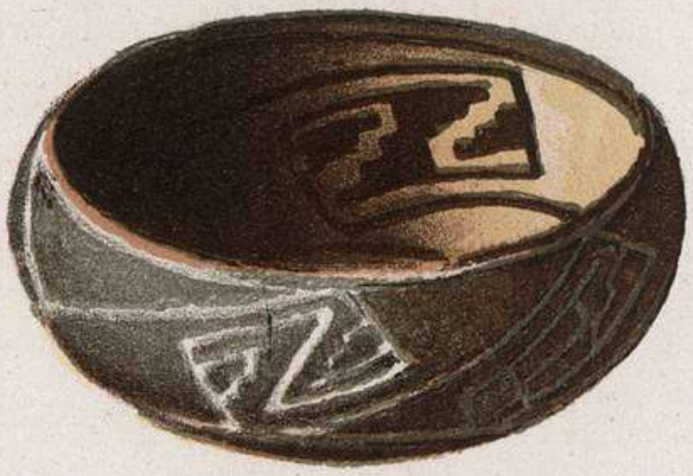

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on the interior are in black on a light-gray to white background. The diameter of this bowl is a little more than seven inches, the height about three inches.

No. 5440 is a fragmentary, decorated, light-ware drinking-cup found in the western central excavation, at the head of the much decayed skeleton of a child.

The food-bowl shown in plate IV, 6 (No. 5453), has a characteristic decoration on the interior surface.

The medium-sized jar (No. 5460) shown in plate III, 4, has the rim slightly broken. Its color is orange-yellow with black decoration. The vessel is girt by a broad, continuous line edged with black, and the neck has alternating black and yellow bands. The zones above and below the central band are crossed by zigzag lines, and bands formed of numerous small parallel lines.

A platter (No. 5456a; plate V, 5) is of brick-red color, and is ornamented both inside and outside. The rim is notched at one point. The outside ornamentation consists of white lines forming a double triangular pattern; the inside is decorated with black zigzag lines of varying width, on a deep-red ground.

Plate II, 5 (No. 5456b), is a small ladle of light-brown color, ornamented with dark-brown lines, and with terraced figures that may represent clouds. Its handle is small and slender, and is turned up in a pointed tip at the end. On the upper surface of the handle are six bands, four of which are parallel, and partially encircle the handle, while the remaining two extend longitudinally. The outside of the bowl is not ornamented, but its interior is decorated with encircling bands which alternate with stepped figures. The external surface is more or less discolored by firing.

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A flat bowl or platter, plate V, 4 (No. 5465), ornamented inside and outside, has the rim slightly nicked. The decoration consists of several encircling lines arranged in two series on the inside. Four of these bands are found on the upper margin, and three on the lower, and between them there is a green zone in which occurs an elongated zigzag ornamentation. The outside of the specimen is decorated in zigzag white bands.

Plate II, 14 (No. 5466a), is a small white ladle the handle of which is decorated with black bars. Six of these bars are placed transversely, and three longitudinally. The interior of the bowl is decorated in black zigzag lines accompanied with black encircling bands above and below. None of the encircling bands is broken by a "line of life." There is a loop in the end of the handle of the ladle.

A small, well made ladle, light-brown to white in color, has a loop at the end of the handle, which is crossed by nine broad black bands arranged in threes, two of which are parallel, the others placed longitudinally. The outside of the ladle is plain; the inside has a white base with dark brown or black encircling zigzag lines.

Plate IV, 2 (No. 5468), shows a small platter of light color, with external undecorated walls. On its inner surface occur black lines connected with parallel lines and disconnected bars. The former are black on a light ground, the latter light on black.

Two beautifully decorated food-bowls are shown in plate IV, 1, 3. The latter is characteristic of the bowls from the Little Colorado valley.

No. 5469 is a large ladle having a broken handle which has been repaired. This is one of the most interesting ladles in the

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collection, as the interior decoration combines straight-line figures with figures composed of spiral lines. The ware is thin, and the form of the vessel symmetrical, although its handle is somewhat bulky. The decoration on the stump of the handle is obscure, but it seems to consist of alternating black and white bands. The pattern on the inside of the bowl consists of transverse notched bars alternating with a rude spiral of one or two whorls. In places the outline of the figure is difficult to trace, as the inner surface is more or less broken and its margin destroyed. The diameter of the bowl of the ladle is five inches.

A fragment of a ladle, plate II, 2 (No. 5473), consists of a bowl with a broken handle. The inside is decorated with crossbars, step-like figures, and zigzags. The bowl has a brown base ornamented with black.

No. 5481 (plate III, 1) is a vase of medium size with slightly notched rim. The body has an elaborate external decoration drawn on a black background, and the neck is painted light brown. An interesting feature of this jar is a black line girting the neck, enlarged at one end. On each side throughout its entire length there are small lateral bars opposite each other. The extremity of this band opposite the bulb is trifid. On the inner rim there are two black continuous lines, and a single broad black band surrounds the neck. The decoration of the larger part of the jar is colored white, and consists of zigzag lines with terraces. The same trifid termination or extremity of the figure about the neck of this jar can be seen on the figure upon the double-handled ladle in the collection.

In a remarkable dipper from Halona there is a groove on the upper side of the handle in which is painted a figure that

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exactly resembles that around the neck of the jar shown in plate III, 1. The head of this figure faces the bowl of the dipper, and its lateral appendages are painted white; the whole is of bright-red color. It strongly recalls that of a centipede or myriapod, with bilateral appendages frequently repeated. The broad black line in this specimen is continuous throughout, but at one point there is a small transverse line. The two black lines on the mouth of the vessel are continuous, so far as can be observed, although a section of the rim is broken. The entire dipper is very smooth. It is colored almost white on the inside. The fine design on the body is repeated four times.

No. 5442 (plate II, 4) shows a ladle with a broken handle attached to a square and flat bowl. Its color is brown. The exterior surface is not ornamented; but it is decorated inside with rude zigzag lines, and the surface is slightly discolored near the handles. The color of the inside is light-gray, almost white.

MISCELLANEOUS OBJECTS

Bone Implements. — The collection of bone implements (plate I, 9–23) found at Heshotauthla is quite large, and presents a variety of forms. The leg-bones of the deer and the turkey seem to have been most commonly used in the manufacture of these implements, though bones from other parts of these and other animals are not wanting. The antler of the deer was also employed. These bone and horn objects range in form from sharp-pointed awls (figs. 10–12) to flat, chisel-like gouges (figs. 13, 17). As a rule they are smoothly polished, showing evidence of long use, and sometimes are decorated with incised lines.

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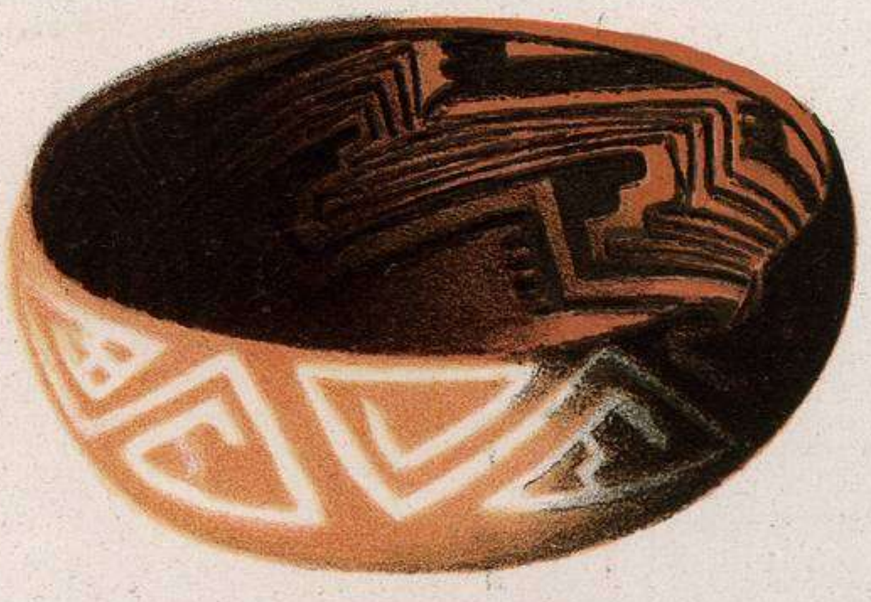

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Of the awls, the most common form (fig. 15) is sharply pointed at the tip and of uniform size. Although not ordinarily perforated at the end, in very rare cases they have a hole at the blunt extremity (fig. 12). A stouter form of awl or bodkin was made from the tibia of the turkey, sharpened at one end, and retaining at the other the natural condyles of the bone for a handle (fig. 15). There are several specimens made from split bones of the deer (figs. 24, 25). Two or three forked-shaped implements (fig. 21), made from the tibia of the turkey, occur in the collection, the three condyles at the end of the bone serving for the handle. There may also be mentioned flat split bones, not unlike wooden combs.

Figure 12 of this plate represents a finely finished tapering implement made of bone from a deer's leg. It is perforated transversely at the ball of the joint, for suspension. Similar objects have been found in cliff-houses and in ruins in the Chaco Canyon region.

A well-wrought scraper or gouge, made from the tibia of the deer, has its end flatly beveled and its axis rounded.[1] These implements (figs. 13, 17) are superficially incised with geometrical markings. A fragment of a tibia of a deer (fig. 18), also incised, occurs in the collection. There are also several bone implements, very much worn, especially on the edges, made from the scapulæ of deer. An exceptional form of bone implement (fig. 16) is fashioned from the tarsus of a deer, the condyles of which are flattened on opposite sides, and perforated. This object has a deep groove on one side, extending from the condyles to the tip.

[1] Similar scrapers are found in cliff-houses and other ruins in Colorado.

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Among the more remarkable forms of bone objects are those resembling whistles, made of joints of the leg-bones of the turkey (figs. 22, 23). These tubes have a highly polished external surface.

A single lower jaw of a small mammal, in which the sockets for the teeth are present, although the teeth are missing, is without a duplicate in the collection. This fragment is perforated at its broadest part, as if for suspension, and may have been used as an amulet.

One of the most interesting bone objects is a unique carved ornament of bone (fig. 24), certainly the most successful example of bone carving in the entire collection. It resembles a human effigy, extensions below the head suggesting arms and legs. This and the similar object shown in figure 26 are probably fetishes. There are several split fragments of bones (fig. 25), roughly rectangular in shape, generally made from the ribs of deer. Their surfaces are usually smooth, and they are generally more or less broken at the extremities.

Pipe. — Among the prehistoric specimens obtained from Heshotauthla, there is one which bears evidence of great antiquity. This is the only pipe found in the collection. It is made of burnt clay, in which occur white particles that have the appearance of finely ground fragments of older pottery. Its bowl is more or less broken on one side, but about half the rim remains. The stem is short, with a prominent keel on the front of the bowl, which is much mutilated on one side. Its interior surface shows marks of fire. The perforation of the stem, which enters the bowl on one side, is not larger than that of an ordinary tobacco-pipe. It has been supposed, from the general shape and

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blackened interior of the bowl, that this pipe was used for smoking, but the stem exhibits no marks of use. This was evidently a ceremonial pipe, as the modern Zuñi commonly employ cigarettes made of corn-husks in their secular smoking.[1]

Lignite Gorget and Tablets. — A beautiful specimen of jet or lignite is convex on one side and flat on the other. This specimen is semicircular in form, and shows a perforation on the rough side. Its diameter is an inch and a half. The convex side is highly polished; the flat side is smooth.

Among other objects regarded as ornaments there are several specimens made of lignite or jet (plate 1, 6, 30). These ornaments have in some instances an eye in the flat or non-lustrous side, but in the case of the cube (fig. 6) it is simply perforated.

Figures 28 and 29 represent stone objects of unknown use.

The finely polished tablet (No. 5242; plate 1, 30) is of lignite, and was found with a skeleton.

The collection contains a square, flat lignite tablet, two inches wide, with very smooth surface on one side, rough and irregular on the other. A perforation on the rough side of the tablet serves for suspension. This tablet was found with a skeleton and a finely finished awl.

There is another flat lignite tablet (fig. 1) more finely made than the last. Its smooth surface is very much crackled, and somewhat broken, but is finely carved and smoothly polished. The side upon which the perforation occurs is formed of four flat triangular faces bounded by four diagonal ridges.

[1] The author found a similar pipe on the surface of the ground at one of the two ruins on Inscription Rock, east of Heshotauthla, and excavated several from mounds at Homolobi and Chevlon, near Winslow, Arizona.

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Another beautiful fragment of lignite, smooth on one side and rough on the other, occurs in the collection. With it was a large fragment of the same material that has never been worked.

From their color, and more especially their high polish, there is little doubt that these lignite tablets were used as personal ornaments.

Figure 31 is an arrow-shaft smoother of conventional form, and figures 32–36 are beads and pendants.

Haliotis Shell. — That the inhabitants of Heshotauthla knew and prized the well-known haliotis or abalone shell is seen from a fragment of one of these mollusks found in the south-eastern excavation. This fragment consists of a portion of a bracelet. It is very highly polished, and does not differ greatly from those found in the neighborhood of Casa Grande and in ruins in the Salt River valley. The older inhabitants of the Zuñi valley greatly prized sea-shells, as is shown by several ornaments made therefrom found at Heshotauthla, and in other ruins of this region.

Stone Fetish. — In the collection there is an idol, made of gray sandstone, representing a human being. This fetish (plate I, 37) was found at the head of the skeleton of an infant. Its body is crossed by two ridges extending diagonally from corner to corner. Face, nose, eyes, and mouth are represented. When found, the figure was covered with red pigment over which were drawn brownish lines, while the elevated ridges were colored light brown. The neck is only slightly contracted, and the legs are barely indicated. This figurine shows evidences of black paint on the back of the head. Down the middle of the back,

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corresponding with the vertebral column, there extends a ridge slightly raised above the general surface of the body. This specimen was found in the northwestern excavation.

CONCLUSIONS

When the reader compares the preceding descriptions and accompanying plates of prehistoric pottery and other objects with those of modern Zuñi, it will be evident that the resemblance in the decoration or texture of the two types of ceramics is not very close, while the symbolism is radically different.

The prevailing color of the pottery of the prehistoric Zuñi ruins is red with white or black decoration, while that of modern Zuñi is white with black figures, recalling the so-called black-and-white ware of the cliff-dwellers of the Mesa Verde, Canyon de Chelly, and Tularosa valley in western New Mexico. The decorations on the two are radically different, the figures on the modern ware being more complicated than those on the ancient. In the former more variations of life forms or animal and plant designs are introduced. From a comparison of these two types the student is led to believe that new symbols of extra-cultural origin have largely replaced the ancient in the decoration of modern Zuñi pottery.

This conclusion applies not only to figures of animals, but also to geometrical designs. Thus the figure of the butterfly shown in figure 1 and on plate V, 5, is wholly different from that of the same insect depicted on modern Zuñi ware. The combination of the spiral and the triangle with cross-hatching or parallel lines, which is one of the most characteristic symbols of modern Zuñi ware, is wholly absent as a decorative motive of prehistoric pottery from the Zuñi valley, where the geometrical lines, instead

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of being curved, are more often straight, or replaced by terraces, triangles, and like geometric figures.

This want of uniformity between prehistoric and modern Zuñi ware is repeatedly paralleled in the Pueblo region. In the ceramics of the Hopi Indians, for instance, a radical change has taken place. The modern ware is very different in texture and symbolism from the prehistoric. The same is true of prehistoric and historic ceramics of the Rio Grande pueblos.

If, for instance, we consider the pottery from the ruins of the Hopi pueblo of Sikyatki, or from Awatobi and other Antelope Valley ruins, we find the dominant color to be yellow, with decoration in brown, black, and red. They show no sign of a superficial slip of white. The decorations of this Hopi ware are characteristic, certain symbols being found here that do not occur elsewhere in the Southwest.

The symbolism of prehistoric Hopi pottery has been amply discussed elsewhere.[1] It is characteristic, as appears in collections from this region of the Southwest. The so-called modern Hopi ware has only the most distant relation, either in color, texture, or symbolism, with that of ancient Sikyatki, the type of prehistoric Hopi ceramics. Modern Hopi ceramics are not the development of the ancient pottery, nor are the symbols of one derived from he other. Both symbols and texture were introduced by foreign clans. The pottery called modern Hopi is made by Tanoan potters, and it consequently has Tanoan symbols introduced into Tusayan in recent times. This is evident, not only from the character of the pottery, which itself is ample evidence, but from tradition and language. The clans of the

1 *Seventeenth Annual Report, Bureau of American Ethnology*, part II, 1895.

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present potters, like Nampéo, are Tanoan.[1] These differences in ancient and modern pottery emphasize the composite character of the Hopi people.

A similar explanation may be advanced to account for the differences in ancient and modern Zuñi pottery, except that the component clans of the Zuñi population have become so amalgamated that the foreign introductions have lost language and identity. The majority of modern Zuñi pottery decorations are from foreign sources, and this introduction has profoundly changed Zuñi ceramics.

It is interesting to notice that, while the modern Zuñi pottery differs essentially in symbolism from that of the Tewa pueblo of Hano in the Hopi region, its texture and color have more in common with the Tewa ware than with the ancient Zuñi, which would imply that the modern Zuñi clans that introduced pottery symbols are related to those Tewa who settled Hano. Neither the decoration nor the texture of modern Zuñi pottery is closely related to that of ruins in the Gila and its tributaries, but is allied to that of the eastern or the northeastern part of the Pueblo area, where older modern Hopi ware is reputed to have originated.

A comparison of the prehistoric pottery of the Zuñi valley with other prehistoric ceramics in the Southwest reveals the fact that it belongs to a type common to all ruins along the Little Colorado as far down as Wukoki, a ruin at Black Falls, Arizona, where the resemblance ceases. This identity can readily be seen by a comparison of the objects figured in the accompanying plates and those from Homolobi and the Chevlon Fork ruins excavated by the author in 1896. So close is the likeness

[1] Stimulated by commercialism, Nampeo now decorates her pottery not with the symbols of her own people but with those of Sikyatki and other ancient Hopi pueblos.

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that there is no necessity for making a special ceramic culture-area for the prehistoric Zuñi.[1] Their ancient pottery is practically identical with that of the Little Colorado and some of its tributaries.

The teaching of this radical difference in the symbolism of prehistoric and modern Zuñi pottery confirms legendary evidence of the dual composition of the tribe, and it shows that the ancient culture of the Zuñi valley was almost identical with that of the rest of the Little Colorado drainage, implying that the modern Zuñi culture contains elements due to acculturation from the north and northeast. That culture which it shares with other Little Colorado pueblos came from the Gila valley in southern Arizona.

BUREAU OF AMERICAN ETHNOLOGY
WASHINGTON, D. C.

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1 See *Twenty-second Annual Report, Bureau of American Ethnology*, part II, 1904.

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POTTERY OF THE NEW ENGLAND INDIANS

BY

CHARLES C. WILLOUGHBY

THERE is evidence that a considerable portion of at least the eastern part of New England, in ancient times, was occupied by a non-pottery making people, no pottery having been found in numerous graves of a certain type in various sections of Maine, although stone implements were abundant. As pottery is usually common in the cemeteries of pottery-making tribes, its absence from these burial-places may be accepted as good evidence that it was unknown to this early people.

New England earthenware may be divided into three groups — Archaic Algonquian, Later Algonquian, and Iroquoian. Data for an exhaustive study of pottery from all sections of this region are not at present available. The above classification is based upon the study of a large amount of material from Maine and eastern Massachusetts, and a smaller number of specimens from other sections.

Whole pottery is extremely rare, nearly all the specimens thus far recovered being illustrated in this paper. Our knowledge of New England earthenware is derived, therefore, largely from fragments, which are fairly abundant in many sections.

Most of the examples figured, not otherwise noted, are in the Peabody Museum of Harvard University.

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ARCHAIC ALGONQUIAN POTTERY

The first New England potters were probably Algonquian. Their earlier ware is characterized by a more or less conoidal base, the lower part of which is often massive (figs. 3–6). A large portion of the surface of this pottery is commonly decorated with indentations made with natural objects of simple designs or with notched sticks or other implements. Incised decorations, either alone or in connection with indented designs, occur less frequently. There is often an outer zone near the rim bearing a special design, and the inner side of the rim is also often decorated.

A very common design consists of zigzag indentations made with a chisel-like implement having a notched and slightly curved edge, which is pressed against the soft clay with a rocking motion, each opposite corner being raised and slightly advanced alternately, the tool not being wholly lifted from the vessel (fig. 4). This type of decoration is characteristic of much of the eastern Algonquian pottery, but, so far as the writer is aware, is never found on the earthenware of the Iroquois.

Fig. 1 shows rims of various vessels taken from the shell-heaps and village-sites of Maine and Massachusetts. Many of the designs are produced by pressing the notched edges of thin tools into the clay, or by using sticks and other simple implements. In *c* of this figure the design may have been produced with a thin piece of wood wrapped with cord or thong. The undulating lines of *n* and *o* seem to have been made with the scalloped edge of a cockle-shell.

The inner side of the rim of *o* is ornamented with a series of round holes, an inch or more apart, made by pressing a round

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stick or similar object into the clay, the thumb being held against the outer side of the rim, thus forming upon the outer surface a row of slightly raised projections, one of which is shown in the

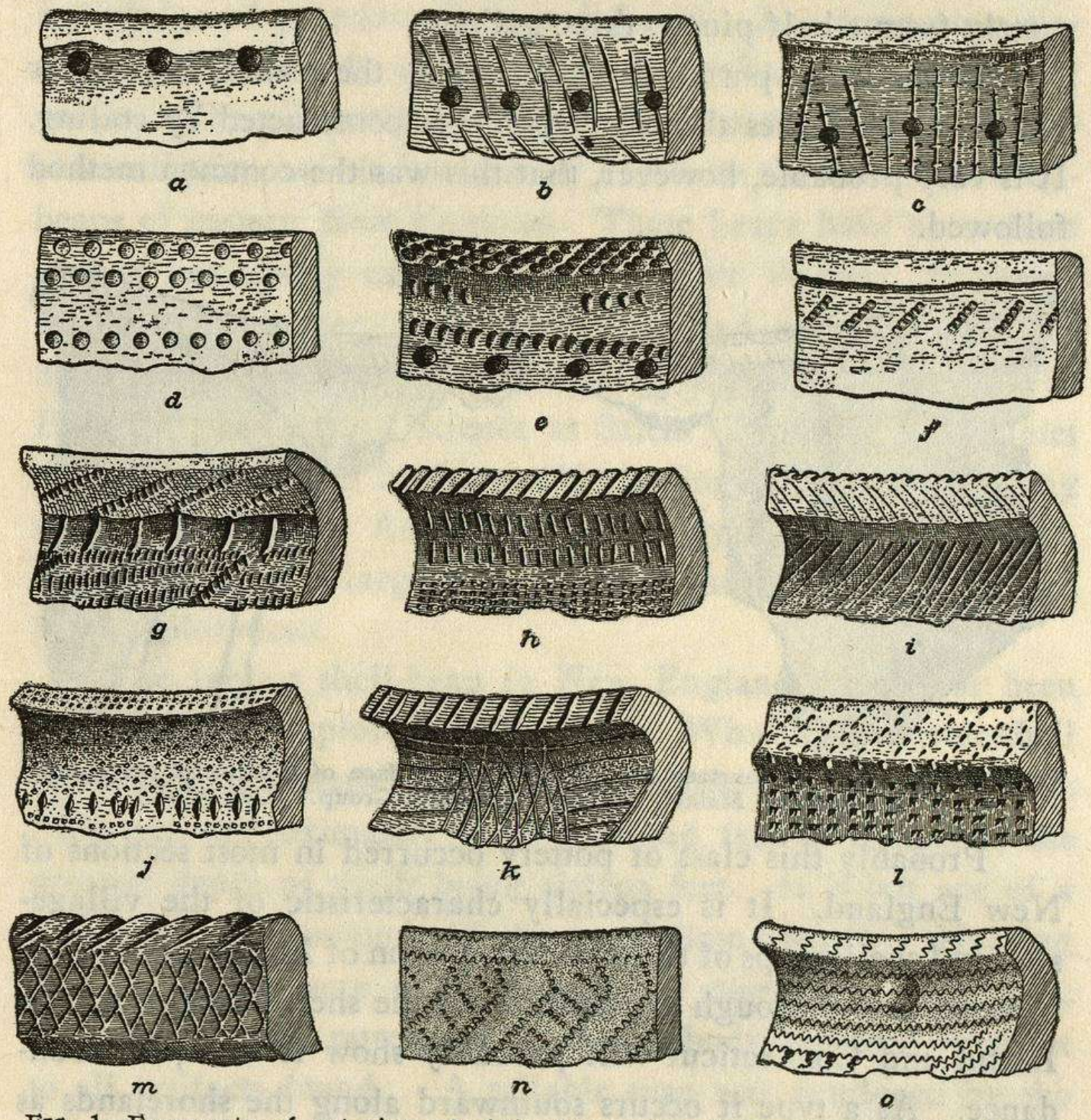

FIG. 1—Fragments of pot rims, Archaic Algonquian Group, from shell-heaps and village sites in Maine.

drawing. The inner side of the rim is also decorated with the zigzag pattern above referred to. Rims that are scalloped, or cut into points, are occasionally found, but are not characteristic

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of any period, as they occur upon the oldest pottery as well as upon historic earthenware. Cord-markings are comparatively rare. The capacity of these cooking-vessels ranged approximately from a half-pint to three gallons.

Of the many potsherds examined by the writer, but one or two show evidences that the vessel was constructed by coiling. It is very probable, however, that this was the common method followed.

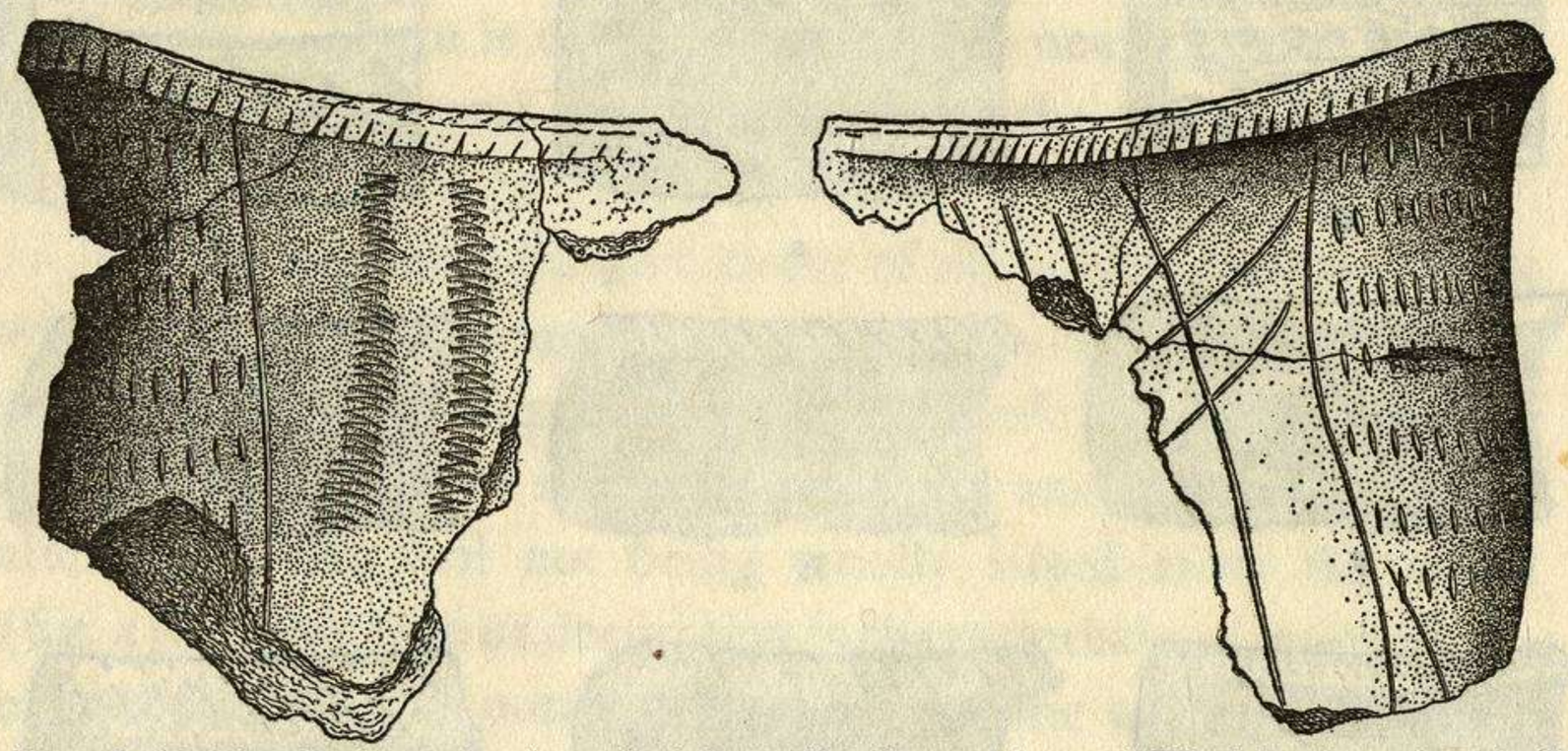

FIG. 2—Potsherds from fourteen feet beneath the surface of Whaleback oyster-shell heap, Damariscotta, Maine. Archaic Algonquian Group. (One-third.)

Probably this class of pottery occurred in most sections of New England. It is especially characteristic of the village-sites and shell-heaps of the tidewater region of Maine and Massachusetts, and thorough explorations of the shell-heaps of Rhode Island and Connecticut will probably show it in equal abundance. As a type it occurs southward along the shorelands as far as the Algonquian tribes extended. In the coast region of Maine, where the tribes came least in contact with the Iroquois, the use of this class of pottery probably prevailed up to proto-historic times.

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Much of the paste used by the New England Algonquians seems to have been somewhat inferior to that of the Iroquoian potters. Either the clay was not as carefully selected or their knowledge of preparing it was deficient. The tempering material was commonly crushed shell or crushed stone, often very coarse. There is every evidence that this pottery is of considerable antiquity, as it is found at all depths in the numerous shell-heaps of eastern New England. These heaps have been more or less extensively explored by Professor Wyman, Professor Putnam, the writer, and others connected with the Peabody Museum of Harvard University; Professor Morse of the Peabody Academy of Science at Salem; Professor Arlo Bates of the Massachusetts Institute of Technology; Frank H. Cushing of the Bureau of American Ethnology; and many others. Potsherds form a large proportion of the artifacts secured in these explorations.

The largest shell-heap in New England which has been systematically explored is the great Whaleback oyster-shell mound on the eastern bank of the Damariscotta river in Maine. This was approximately three hundred feet in diameter, the greatest depth of shells being sixteen feet. It is but one of a group of large mounds in the immediate vicinity. Hearing that the shells were to be ground for commercial purposes, Professor Putnam purchased for the Peabody Museum the right to all artifacts found. A reliable man was employed by the Museum to watch the workmen and to record the position of the specimens. A considerable collection of sherds of the class of pottery under consideration was procured. These were found scattered throughout the heap at all depths. The conclusions

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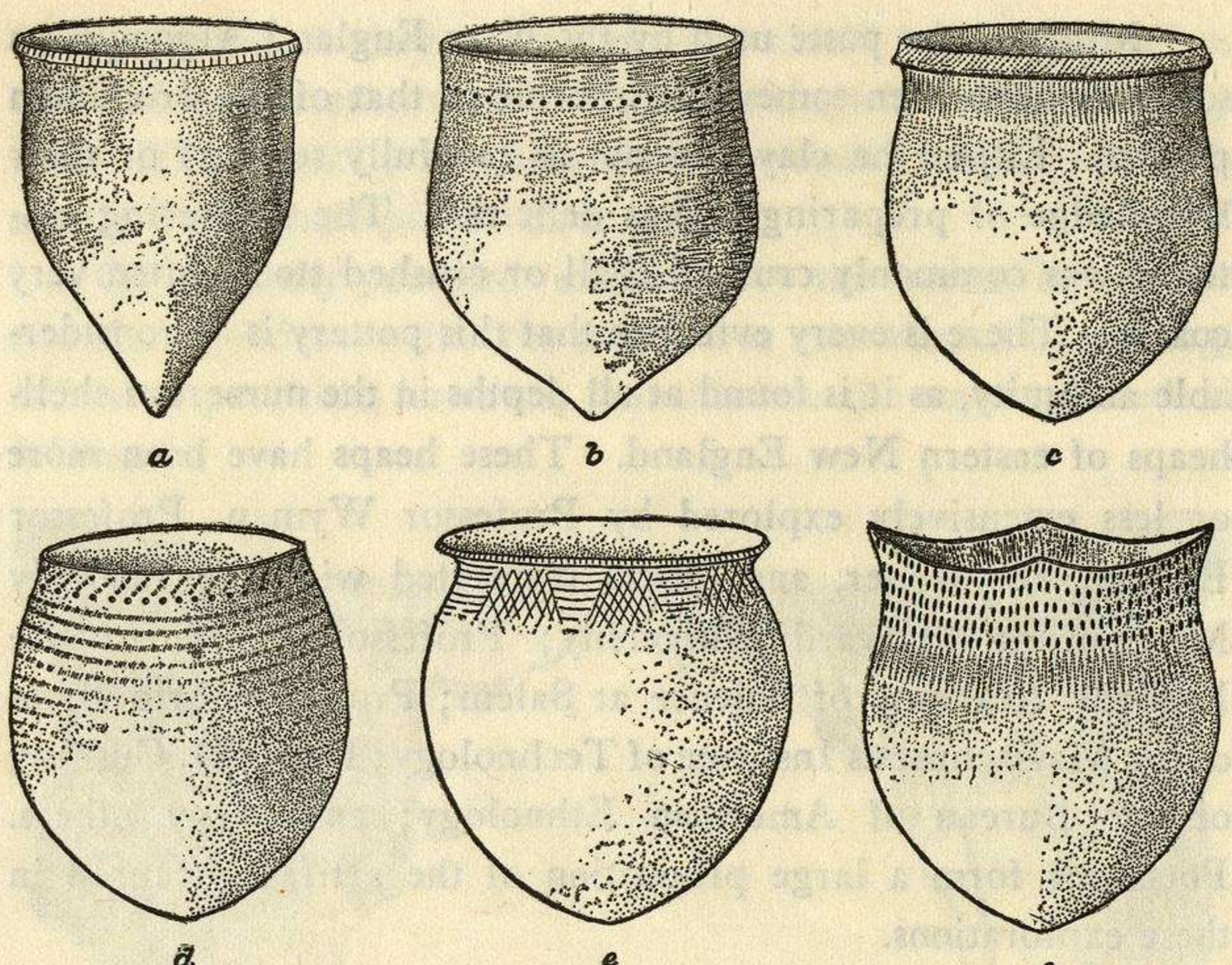

FIG. 3—Pottery vessels from Maine shell-heaps. (Restored from fragments.) Archaic Algonquian Group.

resulting from a study of these specimens are confirmed in general by other less thorough explorations throughout the tidewater regions of eastern New England.

It seems that the art of pottery-making was not indigenous to these states, but was brought to this region at a period nearly approaching the time when shell-fish were first used for food along our coast. Moreover, but little if any advance was made in this art during the long period necessary for the accumulation of most of the shell-heaps, pottery from the lower layers showing the same general characteristics in composition of paste, in form, and in decoration, as that from the upper layers.

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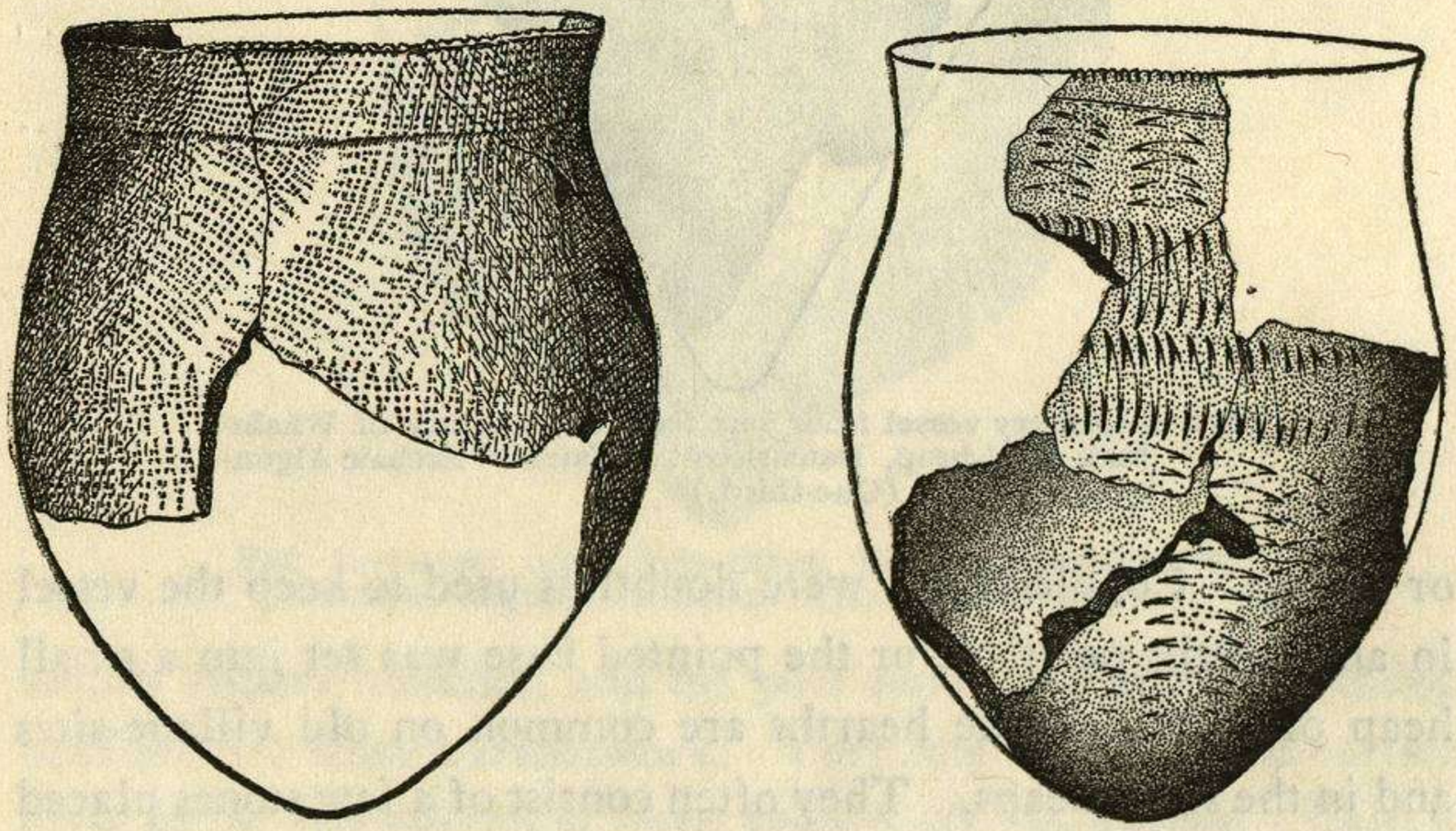
Fig. 2 shows drawings of two fragments of a cooking-pot from fourteen feet beneath the surface of the Whaleback mound above noted. The decorations consist of broad vertical bands of incised and indented ornamentation, an unusual arrangement, seen, so far as the writer's experience goes, only in very old specimens. Part of the design consists of the zigzag pattern so characteristic of the class of pottery under consideration.

In fig. 3, *f*, is shown a restoration from fragments of another well-made vessel found fourteen feet beneath the surface of this mound. The upper exterior decorated zone consists of indentations similar to those on fig. 2. A space on the inner side of the rim, and the greater portion of the exterior surface, is ornamented with the zigzag pattern. The vessel illustrated in fig. 3, *b*, is restored from fragments found at the depth of six feet in the above mound, and the two pots shown in figs. 4, *a*, and 5, were



a *b*

FIG. 4—Pottery vessels from Maine: *a*, From four feet below surface of Whaleback shell-heap, Damariscotta. *b*, From grave at Waterville, Kennebec county. Archaic Algonquian Group. (About one-third.)

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taken from different sections at a depth of about four feet. The well-made rim (fig. 1, *m*) was found ten feet below the surface of the same mound.

The vessel shown in fig. 5 and restored in fig. 3, *a*, has an unusually pointed base. Probably none of the earlier New England pottery was suspended over the fire by means of cords

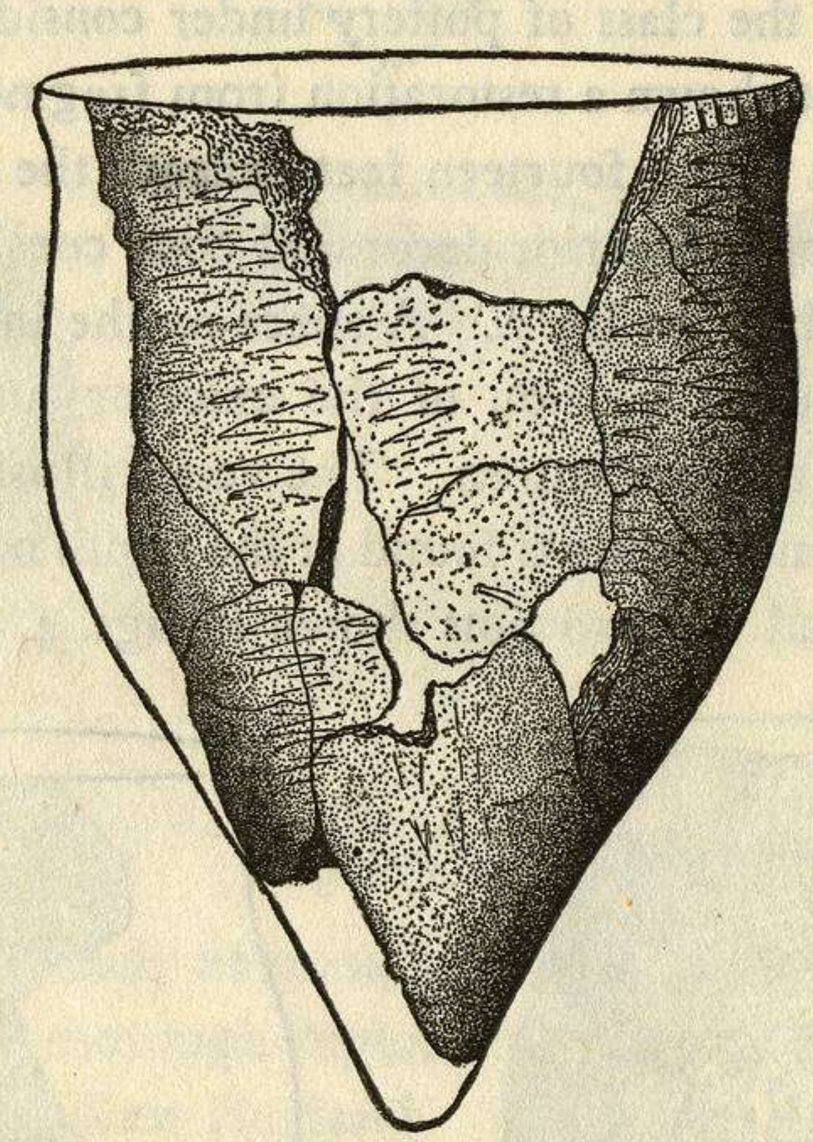

FIG. 5—Pottery vessel from four feet below surface of Whaleback shell-heap, Damariscotta, Maine. Archaic Algonquian Group. (One-third.)

or thongs. Cobble-stones were doubtless used to keep the vessel in an upright position, or the pointed base was set into a small heap of earth. Stone hearths are common on old village-sites and in the shell-heaps. They often consist of a few stones placed together apparently without order. The better hearths, however, are made of selected stones carefully laid in the form of a

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disc about three feet in diameter. The more or less pointed bases of this class of earthenware are well adapted for fitting into spaces between the stones or of being set into the earth.

The Virginia Indians, whose earthenware probably resembled that of New England in general form, set their cooking-pots upon a "heape of erthe to stay them for falling," and "putt wood under which being kyndled one of them taketh great care that the fyre burn equally rounde about." [1]

After much of the later New England pottery had become somewhat modified by Iroquoian influence, the bodies of the

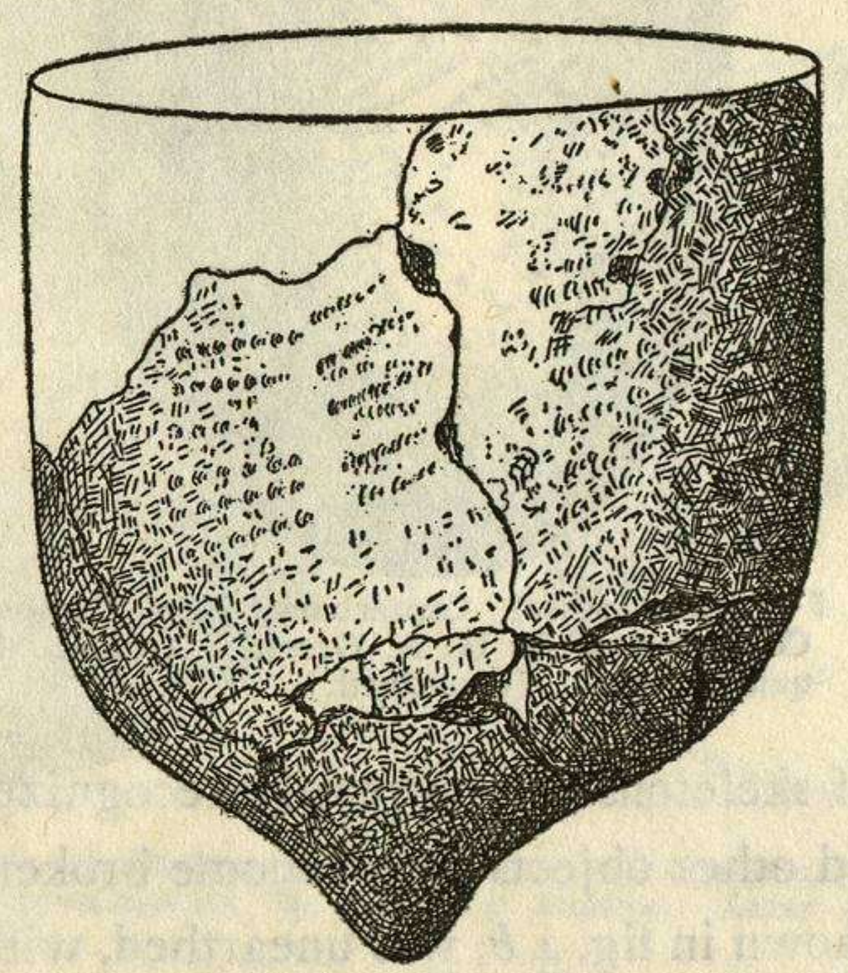

FIG. 6—Pottery vessel from grave, Revere, Massachusetts. Archaic Algonquian Group. (About two-fifths.)

vessels became rounder, and the pots were sometimes suspended over the fire from a framework. Very few vessels of the earlier class under consideration have been found in graves. This is

[1] Thomas Hariot, *A Brief and True Report of the New Found Land of Virginia*, Holbein edition, p. xv.

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owing in a measure to the rapidity with which skeletons disintegrate and disappear in the shallow Indian graves of this region. Instances have come under the observation of the writer where the skeletons in proto-historic graves in which European objects were found have become so disintegrated that not a bone retained its form; nothing in fact but discolored earth and an occasional spot of white lime-powder remained to show the former presence of the skeleton. Burial places not marked by

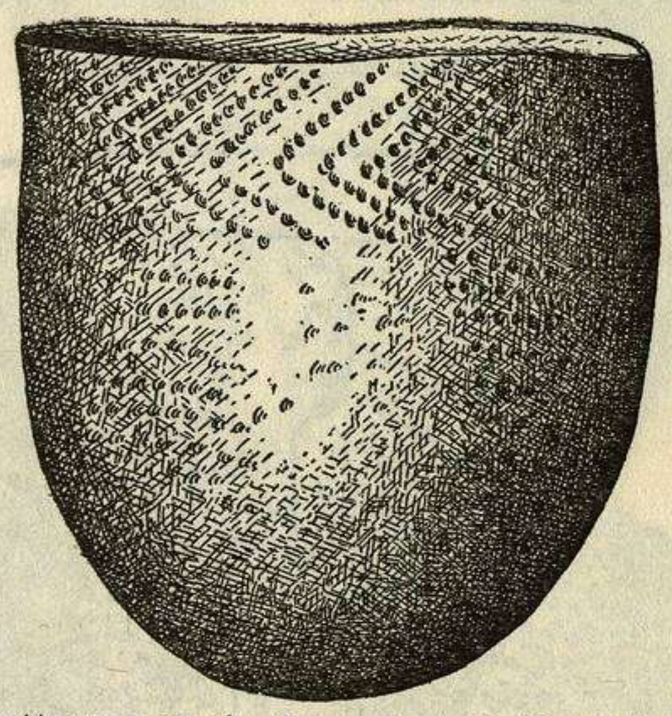

FIG. 7—Pottery vessel, Canterbury, New Hampshire. Collection of Dr H. A. Green. Archaic Algonquian Group. (One-third.)

the presence of skeletons are not easily recognized if disturbed, and pottery and other objects soon become broken and scattered.

The pot shown in fig. 4 *b*, was unearthed, with a skeleton, on the right bank of the Kennebec river at Waterville, Maine; and the one illustrated in fig. 6 was also found with a skeleton at Revere Beach, a few miles north of Boston. In sections most remote from Iroquoian influence, as in the tidewater regions of Maine, the archaic type of Algonquian pottery probably continued well into proto-historic times.

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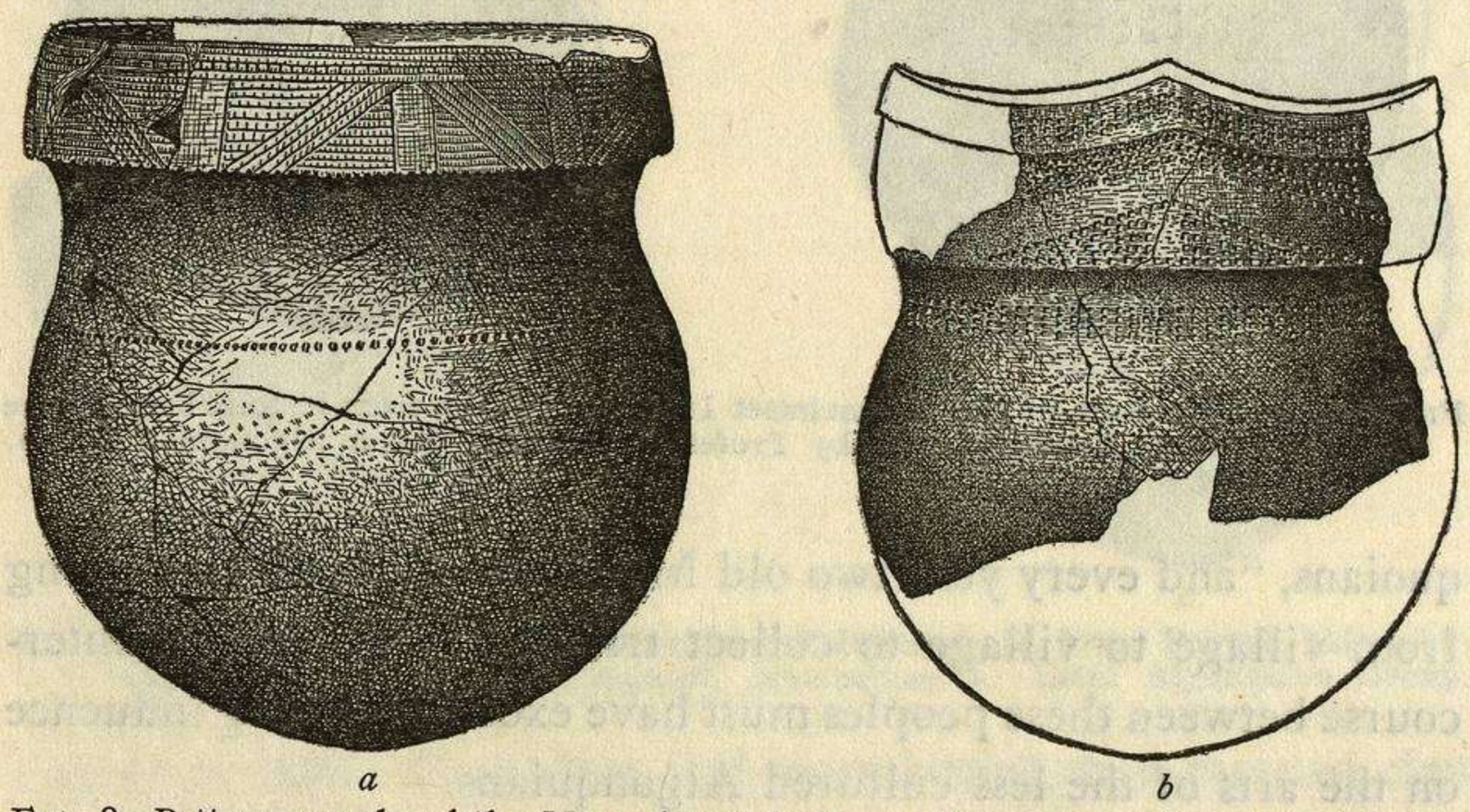
LATER ALGONQUIAN POTTERY

In this group is included much of the pottery used in western, central, and southern New England during later prehistoric times and to the latter part of the seventeenth century. Most of the examples illustrated were taken from graves of the proto-historic or early historic periods. Sherds of this class are not as common as those of the earlier pottery in the shell-heaps of eastern Massachusetts, and they are rare in Maine. A study of the sherds from central, southern, and western New England, indi-



a *b*

FIG. 8—Pottery vessels of the Massachuset Indians. Taken from historic burial-place at Winthrop, Massachusetts, by Professor Putnam. Later Algonquian Group. (About one-third.)

cates a transition from the more primitive types to the forms illustrated. This modification is due largely to Iroquoian influence. In most of the specimens shown, Iroquoian characteristics predominate, the more pronounced of which are the globular body, the prominent and highly decorated rim, and a narrow decorated zone on the body.

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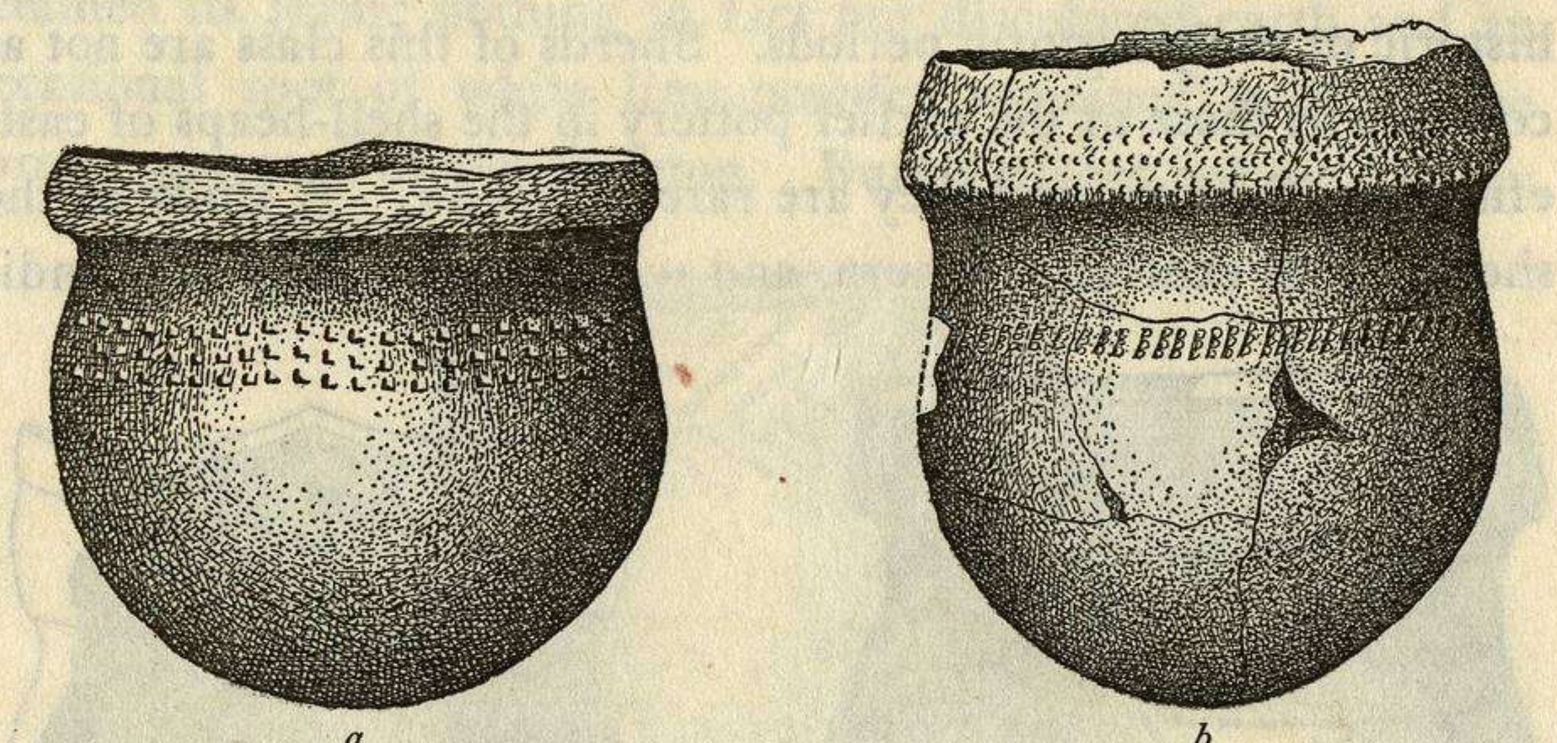
The Iroquoian tribes, more especially the Mohawk, were constantly making raids into this territory, even attacking villages of eastern Massachusetts. At one period they claimed the country west of the Connecticut.[1] In more recent times, some of the villages of the western section became subject to the Iro-



a *b*

FIG. 9—Pottery vessels of the Massachuset Indians. Taken from historic burial-place at Winthrop, Massachusetts, by Professor Putnam. Later Algonquian Group. (One-half.)

quoians, "and every year two old Mohawks might be seen going from village to village to collect tribute."[2] Prolonged intercourse between these peoples must have exerted a strong influence on the arts of the less cultured Algonquians.

The use of this earthenware continued well into historic times. Champlain tells us that when the Indians of eastern Massachusetts prepare corn "they boil it in earthern pots which they make in a way different from ours."[3] Morton's description is as follows: "They have earthern pots of divers sizes, from a

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[1] Marquis de Vaudreuil, Letter of April 21, 1725 (*Doc. Col. Hist. New York*, Albany, 1855, vol. IX, p. 943), quoted by Holmes.

[2] De Forest, *History of the Indians of Connecticut*, p. 66.

[3] Champlain, *Voyages* (Prince Society), vol. II, p. 86.

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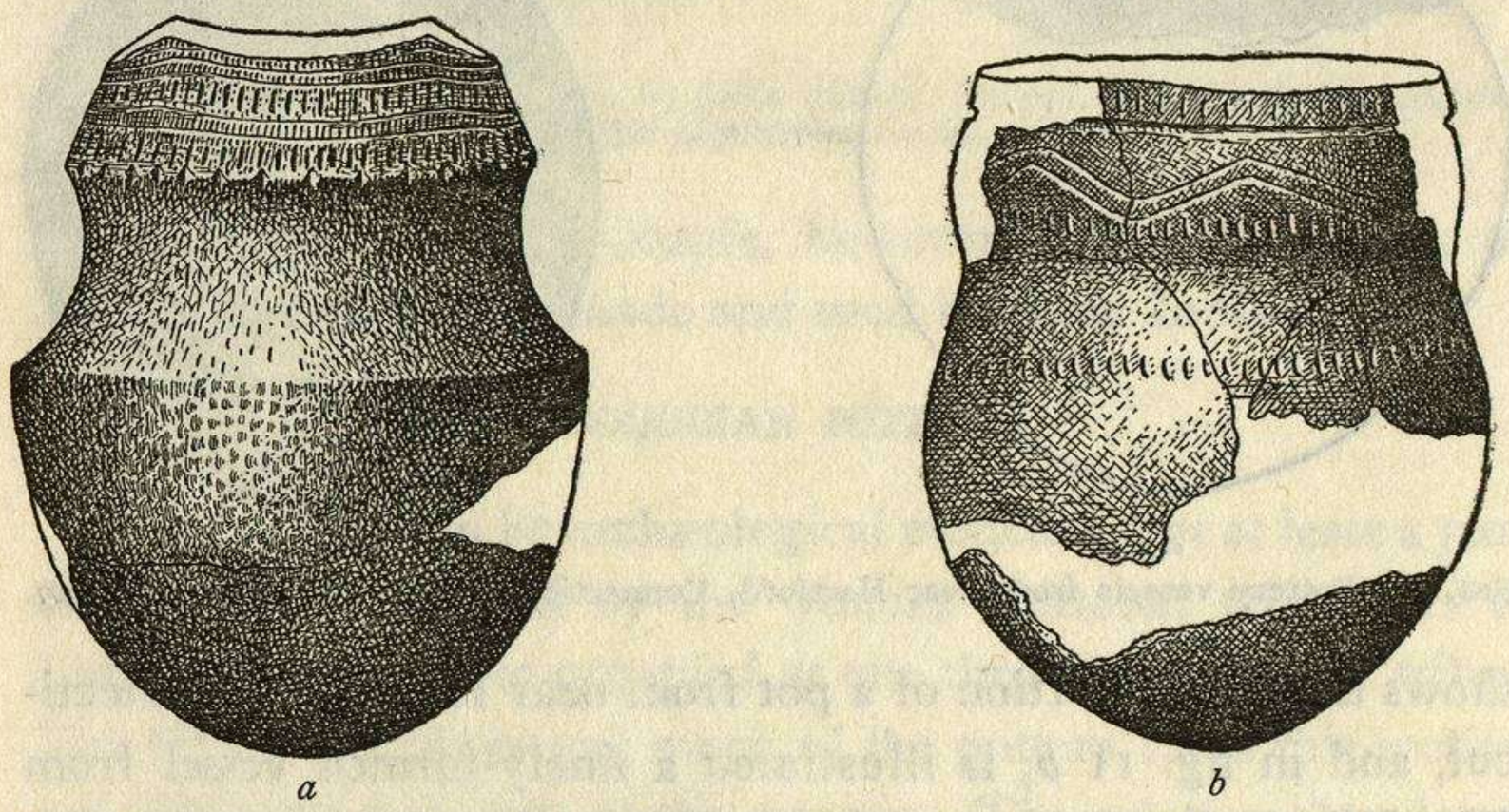
quart to a gallon, 2 or 3, to boyl their vitels in; very strong though they be thin like our iron pots." [1]

Clay vessels were used by the New England Indians as late as 1674. At this date Gookin writes: "The pots they seeth their food in, which were heretofore and yet are in use among some of them, are made of clay or earth, almost in the form of an egg, the top taken off. But now they generally get kettles of brass,



a *b*

FIG. 10—Pottery vessels, probably Massachuset Indians. *a*, From Revere, Massachusetts. *b*, From grave at Hingham, Massachusetts. Later Algonquian Group. (About one-half.)

copper or iron. These they find more lasting than those of clay which were subject to be broken and the clay or earth they were made of was very scarce and dear." [2]

Four pots, taken from graves of the historic Massachuset Indians at Winthrop by Professor Putnam, are illustrated in figs. 8 and 9. While these specimens show decided Iroquoian characteristics, they are undoubtedly the work of the Massachuset.

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[1] Morton, *New English Canaan* (Prince Society), p. 159.

[2] Gookin, Historical Collections, in *Mass. Hist. Soc. Coll.*, 1st s., repr., 1859, vol. 1, p. 151.

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In fig. 10 are shown two small vessels, probably also the work of this people: *a* is from Revere, and *b* from a grave in Hingham. The former is in the Peabody Museum at Salem. Fig. 11, *a*,

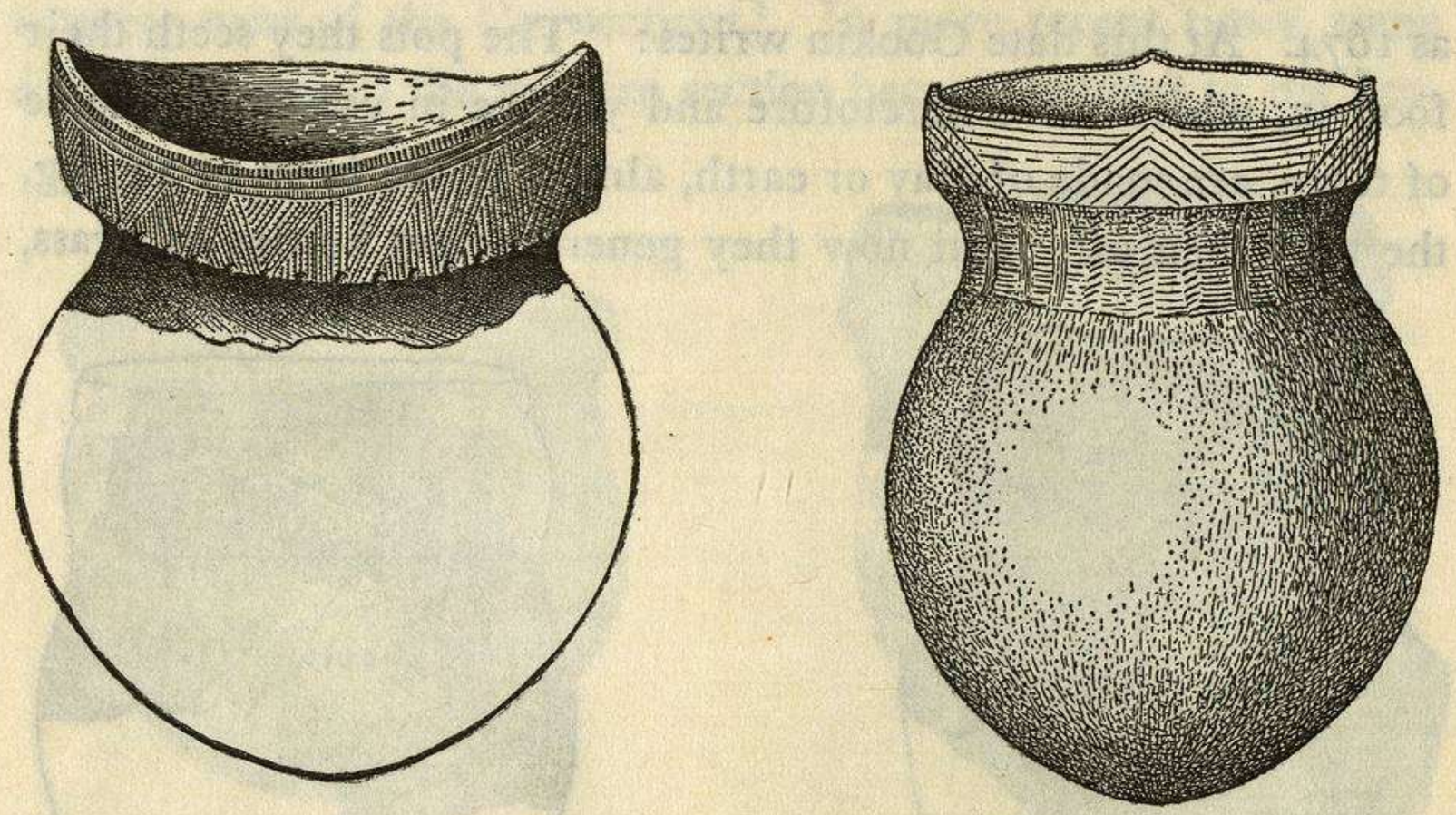

FIG. 11—Pottery vessels from near Hartford, Connecticut. Later Algonquian Group.

shows the upper portion of a pot from near Hartford, Connecticut, and in fig. 11 *b*, is illustrated a finely-formed vessel from East Windsor, a few miles above Hartford. This is now in the American Museum, New York City. Much of the later ware shows cord-markings upon the bodies, caused probably by cord-wrapped paddles used as implements by the primitive potters. Cord-markings sometimes occur also upon archaic pottery, but they are not characteristic of this class.

An interesting example of the influence of foreign forms upon the further development of native pottery is illustrated by a flat-bottomed, handled mug, now in the Peabody Museum of Harvard University, made by the Indians from shell-tempered clay, the shape, of course, being copied from a European model.

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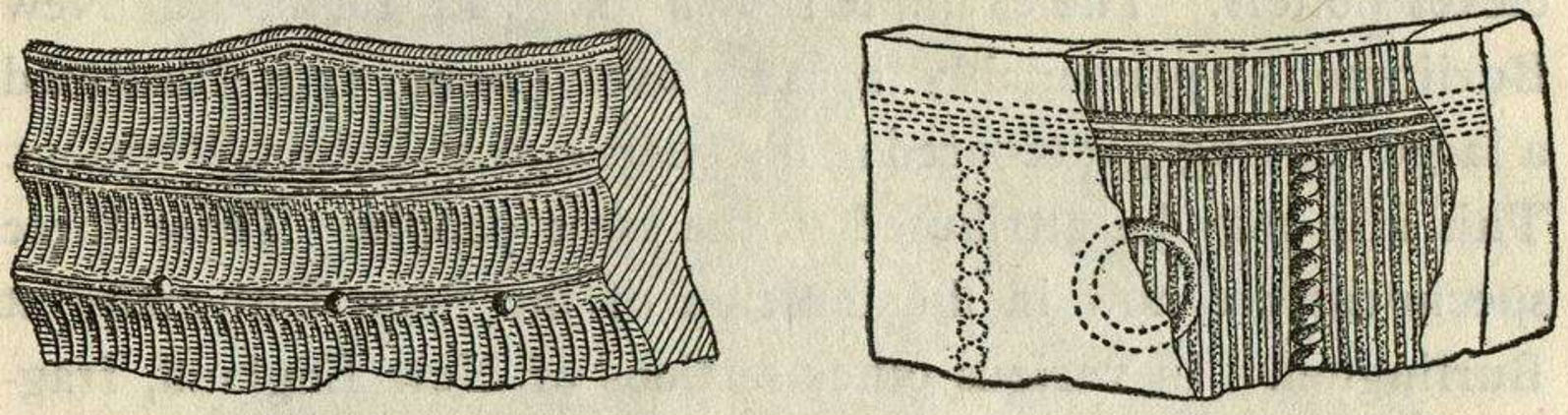
This was taken from a grave near Springfield, Massachusetts, and is the only example of its kind from New England known



a *b*

FIG. 12—Fragments of pot-rims. *a*, Lake Auburn, Maine. *b*, Damariscotta, Maine. Later Algonquian Group.

to the writer. It is probable, however, that other copies of European dishes were made and used by these Indians.

IROQUOIAN POTTERY

There seems to be archæological evidence that at least a part of the region drained by the western Vermont tributaries to Lake Champlain was occupied at one time by Iroquoian tribes. The terra-cotta pipes and much of the pottery from this section are distinctly the work of this people. The relative abundance of these remains seems to point to occupancy rather than to commerce. The collection of Iroquoian pottery from the state of New York in the Peabody Museum of Harvard University consists of about forty-six perfect vessels and thousands of sherds, many of which are fragments of rims. A comparison of this collection with the illustrated examples from Vermont leaves no doubt in the mind of the writer as to the Iroquoian origin of the latter.

The beautiful pot shown in fig. 13 is from Colchester, Vermont. Perfect vessels of this type are rare, but fragments are

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found in the Iroquoian country of New York and Quebec. This is one of the most elaborate and ornate forms made by these clever potters. The example shown in fig. 14, found near New Burlington, is presumably from a grave. In fig. 15 is illustrated a large cooking-pot secured many years ago at Bolton, Vermont. This also may be attributed to the same people. These three specimens are now in the museum of the State University at Burlington. In various other sections of New England, fragments of Iroquoian pottery are found, but not as yet in sufficient quantity to indicate occupancy of the region by this people.

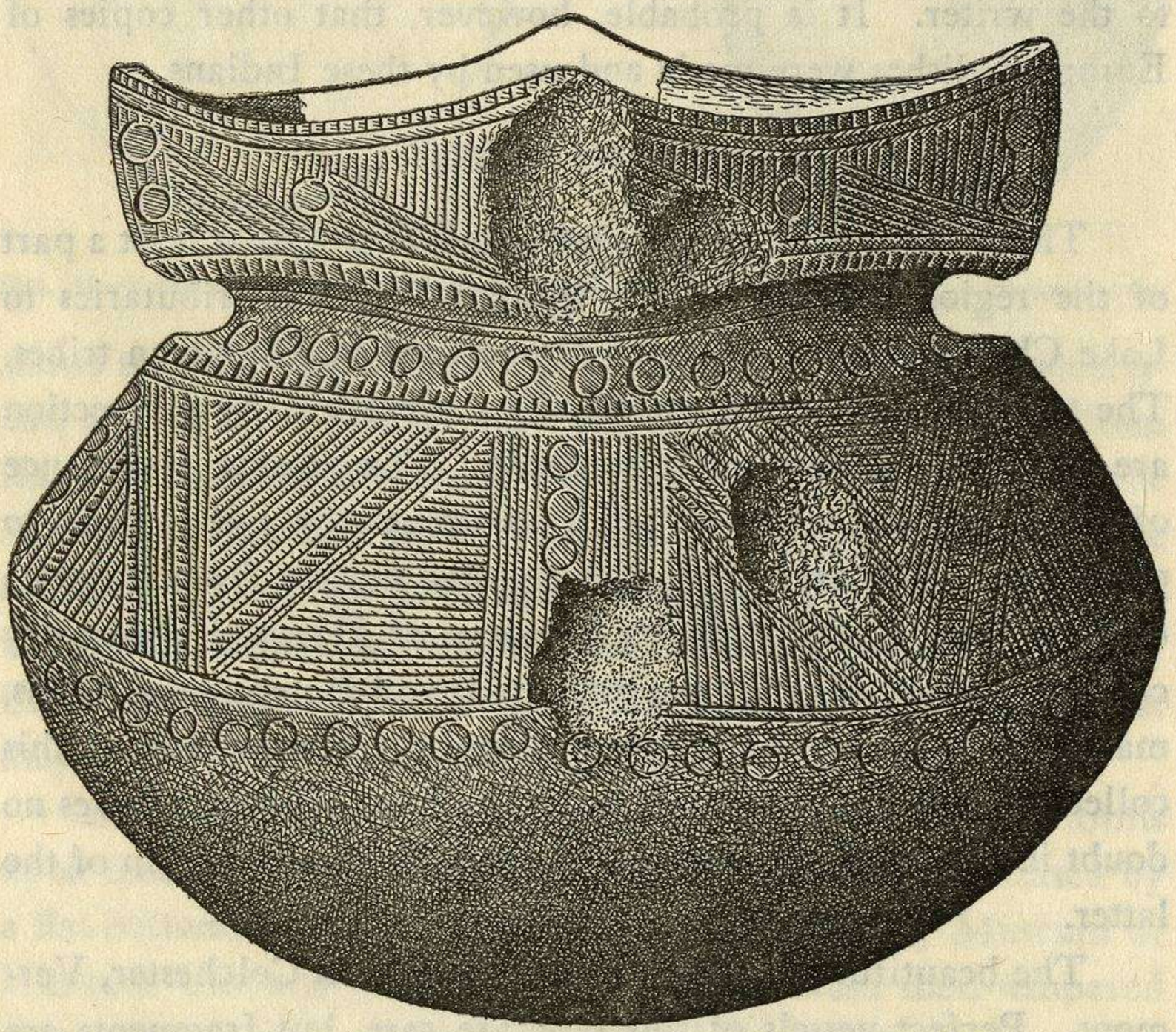

FIG. 13—Pottery vessel, Colchester, Vermont. Iroquoian Group. (About one-half.)

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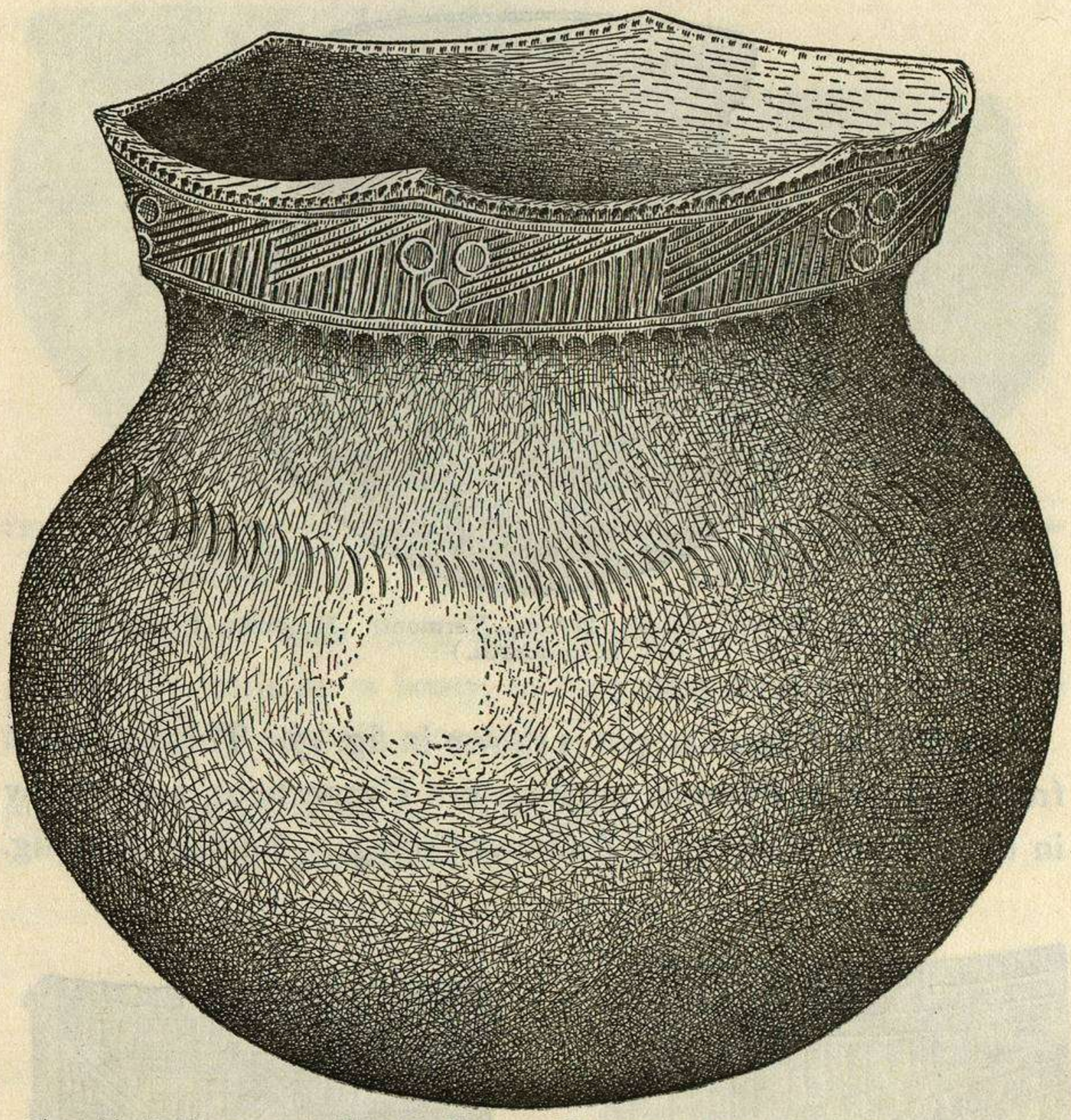

FIG. 14—Pottery vessel, New Burlington, Vermont. Iroquoian Group. (About two-fifths.)

Fragments of two rims are shown in fig. 16; *b* is from the beach at Ipswich, Massachusetts, and *a* is from Holderness, New Hampshire. These are distinguished not only by their form and decoration, but by the texture of the clay, which, in nearly all this pottery, is of good quality, and free from the coarse tempering material often used by the eastern Algonquians.

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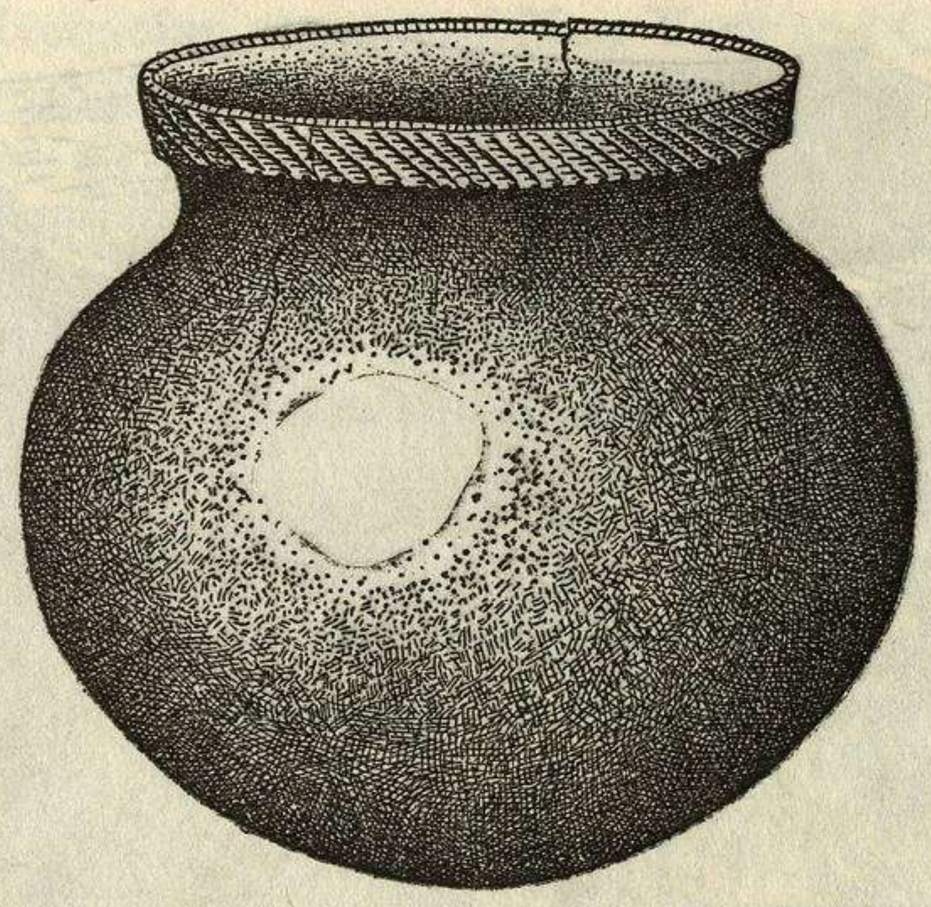
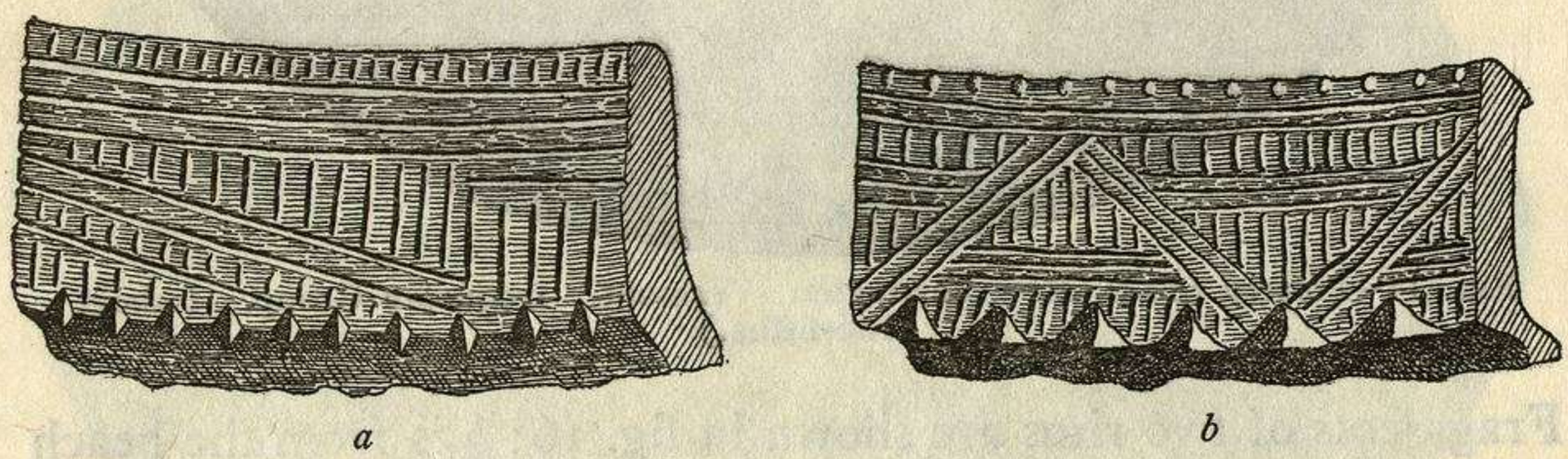


FIG. 15 — Pottery vessel, Bolton, Vermont. Iroquoian Group. (One-fourth.)

A typical Iroquoian pot is shown in fig. 17. This was taken from a grave in Putnam, northeastern Connecticut, and is now in the Gilbert Museum at Amherst College. Another pot (fig. 18) having strong Iroquoian characteristics, was obtained from an historic grave in Deerfield, Massachusetts. It is preserved in the Memorial Hall Museum of that town. Isolated examples



a *b*

FIG. 16—Fragments of pot-rims. *a*, Holderness, New Hampshire. *b*, Ipswich, Massachusetts. Iroquoian Group.

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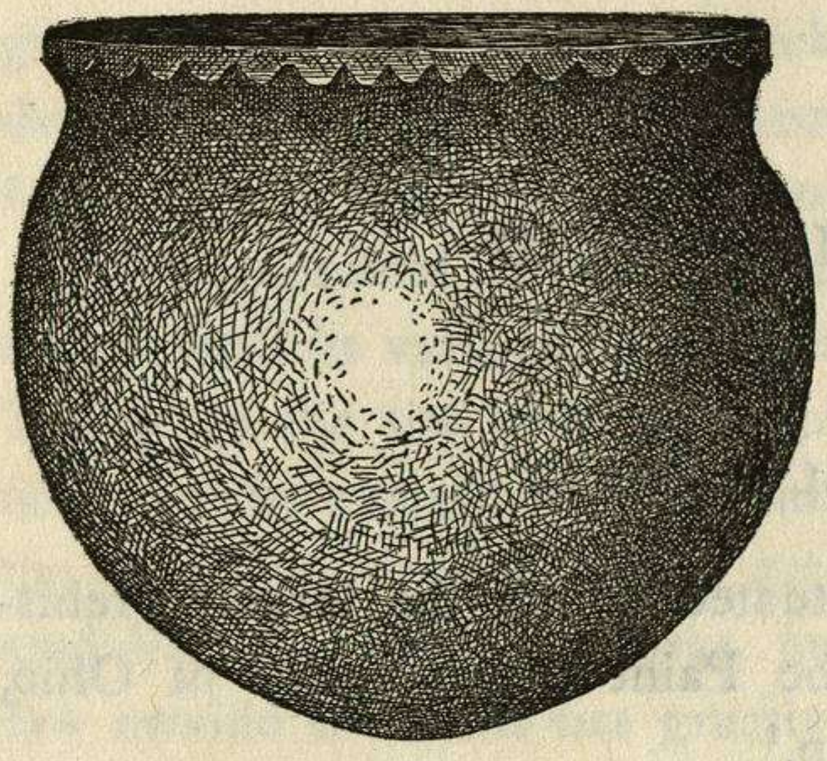

FIG. 17—Pottery vessel from grave at Putnam, northeastern Connecticut. Iroquoian Group. (About one-third.)



FIG. 18—Pottery vessel from historic grave, Deerfield, Massachusetts. Iroquoian Group. (One-third.)

of this pottery may have been brought from the Iroquoian country by trade or as booty, or they may have been fashioned by captured or adopted women.

PEABODY MUSEUM, HARVARD UNIVERSITY
CAMBRIDGE, MASSACHUSETTS

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THE SEIP MOUND

BY

WILLIAM C. MILLS

THE Seip Mound is situated within the largest prehistoric earthworks of the Paint Creek valley of Ohio, known as the Seip Group.[1]

One very large mound and another half its size, enclosed with earthworks, which form a combination of two circles and a square, and five mounds situated outside the earthworks but in close proximity to them, constitute the Seip Group. This group is situated in Paxton township, Ross county, Ohio, about three miles east of Bambridge, a village in the extreme western portion of the county. The mounds can readily be reached by conveyance, as the old Milford and Chillicothe pike passes in sight of the works and the Detroit Southern railway has a flag station only a quarter of a mile away.

Paint Creek valley has long been known for its beautiful scenery and productive soil. It is drained by Paint creek, a stream of irregular turbulence, crossing from one side of the valley to the other until it finally empties into the Scioto river south of Chillicothe.

The mounds and earthworks comprising this group occupy the greater portion of the rich agricultural bottom-land in the

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1 Described by Squier and Davis in *Ancient Monuments of the Mississippi Valley*, pp. 4, 58.

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great bend formed by Paint creek as it changes its course from the north side of the valley directly to the south side, where it follows the base of the foothills for some distance.

At the present time one can readily trace the circles, but the square with its various openings cannot be so readily followed. Yet, when the site is freshly plowed, the old walls are easily discerned by a slight elevation and the change in appearance of the soil. The mounds, which are all quite large, have deteriorated less than the earthworks, but the farm cultivation of the few outside the walls has greatly reduced them in height.

The two mounds within the walls have suffered little by the encroachment of agriculture. The larger of the two mounds is known as the Pricer Mound, and at the present a number of large native trees are growing upon its top and sides. It is about twenty-five feet high and 240 feet long. The mound has been fenced about, and the enclosure is now used as a sheep pasture, consequently the surface of the mound is devoid of the usual growth of weeds and bramble so common to the large mounds in Ohio.

Situation and Dimensions

The Seip Mound, named in honor of the Seip brothers, the present owners of the land, is about half the size of the Pricer Mound and is situated upon the same terrace, only a short distance to the east of the larger mound (see plate I).

Squier and Davis, in their drawing of this group, note the Seip Mound as three distinct mounds, as shown in plate II. I have classed the group as one mound, though made up of three separate but connected mounds, as our explorations afterward

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revealed. This feature is invariably present in all large mounds of this culture group.

The measurements of the various sections of this mound differ greatly. Commencing at the western end of the mound, which was the largest, the height from outside measurements was eighteen feet; but as the explorations progressed, the mound was found to be twenty feet and one inch high, making the base two feet and one inch lower than appeared from the general level of the surrounding surface. The diameter of this section north and south was 120 feet. The second section, closely connected with the adjoining one on the east, was eleven feet ten inches high with a diameter north and south of seventy feet. The third section was not on a line east and west with the other two sections, but was placed to the south, as shown in plate II, and clearly connected with section 2. It was six feet high with a diameter of forty feet.

Special Features of the Exterior

The mound for the greater part was composed of loam or surface soil, obtained upon all sides of the mound and in close proximity to it. The top of the first section, or larger mound, was composed of clay and limestone gravel. This combination, in the course of time, became cemented together, and proved quite a problem in its removal, as almost every portion had to be picked loose before a shovel could be used. Another feature of the mound was discovered shortly after work was begun on the north side by finding, near the base, several flat stones, averaging from ten to fourteen inches, so placed as to resemble steps. A further examination revealed a series of flat stones, from eighteen

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THE SEIP MOUND

Showing the Beginning of the Work upon the Third Section of the Mound. The Pricer Mound in the rear to the left

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to twenty inches under the surface, extending from the base toward the top of the mound. The steps were no doubt used to aid in reaching the summit of the mound with the heavy loads of earth, in the effort of the builders to complete the monument.

Another external feature frequently met with in the mounds of this culture group is the use of gravel in construction; but, in this mound, gravel of large size, with the appearance of having been screened, was placed entirely around the base of the mound, to a depth of two feet, and in many places the depth reached two and one-half feet. The width varied from seven to five feet, and at times was a great hindrance to the workmen, as the gravel had to be removed in order to expose the base of the mound, and at times could not be shoveled but had to be removed by hand.

Only one large pin-oak tree was left standing upon the mound by the owners, and this was variously estimated, before removal by us, to be from 100 to 175 years old, but when cut, and the rings of growth counted, it was found that the tree probably did not exist when the mound was first noted by Atwater in the *Archæologia Americana*, 1820.

Special Features of the Interior

Many very interesting features, as compared with other mounds of this culture group, were brought to light in the examination of the Seip Mound.

First, the site of the mound exhibits three separate inclosures, circular in form, as evidenced by the post-molds, extending into the base of the mound. The post-molds had charred wood at the top of the mold, indicating that the posts

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at one time extended above the surface, and no doubt formed the sides of the building, or charnel-house.

Second, the object of the mound was a monument to the dead, placed over the site of the charnel-house. The burials were similar in many respects to those of the Harness Mound,[1] but differed in many instances as to the number of cremated dead placed in a prepared burial cist. All the burials placed in the charnel-house were cremated, and graves were prepared for the reception of charred bones and ashes of the dead.

Third, the burials in the mound were of two kinds, cremated and non-cremated. The cremated remains were all placed upon the floor of the charnel-house, while the non-cremated were promiscuously placed in various portions of the mound above the base line, only one having a prepared grave for the reception of the body.

Fourth, the builders of the Seip Mound were similar in character to those of the Harness Mound, and represented the highest culture of prehistoric man in Ohio.

The special features enumerated above can be better understood by further discussion, and I shall attempt in the following pages to give a detailed account of the examination of this mound.

The Mound Site

The Seip Mound is situated practically in the center of a large circular earthwork which, for the most part, occupies the third terrace of the Paint Creek valley. The surface of this portion of the terrace is quite level, but this particular spot selected

[1] Explored in 1903, and described by William C. Mills in *Certain Mounds and Village Sites in Ohio*, 1.

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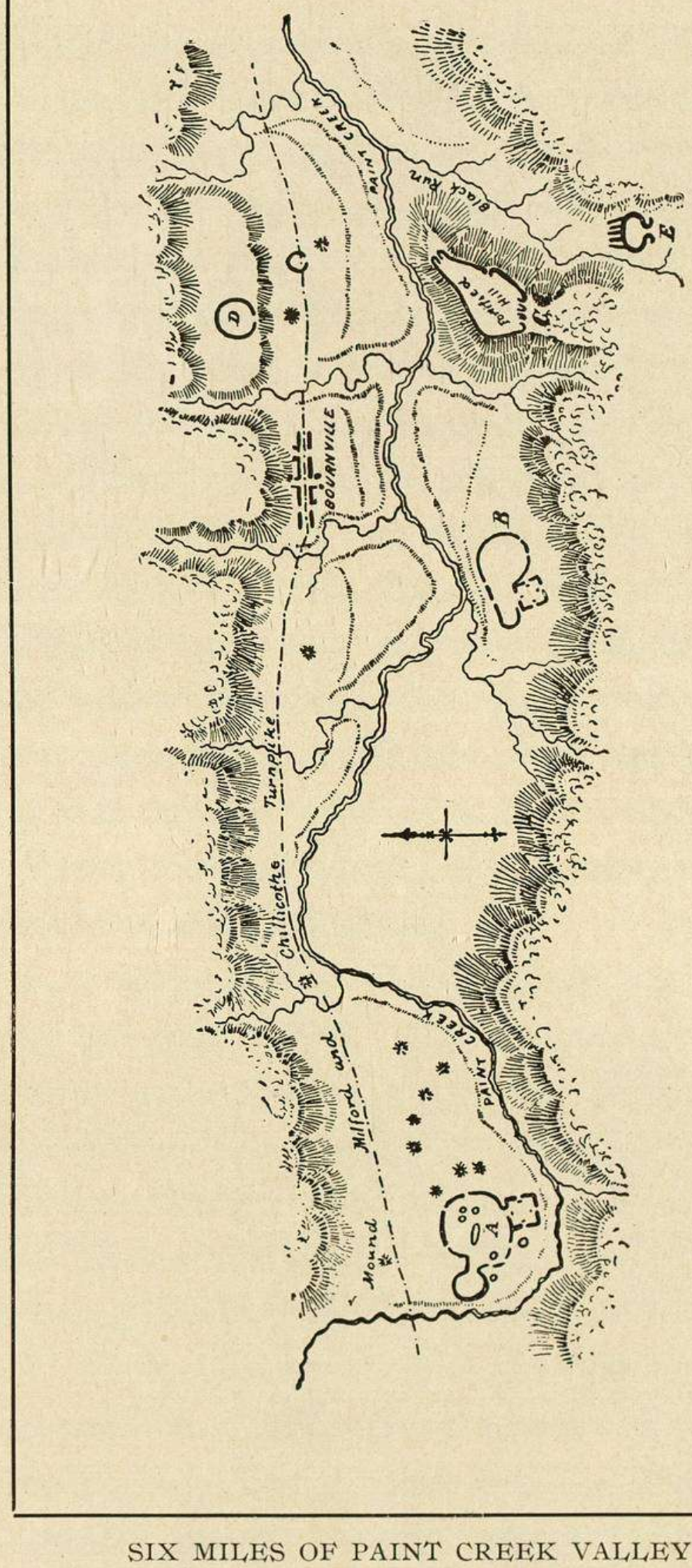

SIX MILES OF PAINT CREEK VALLEY

A, Seip Group of Mounds. *B*, Baum Works. *C*, Spruce Hill Works

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by the builders was somewhat lower than the surrounding surface. Perhaps the surface soil, which had been removed almost to the gravel, had been used in the construction of the large Pricer Mound, which is only a few hundred yards away. After selecting the site, the building was constructed by placing large posts in the ground to a depth averaging two and one-half feet. These were so placed as to form a circular building sixty feet in diameter east and west, and seventy-two feet in diameter north and south. These posts, forming the outside of the building, averaged two and one-half feet apart. Two entrances to the building were found — one to the northwest, and one to the east. The entrance to the northwest was of peculiar construction, and made by the walls overlapping each other, forming a passageway or hall about three feet in width and seven feet in length. The passageway was covered with a fine sand varying in thickness from two inches to half an inch, and so firmly packed as to have the appearance of coarse sandstone.

The floor of this section of the mound was very irregular, as shown by the examination. On the south side but little fill was required to make the floor level. As the north side of the floor of the charnel-house was approached, it was found that seventeen inches of a fill was required to make the floor level. This fill was made with logs, brush, gravel, and clay. The logs and brush were piled in the lowest places, and covered with clay and gravel. In the course of time the logs decayed, but the imprint or mold remained. Very frequently the molds connected with the large upright post-molds, extending deep into the base. At first glance one might infer the builders had some

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design other than building up the floor to a common level; but a careful examination revealed nothing beyond the use of logs as a filler in building the base or floor to a uniform level.

The entrance to the charnel-house from the east was a short passageway from the second circular charnel-house. The passageway was only about three feet in width and two and one-half feet in length. The floor was also covered with fine sand.

The second section was also a circular charnel-house measuring forty-three feet east and west, and thirty-two feet north and south. The floor of this section did not require very much, if any, filling to make it level. The outside posts formed the sides of the building, and were quite large on the north side, while those used for the other portions were similar in size to the first section.

The openings in this section were two — one leading into the first section, as described, and the second leading into the third section, with practically no passageway, as the third section was built to the southeast of the second section. The third section was oblong, the longer diameter (which was north and south) being twenty-two and one-half feet, and the shortest diameter (east and west) fifteen feet. The floor of the third section was prepared and leveled in the same manner as the other two sections. The posts used in the construction of the sides of this section were all smaller than those used in the other sections.

The Object of the Mound

The object of the mound was a monument to the dead, erected over the site of the various charnel-houses described above.

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Before the monument was erected, the superstructure was destroyed by fire, as evidenced by the charred remains of the posts forming the outside walls, as well as of the posts promiscuously distributed throughout the interior of the structure, which perhaps supported the roof. For the most part the upright posts were burned off at the base-line; but now and then a large post was not entirely consumed, and a portion of the charred remains extended, in many instances, several feet above the base and was preserved, while the portions of the posts extending into the ground were entirely decayed, only the post mold remaining. Very frequently the post-molds showed a perfect imprint of the bark; while in others knots, limbs, or any imperfection in the log was visible. In several instances large quantities of bog iron had formed in the mold.

Cremated Burials

All the remains of the dead placed in the charnel-house were cremated, and I shall describe each section, as they differed somewhat one from the other.

In the first section, which was the first charnel-house erected, and the largest of the group, many of the prepared graves were so constructed that one or more burials could be placed in the same burial cist. This was done by preparing a large platform of prepared clay (pl. IV, *b*), usually six to seven feet in length and four feet wide, and building up the sides and ends with round logs, varying in diameter from five to three inches, to the height of eighteen or twenty inches. A cover was placed over the top, which was made up usually of split pieces instead of round

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pieces used for the sides and ends. Clay was then placed around the sides and ends to firmly hold the logs in place.

Four burials, as shown in plate IV, *b*, were the largest number found in a grave; but two or three burials were met with quite frequently. The large graves were placed near the center of the charnel-house, and large passageways, often six to seven feet in width, intervened. Near the large graves a cluster of small post-molds, varying in number from five to seven, were found. These posts were usually placed about a foot apart, but not in any particular order. Frequently the floor around the posts was covered with great quantities of charred cloth, ornaments, and implements; and occasionally the floor was covered with mica, as shown in plate V, *a*. The mica was usually placed so as to cover the floor completely, and only the natural mica crystals, split in many pieces, were used.

It seems very probable that the cluster of posts near the graves were the sacred shrines for the dead; and here the clothing, and very frequently some of the most interesting ornaments — such as cut and polished human jaws, large effigy eagle-claws, bear teeth set with pearls, pendants of ocean shells, and shell and bone beads in great numbers, and in a few instances, copper ornaments — were found, with the charred woven fabrics, promiscuously placed upon the floor surrounding the posts. At one of the shrines a quantity of charred rope almost four feet in length, and a number of effigy eagle-claws made of bone, were found. The rope was three-ply, and made of course bast-fiber, perhaps that of basswood.

The graves placed near the outside walls were all smaller than those placed in the center of the charnel-house and con-

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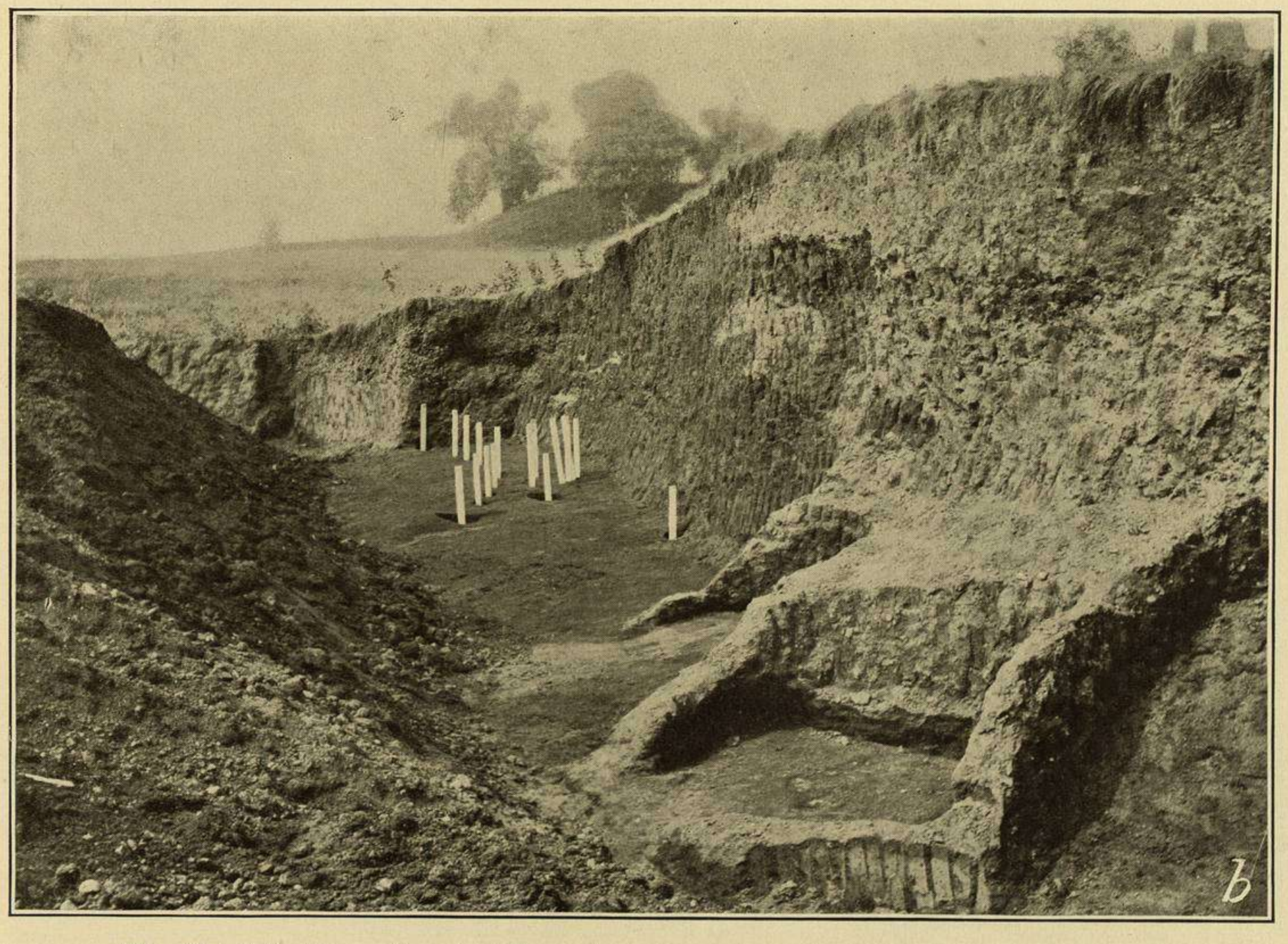
Plan of examination, with men at work



The Third Section and part of Second as shown by stakes placed in the post-molds

EXCAVATION OF THE SEIP MOUND

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tained only the remains of one individual; in this respect they were similar to the burials of the Edwin Harness Mound.[1]

All the burials in this section of the mound, which numbered twenty-four, were cremated at the large crematory situated just inside the northeast entrance. The crematory, when uncovered, was perfectly devoid of ashes or human remains, and measured six feet by eight feet, the longer diameter being east and west.

All the graves, both large and small, in this section, were of the plain elevated platform kind, so common in the Edwin Harness Mound. The platform type was made of clay, and invariably elevated from six to ten inches above the floor of the charnel-house. The platform was usually higher in the center, gradually sloping to the sides and ends, where logs averaging about six inches in diameter had been placed, usually in the form of a parallelogram. The clay used in the construction of the grave had the appearance of having been puddled before being used; and in many instances, after the coating of puddled clay had been placed over the grave, a fire was built and the clay burned to a light red. The ashes and any charcoal that might remain were removed before the incinerated remains were placed in the grave.

As stated, the single graves in the first section were similar in construction to those of the Harness Mound, but showing difference in the final ceremony. In the Harness Mound, after the incinerated remains were placed in the grave, objects of clothing, together with straw, bark, or twigs, were placed over

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[1] The Edwin Harness Mound is situated eight miles south of Chillicothe, along the Scioto. Explored by William C. Mills, 1903, and described in *Certain Mounds and Village Sites in Ohio*, I.

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the remains and set on fire; while burning, clay was covered over the grave, thus preserving the cloth, the grass, and twigs in a charred state. This ceremony was dispensed with in this section of the Seip Mound; the incinerated remains were placed in the prepared grave, and a covering of wood, usually split pieces, was placed over the top, and the grave covered with earth to a depth of a few inches.

For the most part, adults were buried in this section; yet in the grave containing four burials, one was an adolescent, and in another, a very small child was placed by the side of an adult. All the burials in this section were rich in copper implements and ornaments, placed in the graves.

The graves in the second section were similar in construction to those of the first section; all being of the platform type, however, they varied greatly in size from the ordinary single grave to a very large size (twelve feet two inches long by four feet five inches wide) and contained the remains of two individuals, so placed as to occupy the ends of the grave. The intervening space was not used, due perhaps to the fact that this section, together with the third section (which did not contain a single burial), was abandoned before the house was filled.

The burials in the second section were placed around the side walls, and the center was devoid of graves.

The final ceremony of burning straw, bark, and clothing over the remains, similar to the burial methods at the Harness Mound, was in evidence in nine burials of the nineteen found on the base of the section, and only one of the nineteen was cremated in the grave where the remains were found.

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Uncovering the floor of the mound



A family burial cist containing four cremated burials

EXCAVATION OF THE SEIP MOUND

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The floor of the third section of the charnel-house was entirely devoid of burials, and at only one point, which was near the west side, did the floor show any signs of having a fire built upon it. Here the earth was burned to a deep red. Perhaps a body had been cremated there, and the remains deposited in one of the other sections.

Perhaps no definite reason can be given for erecting a monument over an unoccupied site; but the most plausible reason, when taking into consideration the second section, which was only partially filled, is that the site was abandoned, the charnel-houses burned, and the mound erected over all as a monument to the dead.

Non-cremated Burials

The five non-cremated burials found in the various sections of the mound were promiscuously placed at various heights from the base-line, and only one had anything like a prepared grave for the reception of the body. The grave was placed three feet above the floor of the charnel-house in Section 2. The bottom of the grave was formed of large slabs of slate, and the body was laid at full-length upon the slabs and covered with soil.

One burial was found in the third section, two feet and a half above the floor. No grave was prepared, and the body was doubled up and laid on the mound, and was covered with earth, similar to the burial in Section 2.

The two burials evidently were individuals who died during the building of the mound, as their implements of copper and ornaments of shell were identical with those found in the

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graves of the cremated dead placed upon the floor of the charnel-house.

The other three burials were found in Section 1. One burial, that of an adolescent, was placed seven feet above the floor, and was buried similar to the one in Section 3, with no apparent grave prepared for the body. The ornaments of bear-teeth set with pearls, and a large string of ocean-shell beads, were similar to those found with the cremated dead placed upon the floor.

The remains of the other two burials of this section were placed together in a double grave, ten feet above the floor. The grave was evidently dug into the side of the mound, as the outlines of the grave were very noticeable. The remains, when placed in the grave, were perhaps for the most part devoid of flesh, and had been carried from some distant part of the country, or had been temporarily buried in some convenient place where the bones could be collected and afterward placed in the mound. The various parts of the skeletons were promiscuously placed in the grave: the skulls were placed upside down, and only a few inches apart; the lower jaws were detached and placed in another part of the grave; the arm and leg bones were placed side by side, and several bones of the hands and feet were entirely missing.

One large copper plate (ten inches in length and five inches in width) and a fine copper axe (four inches in length and two inches in width), together with large strings of ocean-shell beads, were found near the bottom of the grave. The implements and ornaments were similar in every respect to those found upon the floor of the charnel-house.

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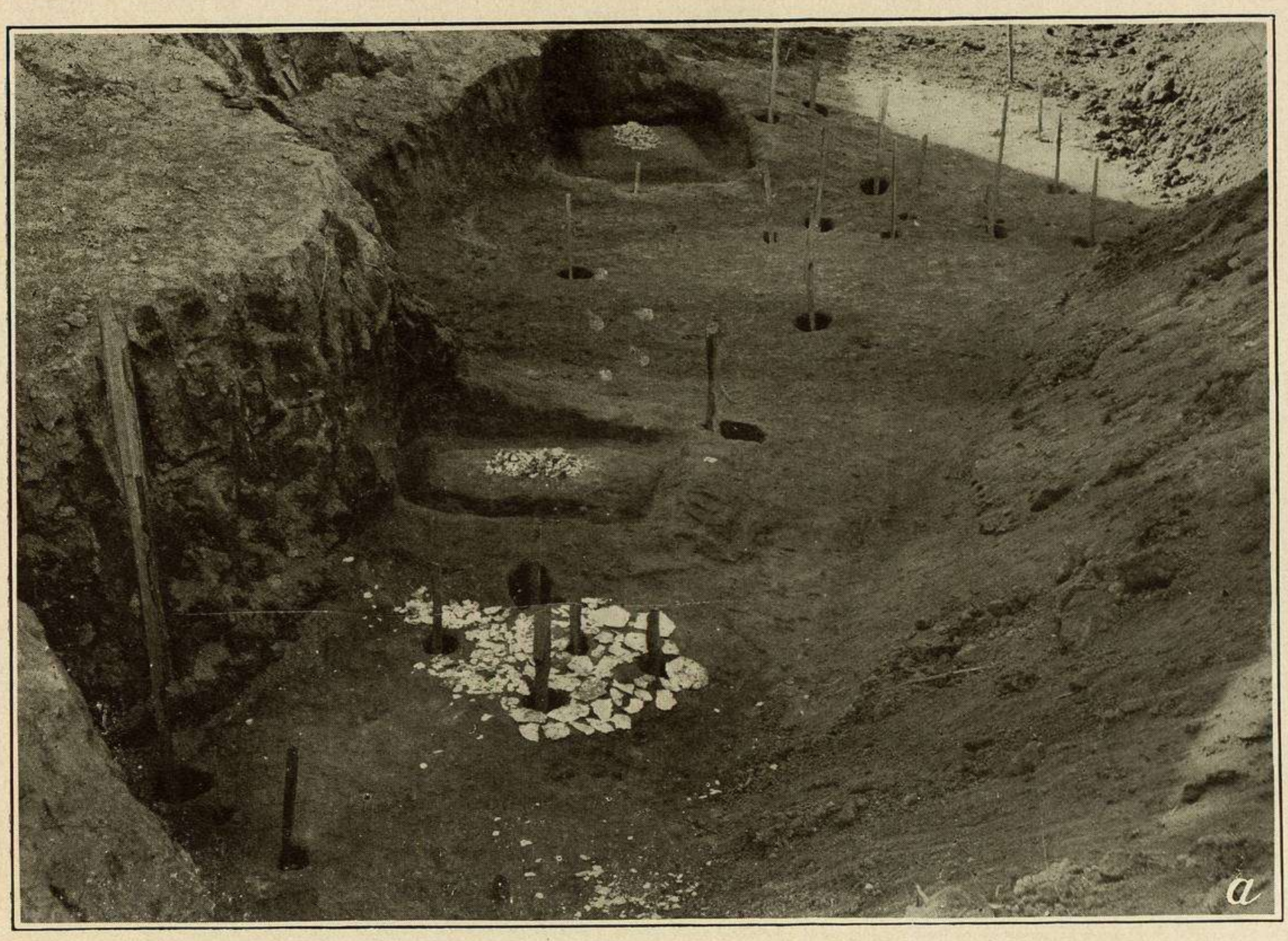
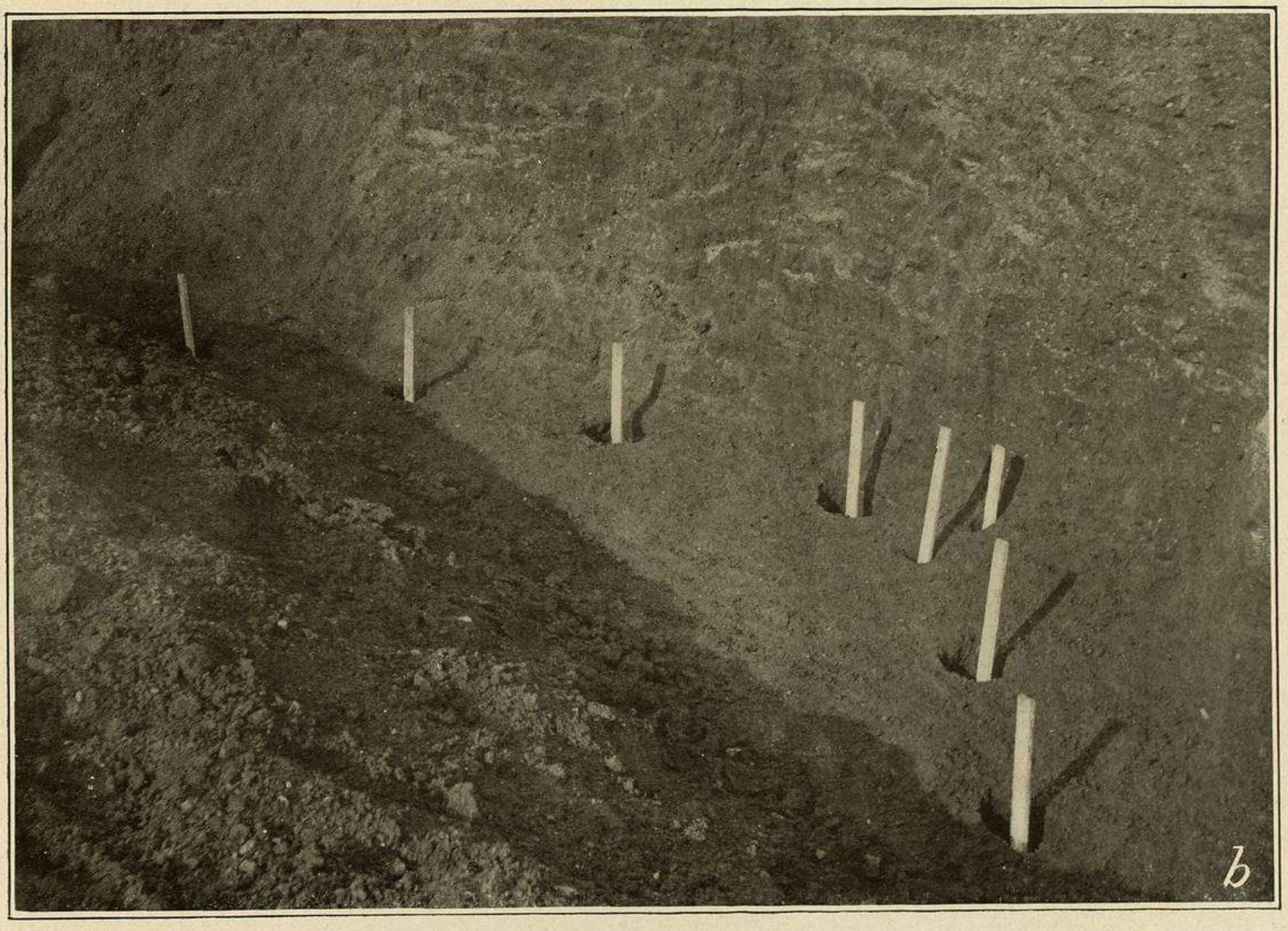


Floor of shrine covered with sheets of mica



The post-molds in the second section

EXCAVATION OF THE SEIP MOUND

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My conclusions are, concerning the non-cremated dead promiscuously placed above the floor of the charnel-house, that they belong to the same culture represented by the cremated dead placed upon the floor of the charnel-house; that three of the individuals died during the time required for the erection of the mound, and the custom of cremation was dispensed with; that the two dismembered individuals placed in one grave were disinterred, and the remains brought to the mound and buried with the dead belonging to the same culture.

The Artifacts Found with the Burials

The artifacts taken from the burials of this mound, as a whole, were very interesting, although in the second and third sections but few implements and ornaments were placed in the graves; but in the first section, almost every burial was prolific in implements and ornaments of copper, mica, shell, and stone.

From the forty-eight burials contained in the three sections of the mound were obtained upward of two thousand specimens, representing the highest art of prehistoric man in Ohio.

The material from which the implements and ornaments were made came from widely separated regions. The copper used in making the implements and ornaments no doubt came from the Lake Superior region; the ocean shells used in making drinking-cups, pendants, and beads, perhaps came from the Gulf; and the mica which was so universally used for ornament came from North Carolina.

The finding of so much material so remote from the sources of supply indicates that the ancient inhabitants of this section

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had an intertribal trade, for it seems impossible that the Ohio tribes visited these widely separated points.

ORNAMENTS OF COPPER

The best preserved specimens found in the graves are the implements and ornaments made of copper; and perhaps, next to the ear ornaments, the most interesting of the copper ornaments are the large copper plates, of which sixteen were found in the various sections of the mound. The plates are made each of one piece of native copper, hammered to about an eighth of an inch in thickness; and a few were found that would approach a sixteenth of an inch in thickness. The plates vary in size from ten inches and a half in length by five inches and a half in width, to three inches and a quarter in length by two inches and a half in width. The plates are made in the general form of a parallelogram, with the ends cut concave and the sides straight; however, one plate has a large scroll cut on one side, as shown in plate VI, *a*, and one plate has both ends cut into ornamental forms, as shown in plate VI, *b*. A large plate, size ten inches and a half long by five inches and a half wide, and covered with cylindrical beads made of ocean shell, is shown in plate VI, *c*. This copper plate, together with three more, almost equal in size, and the two ornamented plates described above, were all taken from the same grave. On account of the special features of this burial cist, I will quote from my field notes:

Grave No 19, which was placed within six feet of No 18, and directly north of it, was the largest and finest so far discovered in this mound. The cist was made by preparing a platform of clay, the highest point of which was 10 inches above the floor of the charnel-house, and 4 inches above the first logs laid around this platform to form the walls of the cist. The side-walls of

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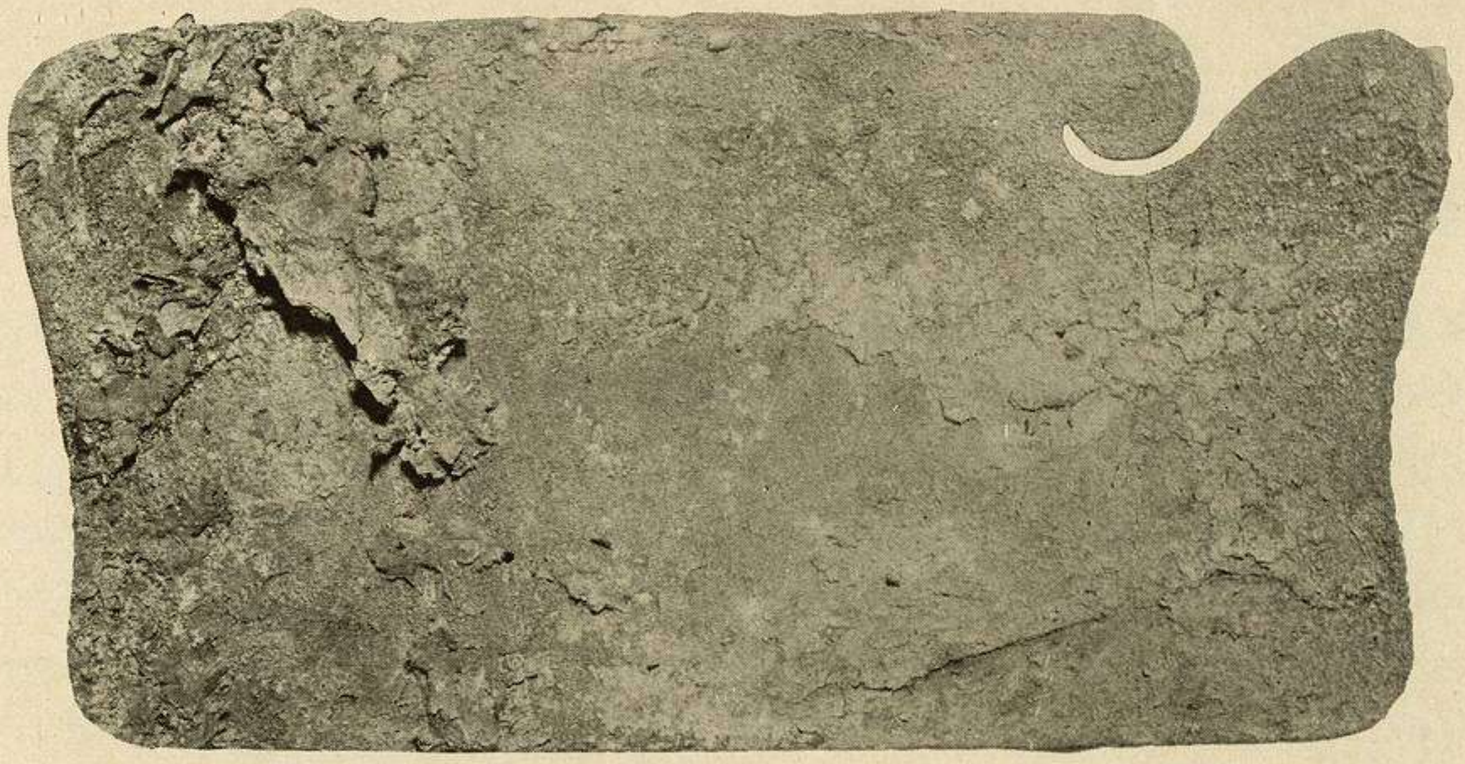

a. Large copper plate with scroll cut in side



b. Copper plate with ends ornamented



c. Copper plate with shell beads attached through corrosion

COPPER PLATES FROM THE SEIP MOUND

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the cist were 18 inches high, and made in the form of a parallelogram—7 feet 3 inches in length, and 4 feet in width. The molds of the lower logs were fully 7 inches in diameter, while the upper logs varied from 5 to 3 inches in diameter. The usual split pieces, as indicated by the molds, were placed over the top. The clay forming the top of the platform had been burned. Upon this platform were placed two burials—one at the south end (which was burial No 21), and one to the east side (which was burial No 22). They were so placed that further burials could be placed in the cist.

Burial No. 21, which occupied a portion of the south end of the cist, was an adult, and, from the general appearance of the incinerated bones, was, no doubt, a male. Before the incinerated bones had been placed in the grave, a tanned skin of some animal was placed at the bottom of the cist. Upon the skin was placed a large copper axe, 6½ inches long, 4 inches wide at the bit, and 3 inches wide at the pole. The axe was also wrapped in leather, which was preserved by the salts of copper. The incinerated remains were placed in a pile over the copper axe, and covered with a coarse matting of bark.

Between burials 21 and 22 was placed a large spear-point that was very much broken by heat.[1]

Practically the same preparation was given burial No. 22. The tanned skin was placed on the bottom of the cist, and large copper plates, 6 in number, were placed upon the covered platform. Two of the plates differed greatly from the other four, in being decorated with scrolls and scallops upon the sides and ends. Over the plates a very long string of beads was coiled. The beads were made of ocean shell, cylindrical in form, and varied in length from ½ to ¾ of an inch. The beads were firmly attached to the plate by corrosion of the copper. On each side of the copper plates was placed a single ear ornament of copper, also seven large pieces of ocean shells, several of them 6 inches in length and about an inch in width. Each was perforated with two holes, one at each end, for attachment, and so made as to be not visible from the convex side. This was done by boring a small hole at about the middle of the square end, to a depth of ¼ inch, and connecting this hole with another, bored from the con-

[1] After the entire contents of the grave were shipped to the Museum and examined, the various pieces of the spear were found and fully restored: Length, 9 inches; width, 3¾ inches.

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cave side of the shell. Ten or twelve bear-teeth, which had been split and polished into thin gorget-like forms, and perforated with two holes, were placed around the outside of the copper plates.

The cremated remains were then placed over the ornaments, and several thicknesses of matting, made of bark, were placed over all.

Between the two burials, but near to No. 22, was located an adult human skull with lower jaw.

The plates and other objects found in the grave could only be superficially examined in the field, and the most interesting points were necessarily left until the objects were brought to the laboratory.

The copper plate shown in plate VI, *a*, is perhaps the heaviest and smoothest of all the plates taken from the mound. The scroll pattern cut upon one side of the plate makes the specimen unique so far as the Ohio mounds are concerned. The plate was wrapped in leather when it was placed in the grave, and portions still adhere to the plate, as shown in the illustration.

The plate shown in *b* is perhaps also unique. An attempt has been made in this plate to decorate the ends instead of the side. The work of cutting the scrolls is not so perfect and graceful as in the other plate, but it is more elaborate. The intervening portion between the scrolls is cut into scalloped forms. The other end of the plate is divided into three scalloped sections, and each section has a repoussé decoration at the center. The specimen is covered with several layers of cloth, and repoussé decorations do not show so prominently in the figure.

The plates taken from other graves in the mound were similar in form and size to those contained in the grave described. However, one grave contained two copper plates, a large and a small one, together with eight other copper orna-

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ments. The larger one presented a new feature in copper plates. The original plate was reinforced by being covered with another plate, a little larger in all of its dimensions. The edges were hammered down over the original plate in such a manner as to resemble the work of a modern artisan.

Copper ear-ornaments were frequently met with in graves, and twenty specimens were secured. They were invariably found in pairs. The manufacture of these ornaments required skill as well as a high degree of advancement in decorative art. The form of manufacture of the ear-ornaments, although two different types were found, is similar. One type is made of two concavo-convex plates which are connected by a cylindrical column; but only a few pairs of this type were found. The other type, which is more common, is made of four plates of copper, two of which are circular and two concavo-convex. The concavo-convex plates are attached to the circular pieces which form the inside of the ornament. The discs are connected with a small cylinder of copper.[1]

Other copper ornaments were found sparingly in the burial cists. From one grave a large copper crescent was removed, and from another, six large copper balls.

Only two kinds of copper implements were found in the mound — awls and axes. The awls, four in number, vary in length from seven inches and a half to three inches. The awls are usually round, tapering to a point at both ends, although one specimen has one end blunt, the body flat, and the other end tapering to a point.

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[1] For a complete description of this type of ear-ornaments, see *Certain Mounds and Village Sites in Ohio*, 1, Sec. 3.

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The copper axes are unusually interesting on account of their variation in size. The largest is six inches and a half long and four inches wide at the bit, while the smallest is two inches and a quarter long and an inch wide at the bit. Nine axes were taken from the various sections of the mound, and all are of the plano-convex type so common in the Scioto valley. They are made from masses of native copper, and the irregularities of the surface are quite pronounced in many of them.

BONE OBJECTS

Bone implements and ornaments are always associated with prehistoric man in Ohio, and the implements of bone and teeth played an important part in the life of the builders of this mound. The bone objects may be grouped under two heads, utilitarian and ornamental. Under the utilitarian objects are placed bone digging-tools, needles, awls, etc.

The bone digging-tools were frequently met with outside the graves and scattered through the soil of the mound. The tools are simply large fragments of the femora and shoulder blades of large animals, such as bear, deer, and elk. The bones were used in digging the soil preparatory to its use in building the mound. The tools naturally would be carried to the mound, and frequently one would be lost when the load of soil was deposited thereon.

Bone awls or bodkins were for the greater part destroyed when the bodies were cremated, as many pieces of implements were found among the calcined remains; but several perfect pieces were found.

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The awls were invariably made from the tarso-metatarsus of the wild turkey by cutting away the anterior part of the bone almost to the center, and carrying this cut through to the posterior end.

The awls vary in length from three to four inches, and the points have a gradual taper and are very sharp.

Great skill and much labor were required to make the bone needles of the type found in the mound. They are usually made from the strong metapodial bone of the deer. The needles are usually from three to five inches long, gradually tapering from the head to the point. The head is invariably flat, and pierced with a small hole near the end. The hole is bored from both sides. In one of the graves was unearthed a large curved needle, eight inches in length, made of the rib of some animal. The eye of the needle is placed three-quarters of an inch from the end, and in many respects resembles the needles found at Fort Ancient. [1]

Many ornaments of bone and teeth were found in perfect condition with the burials in the mound, but many of the most valuable and interesting were destroyed by fire when the bodies were cremated. A large number of ornaments made of bear-teeth were perforated for attachment; the teeth were cut horizontally and the halves highly polished, and perforated with two holes near the center.

The most interesting of the bone ornaments are those of the effigy eagle-claws. They were found in several graves; but the finest specimens were found at one of the burial shrines.

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[1] Explorations of the Baum Village, in *Certain Mounds and Village Sites in Ohio*, I.

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The effigy claws are made of the rib-bones of the elk, and very often exceed four inches and a half in length.

Several cut and polished human jaws, with the teeth intact, were removed from one of the burial shrines; this, however, was not an uncommon find in this culture group.

A large tooth of an alligator was unearthed, and from another grave four more teeth of the same reptile. The large tooth is two inches and a half long and almost three-quarters of an inch in diameter. The teeth are all perforated for attachment. So far as records go, this is the first instance of finding alligator-teeth in the mounds of Ohio.

ORNAMENTS OF SHELL

Ornaments such as pendants and beads were found abundantly, and all are made from ocean shell. From one grave almost a thousand beads, made from ocean shell and averaging half an inch in length, were removed.

From one burial a beautiful string of pearls, in a good state of preservation, was obtained.

The flint implements and the various objects made of slate and granite were not abundant in the graves, but a number of excellent examples were procured.

TEXTILES

In a number of graves of the second section the final burial ceremony consisted of setting fire to the covering of straw, twigs, and cloth, and here the charred remnants of cloth and matting are preserved. In the first section, the charred cloth, showing the simplest to the highest art in primitive weaving, was found

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at the burial shrines outside the graves. The builders of the Seip Mound had learned well the art of textile making, for we know that the true textile art began with the spinning or making of the yarn. This, of course, requires the separation of fibrous tissue from the plant, and twisting the fibers so as to make a strong yarn. The cloth was made from bast-fiber, secured from many of the trees and plants known to exist in prehistoric times.[1]

POTTERY

Fragments of broken pottery were found in almost every portion of the mound, and in several instances potsherds of good size and representing a high type of fictile art were found in several of the graves, but were not associated with the charred remains.

It seems strange to find a people so well versed in the fictile art, being able to produce objects in pottery, as shown by the discarded sherds, that required great skill and patience in order to create the symmetry and grace displayed, who would not in some way use it in their mortuary customs.

OBJECTS OF MICA

Large blocks of mica were found in many graves, as well as in the shrines of the burial cists, where the blocks often completely covered the floor. The detached thin sheets were often cut into geometrical designs and figures, and perhaps served as objects of personal adornment, as many of the pieces have perforations for that purpose.

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1 Specimens of cloth were subjected to microscopical examination by Prof. J. H. Schaffner, head of the Department of Botany, Ohio State University, who pronounced the cloth to have been made of bast-fiber.

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RÉSUMÉ

A concise account of the examination of the Seip Mound having been given, a brief mention of the more salient parts brought out by this examination might be of interest.

The site of the mound was a charnel-house where the dead were brought and prepared for the grave. The preparation consisted of cremating the body, and afterward placing the incinerated remains in a prepared grave within the charnel-house. The site was abandoned before the house was filled, the building destroyed by fire, and a mound erected as a monument to the dead.

The charnel-house consisted of three distinct sections, and the size of the mound erected over the various sections was perhaps gauged by the standing or importance of the dead occupants.

Over the first section the mound was twenty feet high, and the house contained twenty-four burials, most of which were rich in copper and other objects.

The monument over the second section was eleven feet ten inches high, and the house contained nineteen burials. Only a few of these contained objects of copper, and other implements and ornaments were very sparingly found; while the third section was five feet high and did not contain a single burial on the floor of the house.

In the first section, graves were enlarged, and very often two and sometimes three and four burials, together with sufficient space for more, were recorded from a single burial cist. As not all the remains were those of adults, this condition would suggest that the large graves containing the remains of more than

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one person were those of a family burial cist, and the wide floor-space between the cists made them readily accessible for burial at any time.

The profusion of implements and ornaments made of copper, shell, and bone, of a well-marked individuality, shows that the builders of the Seip Mound belonged to the highest culture of aboriginal man in Ohio, differing widely in customs and culture from the peoples inhabiting the Baum village site, only a few miles down the valley and practically in sight of the Seip Mound.

The data secured by the opening of this mound places this group in the Hopewell Culture,[1] and according to Prof. W. H. Holmes's[2] classification, the Northwestern Group.

The builders of the mound had an intertribal trade, as evidenced by the copper from the Lake Superior region, the ocean shells and alligator-teeth from the far South, and mica from North Carolina.

The great variety and quantity of woven fabrics obtained indicate that weaving was assiduously practised and formed one of the most important industries.

The examination of the mound proves beyond question that its builders were precolumbian.

COLUMBUS, OHIO

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[1] For my own convenience I have named the two great cultures, whose remains are so abundant in Ohio, Fort Ancient Culture and Hopewell Culture. "Explorations of the Baum Village Site," *Ohio State Archæological and Historical Society Publications*, XIV.

[2] *Twentieth Annual Report, Bureau of American Ethnology.*

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THE FISH IN ANCIENT PERUVIAN ART

BY

CHARLES W. MEAD

THE fish as a symbol and as a decorative motive has played a prominent part in the religions and arts of many peoples.

In the various arts of the prehistoric peoples of the Peruvian coast region, numerous species of fish and their many conventionalized forms are of very common occurrence. They are either absent or at least only occasionally to be met with in other parts of the country. Pottery vessels were often modeled into fish-forms, or decorated with fish painted or in relief. Wooden vessels in this form are numerous, as are also fish-forms cast or hammered in gold, silver, copper, and bronze.

It is not uncommon to find painted representations of fish on cloth, particularly on such large coarse pieces as were often used to cover the mummy-bundles; but these painted representations are few compared to the great number of conventionalized forms where the fish motive, in various colors, enters into the woven fabrics.

That the prehistoric inhabitants of the coast region of Peru should worship the sea would be natural and in accordance with what we know of other peoples similarly situated and in a like stage of development. The fish would be the natural symbol of the sea, and the frequency with which it appears in all the

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arts of these peoples would certainly indicate for it a religious significance.

Garcilasso de la Vega, in his chapter entitled "Of the Idolatry and Gods which the Ancient Incas adored, and Manner of their Sacrifices," tells us, —

> The inhabitants near the Cordillera worshipped that mountain for its height, those of the coast made the sea their god, which in their language they call Mamachoca, and is as much as to say the mother-sea; the whale for its prodigious bigness was in no less veneration than the rest, and every sort of fish which abounded amongst them was deified, because they believed that the first fish in the world above them takes always care to provide them with a number of the like sort or species sufficient to maintain and nourish them. [1]

We know that the development of Peruvian civilization had been a very long one, that decorative art had reached a high degree of perfection before the coast regions came under the sway of the Inca, at a time variously estimated at from a hundred to three hundred years before the conquest.

Although the art of this region had passed through a number of periods, the present state of our knowledge makes it unprofitable to treat the subject otherwise than as a whole, and it may be roughly summed up under four heads, as follows:

1. *Realism.* Representations of scenes and objects, animate and inanimate, familiar to them in their daily life.

2. *Conventionalism.* Conventionalized forms, mostly of animals, in which the degeneration does not appear to have been carried to the extent that the identity is wholly lost.

3. *Symbolism and Mythology.* Anthropomoths, fish, birds, dragons, serpents, and other figures probably having a religious significance.

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[1] *Royal Commentaries*, ed. Rycaut, Book 1, chap. 4.

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4. *Geometric Figures.* Scrolls, meanders, frets, and other geometric figures, most of which are common to the decorative art of many peoples.

Realism was the chief characteristic of their art; and even in the textile fabrics, where the most highly conventionalized forms naturally occur, realism is apparently never entirely lost sight of: the kind of animal intended to be represented is still recognizable. I use the word "apparently" advisedly, as it is, of course, within the bounds of possibility that any of the numerous geometrical figures may have represented to the mind of the artificer some animal form.

Among the woven fabrics the greatest number of conventionalized figures are found in the vicuña borders which were commonly sewed to the lower edge of cotton ponchos, and in such long, narrow pieces of cloth as were used as head-bands, belts, etc. In these the fish motive occurs much more frequently than any other. The head is triangular, and its identity not to be mistaken by any one at all familiar with the fish-figures painted on cloth, or represented in relief on pottery vessels. The other parts of the design are usually so arranged as to suggest the outline of a fish, as seen from above.

In the woven designs we almost invariably find the pattern to consist of the parts of two fish, turned in opposite directions, making what we may call the "interlocked fish-design," with the whole so arranged, as I have said above, as to suggest the outline of a fish as they commonly represented it (see plate 1, figs. 5–7).

Where such a wealth of material exists, it is difficult to make a selection; but I have endeavored to picture such as might be called types of a class, and in the textiles, where their decorative

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art reached its highest development, to show some few of the steps by which the realistic representation of fish may have degenerated into highly conventionalized forms. It would of course be absurd to attempt to follow this degeneration step by step, but I believe that a sufficient number of figures, representing different stages, have been given to lead to the recognition of the fish motive in such higher conventional forms as are shown in plate II, figs. 1–5.

It was Professor F. W. Putnam who first formulated and clearly set forth the theory of progression by degeneration. This was in 1879.[1] His "Conventionalism in Ancient American Art"[2] followed a few years later. This latter contains a passage which seems to me so applicable to Peruvian art as we know it, that I give it below. He says:

> Thus it is that we find in the lower stratum of human development many cooking-vessels, water-jars, dishes, and other utensils made of clay, that are of the same form and style of ornamentation; but after the particular form of vessel desired was attained, and the early methods of ornament by finger-marks, indentures, scratches, cross-lines, and the imprint of cord or fabric, had been carried to their full extent, one can easily understand that something higher would follow. This advanced step is represented in various ways by different prehistoric peoples, but it is when this step is taken that the imprint is given to the art of each.
>
> Among other ways, this higher expression seems to be shown in the realistic representation of inanimate and animal objects, often of a mythological or historical character. In the course of time, as art attained increased power of expression, it progressed beyond mere realism, and led to the representation of an object by certain conventional characters, without that close adherence to nature which was at first necessary to a clear understanding of the idea intended to be conveyed. Thus conventionalism began. Side by side with this conventional

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[1] *Papers of the Boston Society of Natural History.*
[2] *Bulletin of the Essex Institute,* 1886.

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representation of objects are found realistic forms; conservatism, which is such a strong characteristic of primitive peoples, leading to both methods of expression at the same time.

We are studying the decorative art of a people who had no written language, and whose descendants retain little or no knowledge that can be of assistance to us. The ancient Peruvians have left us a wealth of material in the remains of their structures and in the contents of their graves; and what is revealed by these, together with such information as has been handed down to us by the early writers, — Blas Valera, Cieza de Leon, Acosta, Zarate, Garcilasso de la Vega, Betanzos, Herrera, and a few others, — constitutes our entire knowledge of this people.

The present paper is based on a study of objects in the prehistoric Peruvian collections now on exhibition in the American Museum of Natural History, New York; and from these the sketches used as illustrations have been made.

In cases where it is evident that an attempt at realistic representations had been made, little need be said, and little can be said later. It is with the conventional forms of their higher decorative art that I shall concern myself at present, and trust that I shall be able to show conclusively that many of the designs which have hitherto been described as animal figures, designs derived from animal figures, and the like, are, in fact, conventional fish-forms.

In the attempt to establish the correctness of my identification, I shall begin with such figures as are unmistakably derived from fish, and, by calling attention to some intermediate forms I hope to carry the eye, step by step as it were, from those that depart but slightly from the realistic to such as appear to me to have run the whole gamut of degeneration, and reached a stage

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unrecognizable by one not familiar with Peruvian decorative art in general, and its apparent methods of working out ornamental designs, not only in the textiles, but also in wood, stone, and metals.

Plate 1, fig. 5, is from a large piece of coarse cloth which originally formed the outside wrapping of a mummy-bundle. The figure is painted in black, except the openings at the gills and the fins, which have been left white, the color of the cloth. The fish is represented as seen from above, the six white squares in the center representing a dorsal fin.

Fig. 6 shows another painted design from the covering of a complete mummy-bundle. In this a decided change has taken place. The curved lines representing the gill-openings have become straight lines, and parts of the animal are represented by zigzags marking the projecting points which are so characteristic of most of their conventionalized forms of animals, particularly of the bird and fish.

Fig. 7 is from a long belt or sash of vicuña cloth. The figure is repeated a number of times in different colors, and is part of the woven fabric. Although unmistakably a fish, the degeneration has proceeded to the extent that nothing remains but the general form, eyes, and the characteristic projecting points seen in fig. 6. In this figure, together with figs. 8 and 9, I think we will find the key to all the higher conventional forms of fish-designs shown in the illustrations.

Figs. 8 and 9 are from vicuña borders sewed to cotton ponchos; and, to save repetition, I may say here that all the other designs from cloth, to be described later, have been taken from similar borders, where they form a part of the woven fabric.

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That these two designs had their origin in some fish-form very similar to that shown in fig. 7, I think there can be no doubt, and, if we accept this as a fact, I think the way will be clear to the identification of other forms.

In fig. 10 we have the first example of the interlocked fish-design, which, in some one of its great variety of forms, is oftener to be met with on the vicuña borders than any other form of ornamentation. It will be seen that two designs like that shown in fig 8, with very slight alteration, will give, when interlocked, the form we are considering.

Before proceeding further, I will call attention to an important feature of Peruvian decoration that applies particularly to these vicuña borders. This is a rhythmic repetition of six units, each being of the same size and design, but varying in color. Commonly each square, band, or diagonal bar, or any other form constituting a unit, is different in color or colors from the one preceding and the one following it; but it often occurs with three all colored alike, followed by three in other colors, also alike, — four of one and two of another, etc. In whatever way these units are arranged, the next six will be a repetition of the first series; and so on indefinitely. In another place I have described and illustrated this feature of their art.[1]

Fig. 11 shows one unit of the six-unit design just described, and is in the form of an irregular diagonal bar. The colors are red and black, the latter color being represented in the illustration by shading. The bars on either side of this one have the same outlines; but different colored threads were used in the

[1] The Six-Unit Design in Ancient Peruvian Cloth, *Boas Anniversary Volume*, 1906.

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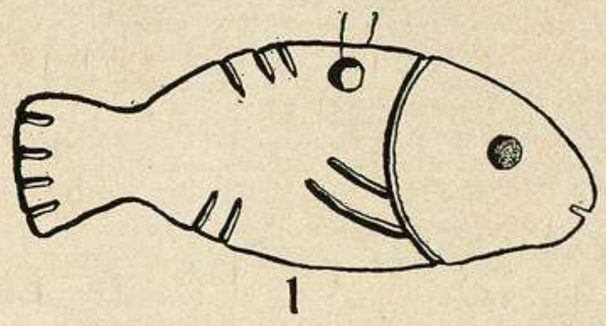

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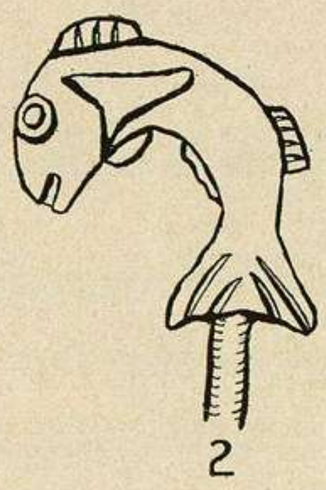

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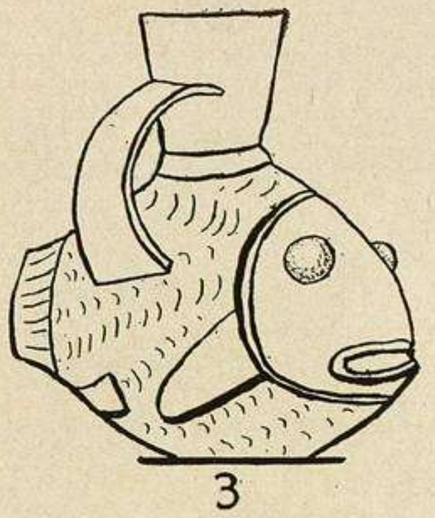

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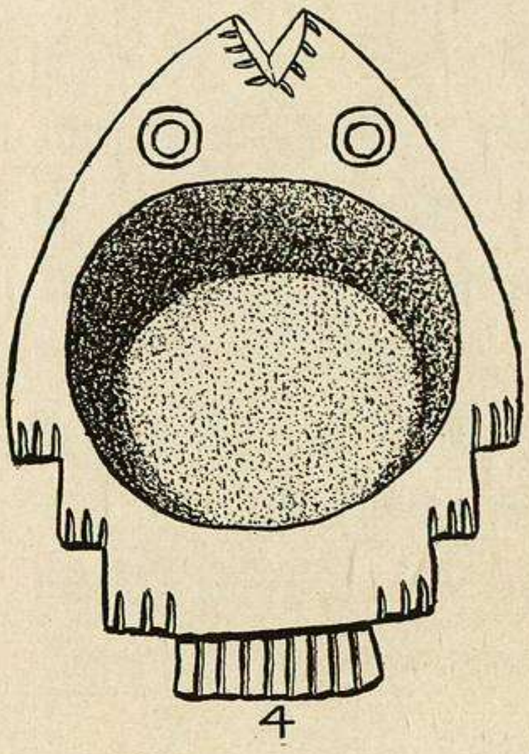

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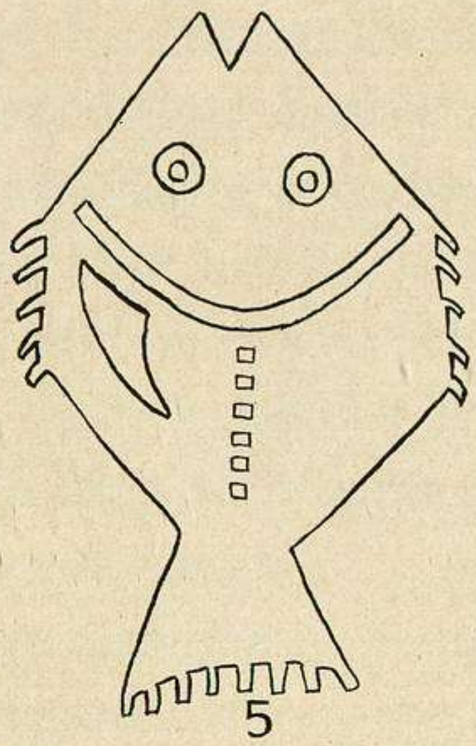

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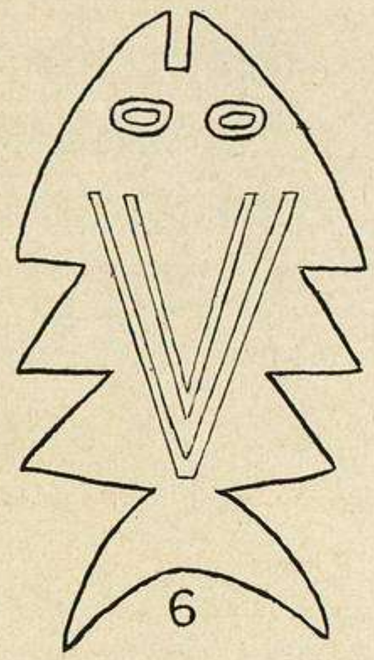

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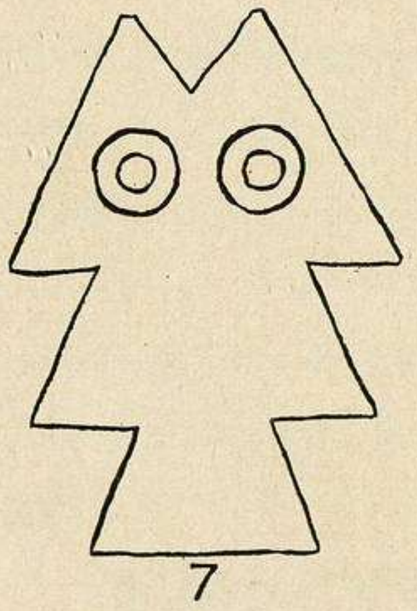

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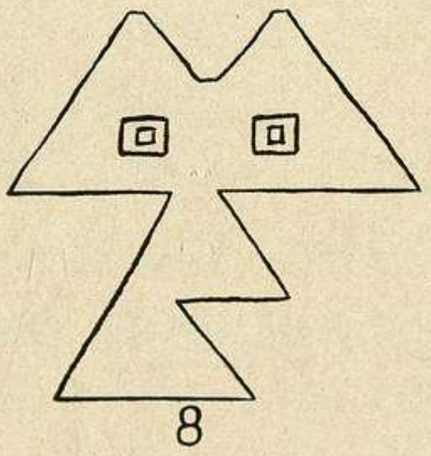

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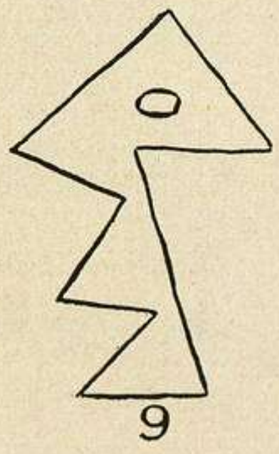

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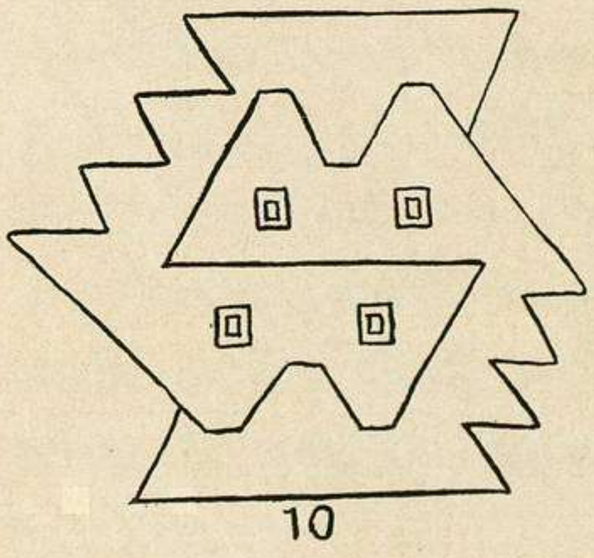

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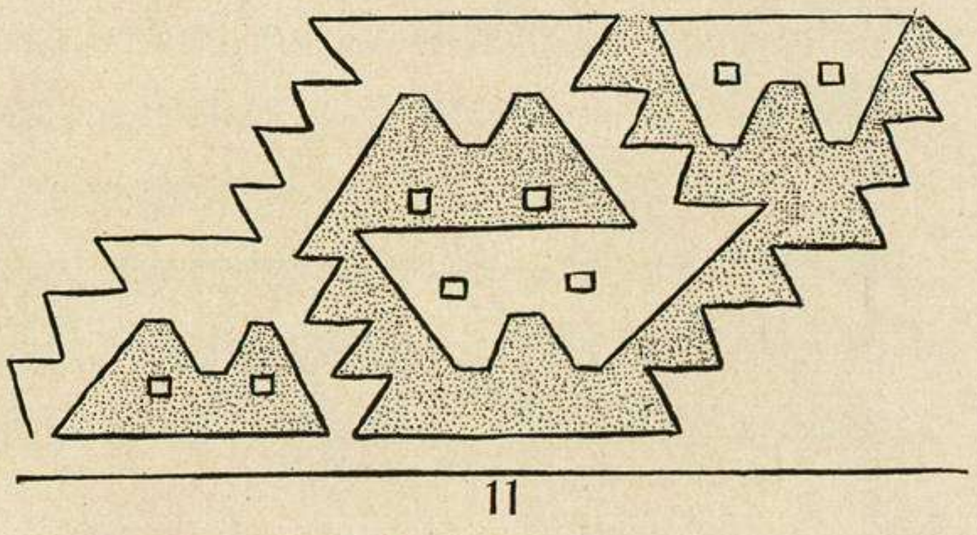

11

THE FISH IN ANCIENT PERUVIAN ART

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weaving. We see in this the same interlocked fish-pattern that we had in fig. 10, and also two conventional fish-heads.

Plate 2, fig. 1, illustrates another of the almost endless varieties of the interlocked fish-designs. It is also an excellent example of another feature of their decoration which may assist us in the identification of some obscure figures. When the central design was of such a form as to leave large surfaces undecorated, these were filled in with smaller figures, — either conventional forms of the same animal represented in the central design, or motives derived from it. In this case we have both, the three small fish-figures and the highly conventional one directly over the fish at the lower left-hand corner.

This latter form is very common in Peruvian art, especially in the treatment of bird-figures, where the head and neck are often fairly realistic, with the other parts represented by a broad line of color, one side of which is straight and the other bounded by a zigzag, as is the case in this fish motive.

Fig. 2 is from a poncho of alpaca wool. It represents a pelican (?) with a fish in its mandibles, and it will be seen that this fish-figure is identical with the three in the preceding illustration.

Figs. 3 and 4 show forms where the entire designs, with the exception of the eyes and dots, are made by continuous lines. After a study of the preceding forms, particularly those on plate 1, figs. 8 and 9, I think there would be no hesitation in identifying these as other forms of the interlocked fish-design.

In fig. 5 we have, perhaps, the most obscure of these conventional animal figures. This obscurity arises largely, as I think, from the angular appearance of the figures. We have, how-

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ever, but to change the outlines of these heads to straight lines to obtain practically the same forms that are shown at the bottom of plate 1. It is very possible that the step-form figures opposite the heads may represent tails, as we have seen that conventionalized parts of the animal represented were often introduced into these designs. However, from the form of the heads alone, I have no hesitation in identifying these figures as motives derived from the fish.

Fig. 6, interlocked fish-design, in relief, from a pottery vessel. As we would expect, these figures are less highly conventionalized than those of the woven fabrics. That this was a favorite design is shown by the frequency with which it appears, not only in the cloth, but on other materials, particularly on pottery and gourd vessels.

Fig. 7 is from a border of vicuña cloth, and shows one of the many designs in which conventional fish and bird forms are so often combined. It may be said that, aside from geometrical figures, all the designs on these borders, with very rare exceptions, are derived from three animal forms: the fish, the bird, and some species of the cat family (jaguar?); and that two of these are often combined, and in some cases all three appear in the same design.

Fig. 8 is a gourd bowl about six inches in diameter, with the design burned in. Examples of decoration by pyrography are numerous in any large collection from the coast region, and it was the medium commonly employed on gourd vessels, many of them showing work of no mean order. In this interlocked fish-design, although the workmanship is crude, we have again the

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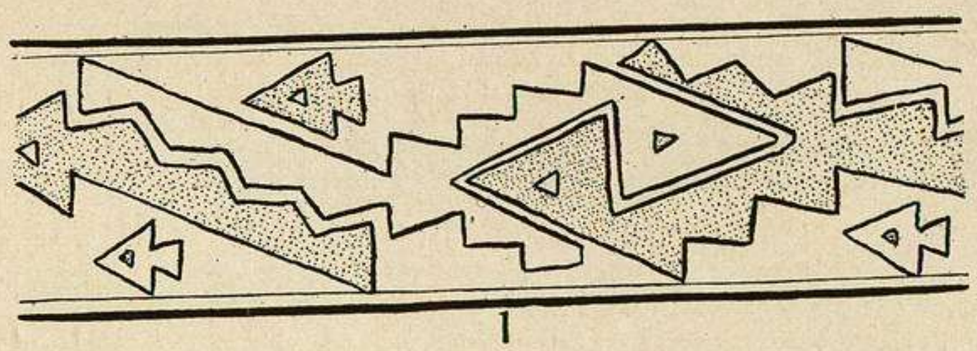

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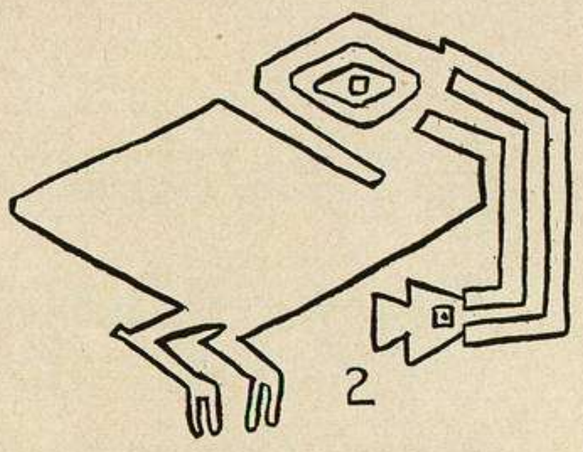

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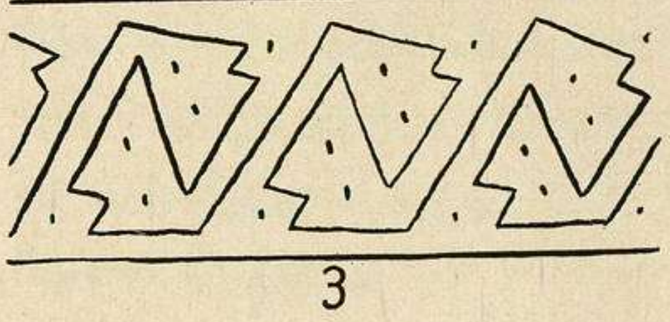

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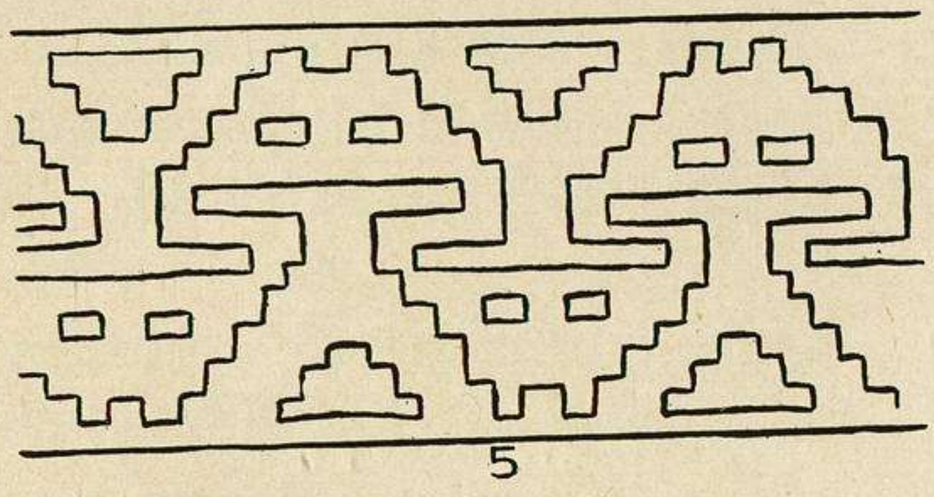

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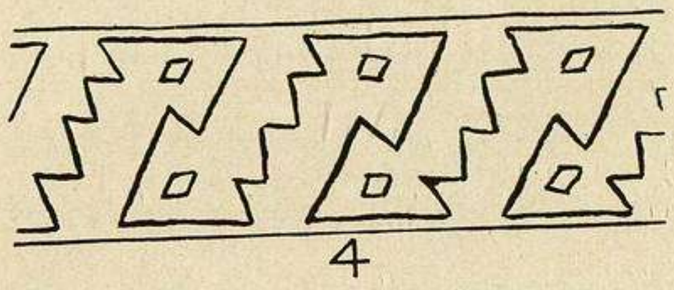

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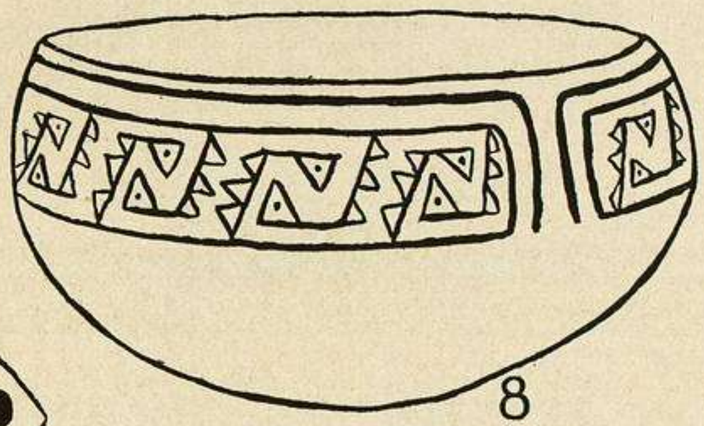

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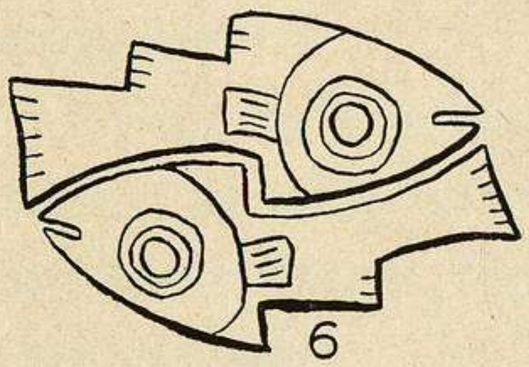

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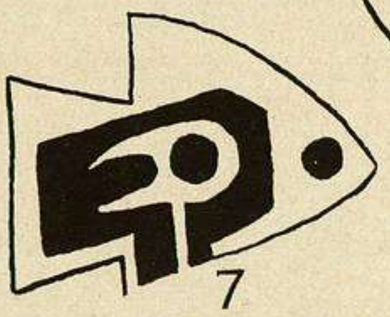

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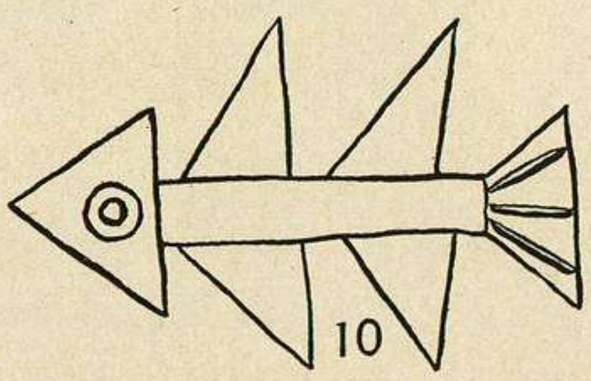

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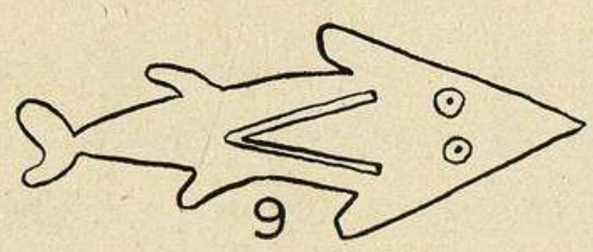

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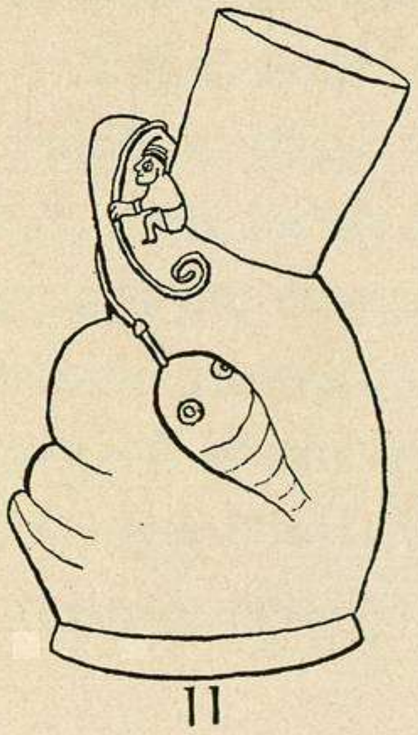

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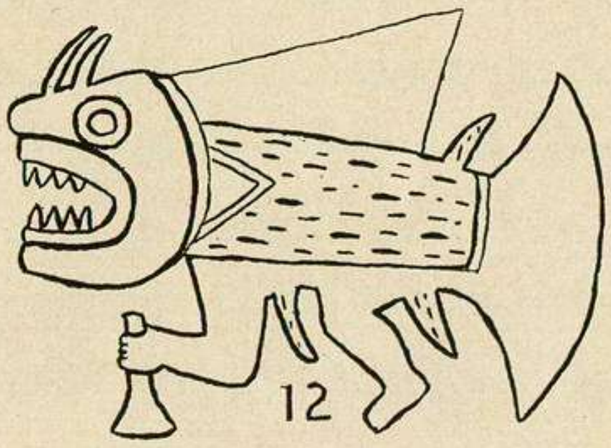

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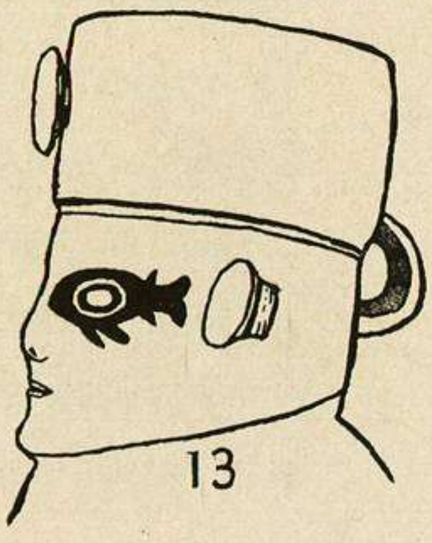

13

THE FISH IN ANCIENT PERUVIAN ART

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triangular head, with the other parts represented by a straight line and a zigzag.

Figs. 9 and 10 are from painted figures on pottery vessels. Fig. 9, evidently representing a shark, is fairly realistic in its outline. Fig. 10 has the characteristic triangular head so common to fish-figures on pottery vessels. Heads of this form will be found in fig. 4.

Fig. 11 shows a pottery water-jar. The front part of the vessel represents a ledge of rocks rising from the water. Near the top of this ledge sits a fisherman who has hooked a large fish, and, the better to hold it, has taken a turn of his line about the highest point. On the other side of this vessel, on the lowest shelf of the rock, are representations of a seal and a large sea-shell. This is one of the many attempts to depict scenes in their daily life.

Fig. 12, a mythological monster (part fish, part man), is from a painting on a pottery vessel. This figure is found on a number of vessels, and is usually represented as in pursuit of two men in a balsa.

Fig. 13 represents the upper part of a pottery water-vessel. The fish-figure around the eye shows a form of facial painting.

A few words remain to be said concerning the illustrations on plate 1, which have not yet been described. Fig. 1 is a pendant, three inches in length, cut from shell. Although many of its parts are conventionalized, it presents, on the whole, quite a realistic appearance. Fig. 2 is a fish cast in bronze; it forms the head of the handle of a small bronze implement. Fig. 3 shows one of the many pottery vessels modeled into fish-forms, — a form extremely common with the coast peoples. Fig. 4 is a

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small wooden vessel. These wooden fish vessels are found in considerable numbers in the graves, especially in the work-baskets of the women. They were probably used as rests for spindles while twirling them.

It is not my intention to enter into a discussion of the various theories concerning the origin and development of art. I have simply said that the theory of development by degeneration seemed to me the most natural one. Another theory claims that from marks and scratches a steady progression took place, culminating in highly complex forms and realistic representations; and still another, that both these processes were active at one and the same time. I have no quarrel with any of these theories; all may be right, and all may be wrong.

I do not claim to have discovered in these designs any series representing an historical sequence. My object has been to show to what extent fish-forms appear in all the arts of the prehistoric peoples of Peru, and to attempt the identification of some of the conventionalized animal figures.

American Museum of Natural History
New York

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A STUDY OF PRIMITIVE CULTURE IN OHIO

BY

WARREN K. MOOREHEAD

IT is nearly thirty years since Professor Frederic Ward Putnam began his archæological explorations in the southern part of Ohio. Previous to his investigations, in the period 1805-20, Caleb Atwater examined the earthworks and mounds, and the results of his observations were published in 1820.[1] Atwater labored under many disadvantages, but he prepared the way for Squier and Davis,[2] whose explorations were much more extended, and have been the subject of no little controversy.

No thorough scientific work in Ohio archæology was done until Professor Putnam took the field; but, from the date of his first mound exploration until the present time, real progress in archæology has been more or less continuous. It is not the purpose of the writer to deal with the extensive explorations in detail, but to draw certain conclusions based on the researches of several investigators of the archæology of Ohio.

So much material is now on exhibition in Cambridge, Columbus, Chicago, Washington, and Salisbury, England (where the Squier and Davis collection is preserved), — not to mention other places, — that it seems proper that one should

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1 *Archæologia Americana*, Worcester, 1820.

2 *Ancient Monuments of the Mississippi Valley*, Washington, 1846.

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venture to attempt the interpretation, or at least to point out the trend, of the evidence accumulated.

It must not be forgotten that no given area in the United States contains more earthen monuments than southern Ohio. Furthermore, no section has been the subject of so much "mound digging" by individuals as well as by scientific institutions. The museums are full of Ohio material, and the writer is familiar with at least twoscore collections that are on exhibition and which contain objects from tumuli. Such an array of witnesses, while varying as to minor details, must of necessity present testimony pointing to certain general conclusions. If it is not possible for us to indicate today the types of prehistoric culture of southern Ohio, then have we indeed labored in vain.

The evidence accumulated makes it clear to the writer that in southern Ohio three separate types of culture existed.

It is well established that there was a culture peculiar to the hill enclosures, and another and higher one represented by the geometric works in the broad valleys. Professor W. C. Mills has coined the terms "Fort Ancient Culture" for the former, and "Hopewell Culture" for the latter. These names being expressive, are accepted. A third, however, should be added, "Glacial Kame Culture." The writer is convinced that the numerous interments in the gravel-hills of southern and central Ohio, and the peculiar artifacts found therein, indicate the presence of another type of tribal culture.

Shortly after Professor Putnam began his work in Ohio, there became evident a tendency, on the part of some other observers, to doubt the statements of Squier and Davis. Much time was spent in resurveying the earthworks, and discrepancies

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between the measurements of Squier and Davis and those of later surveyors were emphasized. It was even doubted that Squier and Davis had found so many remarkable carvings, copper objects, effigies, and the like. Others thought the famous deposit of two hundred effigy pipes indicated white man's influence, and that the pipes had been carved with iron tools.

In the light of recent discoveries at the Turner group, where Professor Putnam found a number of well-made effigies in terra-cotta and copper; at Chillicothe, where Professor Mills brought to light delicate effigy pipes, bone carvings, copper objects, etc.; and at the Hopewell group, which has yielded thousands of beautiful objects in copper, shell, obsidian, pearl, bone, and mica, we see the culture of the lower Scioto in its true light. Squier and Davis were right in their contention that it was a life quite different from that of the later Indians. We may not now subscribe to their enthusiastic claim that it was a civilization; but we must accord them a full meed of praise, for they discerned, more than sixty years ago, that the culture was peculiar and distinctive. It can be proven that the culture was local; that is, it prevailed for a hundred miles along the Scioto, beginning at Columbus and extending to Portsmouth. Between the Scioto and the Miamis it did not extend. Yet in the lower Little Miami, a few miles above Cincinnati, was the Turner group, which belongs to the Hopewell culture. The Serpent Mound does not belong, the writer is persuaded, to the Hopewell culture, but rather to the Fort Ancient division. This statement, however, may be premature.

What Professor Putnam originally termed the brachycephalic and dolichocephalic peoples may now be said to de-

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scribe the people of the Hopewell and Fort Ancient cultures; but, since his last work in the Scioto, much light has been shed on the history of these two prehistoric peoples. A fairly continuous exploration, ably begun by Dr C. L. Metz at Madisonville, and much digging at Fort Ancient, prove that these two are of the Fort Ancient culture. The objects found in these localities are not of the Hopewell type in any sense. Little copper is found; the pottery exhibits a homogeneous character and motive in ornamentation. The burials are totally different from those of the Hopewell culture, and mound groups and altars do not occur. The very character of the works is unlike that of the geometric enclosures of the Scioto.

We may next consider the types and characteristics of the mounds themselves.

Squier and Davis divided their tumuli into certain classes, and Professor Putnam made clearer and more accurate the demarcation of these groups. We now observe that there are altar and conical and other mounds; that the oblong, or oval, or altar mounds were erected upon hard burned floors, which had been carefully prepared; that gutters or trenches are observed on the bases of some of these; that pens or small enclosures were built around certain of the bodies interred. All this, which, no doubt, carried peculiar ceremonial significance, is observed in certain of the large mound groups associated with the valley works. No such mounds are found on the hills, no such works crown the higher hills overlooking the Scioto, although they occur on the high terraces of that stream. Farther back in the hills, some distance from the river, the mounds become smaller. In Adams, Pike, and Highland counties there are numerous stone

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graves, manifestly of Fort Ancient culture. No copper, no obsidian, no effigies, are to be discovered there. The skilled archæologist has but to examine the artifacts from these two distinct regions — or, if you please, from a mound in the Scioto valley itself and from one back a few miles — to note their contrast. What does this mean? Simply that the people represented by the Hopewell culture were surrounded by others characterized by the ruder Fort Ancient culture. No other explanation will fit the conditions, as would appear from observations made in the field and on museum specimens.

The valleys of Paint creek and North Fork of Paint creek, wide of bottom and rich in black soil, are filled with groups of mounds; but near the heads of these streams one observes, as the valleys narrow, small tumuli and typical hill-top fortifications. It is not to be supposed that one people would, in the same region, exhibit two kinds of culture in their monuments and in their arts.

The third culture, and the one to which no one save the writer seems to have given much thought, is that of the Glacial Kame. Often, when traveling about the state in past years, his attention has been called by farmers to gravel-pits in which human skeletons had been found. As all observers know, bones deposited in gravel are preserved almost indefinitely. Investigation of many such burials, and the history of others, bring to light interesting facts. Tubular pipes, cannel-coal ornaments, long, slender unio-shell gorgets, tubes of slate, and hematite plummets abound. The theory built by the writer upon this evidence is as follows.

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No one disputes that the gravel-deposits of southern Ohio, especially those rounded or oval, and usually mound-shaped, were deposited during the flooding of the country in a glacial period. These hills may have been more or less irregular at first, but gradually erosion rounded them. They are usually found in the natural although small prairies of southern Ohio. It is not to be supposed that man on his arrival in the Ohio valley began the construction of mounds or earthworks. The rounded, graceful slopes of the glacial knolls may have suggested to him, presently, the building of mounds. Moreover, digging in these gravel-hills was easy. The outlook from the top of the knoll was attractive.

Although the tribe that buried in the Glacial Kames is classed by the writer as distinct from the other two cultures, yet it is possible (although perhaps not probable) that these people may later have become the carriers of the Fort Ancient culture. It is to be supposed, as a matter of course, that there was a long process of development in both the Fort Ancient and the Hopewell people, and that small and isolated works were built by them before they learned to construct the larger hill-works and the more complicated valley enclosures.

Dr Cyrus Thomas, in his admirable studies in archæology, has thought that the Cherokee were responsible for some of the Ohio earthworks. He has also suggested that the graves at Fort Ancient were of the same character as those of the Shawnee. The writer has presented elsewhere detailed observations[1] to prove that the graves at Fort Ancient differ in character from those of the Shawnee; that there are no graves of Fort Ancient

[1] Fort Ancient (*Phillips Academy, Department of Archæology, Bulletin* IV, part II, Andover, 1908).

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type at the several Chillicothes in Ohio (the Chillicothes, as readers are aware, being sites of historic Shawnee towns); that the exhaustive explorations at Madisonville have produced Fort Ancient culture, and nothing resembling that of Shawnee. If Cherokee were the ancestors of the Ohio mound-builders, the Ohio mounds must have been very old, for Cherokee art and Southern art are totally different from Hopewell art. Professor Putnam found nothing at the Turner group to indicate Cherokee influence, and Professor Mills has exhumed no specimens that could be interpreted as belonging to or as influenced by Cherokee culture. Cherokee pipes are the antithesis of Scioto mound pipes.

Thus we are led to the important problem of the origin of the Hopewell and Fort Ancient cultures. The Fort Ancient culture is not yet to be definitely placed, and its origin is so enshrouded in mystery that one may not even theorize regarding it. It may perhaps be of northern origin. The Hopewell culture can not yet be accounted for in all its details. Future explorations will add to the sum of knowledge, and will solve many problems. But sufficient progress has been made to show that the Hopewell culture was of southern origin. The writer's theory is based on the following evidence, and facts accumulated through the explorations of all investigators who have examined the valley mound groups of the Scioto region.

The statement that the Hopewell culture is confined to a restricted area is one of great importance, and deserves more than passing comment. On the site of Cincinnati and of Portsmouth and Marietta, that culture was almost as much in evidence as at

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the Turner group and the Hopewell group itself. Between Cincinnati and the mouth of the Scioto (more than a hundred miles by river), and between the Scioto and the Muskingum (nearly one hundred and fifty miles), there are no sites representing the Hopewell culture: at least, none have been discovered up to the present. The village-sites indicate that the inhabitants of this area were of Fort Ancient culture. Particularly is this true of an immense village-site (and the word is no exaggeration) between Aurora and Lawrenceburg, Indiana, and below Aurora, where, along the Ohio, there is a site continuous for three miles.

Along the Ohio river, from the mouth of the Kanawha to the Mississippi, there are numerous evidences of camp and village sites. It is remarkable that although Hopewell culture existed at the mouths of the Little Miami, Scioto, and Muskingum, it is doubtful whether it was represented at the mouths of other streams. The village at the Wabash,[1] thoroughly explored by the writer, marks the farthest extension north of southern pottery and ornaments. The Ohio was the natural highway for all Indians passing east or west, and, for that matter, the tributary streams furnished thoroughfares north or south. To the writer's mind it seems certain that the Hopewell people, being more sedentary, sought sites back from the river; hence, their location about sixty miles up the Scioto and a hundred miles up the Muskingum (Newark group). The only exceptions are the three sites mentioned before, situated at the mouths of rivers, where, probably, the village was strong enough to protect itself from outside interference. The Ohio being very

[1] A Narrative of Explorations (*Phillips Academy, Department of Archæology, Bulletin* III, Andover, 1906).

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wide, war-parties passing up or down could easily keep out of range of the bowmen of the Hopewell villages.

Local chert and Tennessee and Indiana flint abound on these Fort Ancient culture sites on the Ohio river; but most of the projectile points and knives seem to have been made of flint from Flint Ridge. This material is easily distinguished from other varieties, excepting that from Coshocton (which is an extension of Flint Ridge), by its peculiar character.

The quarries of Flint Ridge have every appearance of having been worked in times of antiquity. There is nothing to indicate their recent exploitation. It would certainly have been mentioned by some of the early explorers had this flint been made use of by the natives two hundred and fifty years ago. Flint Ridge stone occurs also on the Hopewell sites, but not so frequently as about Fort Ancient sites.

In one of the mounds of the Hopewell group were found upward of eight thousand flint discs as large as a man's hand. These appear to have come from the quarries on Little river, a tributary of the Cumberland in northern Tennessee. This is indicative, to the writer, of a southern origin of the Hopewell culture. The entire mass of flint in this mound weighed two tons. Its transportation in canoes from the quarry necessitated a journey of seven or eight hundred miles. A few flint discs from the region in question might have been brought in accidentally, as were a few hundredweight of ocean shells, shark's teeth, beads, etc. But the vast mass of nodular flint, brought from a distance, seems to indicate southern origin. It is reasonable to suppose that natives would rather carry four thousand pounds of Flint Ridge flint to Licking river, and thence

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down the Muskingum and the Ohio to the Scioto, and northward to the Hopewell village. The Flint Ridge material is superior to that from Tennessee, and the distance that it had to be carried is eighty-five miles overland, or about two hundred and fifty miles by water. The importation of Tennessee flint is, therefore, significant.

It must not be supposed, in suggesting southern origin for the Hopewell people, that they came north in recent times; else their pipes and sculptures would have been of Etowah or Greenville or other characteristic southern types. Their ornaments and "problematical forms" would also have been of southern types; and the "spud-shaped" forms would have been present, together with artifacts peculiar to the South. The human figures (idols as well as pipes) found by Squier and Davis, Professors Putnam and Mills, and the writer, bear striking resemblance to one another, and are peculiar to the Hopewell culture. The features defy verbal description, and they evidently portray the ancient natives of mound-building days. Students will do well to compare them with modern Indian sculptures.

Form and workmanship of chipped implements are more or less alike in Tennessee and Ohio, and yet there are well-defined differences. The best pottery from the Scioto valley tumuli is not inferior to southern mound pottery; yet little of it has been found, and pottery-making seems to have become a lost art in the North. The presence of shells, shark's teeth, mica, and other substances from the South, indicate aboriginal trade.

It must be remembered that when we speak of the Turner, Portsmouth, and Newark finds as representing Hopewell culture, we assume the people living in these villages to have been

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the same as those of the Hopewell group, yet they seem to have lived for a certain length of time on these sites, and have developed local peculiarities. It is unfortunate that the works at Marietta and Cincinnati were destroyed so long ago that a major portion of the forms exhumed have been lost; but we have sufficiently accurate descriptions, in records of explorations, to place them safely in this culture group. The best workers in copper lived at the Hopewell and other Ross county groups; but the natives at the Turner site excelled in the execution of delicate terra-cotta figures. The fact that there are some differences in art, is an indication of considerable population at each site and of sufficiently long residence to develop "local color."

The question of age of these remains is, naturally, interesting, but it is for future archæologists to solve. Nothing definite at present can be affirmed. Yet, while it is far from the writer's purpose to prophesy, he would like to indicate several facts and comment upon them in detail. After several explorations of Fort Ancient, amounting to nearly a year in time, the opinion was ventured that Fort Ancient was at least eight hundred years old. A study of the three mounds at Frankfort, Ross county, Ohio, reveals a peculiar condition. At Frankfort was one of the Shawnee Chillicothes, inhabited in historic times. The burials are in trenches or in ordinary graves. On the same site are several mounds and an earthwork, now nearly obliterated. Yet the Shawnee seemed to have lived in ignorance of the occupancy of the region by an earlier and different culture. There was one intrusive burial in the top of one of the mounds, but the other mounds contained nothing of modern origin, and on the base-line of each were found skeletons, copper objects, and

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pearl beads, indicating Hopewell culture. Squier and Davis often noted these intrusive or recent burials. No competent observer could mistake the disturbed strata and the modern character of the grave.

The Hopewell group itself was distant no more than seven miles from the Chillicothe noted above, and but sixteen miles from Cornstalk Town on Sippo creek, Pickaway county. Yet the Shawnee, or other recent Indians, for that matter, never lived at the Hopewell group. Their residence at Frankfort had no relation to these prehistoric remains. Not only are the Shawnee burials very different from those of the Hopewell or Fort Ancient culture, but their appearance is such that even inexperienced observers will notice the contrast.

One must not neglect to state that, although from our historic records we know that large numbers of Indians lived on all of these sites, yet the evidences of their occupancy are today exceedingly scant. The writer has frequently called attention to this fact. The prehistoric sites contain many times more material on the surface and in the mounds than do historic sites. All of this may seem very simple, yet it is of great moment, and carries a definite meaning. Hundreds of Indians lived, and we know that they did, on each of the Chillicothes; yet, after an entire day spent in searching the fields, the archæologist may find three or four bullets, pieces of metal, and a few gun-flints. May he not draw conclusions, when he inspects precolumbian sites in the same region, and is able to pick up in a day's hunt more unfinished or broken stone implements than he can carry?

The natural-history method applied to a study of these sites will go far toward establishing their age. This does not imply

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that we are to determine exact dates; but, as has been intimated, certain fields, from the very abundance of material in sight, give evidence of long occupancy by stone-age people in the past. A site in Greene county, Ohio, will furnish similar material to that picked up in Ross county on an equally large village place, yet there will be differences. For instance, in Greene county there are broad, thick spears, of oval outline, chipped from Flint Ridge flint. They are usually of colored flint, the pink and white predominating, and always finely chipped. In many of them the chipping has been carried to such a degree that the flakes removed are exceedingly minute. These specimens have always appeared to the writer as a well-defined type characteristic of this locality, but it may be that their distribution is more general.

In northern, eastern, and western Ohio there is no Hopewell culture, and one may hesitate to class the sites as belonging to the Fort Ancient culture. Why Fort Ancient and Hopewell cultures were not developed along the lower Maumee, or upon the shores of Lake Erie, is not known. There are some villages on the Maumee; but, aside from that, there is nothing in the northern part of the state to compare with the sites mentioned.

Exhaustive study of sites and the material found on each, followed by careful comparisons, will make clearer the differences between these various cultures.

The earthworks themselves furnish the best evidence in support of the southern origin of the Hopewell culture. If the Hopewell people had moved south, we may suppose that geometric works similar to those of the Scioto would have been constructed by them in favorable spots in the South. They would have distributed copper, very valuable to them, more

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extensively. They understood the construction of mound groups before coming north, and left many such in the South. A part of these people, possibly most of them, remained south. One may surmise that they did not construct geometrical works until they reached the country north of the Ohio river. Here, as they built mounds, it occurred to them to add walls, circles, octagons, etc. All of the above is, it should be understood, merely the writer's opinion. It is quite likely that future explorations will change or expand our understanding of prehistoric times; but it is safe to assume that the three cultures mentioned have been clearly established, and that the original contention of Professor Putnam as to the short-heads or southern people, and the long-heads or Fort Ancient people, has been proven.

PHILLIPS ACADEMY
ANDOVER, MASSACHUSETTS

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THE CRUCIFORM STRUCTURES OF MITLA AND VICINITY

BY

MARSHALL H. SAVILLE

INTRODUCTION

A PORTION of the material contained in this paper has already been published under the title "Cruciform Structures near Mitla." In view of the fact that other cruciform structures were found during subsequent explorations, and an opportunity was afforded to add to and to correct former notes, I have thought best to revise, and bring together in a single paper, much of what I published before, making this a chapter of a monograph which I hope to publish later, giving a complete account of the explorations of the Loubat Expedition at Mitla.

During the winters of 1898-99, 1899-00, 1900-01, 1901-02, the Duke of Loubat furnished funds for the American Museum of Natural History to make extensive archæological explorations in the State of Oaxaca, Mexico, under the terms of a concession granted by the Mexican Government, through the kind offices of President Diaz. The interests of the Mexican Government were represented in the field by Leopoldo Batres, Inspector of Ancient Monuments. Two winters were spent in excavating the ancient mounds, called *mogotes*, in the Valley of Oaxaca, and during two winters work was carried on in the vicinity of the well known Temples of Mitla.

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ZAPOTECAN TOMBS

In 1898 the Loubat Expedition made excavations in the mogotes at Xoxo, about two leagues south of the city of Oaxaca.[1] Minor excavations were made at the great ruined hill-city of Monte Alban, just south of the city of Oaxaca. Monte Alban is one of the most important and extensive ruined cities in Mexico, and during the time when the Loubat Expedition was later engaged in explorations at Cuilapa, the Inspector of Ancient Monuments commenced a survey and exploration at this site, with very important results.

At Xoxo the Expedition discovered a number of interesting tombs in the mogotes. Funeral urns of the well known Zapotecan type were usually found near the front walls of the vaults. The stonework was of an extremely simple type, and often covered with cement and stucco decorations. Evidence was found of a dome-shaped cement covering of at least one of the mogotes.

In 1902 investigations were continued in the Valley of Cuilapa, a much larger group than that at Xoxo, and less than two miles southwest of Xoxo. As in all the groups of mogotes, those at Cuilapa were found to be of two classes, namely, temple mounds and burial mounds. Of the former class three were explored, revealing the construction of the pyramids, and the foundations of old Zapotecan temples. In the burial mounds, seven tombs and seven stone graves were uncovered. The tombs were of the same general character as the tombs at Xoxo. They are stone vaults which were usually built

[1] A brief account of the exploration of the mogotes at Xoxo will be found in the *American Anthropologist*, N. S., I, no. 2, 1899, pp. 350 to 362.

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on approximately the level of the surrounding fields, and after interments had been made the entrance to the chamber was sealed by a large stone (sometimes by two stones), and over the tomb a solid structure of adobe bricks, earth, and stones was erected, strengthened by cement layers or floors, and undoubtedly covered in many cases by a dome-shaped cement surface. In one instance three tombs, facing respectively north, west, and south, were found under a cement floor or platform slightly raised above the surrounding level. The burial chambers vary in size and construction, and while at Xoxo those discovered faced the west, in Cuilapa tombs were found facing the other points of the compass. In these vaults were many skeletons with the usual food and drink vessels, incense burners, and many personal ornaments made of jadeite. In Xoxo practically no personal ornaments were found, but fragments of mosaic work, bits of shell, obsidian, jadeite, and hematite on stucco objects, were obtained. In Cuilapa and Xoxo were found lintels with hieroglyphic inscriptions, and mural paintings on the outer and inner walls of several tombs. Terra-cotta tubing was excavated near a number of these tombs, and was ascertained to have been used for water drains. Drains made of stone were also uncovered near tombs.

Early accounts regarding the customs of the Zapotecan Indians, which have been verified by the explorations of the Loubat Expeditions, show that their funeral ceremonies were as follows: When an important person died, the body was dressed and placed in a stone chamber together with various personal ornaments and objects belonging to the deceased. Food and drink were placed in or near the tomb to sustain the de-

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ceased on his journey to the other world. Once a year for four years his friends came to the tomb and made fresh offerings of food and drink. At the expiration of this time the flesh had decayed. Sometimes the bones were then gathered and placed in niches, but otherwise they were allowed to remain on the floor. Often they were painted red. In some instances the metate and hand-stone for grinding corn, and the clay griddle for baking tortillas or corn-cakes, were placed in the chamber, with numerous incense burners. Then the door was sealed with a large stone, and usually objects of value, such as personal ornaments and mosaics, were thrown into the space in front of the vault. Probably some of the offerings of food, drink, and incense were intended for the deities whose effigies (the funeral urns) were placed near by, to guide the spirits of the deceased on their journey to the other world. A mound of earth, adobe brick, and stones was then raised over the structure, and was sometimes covered with a dome of cement. Nothing of the nature of mosaic stone work, similar to that of the Mitla tombs and temples, was discovered in the mogotes; nor was such found at Monte Alban, either by the Loubat Expedition or by Mr Batres. The mural paintings are also widely different from those of Mitla.

MITLA

During the winters of 1900-01 and 1901-02 the Loubat Expedition worked at Mitla. The Mitla ruins are situated about ten leagues east of the city of Oaxaca. Since the completion of the Mexican Southern Railroad to the city of Oaxaca, several years ago, the ruins have been visited by hundreds of tourists,

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with an increasing number of visitors each year. The journey is a comparatively easy one, and is best made during the dry season, between December and April. Leaving the city of Puebla in the early morning, the train makes a gradual descent until a tropical region is reached at an elevation of about 1700 feet above the sea. As Puebla is nearly 8000 feet in altitude and Oaxaca 5000, one travels from the cold region to the tropics, and then into a delightful temperate zone in which are situated Oaxaca and Mitla. The latter part of the journey is made through some of the grandest railroad scenery in the world. The road winds in and out at the bottom of immense canyons, then climbing steep grades and passing down into a fertile valley, the train arrives at Oaxaca in the early evening. From Oaxaca to Mitla the thirty-mile carriage ride is over a good road, and the hacienda of Sr D. Felix Quero at Mitla is one of the most delightful stopping places in Mexico.

We find the first mention of Mitla in the postcolumbian Nahuan book known as the Codex Telleriano Remensis. Under the account of what transpired during the reign of Ahuizotl, the Aztecan monarch who preceded Montezuma, it is stated that, "In the year two rabbits, which is 1494, the Mexicans conquered the pueblo of Mictlan, which is in the province of Huaxaca."[1] Fray Diego Duran places the subjugation of Mitla during the reign of Montezuma the First.[2] The majority of original sources agree in placing his reign between the years 1440 and 1454. The date 1494 of the Codex Telleriano Remensis is, per-

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[1] *Codex Telleriano Remensis*, Loubat edition, 1899, p. 40 reverse.

[2] Duran, *Historia de los Indios de Nueva España*, written between the years 1579 and 1581; first published in Mexico in 1867-80.

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haps, the most trustworthy, and is accepted by Gay.[1] The earliest mention of the ruins by a Spanish priest is made by Motolinia,[2] from whom we learn that Father Martin de Valencia passed through Mitla some time about the year 1537. A brief account is given of a temple containing a hall in which are columns; and it is stated that the edifices are more worthy of being seen than any others in New Spain.

In Sahagun's great work [3] we find the statement that Quetzalcoatl, after leaving Tecamachalco, "made and built some houses underground, which are called Mientlancalco." This undoubtedly is a misprint, and in Jourdanet's translation into French the place is spelled Mictlancalco. As Bandelier remarks, "the subterranean buildings agree very well with the architecture of Mitla or Mictlan." [4] Torquemada, who evidently makes use of the work of Motolinia, writes that the followers of Quetzalcoatl left Tullan offended and came to Cholullan, where they lived many years with their people; thence they sent some of their number to Huaxayacac to settle there as well as in the Mixteca Alta, Mixteca Baja, and Tzapotecas, and these people are said to have erected the great and sumptuous "Roman" edifice of Mixtlan. People called Tultecatl, from the name of Tullan, are said to have been great artificers.

The first extended account of Mitla is given by Burgoa, whose work is exceedingly rare.[5] His description of the ruins

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1 Gay, *Historia de Oaxaca*, p. 185.

2 Motolinia, *Historia de los Indios de Nueva España*, written about 1540 and first published by Icazbalceta in 1859.

3 Sahagun, *Historia General de las Cosas de Nueva España*, tomo, 1, lib. 3, cap. XIV, p. 258, Bustamente edition, Mexico, 1829.

4 Bandelier, *Archæological Tour in Mexico*, Boston, 1884, p. 264.

5 Burgoa, *Geografica Description de la Parte Septentrional del Polo Artico de la America, Mexico*, 1674.

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is fairly accurate, but has given rise to the erroneous idea concerning the vast extent of the cruciform chamber found under one of the temples, and also that the substructures of the buildings contain subterranean galleries. This is true of but two of the structures, so far as we have been able to determine during the extensive excavations which we have carried on around the buildings.

The place was occupied by the Spaniards soon after the Conquest. The now famous Temple of the Columns was certainly used either for a dwelling or as a public edifice, and a Spanish window, built of bricks, has existed until recent times in the eastern part of the front wall of the structure. Several of the doorways were partly walled up, and remains of the brick walls were until recently still in place. One of the most important edifices, which contained mural paintings of the utmost value, has been partly demolished, and a church and a curate's house now occupy the site. A number of the rooms are still intact, their beautiful stonework disfigured by numerous coats of whitewash, and the court, in which are the mural paintings, is used as a stable!

The modern exploration of Mitla dates from 1802, when Don Luis Martin and Col. de la Laguna visited the ruins and made sketches of the buildings. It was from their report and drawings that Humboldt obtained his information concerning Mitla. In 1806 the great French explorer Guillermo Dupaix and his artist Castañeda went to Mitla on their second exploring tour, and the results of this visit are published in *Antiquités Mexicaines*, Paris, 1834.[1]

[1] This text is included also in Kingsborough's work, but there is some discrepancy

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In 1830 the German traveler Mühlenpfordt made plans and drawings, the originals of which are now in the Museum in the city of Oaxaca. Copies were made by Juan B. Carriedo, and published by him in the *Illustracion Mexicana*, Vol. II. This account was republished by Peñafiel in his work, *Monumentos del Arte Mexicano Antiguo*, and Mühlenpfordt's drawings are given in the plates copied from the originals in Oaxaca.[1]

About 1860 Désiré Charnay, on his first journey to Mexico, made photographs of the principal edifices, which were published in 1863.[2] These photographs, until recently, have been the basis for reproductions used in general works upon the Mexican ruins.[3]

The explorations of Charnay were followed by the visit of Doutrelaine several years later.[4] Bandelier, Ober, and Ayme came in 1881.[5] In 1888 Professor Eduard Seler of Berlin copied the mural paintings, which were published by him in 1895 through the liberality of the Duke of Loubat.[6] They have

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in the two publications, both in text and plates. Some material found in one work is not given in the other.

1 Peñafiel's great work was published in Berlin in 1890, one volume of text, in Spanish, French, and English, and two volumes of plates.

2 Charnay, *Cités et Ruines Américaines, Mitla, Palenque, Izamal, Chichen Itza, Uxmal; recueillies et photographiées, avec un texte par Viollet-le-Duc, suivi du Voyage et des Documents de l'Auteur.* Text, and Atlas of 49 photographs.

3 The Loubat Expedition has made about two hundred and fifty photographs in the vicinity of Mitla.

4 Doutrelaine, *Les Ruines de Mitla*, published in *Archives de la Commission Scientifique du Mexique*, Paris, 1867, Vol. III, pp. 104 to 111, with plates of plans of the Temple of the Columns and of the Fortress.

5 Bandelier, op. cit.; Ober, *Travels in Mexico*; Ayme, *Notes on Mitla, Oaxaca, Mexico*, with plans and measurements of the ruins.

6 Seler, *Wandmalerein von Mitla. Eine Mexikanische Bilderschrift in Fresko*, Berlin, 1895. A most valuable work, which contains a scholarly analysis of the deities depicted in the frescoes.

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been much defaced during the last few years, since the advent of the tourists, and the colors are fast disappearing.

In 1895 Professor W. H. Holmes spent a week at Mitla, with the Armour Expedition, and his work is the most instructive study and description of the ruins that has ever been made.[1] None of these explorers, with the exception of Dupaix, have made excavations, and their publications relate to the remains above ground. During the last century the condition of the buildings had deteriorated to a certain extent, and until recently no attention has been paid to them by the Mexican Government, except to appoint a guardian to prevent flagrant vandalism.

In 1900 excavations for the American Museum of Natural History were made in the vicinity of the famous "temples," within a radius of ten miles from east to west, and about three miles from north to south. In the valley in which the Mitla ruins are situated are many mounds in which excavations were made, revealing the foundations of buildings now entirely destroyed; buildings partially destroyed, in which the rooms were cleaned out; and tombs, the walls of which were of stone with the "mosaic" pattern seen in the "temples." Two burial places were discovered, but for their complete exploration more time was required than was at the disposal of the Expedition. More than thirty skeletons, in a more or less imperfect state of preservation, were taken out of the tombs and burial places. The doorways of the burial chambers faced the west, but there was no regularity in the manner of interring the dead.

The hills to the east of Mitla were explored, and the ruins investigated were designated Guiaroo, that being the name of

[1] Holmes, *Archæological Studies Among The Ancient Cities of Mexico*, Chicago, 1897.

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the mountain which rises above them to the northeast. Between Mitla and Guiaroo is the Hacienda of Xaaga. Near Xaaga two tombs were discovered, and a small adobe building, almost entirely destroyed, was excavated. In the center of the room a cache of 120 copper tau-shaped objects was found; these may be cutting implements, but are generally regarded as money. There is strong evidence showing their use to have been ceremonial. In the Guiaroo group, in the foothills, two ruined adobe buildings and a cruciform subterranean chamber were explored, and, for the first time, were cleared of the dense underbrush which covered them. These ruins were visited by Dupaix in 1806 and the cruciform structure described by him. They had not been visited by any other explorer since that time.

The operations of the Expedition during the winter of 1901 and the most important results obtained may be briefly summarized as follows:

1 The courtyards of the groups of the Temple of the Columns and the Cruciform Tombs were cleared out, revealing the cement floors painted red.

2. The entrance to Cruciform Tomb 1, under the north temple group of the Cruciform Tombs, was excavated (see plate III, 1).

3. A new cruciform chamber was discovered under the east temple group of the Cruciform Tombs (see plates V-VIII).

4. The ancient water drains of the two courts were discovered and cleaned out. Each was found in the southwestern corner of the court.

5. It was ascertained that the mounds on the south side of the court of the group of the Temple of the Columns, and the

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west side of the court of the group of the Cruciform Tombs, were platforms and not substructures for buildings.

6. The courtyards were found to be entirely closed and were entered by stairways in the above mentioned platforms. The platforms of the temples were reached by flights of steps from the court; and in the group of the Cruciform Tombs three small flights of steps led up to the platform from outside the court.

7. The small holes which occur in the façades of the temples, near the doors, served to hold stone heads, one of which was found in the débris at the base of the temple; this head is shown in the hole from which it had fallen, in plate II.

8. Mosaic panels were uncovered in the facings of the substructures corresponding to the panels in the buildings, making a unit of the substructure and the building which it supported; search was made for the famous subterranean passage mentioned by Burgoa. Inasmuch as the Group of the Temple of the Columns and the Group of the Cruciform Tombs are the only groups at Mitla with substructures to the temples, careful search was made in these substructures for concealed chambers or openings into subterranean passages. With the exception of the Cruciform Tomb found under the east temple, and the drains of the two courts, no passages or underground rooms were discovered. The other groups of temples at Mitla are built on the bed-rock. An excavation was made in the northernmost room of the Group of the Curacy. This room is near the base of the hills, and there was a possibility that it might have been placed over the entrance to a natural cave. Several such caves do exist in the hills in the northern part of the valley. The excavation

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of this room, which corresponds with Burgoa's account of the entrance being at the rear of the "last hall with another door at the rear," did not reveal the slightest trace of any door or opening either in the wall or floor. It seems, therefore, that we must

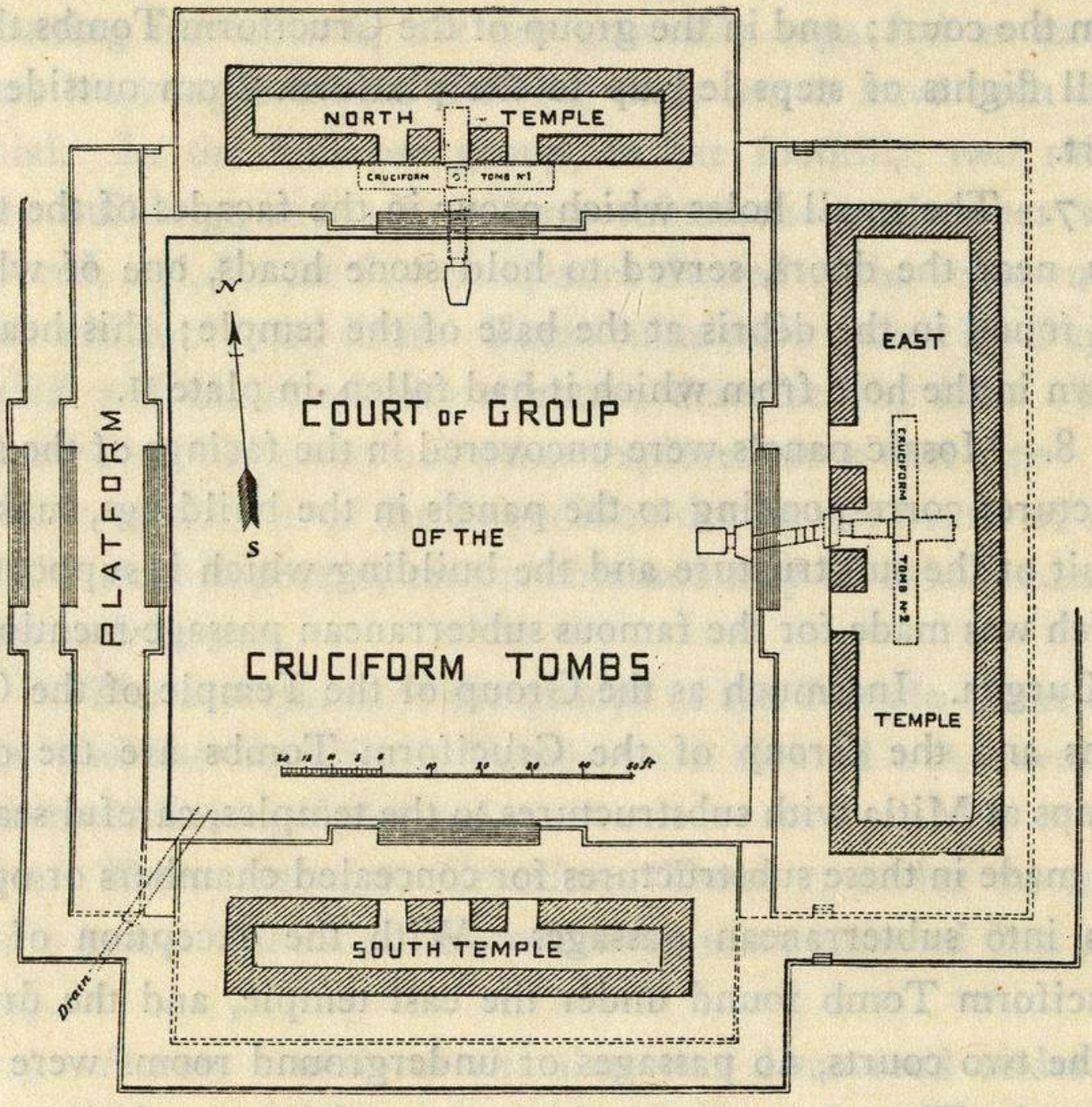

Fig. 1—Ground-plan, Group of the Cruciform Tombs.

dispose of this tradition as being on a par with all others of the same character. In connection with all of the great ruins of Mexico and Central America we find just such legends of underground passages, and as yet none have been found.

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Entrance to Cruciform Tomb No. 1 at base of steps. Cement floor of court in the foreground

NORTH TEMPLE, GROUP OF THE CRUCIFORM TOMBS, LOOKING NORTH

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CRUCIFORM TOMB I

In my former paper[1] a brief account was given of this tomb in the substructure of the north temple group of the Cruciform Tombs (see figure 1), in which I followed the nomenclature of the sketch map of Mitla published by Professor W. H. Holmes in his *Archæological Studies Among the Ancient Cities of Mexico*. The discrepancy in the measurements of some explorers was noted, and the measurements of Mühlenpfordt were considered to be the most nearly correct. I herewith append the result of repeated measurements taken in 1901:

Extreme length, east to west	41.4 ft.	
Extreme length, north to south	34 "	
Length of chamber, base of cross	9 "	
Length of base of cross to lower step	7.5 "	aver.
Length of steps	7 "	"
Top step of corner of arms	2 "	"
Length of eastern arm	18.1 "	
Length of western arm	18.2 "	
Length of northern arm, head of cross	12.3 "	
Width of eastern, western, northern, arms	5.1 "	"
Width of chamber, base of cross	4 "	
Height of eastern, western, northern, arms	6.5 "	"
Height of chamber, base of cross	3.6	

In figure 2 are shown the ground-plan (*a*) and front view of the under-courtyard entrance (*b*) of this chamber.

The three rooms forming the head and arms of the cross are in the substructure of the Temple, above the level of the court. The walls of the several chambers are mosaic,— that is,

[1] Saville, Cruciform Structures Near Mitla, *Bulletin of the American Museum of Natural History*, XIII, art XVII, pp. 201-218, New York, Nov. 9, 1900, 10 plates and 8 text figures.

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the geometric designs are made by the fitting together of small stones of different sizes. Some of these stones are more deeply imbedded than others, resulting in a geometric pattern formed by the projecting stones. This mosaic or grecque work is a prominent feature of the Mitla building, and its exact counter-

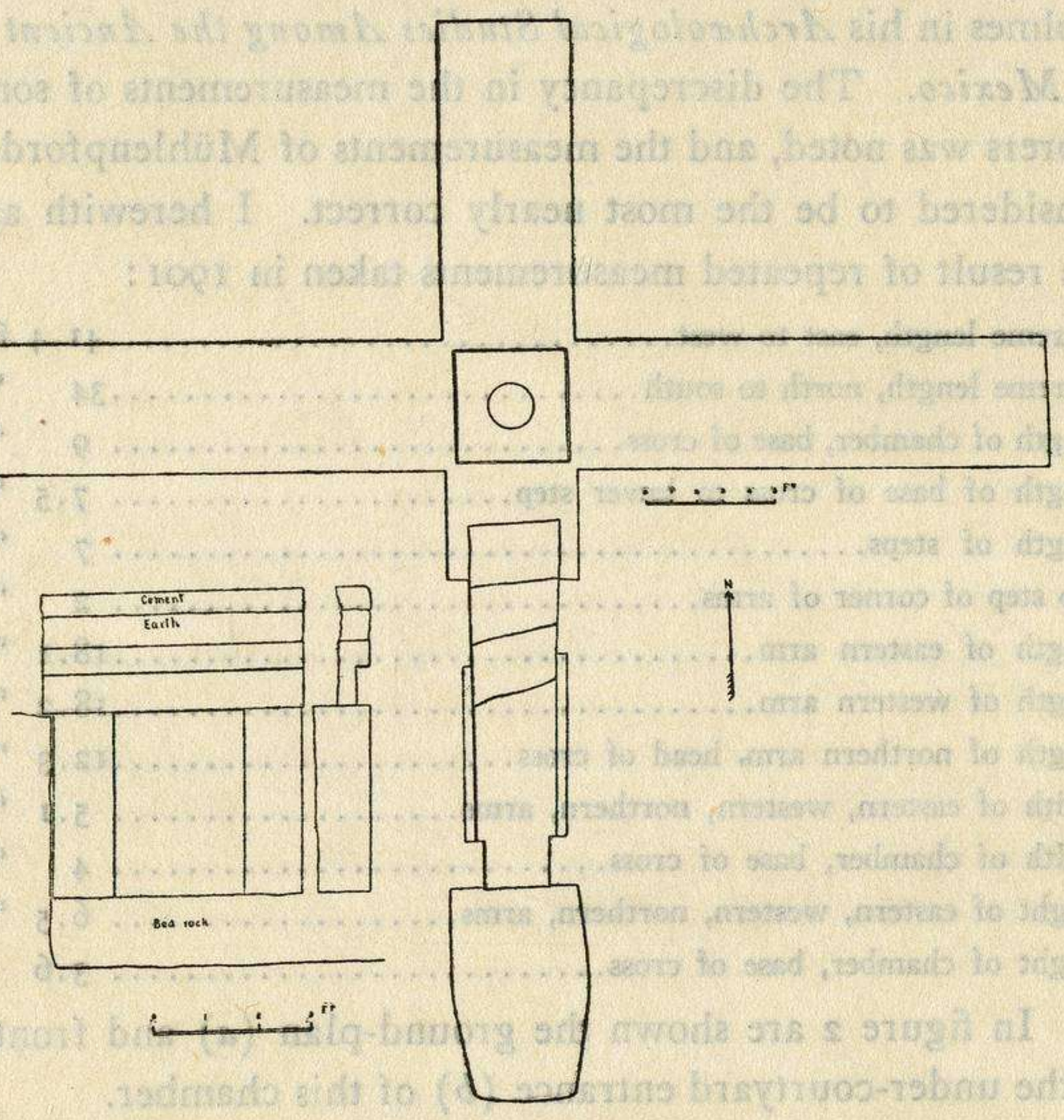

Fig. 2—Ground-plan and entrance, Cruciform Tomb 1.

part is not found elsewhere, although there is a general resemblance in some of the structures in Yucatan, as noted at the end of this paper. Most of the mosaic panels in this cruciform tomb are nearly destroyed, the designs being traced by the

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SECTION OF NORTH TEMPLE, GROUP OF THE CRUCIFORM TOMBS,
SHOWING THE STONE HEAD IN THE FAÇADE

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broken edges of the projecting stones which had formed the pattern. Some traces yet remain of a coating of white cement, painted red. It is extremely probable that the defacing of the panels of the chambers has been done by Indians and not by visitors. The Indians have a belief that stones or fragments taken from the buildings will, sooner or later, turn to gold.

In the center, at the junction of the four arms, is a depression, in which is a large column supporting the roof. This is a feature not found in any other of the cruciform chambers.

In clearing out the courtyard of this group a break in the cement floor was revealed, showing an ancient excavation in the bed-rock below the floor. It is about 8 feet in length from north to south, averages 5 feet from east to west, and is 6 feet in depth. The cement floor of the courtyard is 8 inches in thickness and about 1.5 feet above the bed-rock at this point. Here was found the doorway of the Cruciform Tomb facing the south (see pl. III, 1, showing doorway at the base of the cross and in the background the former entrance where in colonial times the Spaniards probably broke through the stone steps leading up to the temple); the southern arm, or base of the cross, is in the bed-rock in the northern extension of this excavation, the sides of which are covered with mosaic panels, thus concealing the rough walls cut in the rock. The doorway is 3.6 feet in height and 2.45 feet in width. The stone which formerly sealed the door was not discovered, nor were there found any traces of steps leading down from the court to the level of the doorway. It would seem probable that in ancient times this entrance was entirely concealed, the space in the bed-rock being filled in and the cement floor of the courtyard covering the space. The steps

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leading up from the lower room into the main galleries of the tomb are rudely cut out of the bed-rock, as seen in plate IV, a view taken from the inside of the tomb, near the column, looking toward the south.

CRUCIFORM TOMB 2

The cruciform chamber in the substructure of the east temple was discovered January 24, 1901, while clearing the débris of the lower platform and steps of this edifice. In plate V is shown a view of this temple after the completion of the explorations in the courtyard. The cement floor is shown also, and in front of the flight of steps leading up to the temple is seen the opening to this new Tomb. An opening in the cement floor was uncovered about 5 feet west from the lower step. This opening averages a little less than 6 feet in diameter from north to south and from east to west, its shape being slightly irregular (see plate VII, 1, and the ground-plan and cross-section of the chamber in fig. 3). It is much smaller at the base than at the top, as seen in the cross-section.

The first doorway (see *a*, plate VI, 1) faces the west, and has been sealed by a large stone (shown in plate VII, 1), 4.4 feet high, 4 feet wide, and 8½ inches thick. This stone has been thrown back against the sloping western side of the opening in the position shown in the picture, and under it were found fragments of two human skeletons and several pottery vessels of the common type found in the tombs — a grayish black ware.

On the south side of the opening, leading down from the level of the courtyard to the level of the floor, at the outer doorway, was found a line of Spanish roof tiles, seemingly placed

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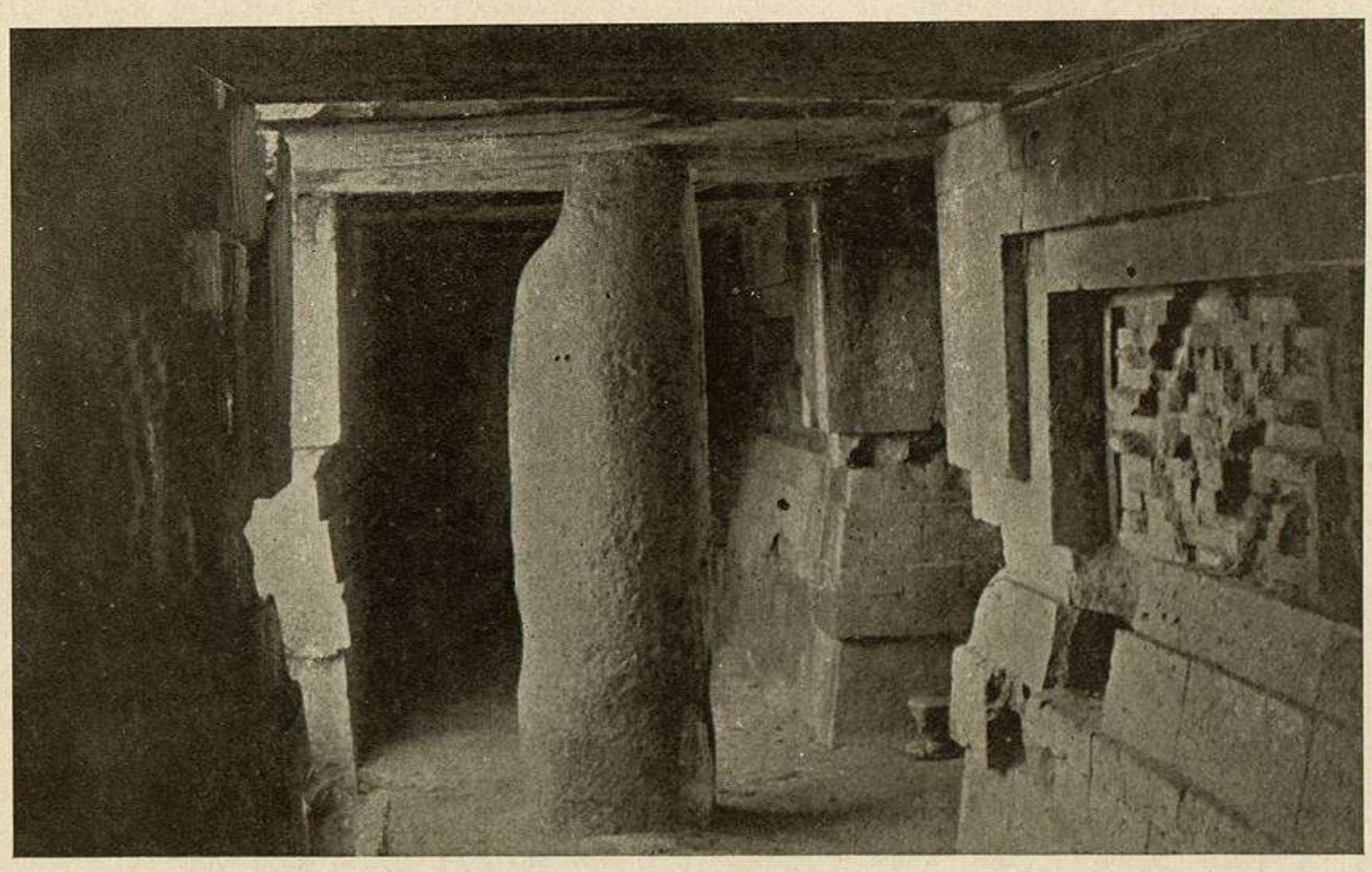
1. Entrance to the Tomb, looking northeast



2. Interior of the Tomb, looking west

CRUCIFORM TOMB NO. 1

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there to conduct water into the two lower chambers of the tomb. It is probable that after the discovery of this Cruciform Tomb

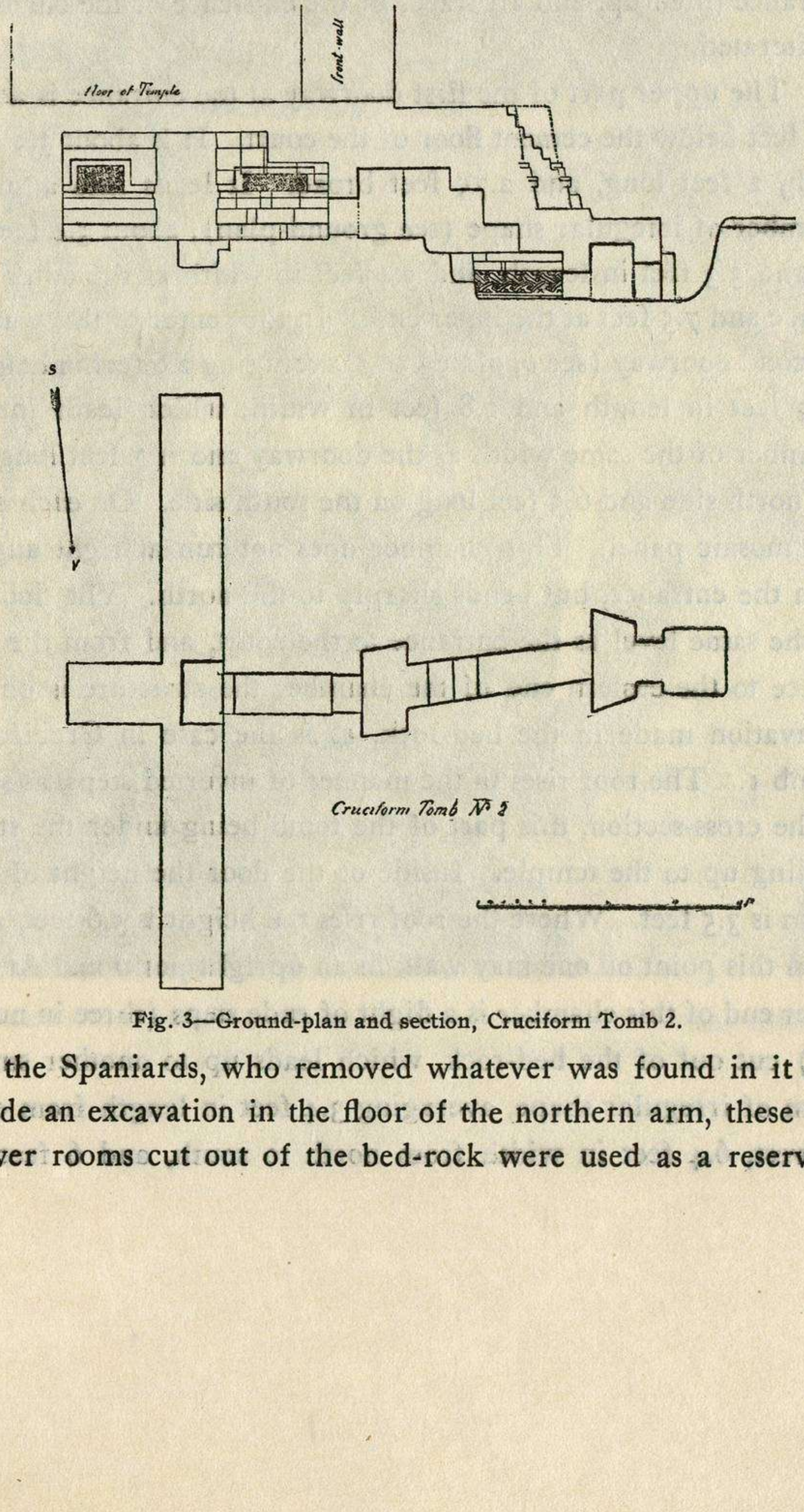

Fig. 3—Ground-plan and section, Cruciform Tomb 2.

by the Spaniards, who removed whatever was found in it and made an excavation in the floor of the northern arm, these two lower rooms cut out of the bed-rock were used as a reservoir,

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the grecque work of the inner chamber being badly disintegrated by water. Later the chamber was partly filled with earth, the entrance filled up, and all traces of the existence of the chamber obliterated.

The upper part of the first doorway at the entrance is about 3.2 feet below the cement floor of the court. It is about 3.5 feet high, 2 feet long, and 2.75 feet broad. It leads into a small chamber of irregular shape (see ground-plan), about 5.4 feet in height, 3.3 feet in length, and 5.4 feet in width at the outer entrance and 7.5 feet at the inner end. In the center of this wall is a second doorway (see *b*, plate VI, 1), averaging 2.9 feet in height, 2.15 feet in length and 2.8 feet in width, which leads into a chamber of the same width as the doorway and is 7 feet long on the north side and 6.5 feet long on the south side. On each side is a mosaic panel. This chamber does not run at right angles with the entrance, but bends sharply to the north. The floor is on the same level as the entrance to the court, and from the entrance to the eastern end of the chamber the structure is on an excavation made in the bed-rock, as is the case in Cruciform Tomb 1. The roof rises in the manner of inverted steps, as seen in the cross-section, this part of the tomb being under the steps leading up to the temple. Inside of the door the height of the room is 3.5 feet. Where the roof rises the height is 5.6 feet, and from this point on one may walk in an upright position. At the inner end of this chamber is a flight of rude steps (three in number) cut out of the bed-rock, which leads up to another small room of irregular shape, averaging 3.4 feet in length from east to west, 6.4 feet in width from north to south, and 6 feet in

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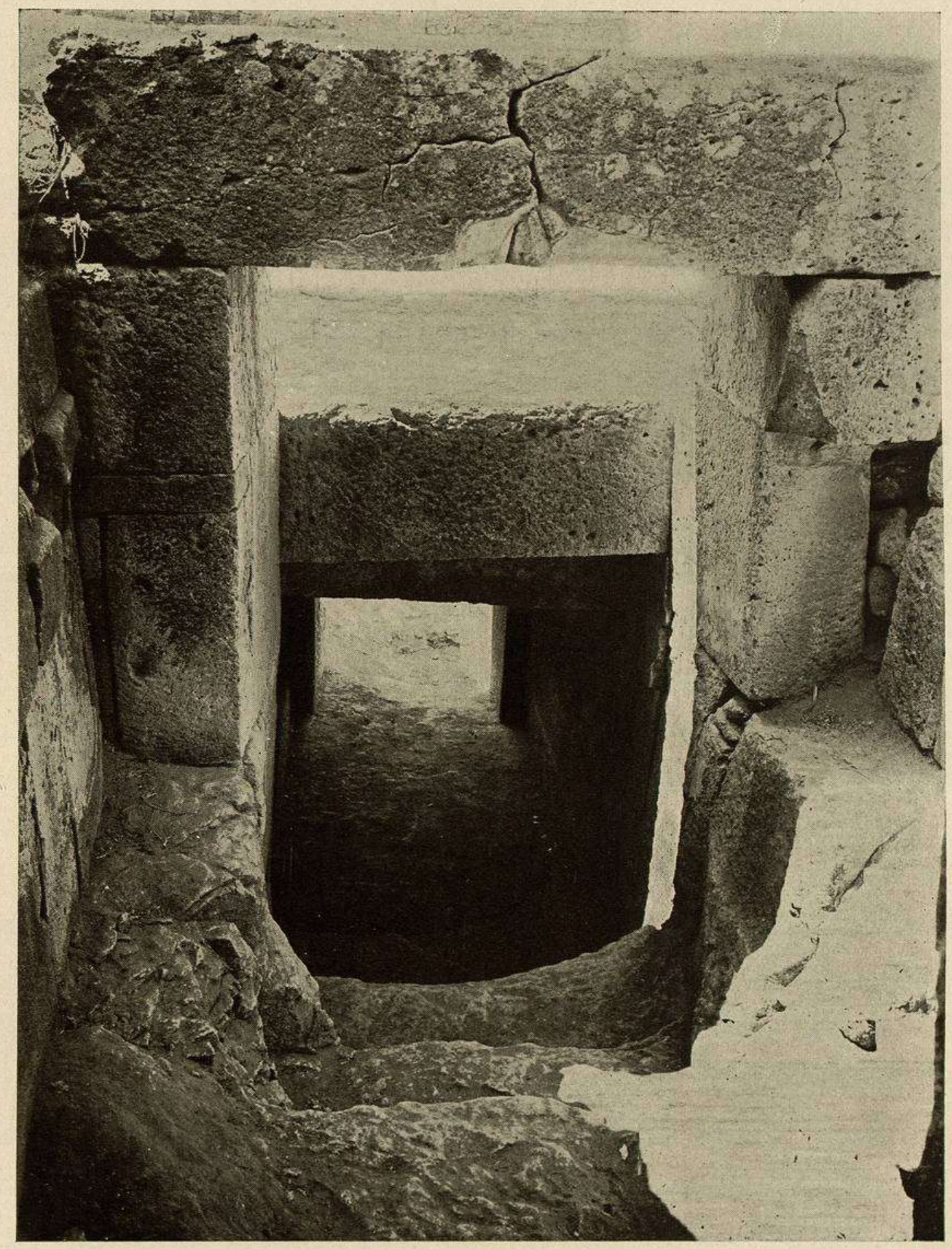

STEPS CUT IN BED-ROCK, SOUTHERN ARM OF CRUCIFORM TOMB NO. 1, LOOKING SOUTH TOWARD ENTRANCE

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height. The walls of this chamber are made of smooth stones and painted red.

From this chamber is a third doorway (see *c*, plate VI, 1), 3 feet high, 2.2 feet long, and 2.8 feet wide, with a step .75 feet high. This doorway is immediately under the front wall of the temple, and leads into the main part of the structure, which is cruciform and composed of four arms or galleries (see plate VII, 2, and plate VIII). Inside of the door the roof of the western arm is 6 feet above the floor for a distance of 4.65 feet, where it rises to a height of 8.3 feet, which is the height of the eastern, northern, and southern arms. This western arm is 8.35 feet long from the doorway to the junction of the other arms, and 3 feet wide. At the point of union of the four arms is a depression in the floor, as seen in the cross-section (see also plate VIII), about 4.4 feet from north to south, 3.25 feet from east to west, and 1.25 feet deep. There is a step into this depression, as one enters from the western arm, which is .85 feet deep from the floor.

The head of the cross, or eastern arm, is 7.15 feet long and 4.7 feet wide. The northern arm on the eastern side is 20.2 feet long and 4.7 feet wide, and the southern arm on the eastern side is 20.3 feet long and 4.7 feet wide. The total length of the tomb from north to south, which runs parallel to the temple above, is 45.2 feet, and from the doorway at the entrance of the courtyard to the inner end of the eastern arm, the distance is 44.7 feet, there being but little difference in the two dimensions.

In these four galleries the walls are in a perfect state of preservation, and contain the best stonework to be found in Mitla. The large stones are neatly joined; in some cases it is difficult to find the joints. The general method of construction

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is shown in the drawing of the south wall of the western arm in the cross-section of the tomb (*e*, plate VI, 1). The north wall of the western and southern arms is shown in *d* of the same illustration. Plate VI, 1*a* shows the eastern walls of the northern and southern arms, and *b* the opposite walls of the same galleries. As in the temples the walls have grecque panels, but the designs are cut in slabs as in the cruciform tomb at Xaaga, and not in the mosaic style as in the lower chamber near the entrance, and in the temple. There are eleven panels in all, in each of which is a different pattern. The designs in relief are covered with white cement; the inner cutting is painted a bright red in which glisten silver-like particles. This red color is probably from cinnabar. The designs were cut in the slabs after the walls were finished, and were sketched out in black with a blunt implement. In some instances the stone-cutter worked inside of the lines, many of which remain, and may be seen where the cement covering has peeled off; apparently the whole surface was lined off horizontally, as many such lines are found in all the panels. The depth of the design is about an inch, and as in the cruciform tombs at Xaaga and upper Guiaroo, the cutting is beveled. The floor is covered with cement. The roof is composed of large, flat, smooth-faced stones. Over the center, at the junction of the four arms, is a single large stone on which a design (figure 4) is painted in red lines. This remarkable tomb is now protected from vandalism by an iron gate which is always kept locked. Visitors are admited only in the company of the local inspector. It is, however, exposed to the elements and during each rainy

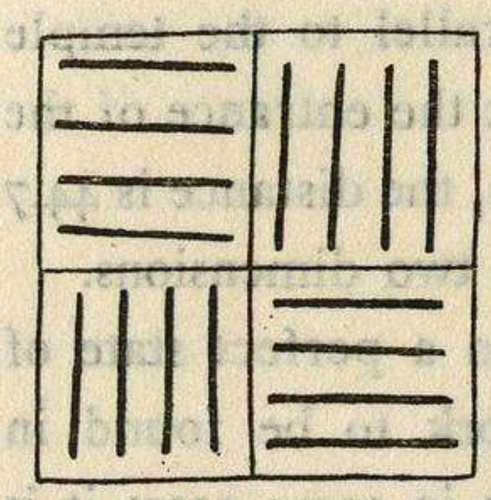

Fig. 4—Design on roof stone over central part of Cruciform Tomb 2.

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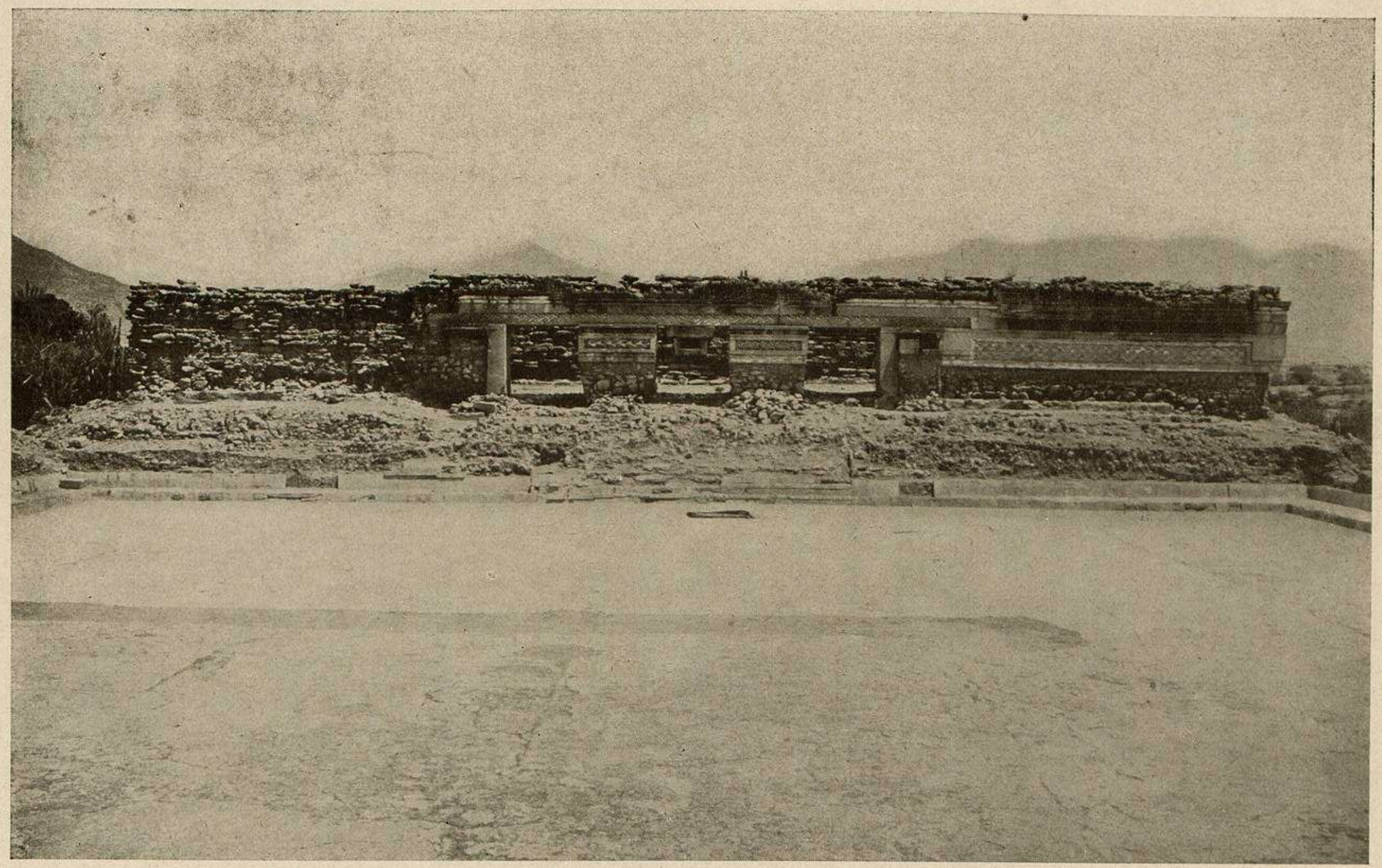

EAST TEMPLE, GROUP OF TWO CRUCIFORM TOMBS, LOOKING EAST. ENTRANCE TO CRUCIFORM TOMB NO. 2 AT BASE OF STEPS

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season the lower chamber is flooded with water. A light structure should be built over the entrance by the Mexican Government.

XAAGA

The Hacienda of Xaaga comprises the extreme eastern end of the Valley of Mitla, and extends for miles to the eastward. The mountains, in which are the ancient quarries and the Guiaroo groups, form a part of this great estate.[1] The Hacienda building is about three miles southeast of Mitla, and is built on the top of the principal mound. Near the houses are the huts of the Indian laborers, some of which are placed upon ancient mounds, while scattered about in the immediate vicinity are other remains. In the great mound under the Hacienda building a cruciform structure was discovered about thirty years ago. It was first described very briefly by Bandelier, who gives a rough plan of the structure, but no measurements.[2] The ground-plan and entrance are shown in figures 5 and 6, and a photograph of the entrance is given in plate IX, 1. The entrance, at the foot of the cross, faces the west, and was found sealed by a large stone resting on a step 19 cm. in height, a short distance in from the edge of the mound. The floor of the structure is somewhat

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1 The word *Xaaga* is Zapotecan, and is probably derived from *xaguiagaa, xani* meaning below; *guia*, mountain; *gaa*, nine; or, "below the nine mountains," as it is just below a high ridge with nine peaks or points which bears the name, in Zapotecan, *Guigaa*, or in Spanish, *Nueve Picachos*. This etymology will be found in the valuable work of Manuel Martinez Gracida, "Catalogo etimologico de las poblaciones del Estado de Oaxaca," *Boletin de la Sociedad de Geografia y Estadistica*, Cuarta epoca, tomo 1, núm. 6, 7, and 8, p. 418, Mexico, 1889.

3 Bandelier, op. cit., pp. 309-310.

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lower than the level of the ground in the immediate vicinity. An excavation of this mound would very likely reveal walls, and possibly the ruins of a building: this was the case in mound 2, in which Tomb 1 was found near Mitla during the winter

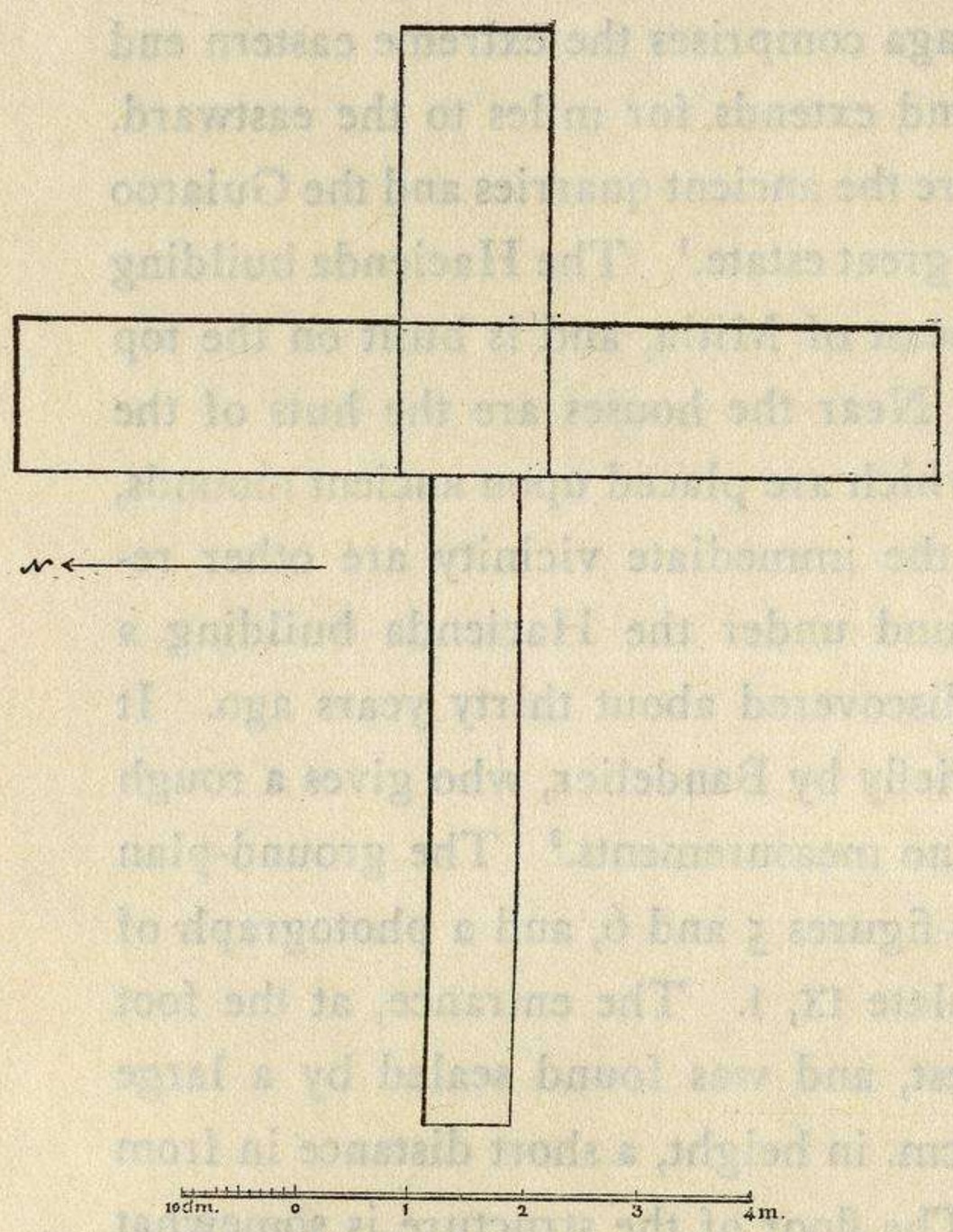

Fig. 5—Ground-plan of Cruciform Chamber, Xaaga

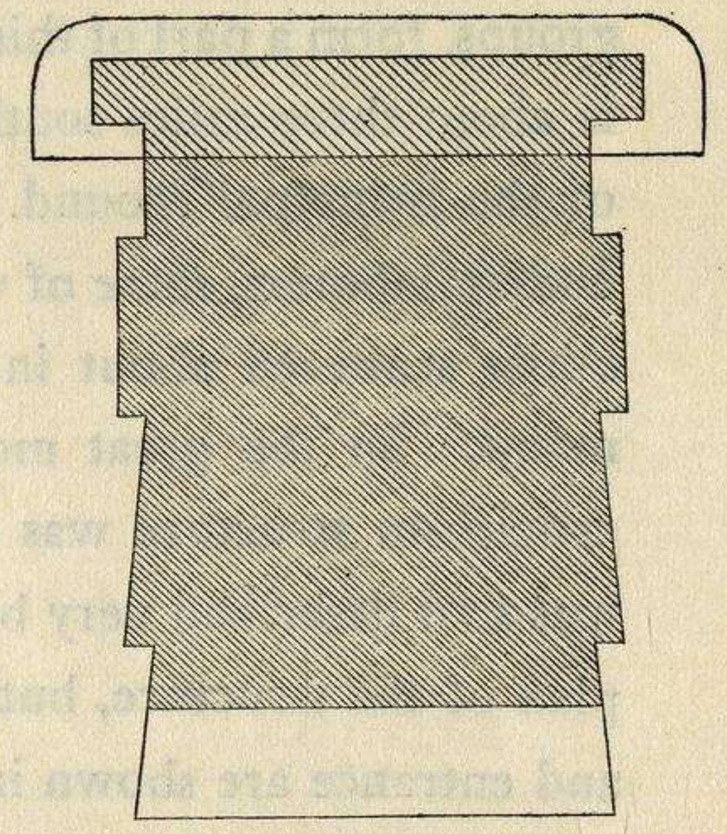

Fig. 6—Entrance to Cruciform Chamber, Xaaga

of 1901, where the tomb was in the western side of the mound and excavations uncovered stone walls and a filled-in structure. The four chambers which form the cross of the Xaaga structure are covered by large flat roof-stones. Over the western chamber or

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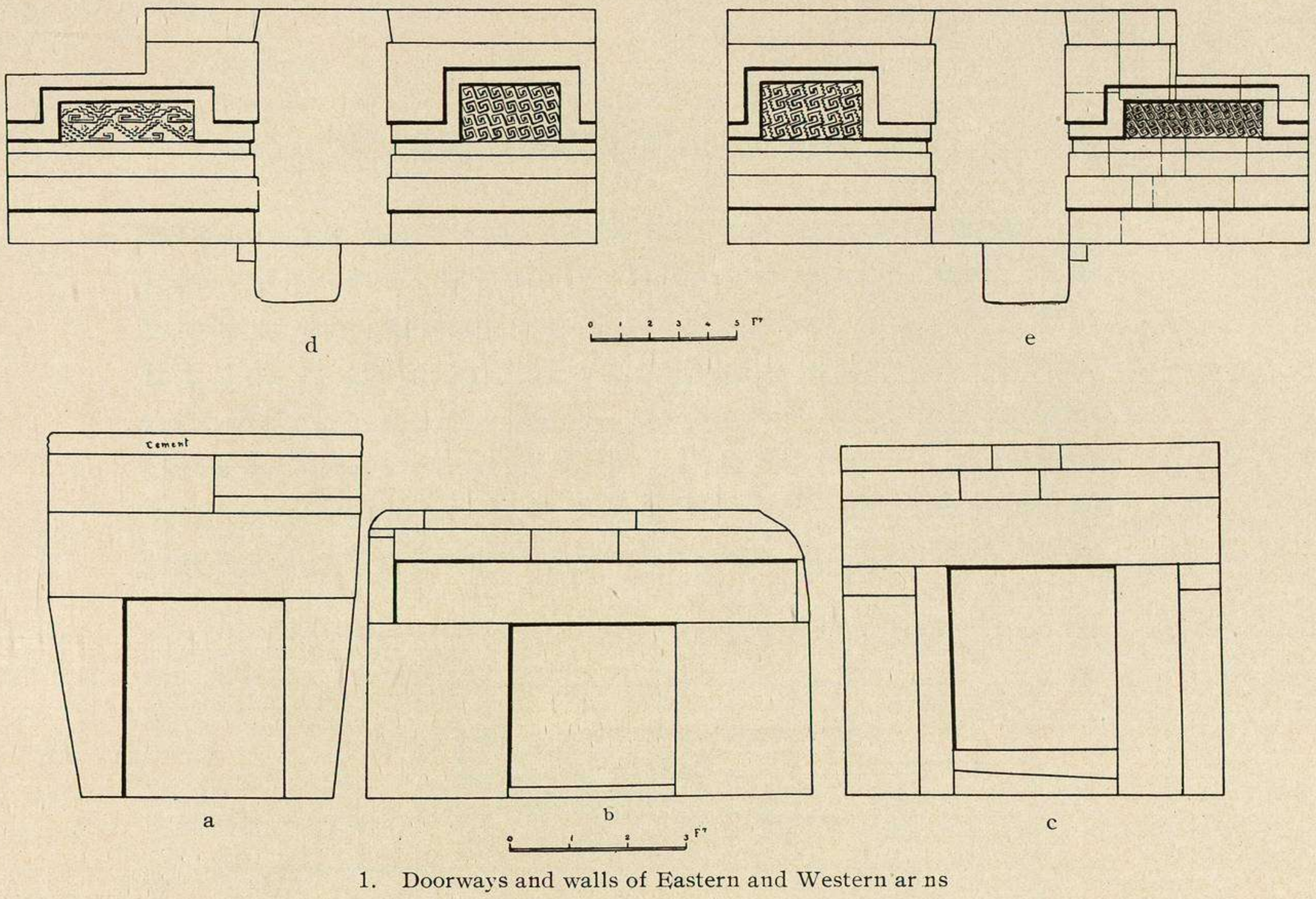
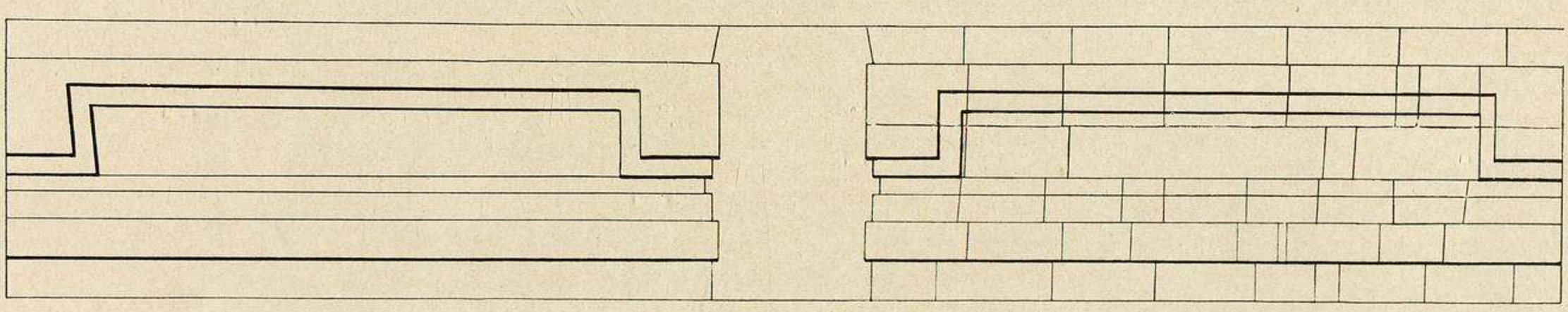


d e a b c

1. Doorways and walls of Eastern and Western ar ns



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2. Walls of Northern and Southern arms

CRUCIFORM TOMB NO. 2

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base there are four stones which form the roof, and beyond are four others which extend to the junction of the four arms. The height of this chamber varies; at the entrance, which is low, it is 1 m. 15 cm. in height. At a distance of 5.6 feet from the door the roof rises 2½ inches, the average height throughout the entire structure being 5.6 feet. Over the eastern chamber or head of the cross, one stone forms the roof; over the northern arm are three, and over the southern arm are four stone slabs.

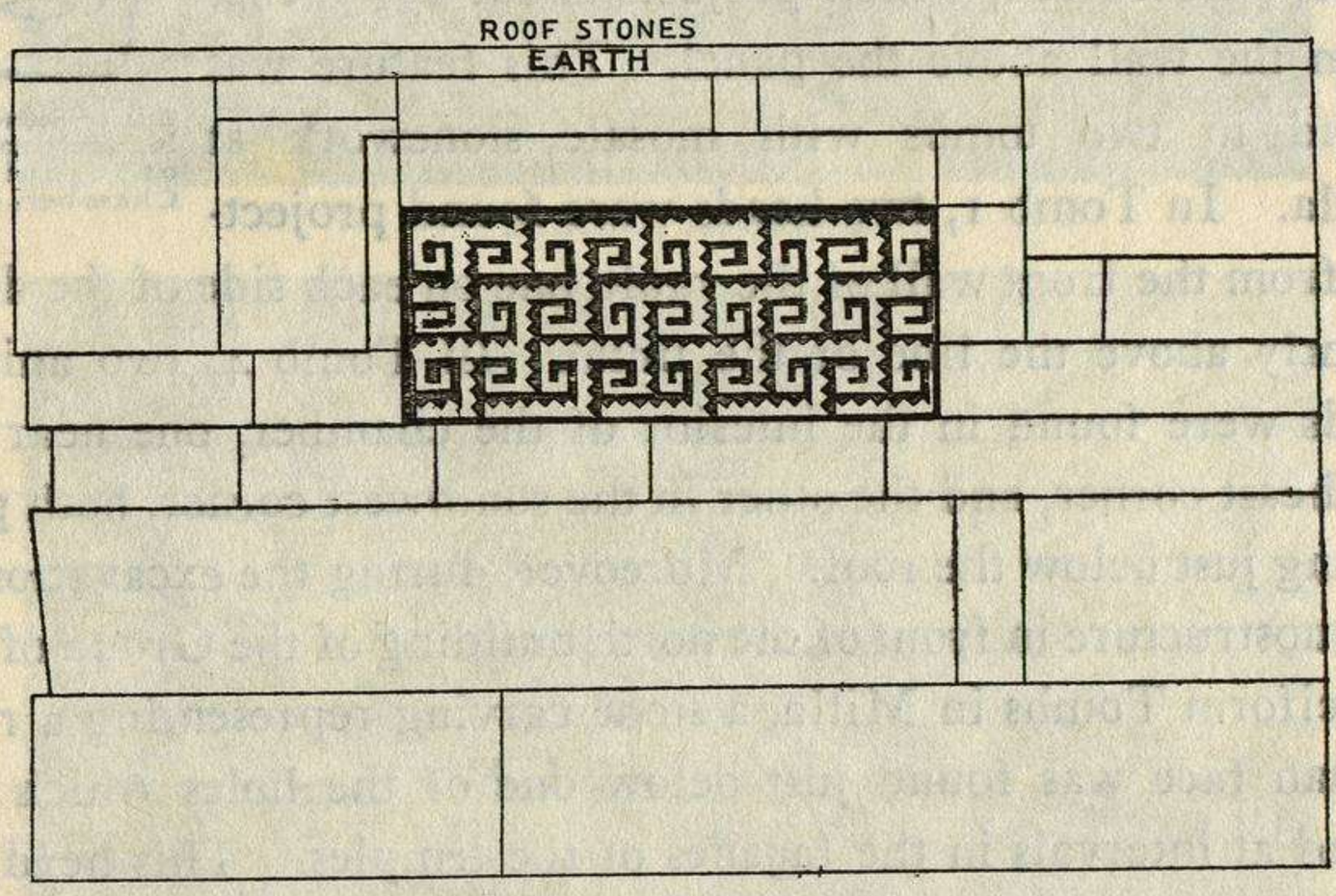

Fig. 7—North wall of eastern arm, Cruciform Chamber, Xaaga

The center of the cross is covered by a single large stone, at which point the floor is depressed 6 inches. The floor of the entire structure is covered with cement 6 cm. in thickness.

The stonework of the eleven walls resembles that of the outer walls of the "temples," being composed generally of five courses of stones. In the center of each of the walls is a mosaic panel. In the different panels are found repeated all of the

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various designs seen in the "temples," and several peculiar to this structure. A section of the north wall of the east arm is shown in figure 7. These panels are colored; the inner surface is painted red, while the design in relief is covered by a thin coating of white cement. Each of these panels is composed of from four to five stones. In the eastern side of the southern arm, at the point indicated in the ground-plan (figure 5), is a rude human face (figure 8), carved out of stone, painted red, which projects about 2½ inches from the wall above the panel. This feature was found in two tombs with mosaic stonework at Mitla. In Tomb 1, two heads were found projecting from the front wall of the vault, one on each side of the door, slightly above the line of the lintel. In Tomb 4, two animal heads were found in the interior of the chamber, one near the northeast corner, and the other in the southwest corner, both projecting just below the roof. Moreover, during the excavation of the substructure in front of the north building of the Group of the Cruciform Tombs in Mitla, a stone carving representing a rude human face was found just below one of the holes which are found at intervals in the façades of the temples. This head fits perfectly into the hole above, and unquestionably belongs there, thus solving the problem of the use of these holes, for which a number of suggestions have been advanced (see plate II).

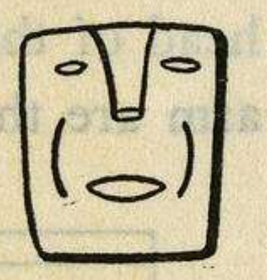

Fig. 8—Stone head in southern arm of Cruciform Chamber, Xaaga

The dimensions of the chamber are as follows:

Extreme length from east to west	32	ft.
Extreme length from north to south	26.9	"
Length of base of cross	18.9	"
Length of head of cross	8.7	"
Length of northern and southern arms	11.11	"

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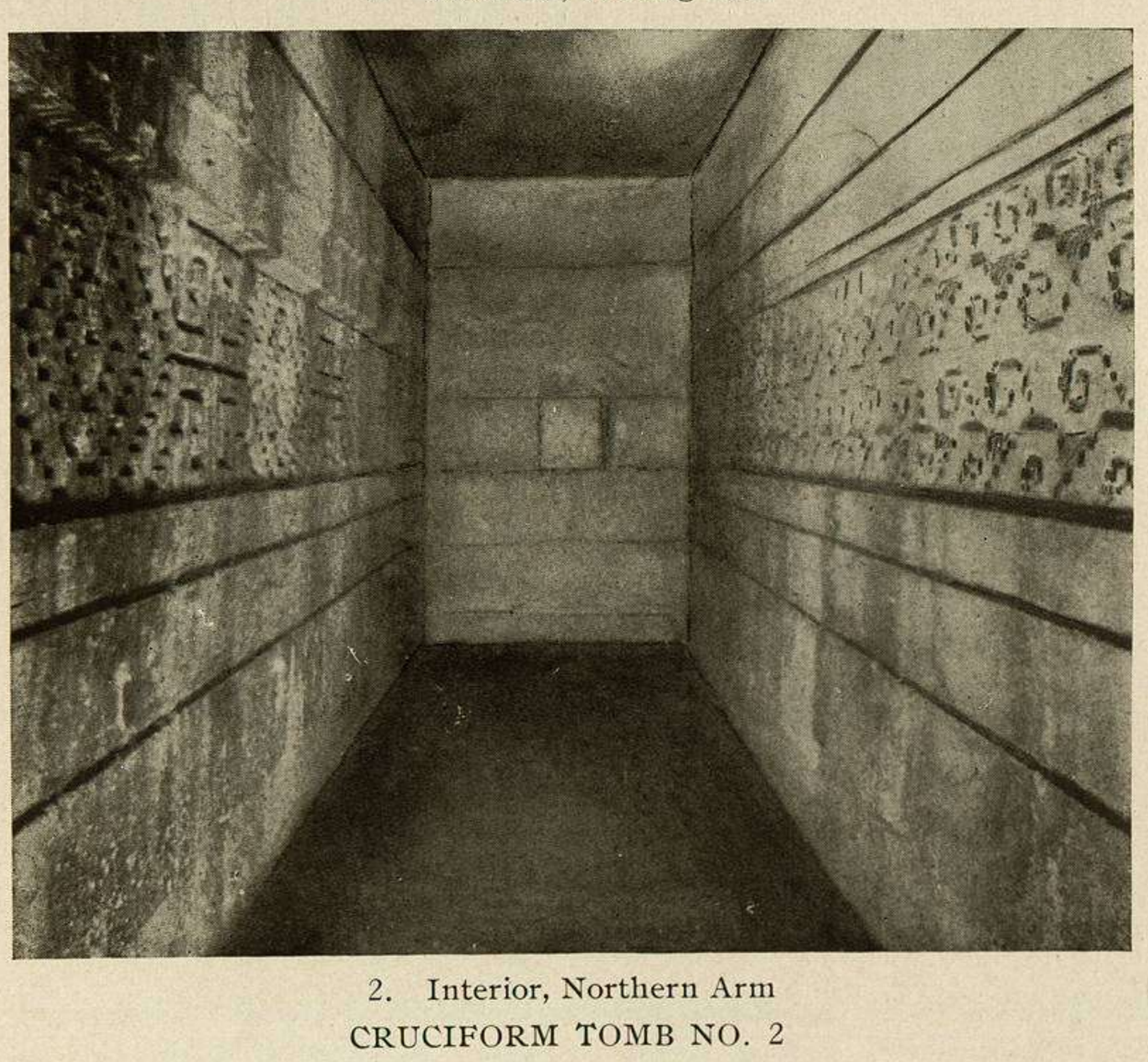
1. Entrance, looking east



2. Interior, Northern Arm

CRUCIFORM TOMB NO. 2

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Width of northern and southern arms	4.3½	ft.
Width of entrance and entire base of cross	2.6	"
Width of head of cross	4.3½	"
Length of northern, eastern, and southern arms	11.7	"
Width of northern, eastern, and southern arms	5.2	"

GUIAROO

The general location of the Guiaroo group of ruins is shown in plate XII, 5, being in the depression of the mountain range, directly in the center of the picture, back of the temple. They are situated about four miles from the village of Mitla, and the hill upon which they are located is more than a thousand feet above the valley. The high peak at the left is Guiaroo mountain; *Guiaroo* is a Zapotecan word, meaning "high mountain."[1] The Xaaga ruins are at the base of the mountains at the right of the picture. The quarries are to the left of Guiaroo peak, on the mountain.

The hill is covered by a dense underbrush, and there was formerly no road or trail leading up to the ruins from the valley below. There is a fairly good ox-cart road to the base of the foothills, and from that point a road was made to the summit, so that now the ascent may be easily accomplished on horseback. The spur on which the ruins are situated is separated from the lower hills to the west, and the high mountain ridge to the east, by deep and almost impassable barrancas.

The view looking west is magnificent; the entire Valley of Mitla is spread out before one, and the high mountains of the

[2] The common term used by the natives in designating the ruins at Guiaroo is *Paderones*, a corruption of the Spanish word *paredones*, "walls." The Zapotecan term for the ruins is ***Basul Lyobaa.*** ***Lyobaa*** is the Zapotecan name of Mitla.

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Mixteca, forty miles distant, are seen in the background. This spur would have formed a natural stronghold in case of attack by an enemy, as the only practicable approach would have been from the high hill to the north on which the ancient quarries were situated. It is not a desirable location for a large settle-

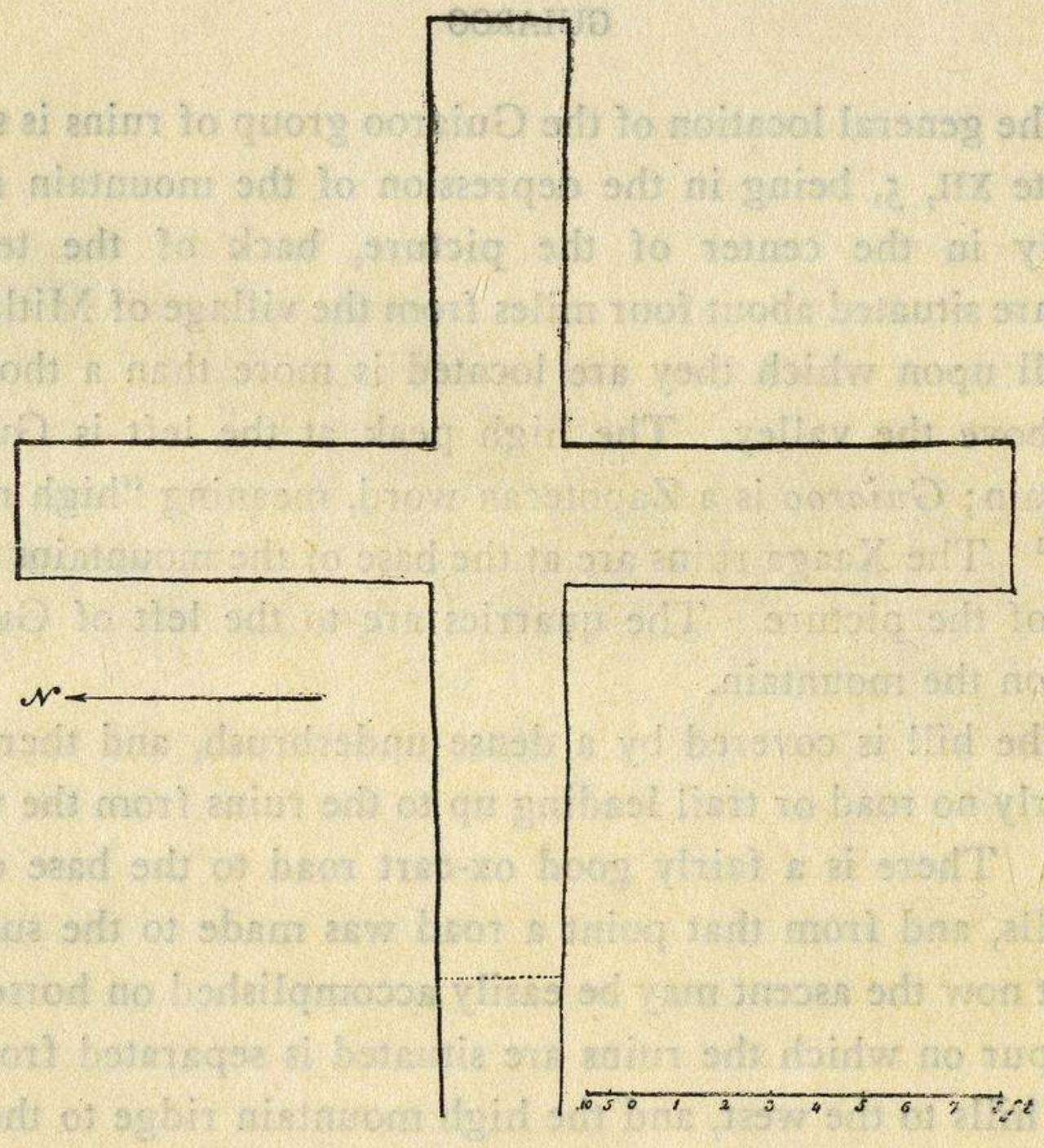

Fig. 9—Ground-plan of Cruciform Chamber, Guiaroo, Lower Group

ment, for the reason that the entire available space on the summit is occupied by the temple and sepulchral ruins, and it would have been impossible for the steep sides of the hills to be used for habitation sites.

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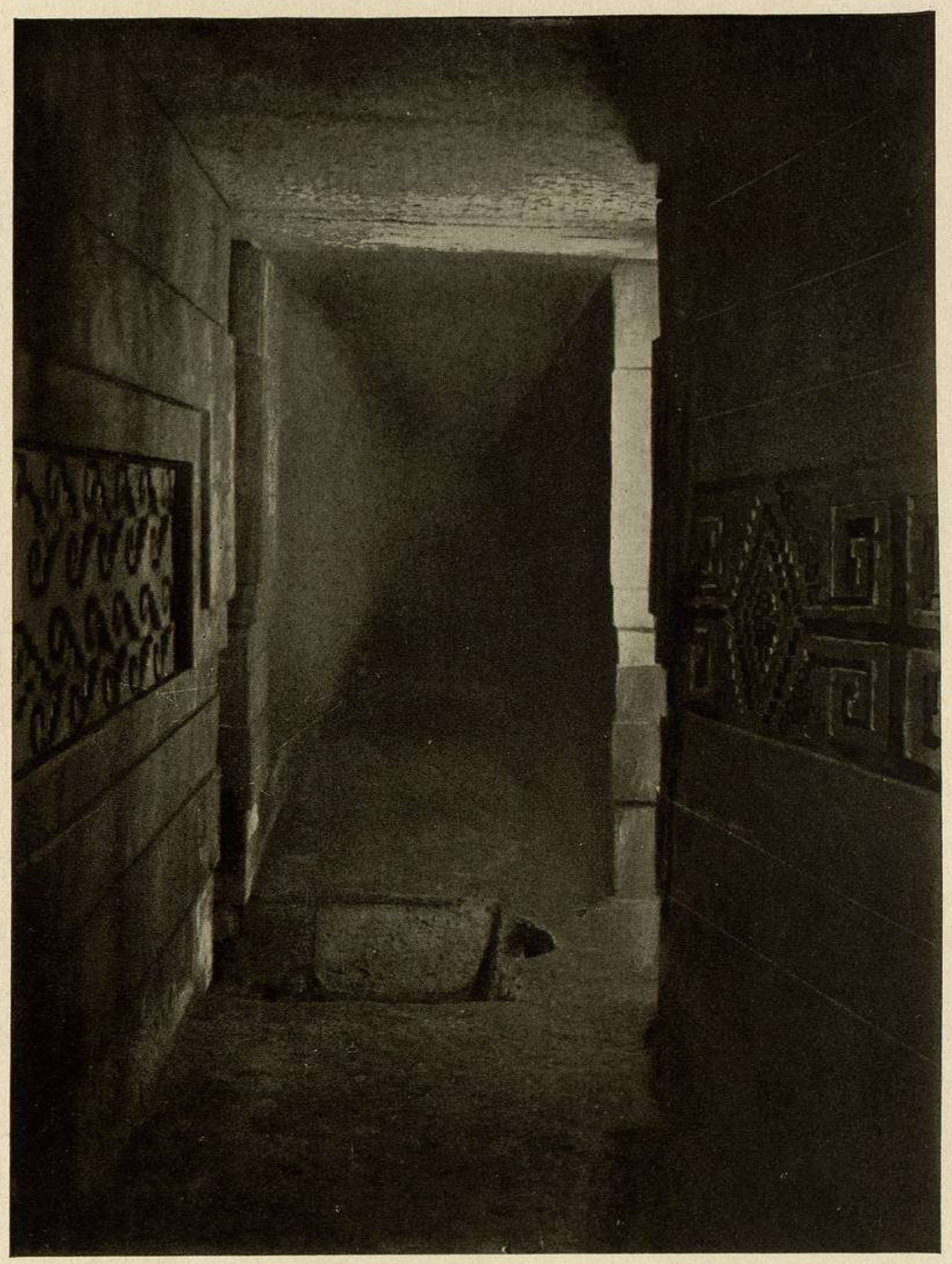

INTERIOR OF CRUCIFORM TOMB NO. 2, LOOKING NORTH FROM SOUTHERN ARM, SHOWING DEPRESSION IN THE CENTER

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GUIAROO — LOWER GROUP

The entrance of the cruciform chamber, discovered by Dupaix, is illustrated in plate IX, 2, and the ground plan is given in figure 9. Dupaix's plan is not correct; it shows steps which have never existed, and the cross-section which he gives of the tomb with mosaic panels is absolutely wrong.[1] The walls of this structure are composed of medium-sized stones, covered with cement; in the center, where the four arms join, the four corners are made of large stones. The walls are painted, the lower half being red, the upper part white, the natural color of the cement. The dimensions of the structure do not show the regularity seen in the Xaaga tombs.

The dimensions are as follows:

Extreme length from east to west	24	ft.
Extreme length from north to south	22	"
Length of base of cross	11.7	"
Length of head of cross	9.3	"
Length of northern arm	9.2	"
Length of southern arm	9.9	"
Width of entrance	2.6	"
Width of head of cross	3.1	"
Width of end of northern arm	3	"
Width of end of southern arm	3.2	"
Average height of the chamber	4.4	"

[1] Dupaix gives the following description of this tomb: "Under the principal entrance of this building, at a very little depth, is a subterranean sepulcher: it is constructed in a simple style, and its plan is in form of a cross, constituting four chambers, the walls of which are coated with square stones polished and painted with ocher. A flight of stairs leads to it, and their descent faces the west. We found nothing in this dismal vault but the remains of a deer and a kid, which some leopard or wolf, the present occupants of this ancient house, had dragged to this solitary spot."

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At the present entrance, which is at the base, and faces the west, there are no signs of any stone which might have served to seal the chamber. It is but a slight distance below the level between the two adobe houses, and the eastern part of the vault is under the eastern adobe house, a portion of the wall being seen in the upper right-hand corner of plate IX, 2. The rude stonework of this structure is somewhat similar to that of two small tombs found in the valley, and may indicate the work of the late Zapotecan occupants of Mitla. They resemble also the stonework of the Xoxo and Cuilapa tombs found in the mogotes of the valley south of the city of Oaxaca, where the mosaic treatment of decoration is entirely absent. In the valley tombs near Mitla, however, no funeral urns like the Xoxo and Cuilapa urns were found.

GUIAROO — UPPER GROUP

The great cruciform subterranean chamber now to be described is on the upper part of the hill about one hundred feet above and six hundred feet north of the main group. To the northwest and higher up in the range of hills, about one mile distant, are the old quarries whence were transported, in ancient times, the immense blocks of stone which form the door lintels of the more important temples of Mitla. Many immense quarried stones still lie scattered about at the quarries, while the others have been partially broken out from the bed-rock. The large blocks used in the construction of the cruciform chamber were transported from this place, and on the way between these two points are several large blocks which were evidently being moved to the chamber when the work ceased. The method of

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1. Entrance to Cruciform Chamber, looking east. Xaaga



2. Entrance to Cruciform Chamber, looking east. Lower Guiaroo

ENTRANCES TO CRUCIFORM CHAMBERS

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transportation was probably by means of rollers and large ropes. The stones were dressed at the quarries, and the mosaic designs carved after they were placed in position in the structure.

The first notice which we have of this splendid structure is given by Ober, who visited it in 1881. Its importance seems to have escaped the attention of subsequent explorers, for it is not mentioned by Bandelier, Seler, or Holmes. Ober gives the following account of the structure: "That the hills are full of ruins which no one has seen of late, we were fully convinced. We visited several sepulchral structures of stone, their inner surfaces carved into the same strange shapes as adorned the walls. Professor Bandelier, sent out by the Archæological Institute of America, had remained here twelve days, but had not seen these paredones, or Indian walls, in the hills which we visited. . . . . We ascended the high hills in quest of the paredones above the valley,— a most tedious climb, over ridges and through barrancas. We found the largest paredon in a dense thicket on a hill commanding the whole valley, near the gap through which passes the trail to the Mixe village of Ayutla. A sepulcher is formed here, of massive blocks, in the form of a cross, about ten feet deep, six wide, and thirty long. All the inner faces of these immense blocks are sculptured, like those of Sagá, while other dressed rocks are scattered about." [1]

In the article on "Oaxaca and its Surroundings," by Dr N. H. Wheeler, published in *Popular Science News* for Janu-

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[1] Ober, op. cit., pp. 541-542. In my first paper on this subject, I gave this extract from Ober in a footnote. It seems to have been overlooked by Leon in his book on Mitla, where he ascribes the discovery to Batres. Before undertaking my work at Mitla in 1900, I had been presented with a plan of this Guiaroo tomb, by Dr N. H. Wheeler. Hence, to correct any wrong impression as to the credit of the discovery of this most important structure, Ober's account has been included in the text of this revised study.

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ary, 1896, this cruciform structure is mentioned; and in a small brochure issued later by the Mexican National Railway, under the title "Tropical Tours to Toltec Towns," the writer quotes from a newspaper article signed "W." (probably Wheeler) in which a brief description, with measurements, of the structure

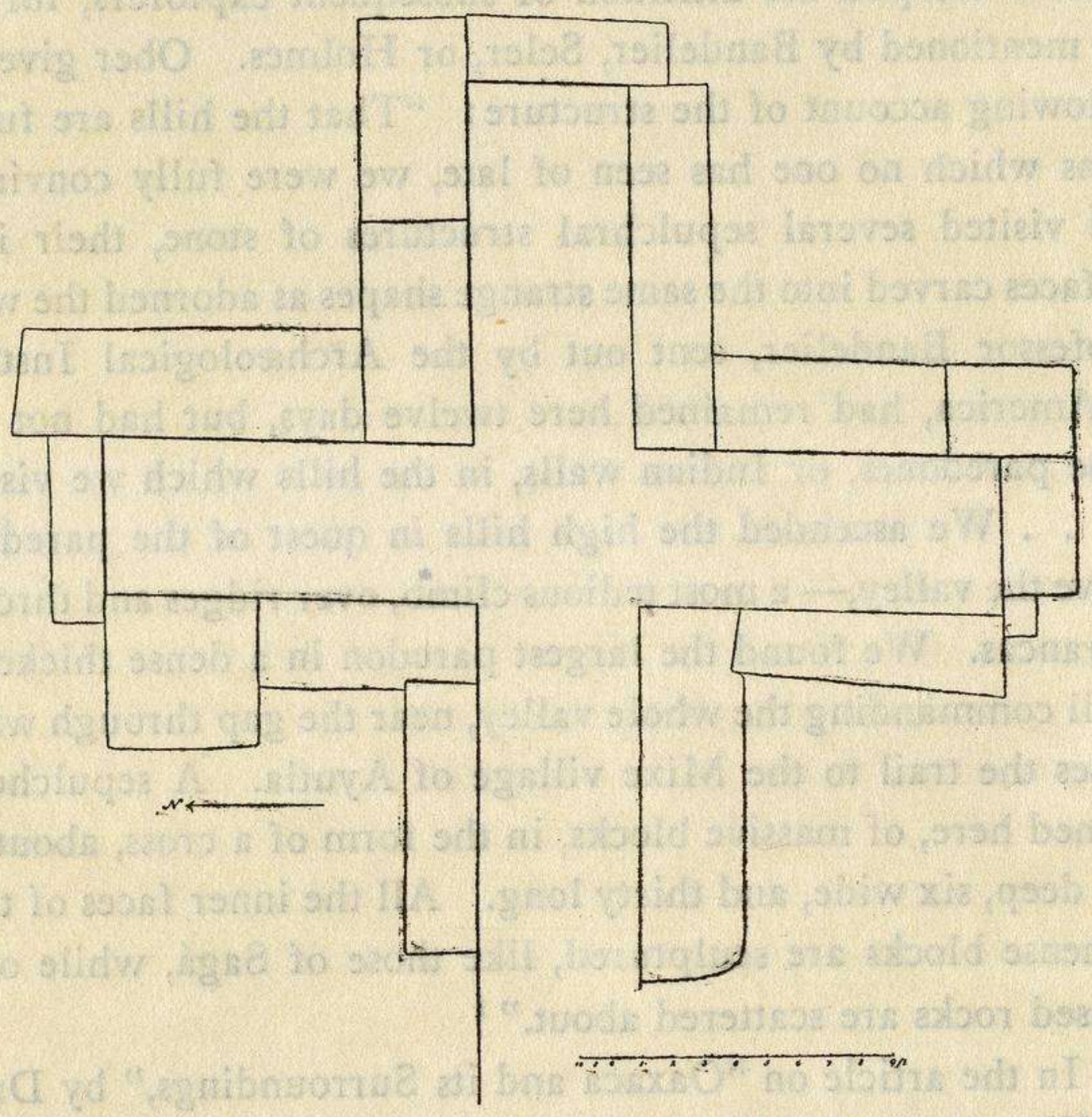

Fig. 10—Ground-plan of Cruciform Chamber, Guiaroo, Upper Group

is given. The chamber was covered by forest, and half filled with débris, composed of rubble stone and earth. The view in plate X, 1, was taken before clearing out the débris, and gives a good general idea of the cruciform plan of the chamber. In the

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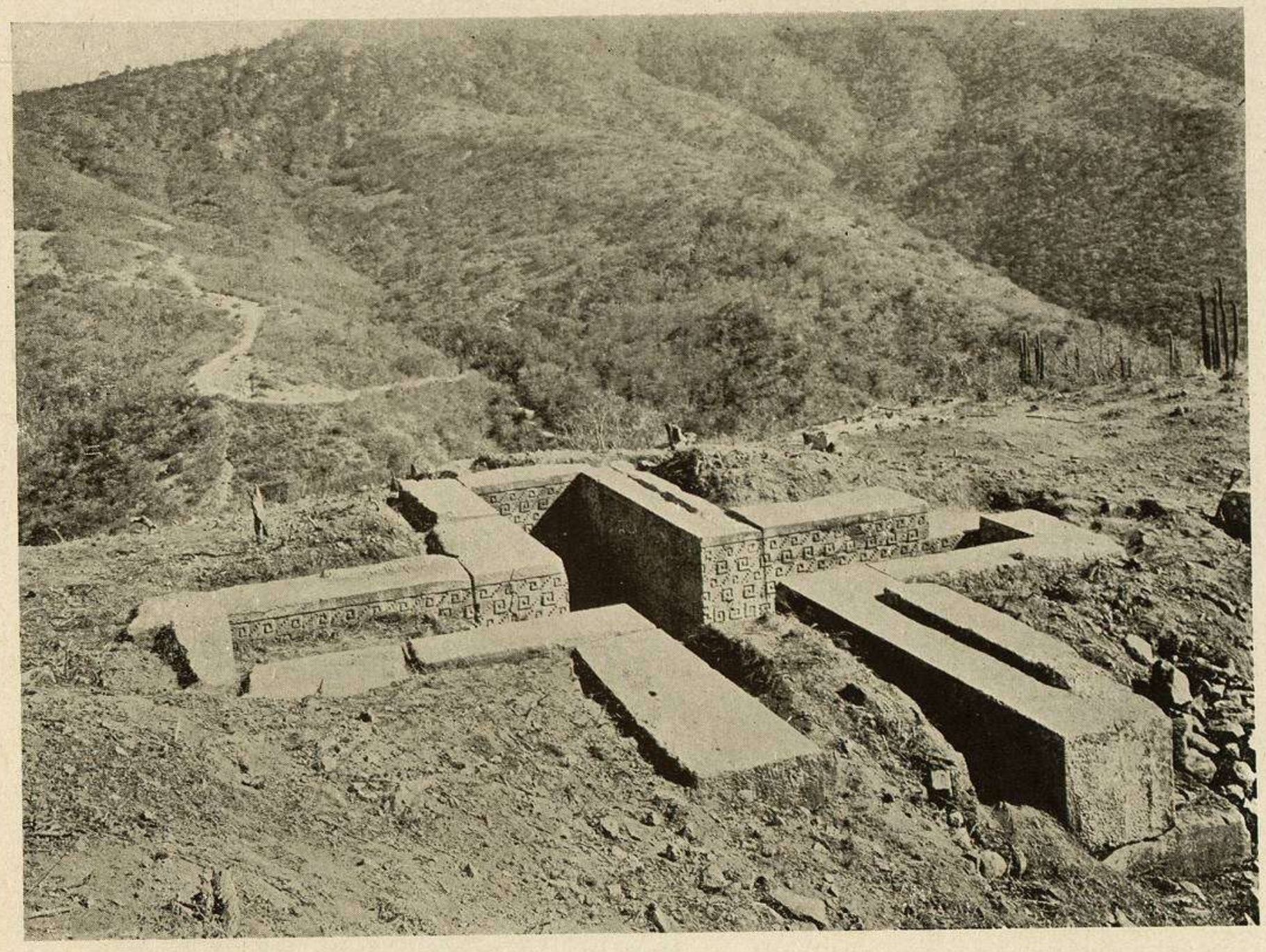
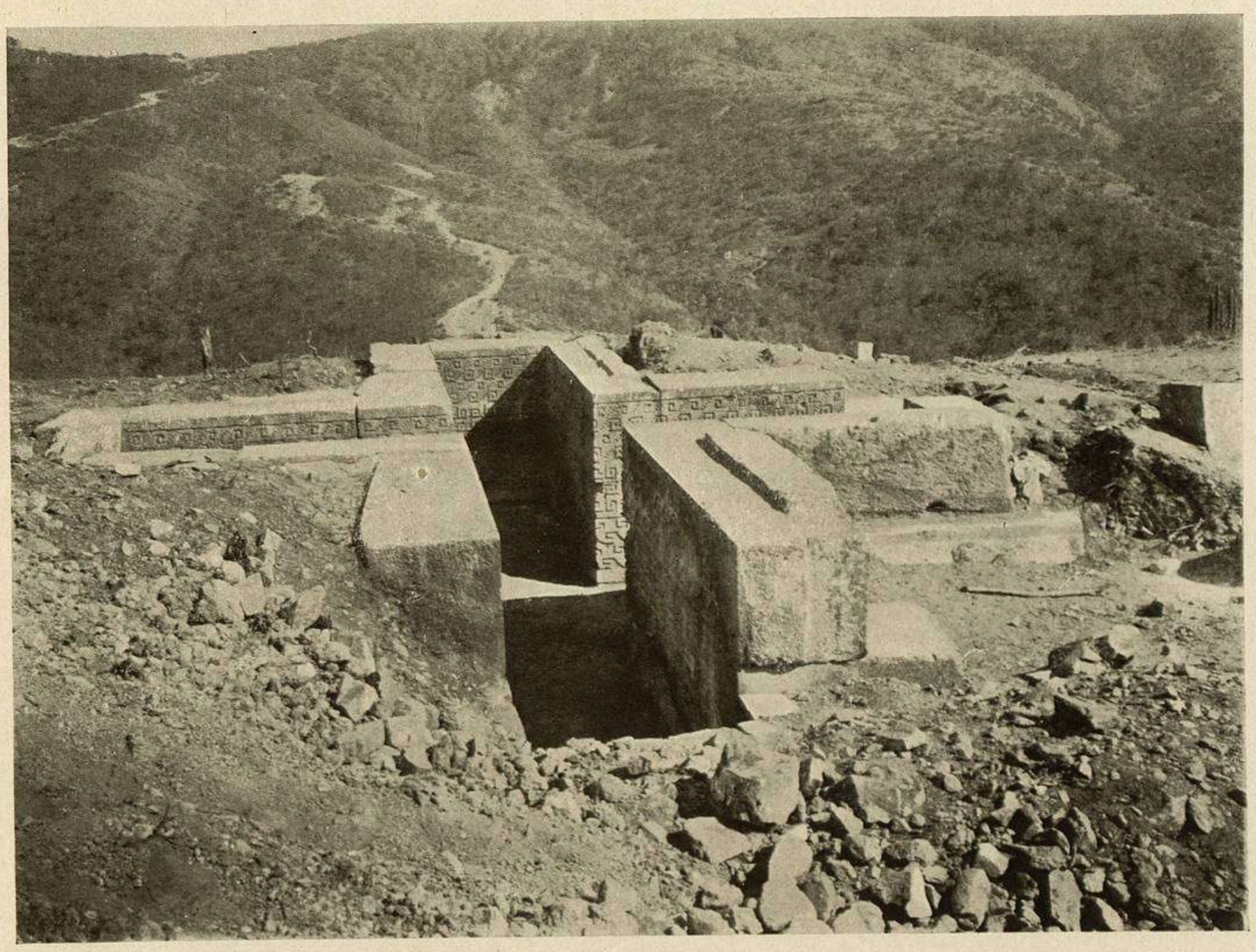


1. Looking southeast, before excavation



2. Looking east, after excavation

CRUCIFORM CHAMBER OF UPPER GUIAROO

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background, to the left, the zigzig bridle-path is seen, which leads into the region occupied by the Mixe Indians, and is also a highway, but not the main one to Tehuantepec.

Figure 10 is the ground-plan, and shows that the angles formed by the junction of the side and end walls of the arms of the cross are not perfect right angles.

Apparently this structure was never completed. The débris with which it was partially filled did not contain the slightest trace of remains of human workmanship, and had probably fallen down and washed in from a ruined structure occupying a pyramidal-shaped mound about twenty feet in height; the base of this mound adjoined the northwest corner of the structure, indications of which are seen in plate XI, 2, near the upper left-hand corner. The large stones were pinched into place by means of the holes in the back of them (plate XII, 1), and the perfect joining of these immense blocks reveals the absolute mastery of the stoneworker's art. The carving was done after the walls of the chamber were completed, and the designs must have been traced out on the wall surface be-

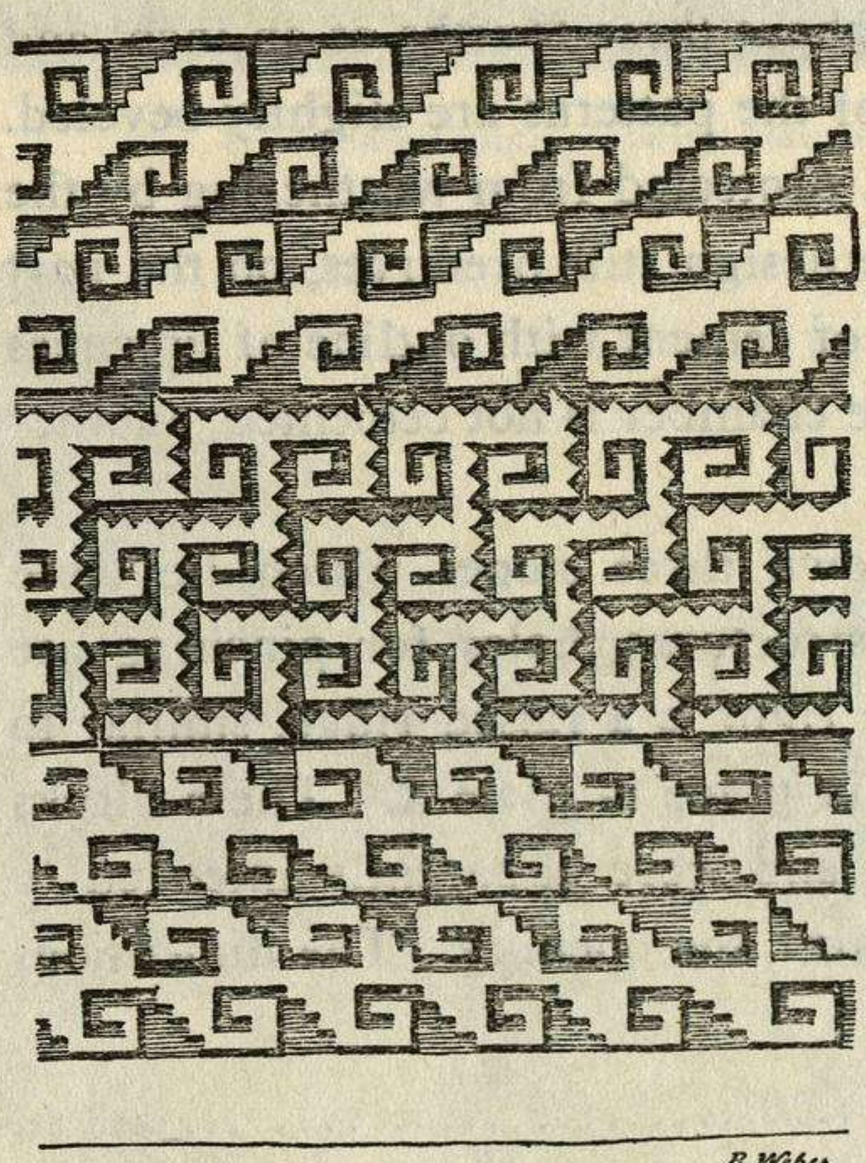

Fig. 11—"Mosaic" patterns, wall of Cruciform Chamber, Guiaroo, Upper Group

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fore the cutting of the mosaic patterns. Stone chisels have been used, and probably this tool was the one employed by the ancient workmen.

There are three different designs in the decoration. A drawing of the end of the northern arm is shown in figure 11. Whether the grecques are purely decorative or are conventional symbols is difficult to say. By a stretch of the imagination the upper and lower patterns might be resolved into a series of swastikas. These three designs form continuous bands of decoration around the chamber; a single break in the carving is found in the plain end-wall of the southern arm, a curious feature of which is the hole for pinching (see plate XI, 1). The depth of the carving is about three-fourths of an inch, and as a rule the serrated edges of the patterns are slightly beveled. In one place which was well protected from weathering by the débris, a small section of the design still preserves, on the part in relief, a very thin coating of cement with outline of grecques painted red. The floor of the chamber is not cemented, another proof of its unfinishd state.

In plate XII, 2, are shown three stones which lie close to the southern end of the structure; holes for pinching are seen, and on the stone at the right is a raised ridge, similar to the one shown on the stones in place in plate X. These blocks do not bear mosaic carving, and were apparently intended to form the end of the western arm, the opening. The dimensions of the chamber are as follows:

Extreme length from east to west.....32.8 ft.
Extreme length from north to south.....28.6 "
Length of northern, eastern, and southern arms.....11.7 "

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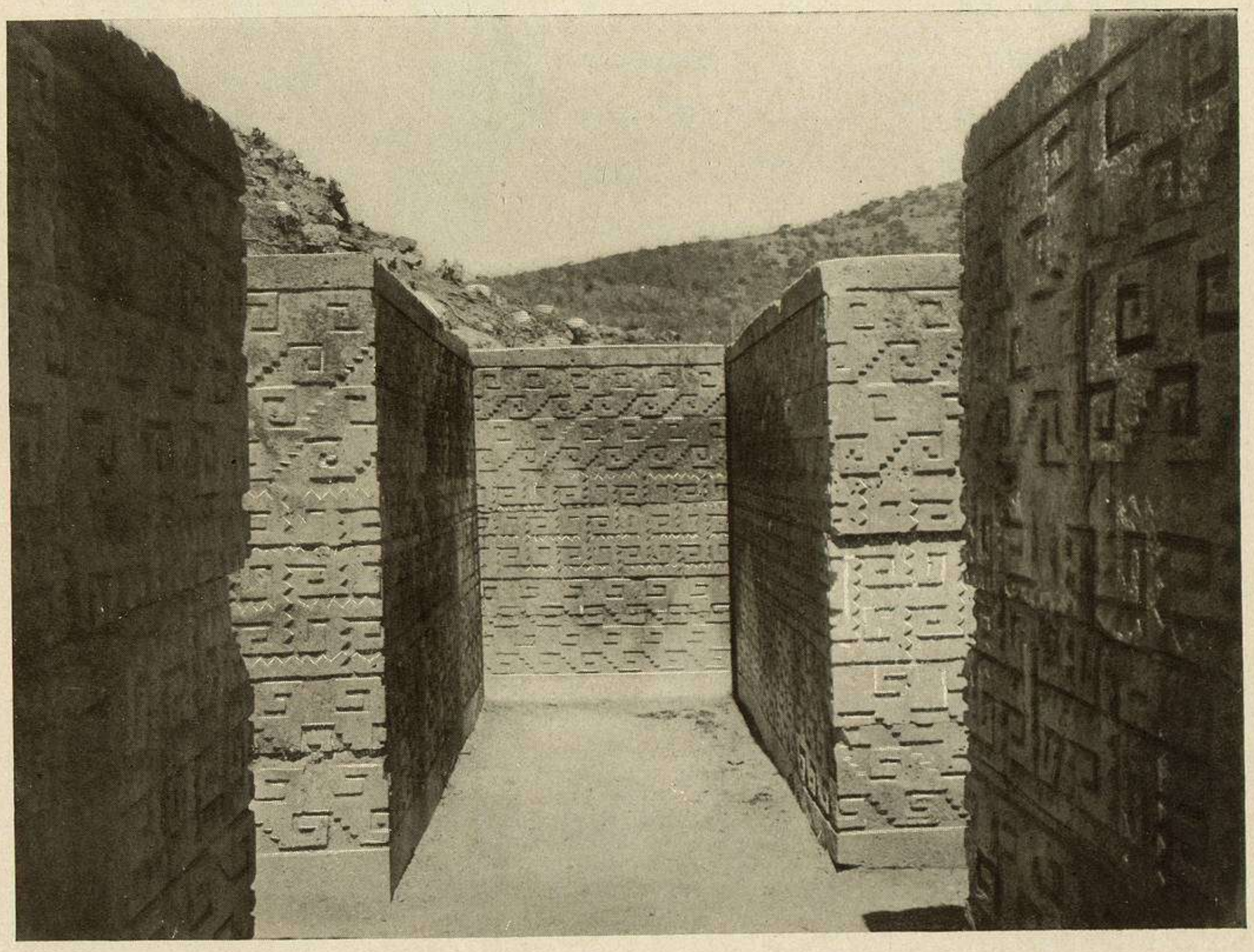
1. Looking south, showing plain wall at end of Southern Arm



2. Looking north, inside of structure

CRUCIFORM CHAMBER OF UPPER GUIAROO

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Width of northern, eastern, and southern arms	5.2 ft.
Length of western arm to end of sculpture	11. "
Width of western arm	5.2 "
Height of chamber	7.5 "
Size of largest block, southern wall of western arm	12.5 by 3.3 by 3 "
Total number of stones employed	52

Above and below the three mosaic bands are plain surfaces, the upper one .4 high, the lower one .7. The heights of the various mosaic designs are, respectively, upper, 2.1 ft., center, 2.15 ft., and lower, 1.9 ft.

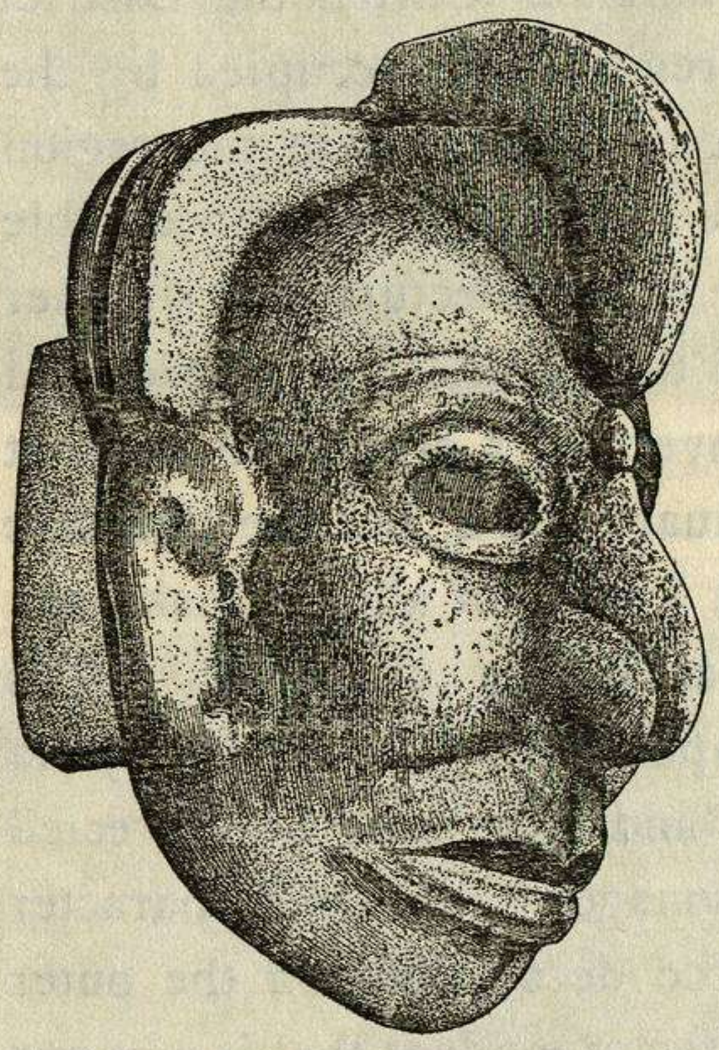

Fig. 12—Stone head, found near Cruciform Chamber, Guiaroo, Upper Group

Rising from the northwest corner of this subterranean chamber is a pyramidal mound, the foundation of a building now entirely destroyed. On the top we found the remains of a much decayed skeleton, buried about two feet from the surface; two stone heads were excavated near by, one of which is shown in figure 12; it is well carved and is one of the finest pieces of stonework from Oaxaca. It is perhaps a portrait of one of the former occupants of this locality; the aquiline nose is one of the characteristic features of the modern Zapotecan Indian. The head is cut from a piece of volcanic tuff, and is about 5⅝ inches high and 4 inches wide. The projection at the back shown in the drawing has served to fasten the head in a stone wall, either

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in the outer or inner wall of a tomb. This point I have already noted in the description of the chamber at Xaaga.

This concludes the description of the cruciform structures at Mitla. There are other covered or subterranean chambers in the form of a cross in Oaxaca and Puebla, which I shall briefly notice. I have been informed by Sr Manuel Martinez Gracida, who is perhaps the best authority on the archæology of Oaxaca, that there are cruciform tombs at Chilchotla, District of Teotitlan del Camino, in the region now occupied by the Mazatecs, and at Otitlan, District of Tuxtepec, in the region occupied by the Chinantecs. These places I have not been able to visit, and I do not know the style of architecture, nor whether they have the mosaic treatment of the walls. I was informed by Dr N. H. Wheeler of the discovery of a cruciform tomb at Ejutla. I visited this place in January, 1902, but the structure had been so covered by débris that I was not able to make any careful survey or observations as to its character. It is situated in the largest and most imposing mogote in the Ejutla group in the center of the village, and must have been erected as a tomb of some important personage. From the character of the stones, the presence of stucco decorations on the outer wall, and the size of the mogote, it seems evident that it was one of the largest burial structures in this part of Oaxaca. A slab found near the front of the tomb, which faces south, which probably served to seal the entrance, bears carving of the Zapotecan type. I secured several small objects of clay and a string of shell and amazonstone beads, said to have been found with a skeleton in one of the arms of the structure. M. Leon Diguet in "Notes d'Archéologie Mixteco-Zapotèque," read before the

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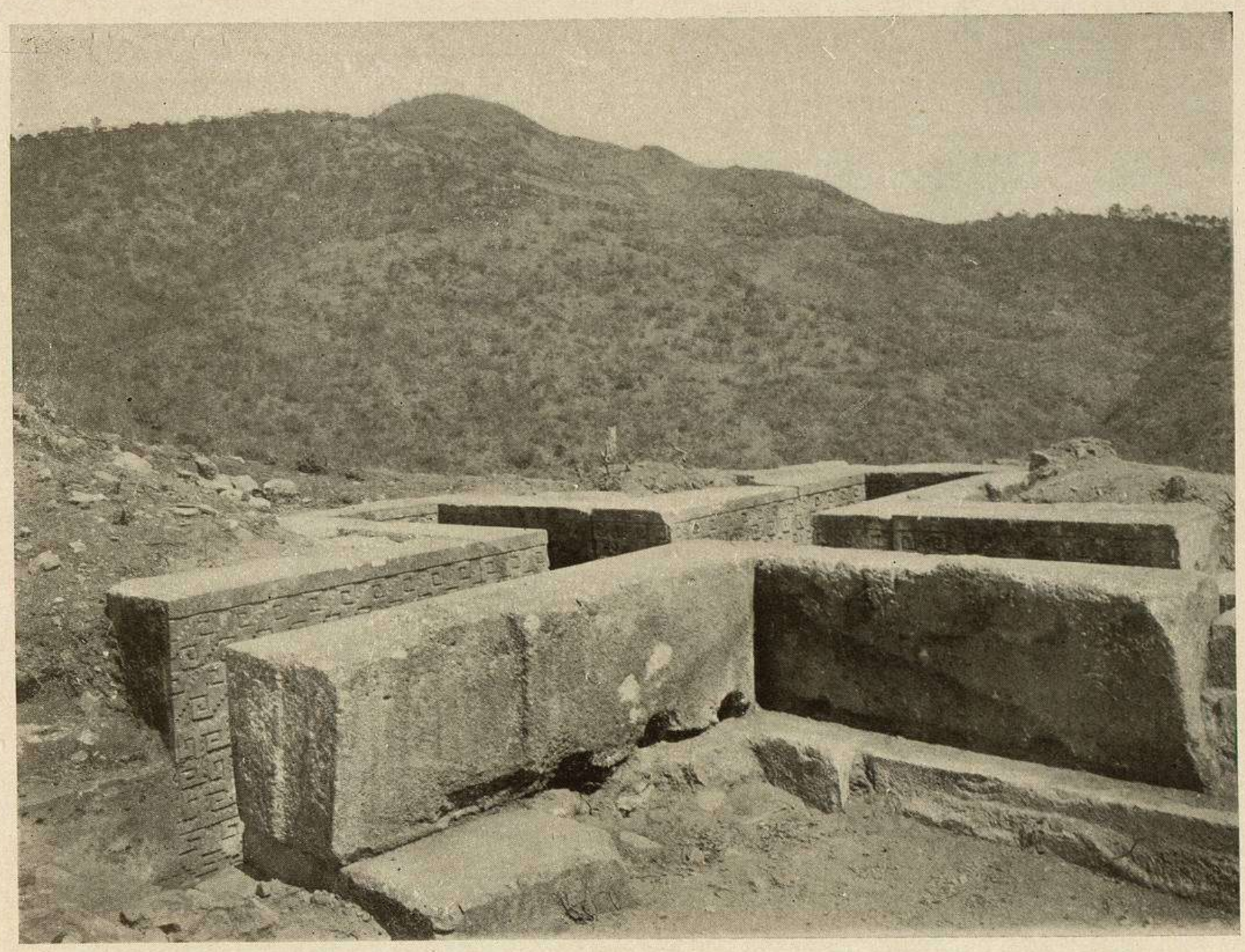

1. Excavation made outside of the chamber, looking northeast



2. Large blocks of stone lying south of the chamber

CRUCIFORM CHAMBER OF UPPER GUIAROO

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Société des Américanistes of Paris, November 8, 1904, calls attention to the Ejutla cruciform structure. He states that "the mogote of Ejutla is of hemispherical form, six meters in height, with a diameter at the base of forty meters, covering in its center a cruciform crypt." In his description of the interior he gives no measurements.[1] I do not know when Diguet made his observations. If later than my visit, the débris must have been removed from the place; this is very probable, as the mound is in the backyard of one of the houses in the town, and the tomb would make an excellent storehouse for the owner of the property.

Another cruciform chamber was discovered many years ago and was described by Dupaix. I quote here from the translation of Dupaix's account as published by Bancroft. "At Chila, in the extreme southern part of Puebla, is a hill known as La Tortuga, on which is built an unterraced pyramid, eighty-eight feet square at the base, fifty-five feet high, with a summit platform fifty feet square. It is built of hewn stone and covered, as it appeared from Castañeda's drawing, with cement. The exterior surface is much broken up by the trees that have taken root there. A stairway leads up the western front. Near the northeastern corner of the mound is an entrance leading down

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[1] I give here what Diguet writes concerning the Ejutla tomb: "Sur la section ainsi mise à jour, on voit clairement que l'édifice fut agrandi à trois reprises différentes. Cet accroissement successif est constaté par des couches de stucage disposées parallèlement dans la construction. Le mogote d'Ejutla, de forme hémisphérique, d'une hauteur de six mètres, d'un diamètre de base de quarante mètres, recouvre en son centre une crypte cruciforme d'assez vaste dimension, mais qui selon toutes probabilités été retouchée, elle aussi, après coup, quand on a augmenté les proportions de l'édifice.

"Elle offre cette particlrarité que la partie centrale, orientée de l'E. à l'O. (et dont la moitié seule existe aujourd'hui), est en forme de nef avec une voûte ogivale, les deux autres chambres formant transept paraissent seulement avoir en une voûte à peine cintrée, presque moitié plus basse que le reste. Le fond de la nef, c'est-à-dire la partie qui

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by seven stone steps to a small tomb about eleven feet below the surface of the ground, and not under the mound. At the foot of the steps is an apartment measuring five and a half feet long and four feet wide, with a branch or gallery four feet long and a little less than three feet wide and high, in the center of each of the three sides, thus giving the whole tomb in ground-plan the form of a cross. . . . . There is certainly a general resemblance to be noted in this tomb structure to those at Mitla; the interior is lined with hewn blocks laid in lime mortar and covered with a fine white plaster, the plaster on the ceiling being eight or nine inches thick. The discovery of human bones in the lateral galleries leaves no doubt respecting the use to which the subterranean structure was devoted."[1] (See ground-plan, figure 13.)

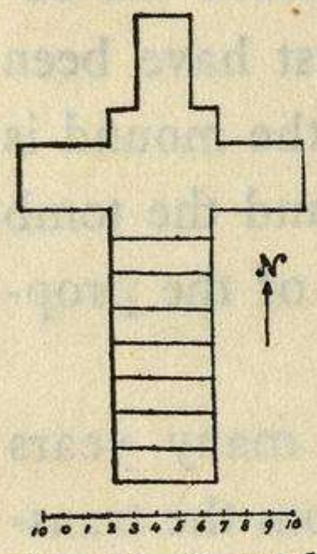

Fig. 13—Ground-plan, Cruciform Chamber, Chila.

I was at first inclined to place some importance to the fact that this structure faced the south as does one of the cruciform chambers at Mitla. The explorations made at both the Mitla

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regarde l'Orient, présente sur sa paroi, à mi-hauteur, une série de petites niches de différentes grandeurs et de formes variées. A proximité de ce fond et sur les côtés, se trouvent deux grandes niches creusées dans la paroi latérale. Les parois de la crypte laissent voir distinctement la brique crue de la construction, sans trace d'un revêtement. L'ogive du haut ne paraît pas avoir été construite, mais taillée, du moins en partie, dans les assises de briques crues que l'on avait ajoutées lors d'une seconde augmentation de l'édifice. C'est du moins ce que prouverait, à mon sens, une trace de stucage, visible encore à une certaine hauteur dans le mur. . . .

"Toute la partie extérieure mise à jour a montré la décoration dont était ornée la base de l'édifice. Sur une hauteur de quatre-vingts centimètres, des pierres calcaires taillées formaient le soubassement se ce socle. Il se continuait en hauteur par une série de frises en stuc épais, parfaitement travaillé. Une seule de ces frises présentait un motif d'ornementation." — *Journal de la Société des Américanistes de Paris*, Nouvelle Série, tome II, 1905, pp. 114, 115.

1 Bancroft, *Native Races of the Pacific States*, IV, Antiquities, chap. IX, pp. 465, 466.

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ruins and in the Valley of Oaxaca, show that there was, with one possible exception, no fixed direction in which the entrances of the tombs must face. The Zapotecan tombs discovered in Xoxo by the Loubat Expedition all faced the west, but there may be tombs there which we did not discover facing in other directions. In Cuilapa, for example, we found under one cement covered platform, slightly raised above the ground, three tombs, facing respectively, south, west, and north, while in some of the other mogotes tombs were found facing west. Thus the point which I raised in my first publications on this subject does not, in the light of later explorations, obtain.

The massiveness of the construction, and simple and chaste ornamentation, place the Mitla cruciform structures in a class unapproached by any other known burial chambers in ancient America. The workmanship revealed in the stonework, the elegant precision with which the stones are laid and carved, is not equaled in any of the Mayan ruins. However, as noted by Holmes,[1] the geometric fretwork mosaics differ from the great façades of the Mayan buildings "in subject matter rather than in kind, for the decorated surfaces there, though depicting animal forms, are mosaics in the sense that they are made up of separate hewn or carved stones set in mortar to form ornamental designs." This method of construction brings the Mitla temples, cruciform chambers, and smaller tombs into relationship with the Mayan ruins. So far as I am aware, outside of the Mayan territory no other group of buildings with the exception of Mitla has this mosaic style of stonework. In plate XIII I have brought together side by side a view of a section of the so-called

[1] Holmes, op. cit., pp. 247, 248.

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"House of the Governor" in Uxmal, Yucatan, and a picture of the northern end of the "Hall of the Mosaics" in the Temple of the Columns at Mitla, which will illustrate the close resemblance in the construction. There is one point of variance, however, which is quite noteworthy, namely, in the roof. In the whole Mayan area the style of roof is what has been called the Mayan or triangular arch, whereas in the Mitla buildings and tombs a flat roof was used. In Yucatan flat roofs are reported from but one ruin — Tuloom, on the eastern coast of the peninsula. Stephens describes a small building visited by him in 1841 in which the ceiling is flat, and several others with fallen roofs, but with indications of the same method of roof construction.[1] On the tops of some of the walls in the Mitla edifices we have seen the mortar sockets in which formerly rested the ends of wooden ceiling beams. Unfortunately these sockets have been filled in by the Inspector of Ancient Monuments in his repairs and restorations at the ruins.

In the Mayan remains outside of Yucatan, for example in Palenque, where much stucco was employed in embellishing the rough stone walls of the buildings, and at Copan, Honduras, where sculptured monoliths are the chief feature, this mosaic work is not found. Stucco was sparingly used in Yucatan, and

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1 Stephens, *Incidents of Travel in Yucatan*, II, p. 398, 299. His description is interesting, and as the ruins of Tuloom have not been visited by archæologists since that time, I quote what he writes concerning this roof: "The interior [of the chamber] is about seven feet high, and discloses an entirely new principle of construction. It has four principal beams of wood, about six inches in diameter, laid on the top of the wall from end to end of the chamber, with smaller beams, about three inches in diameter, laid across the larger so closely as to touch, and on these cross-beams is a thick mass of mortar and large pebbles, which was laid on moist, and now form a solid crust, being the same materials which we had seen in ruins on the floors of other rooms." This describes what was also the probable construction of the roofs of the Mitla temples.

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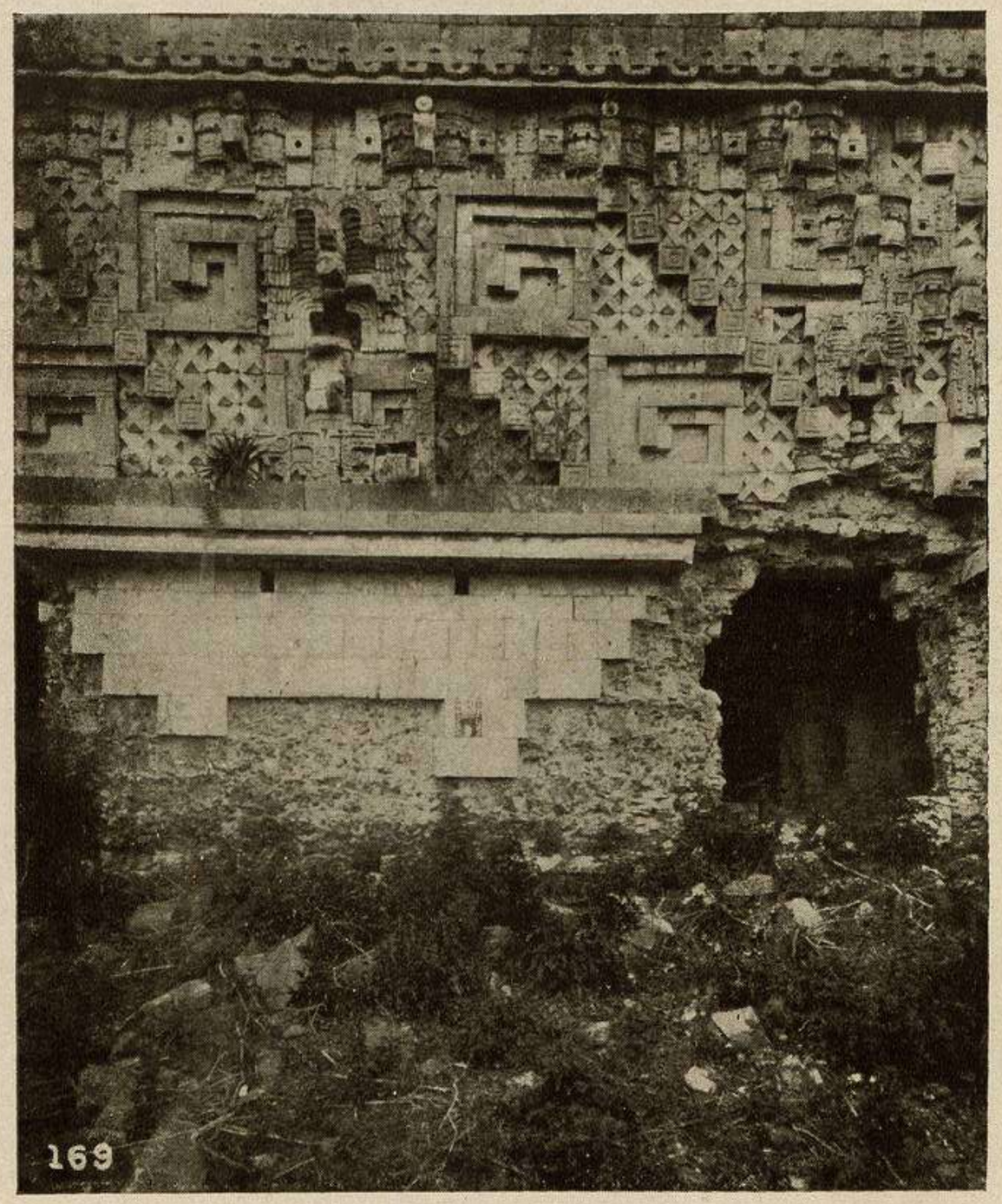
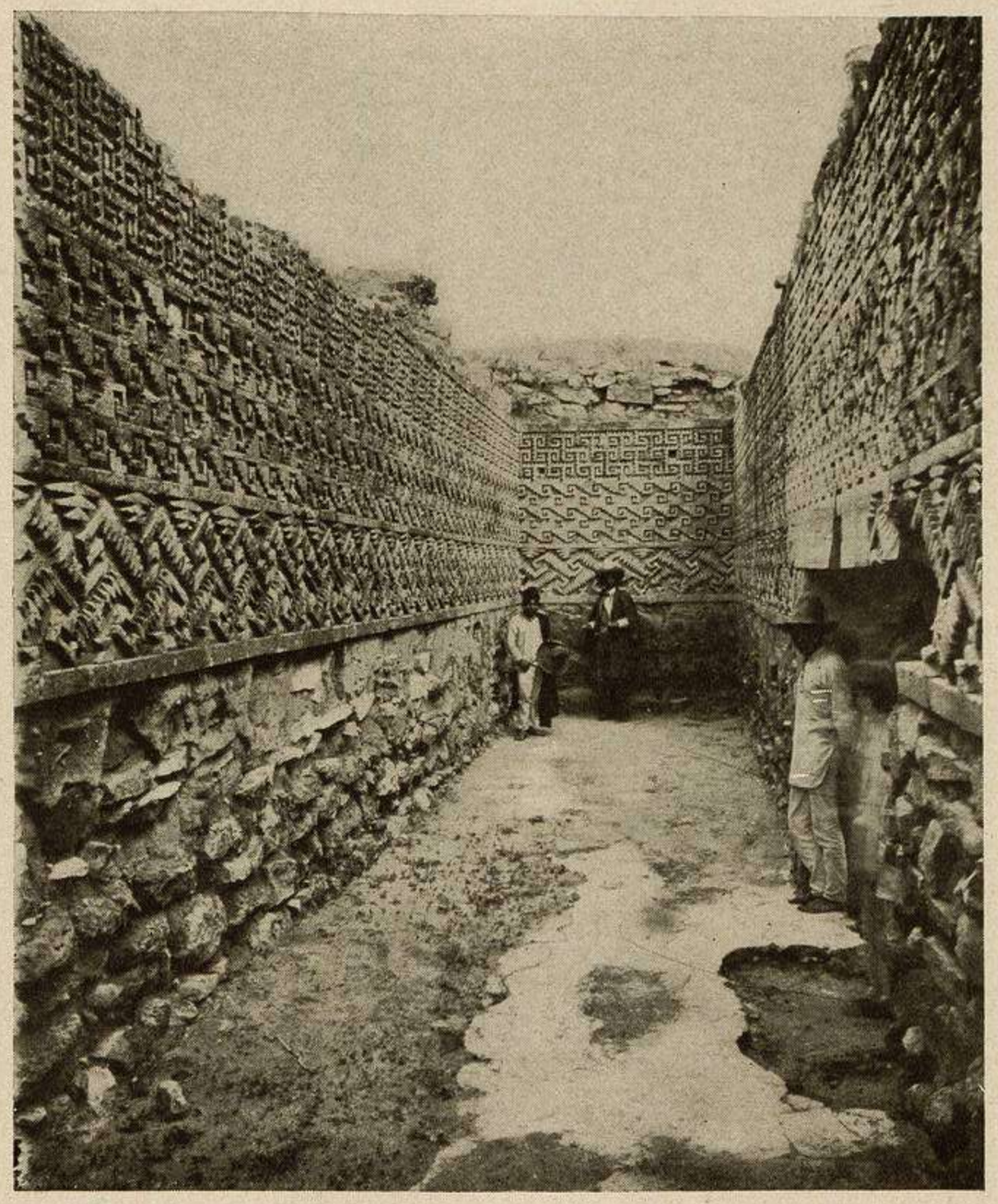


Section of façade of "House of the Governor," Uxmal



"Hall of the Mosaics," Temple of the Columns, Mitla

WALLS AT UXMAL AND MITLA

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there are but slight traces of it in Mitla. Moreover, there is but little separate stone sculpture in Yucatan, and, with the exception of small stone idols and amulets, none is found at Mitla. The absence of carved stone monoliths and stelæ at Mitla is striking, when we consider the great monolithic lintels of one of the temples (where there are single stones nearly twenty feet in length), and the great size of the separate stones used in the construction of the upper Guiaroo structure.

In conclusion, it may be said to be highly probable that the Mitla and Yucatan ruins belong to the same epoch and are the remains of a people having kindred ancestors. I have elsewhere offered the suggestion that the building of Mitla was done by the Nahuas, and that the Zapotecan occupancy was the result of conquest. This is borne out by the character of the mural paintings at Mitla, which are Nahuan in character. Furthermore, our extensive excavations carried on around the principal buildings and in different parts of the Mitla valley, failed to bring to light any traces of Zapotecan pottery or the characteristic features of the tombs discovered in the Oaxaca valley. The material from the vicinity of Mitla resembling Zapotecan workmanship has all been found on or near the surface of the ground.

Regarding the significance of the cruciform shape of the Mitla tombs, which are by far the most elaborate and important burial chambers in the New World, both in size and beauty of stonework, we may state that the cross is not uncommon in ancient Mexican remains, and had a deep significance with the ancient peoples of this portion of our continent. Brinton writes concerning the cross in ancient America as follows: "As the

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emblem of the winds who dispense the fertilizing showers it is emphatically the tree of our life, our subsistence and our health. It never had any other meaning in America, and if, as has been said, the tombs of Mexicans were cruciform, it was perhaps with reference to a resurrection and a future life as portrayed under this symbol, indicating that the buried body would rise by the action of the four spirits of the world as the buried seed takes on a new existence when watered by the vernal showers." [1] Diguet attributes the cruciform plan to the cult of the Nahuan deity Tlaloc, the God of Rain. Undoubtedly the form of a cross in these structures was connected with the cult of Quetzalcoatl, and is proof of the widespread range of the Nahuan pantheon, for we find his worship throughout the area of Mayan culture, as well as in different parts of Mexico.

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[1] Brinton, *Myths of the New World*, p. 116.

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CONVENTIONALISM AND REALISM IN MAYA ART AT COPAN, WITH SPECIAL REFERENCE TO THE TREATMENT OF THE MACAW

BY

GEORGE BYRON GORDON

SOME years ago I undertook a study of Maya decorative art, and was for a time engaged upon an analysis of the various motives that make up this decoration. The subject expanded so much under investigation, the bulk of material became so large and my notes so voluminous, that I was obliged for lack of time to restrict my subject more and more, and at last to confine myself to the Serpent Motive. The result appeared in the *Transactions* of the University of Pennsylvania Museum for 1905. So far as my investigations at that time applied to the general field of Maya art, they have remained unfinished, with little prospect of being resumed by me. On going over some of my notes however, several topics relating to Maya decorative art offer themselves as subjects for special treatment, but most of these would require to be treated at too great length to suit my present purpose. One, however, satisfies the conditions very well and meets my requirements, since it can be treated very briefly and at the same time affords such a good example of certain qualities exhibited by Maya art and illustrates certain of its striking tendencies.

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The tendencies to which I refer are most clearly marked at Copan and may be said to be characteristic of the decorative art of that city in particular. The first of these is a tendency toward exaggeration which marks the representation of animals. This phase corresponds to a certain freedom on the part of the artist, who in his interpretation of nature was bound neither by a desire for realism nor by the conditions of his art. He was guided in a general way by a tradition that stimulated his imagination and betrayed itself in fanciful pictures. At the same time, the Maya artists never produced a wholly imaginary animal or invented one outright. All of their animal pictures are derived from nature, and pretend, throughout many wayward developments, to stand for a true interpretation of natural phenomena. The influence of tradition was so powerful however, that at no point did this interpretation become realism. The general tendency indeed was away from realism, and at many points this tendency carried so far that artistic products abandoned the character of representation entirely, and, losing all trace of natural conditions, became pure conventionalism. At Copan, however, during the later period of its existence, there was a movement in the opposite direction, when sculpture at all events exhibited a much greater degree of realism than before. The monument that marks this development best is the hieroglyphic stairway, which I have shown elsewhere to have a late date. A comparison of the seated figures on this structure with the older statues will serve to show to what extent the traditional methods had been overcome. The greater freedom and naturalness of these figures, the pose of the body, the position of the limbs, and the carving of certain portions in

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the round would seem to mark a new era in sculpture. The rattlesnakes surmounting the headdress of one of these statues and the crouching figure in one of the fallen steps show in a marked degree the same successful effort to break away from the traditional methods. It would be a mistake to suppose that the hieroglyphic stairway is the only monument corresponding to this period of improved conditions, because, although no dates

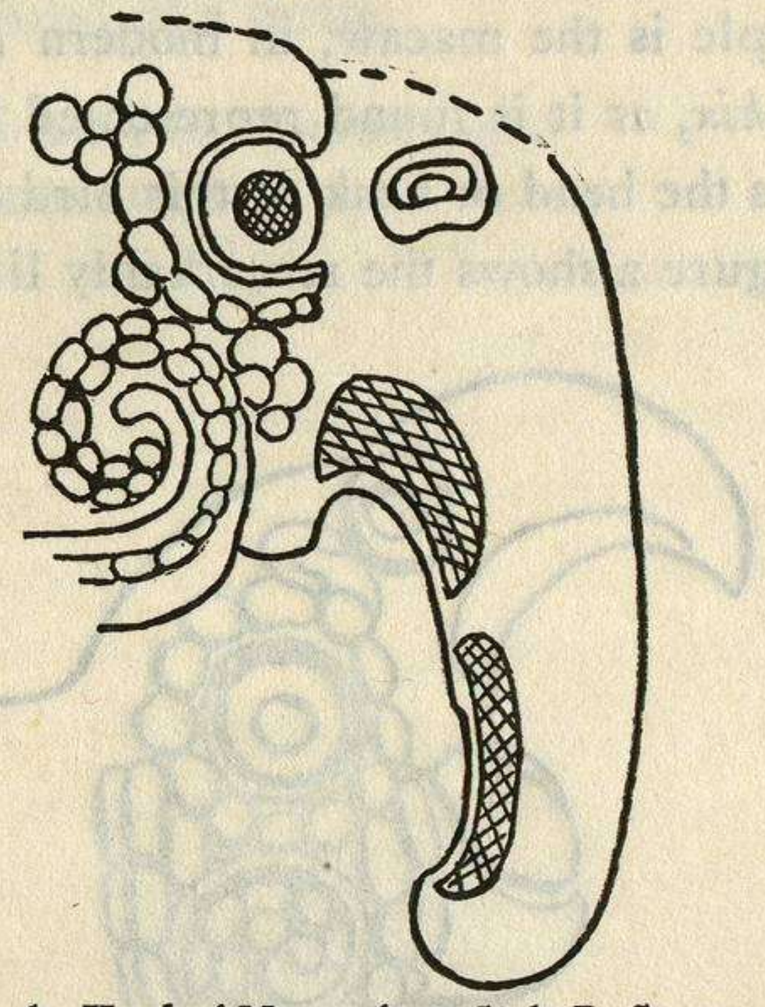

FIG. 1—Head of Macaw from Stela B, Copan.

have been found upon them to determine with accuracy their relative age, the great temples crowning the northern part of the main structure present characteristics which would seem to link them in point of time with the hieroglyphic stairway. It was a period during which new ideas struggled with the old, for it is evident that ancient usage and conventional methods still exerted a very powerful influence, not only affecting the whole body of contemporary art, but even evading, sometimes

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quite successfully, the tendency of the time and perpetuating themselves in works that copied as nearly as possible the ancient monuments. I can not undertake to discuss these various conditions, and my purpose is simply to illustrate by a single example the two historic phases which I have distinguished in the art of Copan, the tendency to exaggeration that marks representation at an earlier stage and a return to realism at a later stage.

My example is the macaw, in modern Maya *moo* and in Cakchiquel *kakix*, as it is found represented in stone at Copan. Figure 1 shows the head or beak of this bird as it appears upon Stela B, and figure 2 shows the remarkably life-like head of the

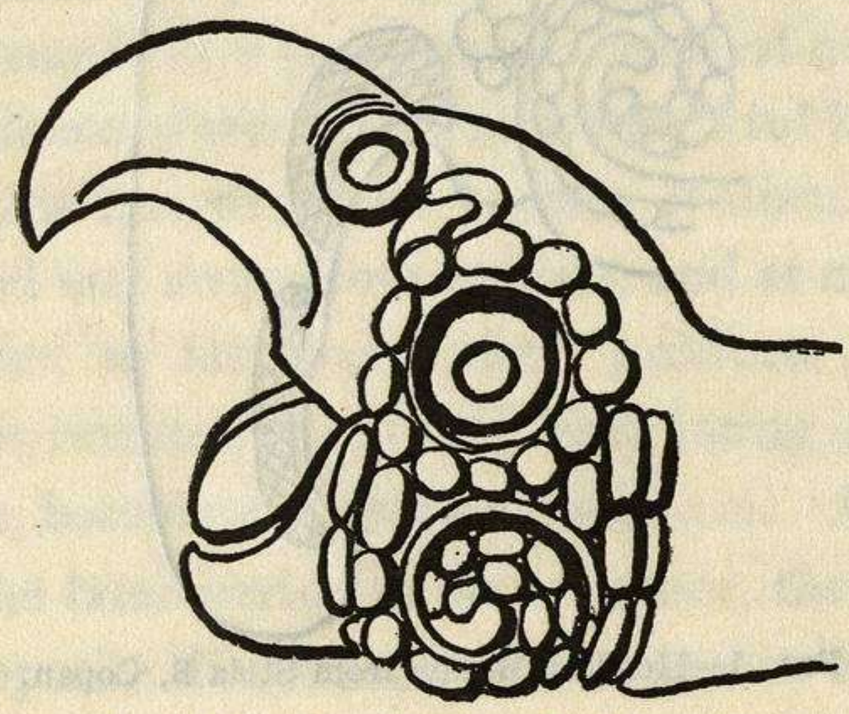

FIG. 2—Head of Macaw from Hieroglyphic Stairway, Copan.

same bird from the hieroglyphic stairway, or from the temple to which it led. The tendency to exaggeration is well illustrated by the enormous extension of the beak in the first example, an extension that has suggested to some travelers an elephant's trunk. The other head is of gigantic size, and fragments of claws and wings of corresponding dimensions, carved with equal spirit, found among the débris of the stairway, indicate a lively

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and very successful ambition to carve a life-like image of the bird that must have dominated in a very effective way that part of the great structure to which it was assigned. The macaw does not appear to figure in Maya art outside of Copan, except in the inscriptions, where the head does duty as the symbol of the month Kayab, in which capacity it becomes everywhere conventionalized, undergoing various modifications until it has been mistaken for the head of a turtle.

THE MUSEUM, UNIVERSITY OF PENNSYLVANIA
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THE EXPLORATION OF A BURIAL-ROOM IN PUEBLO BONITO, NEW MEXICO

BY

GEORGE H. PEPPER

THE great series of ruins in northwestern New Mexico known as the Chaco Canyon group was first brought to public notice in 1776, when Don Bernardo de Mier y Pacheco visited and mapped the region; but it was not until 1844 that these ruins were mentioned in print.[1] Several descriptions of the ruins were published during the late forties and early fifties, notably those of Lieut. J. H. Simpson and William H. Jackson; but it remained for Professor F. W. Putnam to plan the first expedition for the exploration of one of these walled-in towns. He had been interested in this group of pueblos from the time the first Government reports concerning them appeared, and had looked forward to the day when he could investigate one of them.

In 1895 he received promise of coöperation and pecuniary aid from Messrs B. Talbot B. Hyde and F. E. Hyde, Jr., of New York City; and in the spring of 1896 an expedition was sent to the Chaco canyon with instructions to confine the work of that year to the ruined Pueblo Bonito. Owing to other duties that claimed his time, Professor Putnam could not assume active charge of the field operations, and it was the good fortune

[1] Josiah Gregg, *Commerce of the Prairies*, 1844.

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of the writer to be appointed to that position. The scientific work was planned by, and the investigations were conducted under, the direction of Professor Putnam, and whatever results were obtained may be ascribed to his untiring interest and efforts.

The following description concerns one of the most interesting rooms explored, and the object of the paper is to record the remarkable ceremonial objects and other material found therein. This room is situated in the northwestern part of Pueblo Bonito, and near it are several other rooms in which bodies had been buried and ceremonial objects stored. It is 33 of the author's notes, and will be so designated when reference thereto is made.

Room 33 is directly west of and connected with room 32. When the latter was first entered, it was found that the sand had almost filled the western doorway, but there was enough space remaining to allow passage through it, and into room 33. Entrance was gained by the writer, and, with the aid of a candle, certain objects were seen which were in keeping with the ceremonial sticks that protruded from the sand in the room already examined. The room proved to be somewhat smaller than room 32; but the sand had not filled it so deeply as the other room. The first object to claim attention in room 33 was a bunch of five ceremonial sticks that had been thrust between the ceiling beams in the southwestern corner of the room. Directly under them, and protruding from the sand, was a burial-mat made of osiers sewed together side by side. In the southeastern corner the tops of two ceremonial sticks projected above the sand; in the northwestern corner was another ceremonial stick; and in

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the northeastern corner of the room were what afterward proved to be two wooden flageolets.

The ceremonial sticks in the southwestern corner of the room were the first objects to be removed. The beams extended east and west. The points of the sticks had been thrust into the spaces between the beams, the carved ends projecting at least a foot below the ceiling. Not having been exposed to dampness, all the sticks are in a state of perfect preservation (see pl. VII, 2). Three of them are of the subdivision of type 1 shown in plate V; that is, of the type having a carved knob on the end, drilled and having a groove on the raised band at the opposite end of the handle. These sticks measure in length 1 m. 8.5 cm., 1 m. 3.5 cm., and 1 m. 7 cm. respectively, the average diameter being 1.3 cm. A deposit of nearly three hundred sticks was found in room 32: the five show clearly one feature that could not be studied to advantage in the specimens from this room, owing to the fact that the tapering ends of most of them had been destroyed; namely, the gradual and symmetrical tapering of the ends opposite the carved handles. Great care was evidently employed in making this end of the stick cylindrical. On certain parts of the sticks the marks of the grinding implement may be seen, but it is evident that the surfaces have been polished, probably by means of a finely powdered substance and deerskin. The drilled ends of these sticks have practically the same diameter. On one specimen, directly below the drilled portion, is a two-strand yucca cord, a knot at one end marking the point of attachment of a feather.

The fourth specimen is of the third type (pl. V, 3); that is, the one having the flattened end. Instead of uniformly plane,

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this stick is elliptical in parts; the one surface, however, always preserving the full rounded form. The specimen is absolutely perfect, and measures 1 m. 28.2 cm. in length, having a width of 2.9 cm. at the blade-end and 2 cm. at the opposite end, and an average thickness of 1.3 cm.

The fifth specimen is of the fourth type (pl. V, 4), and is somewhat irregular in shape. It is 2 cm. in diameter at the end opposite the blade, and tapers gradually toward the opposite or blade-end. The blade itself is 1.6 cm. in width, and the stick is 1 m. 6 cm. in length.

After these sticks were removed, the flageolets in the northeastern corner of the room were uncovered. As already stated, there were two of these; one (H-4563) protruding 11 cm. above the surface, the other (H-4560) 8 cm.: they were standing in an upright position between two posts and the northern wall. It was deemed advisable to remove the flageolets before the general work of excavation was begun, in order that there might be no danger of anything falling upon them.

Specimen H-4563 (pl. I, 3) was the first to be removed. This was covered with a deposit of earth and vegetable mold; but on parts of the surface of the portion protruding from the sand could be detected decorative designs in black and in colors, over which was a coating of gum having the appearance of shellac or varnish. When the specimen was cleaned in the Museum, it was found that the entire surface was covered with an elaborate decoration in black, orange, and green. The note-holes proved to be four in number, with intervals, on the average, of 6.1 cm. between them, each 6 mm. in diameter.

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This flageolet is of the "self" type; that is, the kind that was played without a mouthpiece. It is 69 cm. in length, 2.3 by 2.1 cm. in diameter at the bell-end, and 1.5 cm. in diameter at the mouth-end, and tapers from the former to the latter.

In plate I, 2, the design is shown as it would appear if on a plane surface — a combination of cloud-terraces and circles separated by encircling bands.

This flageolet is extraordinary on account of the elaborate decoration. Another interesting feature is the coating of gum which covers the entire surface. This use of such material by the ancient Pueblo Indians was suggested by the late Frank H. Cushing; but some students doubted whether any process of this kind was ever employed. The finding of this flageolet having the part that was above the surface in perfect condition, sets at rest all doubts on this point. The exact nature of the material used, however, has not been ascertained. When applied, the coating was no doubt transparent, but at the present time the surface is semi-opaque and cracked.

The drilling of this specimen is also an interesting feature. At the bell-end the sides are only 2 mm. thick; from this point they gradually increase in thickness to 6 mm. for one side and 3 mm. for the opposite side, at the center. Thus it is evident, that, in making the flageolet, the hole was not drilled uniformly in the center. The periphery of the aperture in the mouthpiece is beveled so that it is reduced to an average thickness of 1 mm.

When discovered, the second flageolet (H-4560) was lying but a few inches from the one just described. It is absolutely plain, there being no decoration on the surface. This flageolet, as shown in plate II, 1, is 69.5 cm. long. The bell-end averages

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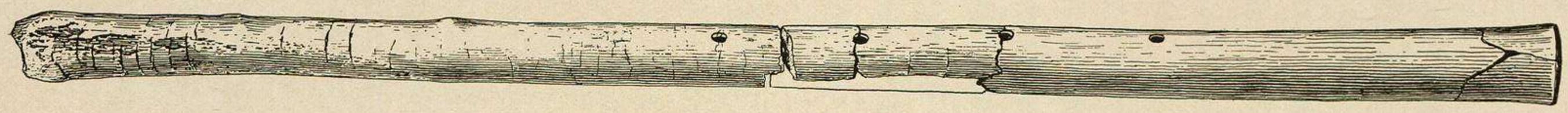
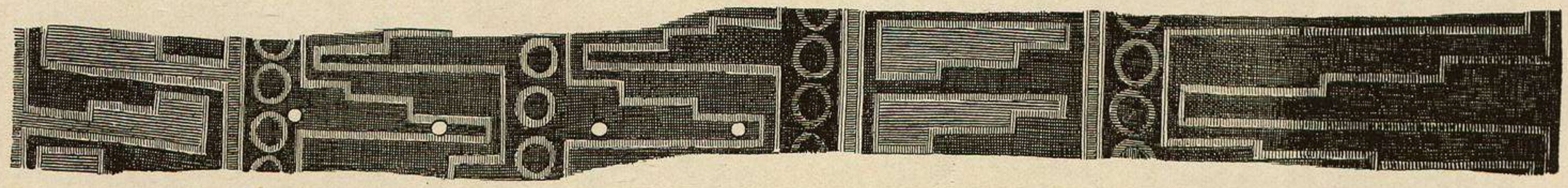


1. Flageolet of extraordinary size from the southeastern corner



2. Painted design forming the decoration on flageolet H–4563



3. Painted flageolet (H–4563) found in the northeastern corner

FLAGEOLETS FROM BURIAL ROOM, PUEBLO BONITO

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2.5 cm. in diameter, and the mouth-end 1.7 cm. As in the other specimen, there is a gradual taper from the bell-end to the mouth-end. This flageolet is not so finely made as the decorated specimen. At the bell-end the sides average 4 mm. in thickness, while the hole is 8 mm. in diameter; the corresponding dimensions are somewhat more than 4 mm. and 8 mm. respectively. This specimen is warped, and is broken in two near the center. There are four holes, the distances between the first and second, beginning at the mouth-end, being 5.6 cm.; between the second and third, 6.8 cm.; and between the third and fourth, 5.6 cm.: the holes average 6 mm. in diameter. This also is a "self" flageolet. It is made of cottonwood carefully dressed smooth, but devoid of polish. Both ends are flat, and the edges are not rounded.

Below the surface of the sand-deposit, within a few inches of the flageolets just described, the mouth-end of another flageolet was found. It is practically the same in style as the end of the undecorated specimen, and has been broken at a point which leaves in evidence half of the first note-hole. The fragment is 13 cm. long and averages 1.5 cm. in diameter near the mouth-end, the aperture at this point being 8 mm. in diameter. This specimen also is undecorated.

Among the objects found in the northeastern corner were ceremonial sticks, the description of which will be given after that of a series of flageolets found in the southeastern corner. These flageolets, five in all, were found beneath the surface, in the space between a post and the southern wall. In form they are similar to the plain specimen found in the northeastern cor-

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ner; but there are individual differences that make them especially interesting from the scientific standpoint.

The first flageolet (H-4557) differs from the plain one just mentioned in having a ridge 1.2 cm. broad, which forms a band at the end of the bell (pl. II, 3). From the evidence at hand, it would seem that this form typifies the squash-flower, which, in the modern flageolets used by the Flute priests of the Hopi, is represented by a bell-shaped piece of squash-rind attached to the end of the flute. Dr J. Walter Fewkes and the late Mr Frank H. Cushing mentioned this fact on examination of these specimens. With the exception of the carved end, the flageolet is absolutely plain. It is 36 cm. long, 2.6 cm. in diameter at the bell-end, and averages 4 cm. in thickness. The opening opposite the mouth-end, as in all of the flageolets of this series, is caused by a tapering countersink carried to the hole which is drilled through the instrument. The distance from the edge to the point where the main hole begins averages 2 cm., the diameter of the general boring averaging 7 mm. In this specimen, only two note-holes, averaging 3 mm. in diameter, have been preserved: the interval between them is 4.2 cm.

The second flageolet removed (H-4558; pl. II, 4) is of the same shape as the plain one from the other corner. It is 35 cm. long, 2.1 cm. in diameter at the bell-end, and averages 1.3 cm. at the mouth-end; the taper from the bell-end is gradual. The rim at the bell-end averages 3 cm. in thickness. The mouth-end is missing, the flageolet having been broken at a point just below the second hole. The interval between the holes is 4.1 cm.; the holes are 3 mm. in diameter. All of the flageolets in this series were found lying with the bell-end upward; the

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mouth-ends of all but one specimen were decayed to so great an extent that they could not be preserved.

The third flageolet (H-4559; pl. II, 2) is a perfect specimen: it has the bell-shaped end, and, as in the flageolet last described, there is a gentle taper from the bell-edge to the main part of the flageolet. There are no decorations on the surface. The specimen measures 51.5 cm. in length, and in diameter 2.5 cm. at the bell-end and 1.5 cm. at the mouth-end. There are four holes, as in the other specimens. The hole at the mouth-end is 5 mm. in diameter. The interval between the first and the second hole from the mouth-end is 4.5 cm.; between the second and the third, 4.7 cm.; and between the third and the fourth, 4.3 cm.: the holes average 4 mm. in diameter.

The fourth flageolet (H-4561; pl. II, 5) is of exceptional form in that it bears on the surface an animal figure carved in relief, identified by the late Mr Cushing as that of a bear. The specimen is 4.2 cm. in length and 2.1 cm. in width at the shoulder: the head is 10.3 cm. from the bell-end. The height of the figure above the general surface of the flageolet averages 3 mm. As may be seen in the plate, the head and legs are brought out in relief, and the eyes are formed by a slight protuberance on each side of the head. The snout is flat, resembling the snout of a frog rather than that of a bear. The bell-end of the flageolet has a raised collar-like piece, similar to that of figure 3, this band being 1.5 cm. in width. The fragment of the flageolet here shown is 36 cm. in length, and the bell-end is 2.5 cm. in diameter: the edge averages 4 mm. in thickness. Only two holes, each 4 mm. in diameter, remain, the interval between them being 4.3 cm. The surface of this instrument was carefully

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smoothed; but, apart from the carved figure, there are no decorations.

The fifth flageolet (H-4562; pl. II, 6) bears on its surface an animal figure carved in relief, the work being similar to that on the specimen just described. The figure is 4.2 cm. in length. The nose is 6.5 cm. from the bell-end. The breadth from the outer extremities of the paws is 2.3 cm. Only half of the animal is shown. The head, the upper part of the body, and the front-legs are carved in relief. At the posterior end the figure is raised seven millimeters, and on a level with the ears, eight millimeters above the surface. The animal represented is evidently a mountain-lion, as the end of the tail is shown lying along the median line of the back. The paws are flattened, as they naturally would be in the case of the animal mentioned; and the eyes and ears are carved in relief. The long tapering head causes the figure to resemble that of a lizard rather than that of a lion, especially as there is a portion cut away under the head, causing it to appear very thin; but, even though the tail were not shown in position on the back, the presence of the ears indicates clearly that the figure was not meant to represent one of the lower forms of vertebrates, as a lizard.

The fragment of the flageolet illustrated measures 38.5 cm. in length, and averages 2.5 cm. in diameter at the bell-end. The thickness of the edge averages 4 mm. Three holes, each 3 mm. in diameter, are shown, the intervals between them being 4.1 cm. In most of the flageolets, the holes are not perfectly round, the longer axis being always on the median line; but whether this was intentional, or was due to the mode of drilling, cannot be

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determined. Apart from the raised figure, this flageolet is devoid of ornamentation.

Returning to the northeastern corner of the room where the first flageolets were unearthed, there is a series of ceremonial sticks to be considered. These were found between the post and the northern wall; none of them projected above the surface. These specimens having been protected to a great extent from the action of water, the upper halves of most of them are in a state of perfect preservation. There were eight of the long ceremonial sticks in this deposit, and two of the small curved sticks which were evidently used with them.

Types of Ceremonial Sticks

Type No. 1 has two knobs carved on the handle. The specimens are of various forms and sizes; but all of this type are characterized by the plain proximal knob. A subdivision of this type has a hole drilled through the proximal knob; while the second knob, or collar, is grooved.

Type No. 2 has the handle-end carved in the shape of a bear's claw. All specimens of this type have an enlargement at the base of the claw. A subdivision of this type shows no enlargement at the base of the claw.

Type No. 3 has a spatula-shaped end, and the stick itself is hemispherical in cross-section.

Type No. 4 has a wedge-shaped end, the stick itself being round. A subdivision of this type shows the handle with a binding of sinew and a second one with a binding of cord.

There were also three sticks having flattened ends, and a variant of this type, which is No. 4 of the types given above. The largest specimen of type 1 has a head 4 cm. high and 4.5 cm. broad; the other two are very much smaller. One specimen, of peculiar form, in this group, has a barrel-shaped piece carved on the end, through which a cylindrical hole was drilled laterally. At each end is a ridge, giving the object the

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appearance of a spool. It is 2.3 cm. long and 1.5 cm. in diameter. All of these specimens have a groove in the collar-like piece, which in three of them is quite deep.

This deposit contained two specimens of type 3, the ones having the thin blades, which, in these specimens, average 3 cm. in width. There is one specimen of the fourth type, having the

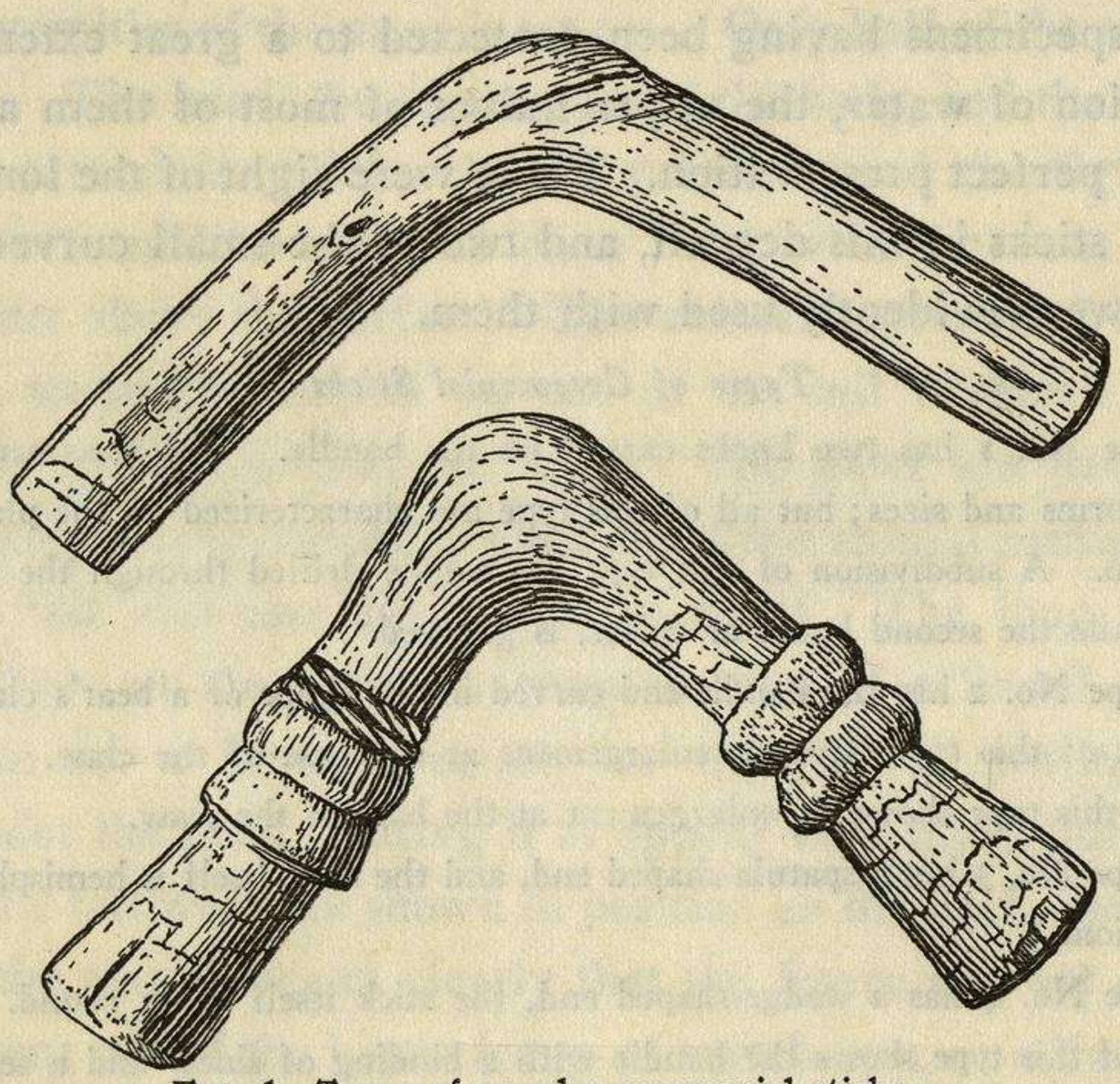

FIG. 1—Types of angular ceremonial sticks.

end flattened: as in the case of some sticks found in room 32, a portion directly under the end of the blade is worn away to some extent, as though from use. The eighth specimen is only a fragment; but the taper at what would be the carved end in the other specimens is very pronounced.

The two small ceremonial sticks, which were evidently meant to be thrown, are shown in figure 1; one of these

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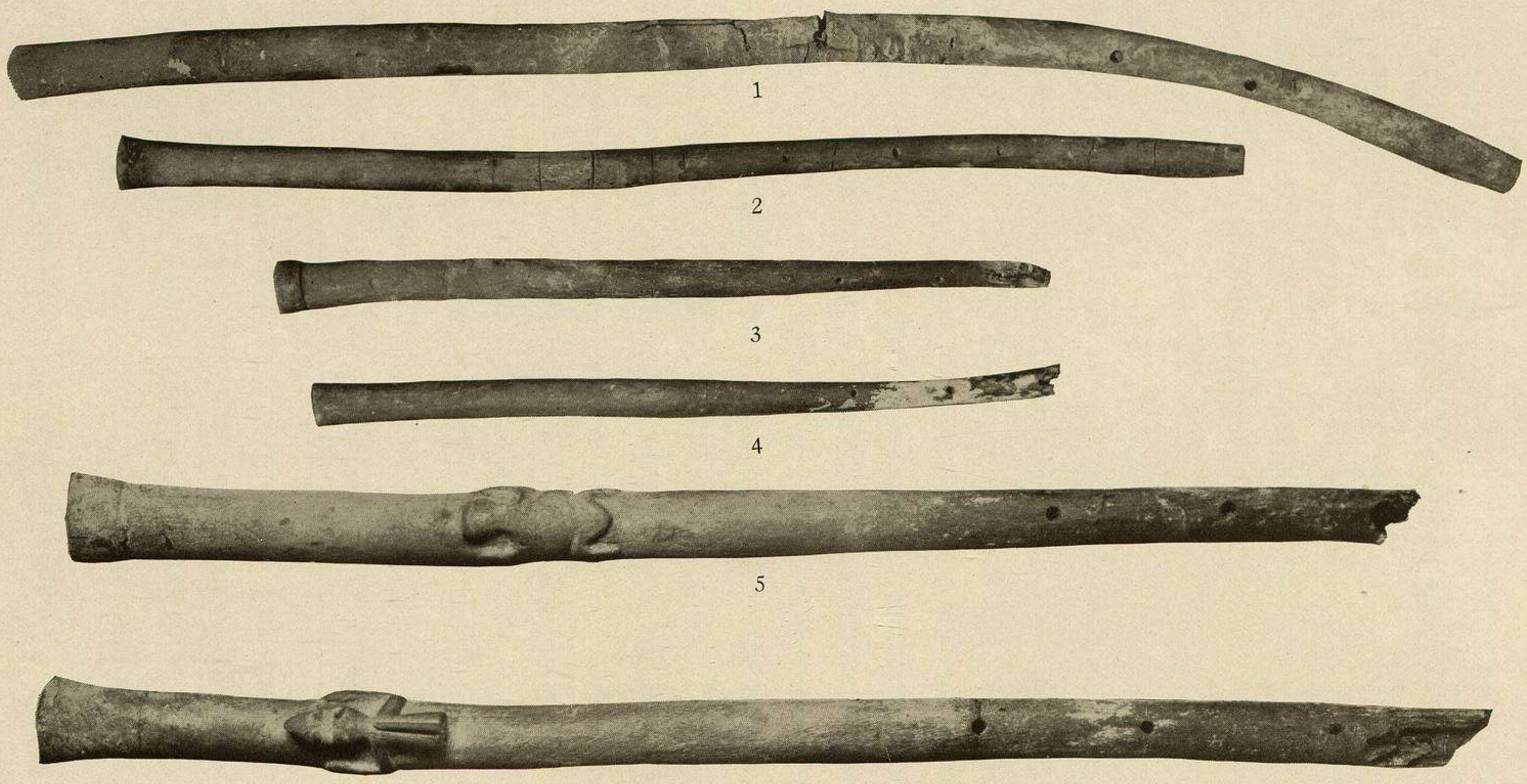

1

2

3

4

5

6

1. Found in the northeastern corner of the room (H–4560). 2, 3, 4. Found in the southeastern corner (H–4559, H–4557, H–4558) 5, 6. Carved flageolets (H–4561, H–4562) found with Nos. 2, 3, 4

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is plain, the other has carved arms. The carvings are in the form of collars, similar to those of the ceremonial sticks belonging to the subdivision of the first type. Directly above one of these collars are remains of two bands of heavy yucca cord. The specimen having carved arms measures 9.5 cm. from end to end, the arms being 7 cm. in length.

In the southeastern corner, where the five flutes were found, were discovered eleven ceremonial sticks. One of these, of a very unusual form, was standing with the carved end protruding above the surface. This stick is a variant or subtype of type 2, which has the end carved like a claw. It would seem that a natural branch of the end of the stick had been utilized; at all events this end of the stick is smaller, rounded, and bent into a circle, with the end brought back to the starting-point. As with most of the sticks in this deposit, the opposite end is broken; and its original length, therefore, cannot be ascertained. It is the only specimen of the form found in this group.

Of type 1, having the flattened knobs on the ends and the plain collars below, there were two specimens, one of which had a two-strand yucca cord tied just above the collar. The subdivision of this type having the ends drilled and the collar grooved is represented by three specimens and one freak, the end of the latter not having been drilled, although, as in the other specimens, the collar is deeply grooved. One of these has a very large end, through which a semicircular hole is drilled. This knob is 5 cm. long, 4.3 cm. broad, and 2.1 cm. thick: it is ground to a well-defined edge, and in its original condition the surface was no doubt polished to some degree.

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Among the specimens found in this deposit are the distal ends of two specimens of type 3; that is, those having the thin flattened ends. Most of the specimens in room 32 having been standing with this end downward, water had affected them, causing this portion to decay. It was therefore interesting to find a specimen that showed the finish and the taper of the opposite end of a stick of this type. There is a small fragment of a ceremonial stick of type 4 and a specimen representing a subdivision of this type; namely, that having the end covered with bands of knotted cord, which is similar to sticks found in room 32. Fortunately, this stick is complete. Its length is 1 m. 22 cm. The surface is rounded, but the knots still project from it.

In the northwestern corner were found three fragments of ceremonial sticks, from one of which the end is missing: this has a round handle, similar to the handles in types 2 and 4. The second is of type 2 form, but has the end merging into the handle, this feature placing it in the subdivision of this type. The third stick is round, except at the end, where it is flattened on both sides: from the polish on both surfaces, it had been used apparently as a digging-stick. Standing between the post and the northern wall, in this corner, was a large pole nearly 1½ m. in height, and more than 5 cm. in diameter. The ends are squared, but the surface does not seem to have been worked. Its purpose, and the reason for placing it in the room with the ceremonial sticks, could not be determined.

In the southwestern corner were brought to light one stick of type 1 and a fragment of the end of a second stick.

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While considering the ceremonial sticks, it may be well to complete the description of the various objects of this nature found in the room. It is deemed advisable to follow this procedure even at the risk of anticipating the work, as none of these objects properly could be associated with any of the room burials.

One specimen of type 4 (H-4514) was found near the northern wall, lying parallel thereto; the upper surface being five feet below the ceiling-beams. This specimen has a secondary binding of sinew four centimeters from the end; also a binding near the end of the blade — a feature noted in some of the specimens of this type from room 32; but the addition of the second band is unusual. This specimen is complete. It measures 1 m. 24 cm. in length, and 1.7 cm. in width at the blade-end.

Another specimen (H-4531) is a ceremonial stick of type 4. It is the crudest of all the specimens found in this room, the bases of the twigs projecting from the surface in places. This specimen was found four feet below the ceiling-beams, lying parallel with, and almost against, the western wall.

Scattered through the débris in the room, and intermingled with the burials, were three specimens of type 1 and a fragment of another ceremonial stick, probably of this type; two specimens of type 3, having the thin blade-end; and two of type 4, both of which are devoid of binding at the blade-end (making in all thirty-nine ceremonial sticks); one large ceremonial pole; and two of the small angular ceremonial sticks made to be thrown.

In considering the contents of this room, it must be remembered that the greater part of the material had been affected from time to time by streams of water that no doubt poured

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through the eastern doorway after each heavy shower. The swirling water displaced the parts of the skeletons to so great an extent, that, of the fourteen skeletons unearthed in this room, only two (Nos. 13, 14) remained in situ; in most cases the under jaw had been detached, and was found some distance from the skull. With the two skeletons just mentioned was found a mass of material that will be described as having been found in situ. The other objects from this room — with the exception of the skulls, the pottery vessels, and some of the turquoise objects — wil be treated in a general way, as it was impossible to determine with which skeletons the various pieces had been buried.

The first skeleton found (No. 1) was lying on its back, the head resting on the occiput. The lower jaw was not in place. The head was lying parallel with the southern wall; but the body extended in a northeasterly direction. The distance from the ceiling-beams to the nearest part of the skull was 4 ft. 6 in., the bones of the body being from three to four inches higher.

Skull No. 2 was 3 ft. 8 in. from the ceiling-beams; it was lying on the occiput. To the left side of the head a piece of burial cloth still adhered. Only the cervical vertebræ remained in place, the remaining bones being scattered through the sand.

Skull No. 3 was 3 ft. 10 in. from the ceiling-beams, resting on its side. Part of the skull was covered with fragments of decayed cloth. Scattered about in the sand near skulls Nos. 2 and 3 were a great many turquoise beads and pendants, which will be considered later (see page 240).

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A short distance northeast of skull No. 2 a corrugated bowl was found (A-H-3656; pl. III). This bowl is oval in form, and is of the type having a finely polished black interior; the outer surface in general is also black. This specimen measures 19.6 cm. in length, 12.5 cm. in width at the central part, and 7 cm. in depth; from the rim it tapers gradually toward the bottom. But few vessels of this kind and shape are found in the Chaco region.

To the northeast of the bowl just described a ceremonial object made of reeds was found (B-H-3673; fig. 2). The reeds had been put together in the form of a mat, and then rolled, thereby forming a cylindrical bundle, which was covered with a coating of cloth. This object is 9 cm. long, 4 cm. wide, and 3 cm. thick, and in shape and size it is similar to an object found in room 32. The flatening of the object evidently resulted from the pressure of the earth above it, it having been originally no doubt cylindrical in form.

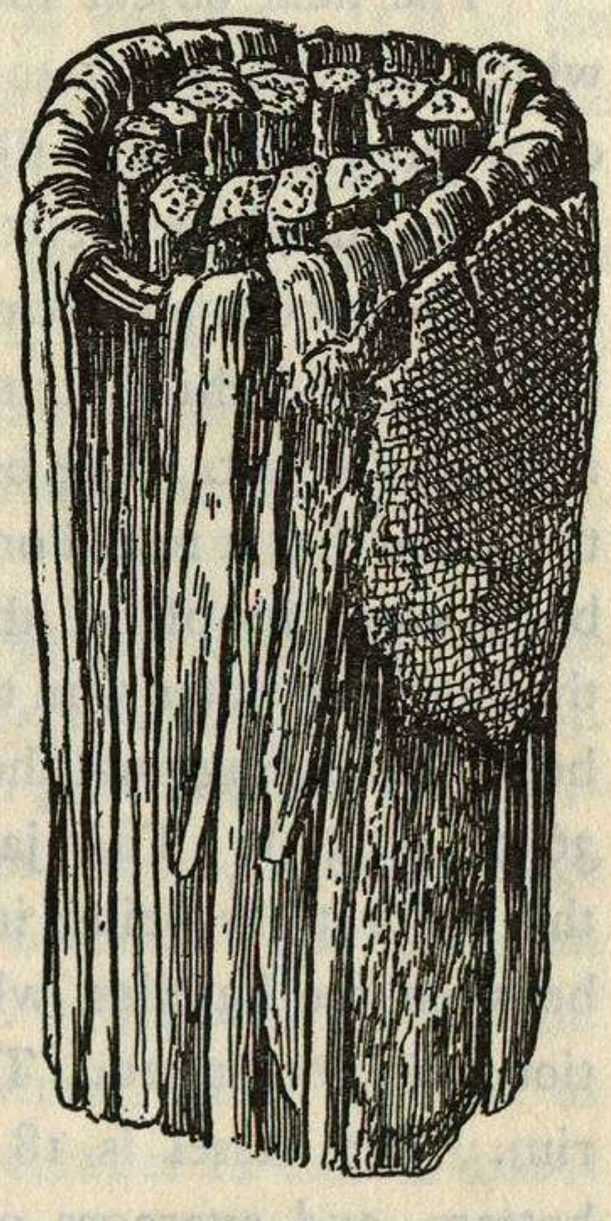

FIG. 2 — Ceremonial object made of reeds.

The head of skeleton No. 4 was lying with the lower jaw against the eastern wall. The right occipital eminence was the highest point, and the distance from it to the ceiling was 4 ft. 6 in. Near the head was a piece of galena.

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The next object found was a pitcher (C-H-3674), which was lying on its side.

Southwest of pitcher C was another pitcher (D-H-3623), of gray ware and of rather unusual form. The base, handle, and lower half of the upper part, are similar to corresponding features of the ordinary cylindrical-top pitchers. A white band separates the designs in black on the upper part, and from this band the vessel tapers to the mouth, as may be seen in plate III. It is 12 cm. in diameter at the widest part, which is just below the base of the handle, 16 cm. deep, and averages 6 cm. in diameter at the mouth.

The next object found was a shell bracelet (E-H-3632), which had decayed to so great an extent that the surface was the consistency of hard chalk.

The head of skeleton No. 5 was found 4 ft. 3 in. from the ceiling-beams. Remains of a piece of cloth were found on the face, and three strings of yucca cord were lying over the right eye-socket. The body was lying on its back, with the head turned so that it rested on the left side. Most of the bones of the body were in place, the skeleton having suffered less from the action of water than those above it. On the eastern side of the head, resting against the occiput, was a cylindrical jar (F-H-3637; pl. III). This jar is of the ordinary gray ware, all of the decorations being in black: they consist of vertical bands between the handles, which are placed in perpendicular position, and perforated. There is an open "life line" on the upper rim. The vessel is 18 cm. deep, 12 cm. in diameter at the bottom, and averages 9.5 cm. at the top, where the vessel is slightly flattened.

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Directly below this specimen was a bowl of gray ware (G-H-3645). As shown in plate III, this bowl is of ordinary form, the diameter at the rim being 15 cm. and the depth 5.7 cm. The only decorations on this bowl are a band on the inner rim and an open "life line" on the edge of the rim. Bowl G rested on another bowl of gray ware (H-3675; pl. III). This bowl is 11.5 cm. in diameter and 4.8 cm. deep. The design, which is in black, covers the interior surface, and there is an open "life line" on the edge.

South of jar F, and resting against it, was a pitcher of gray ware (I-H-3676; pl. III). This pitcher averages 11.5 cm. in diameter at the lower part and 7.6 cm. at the rim. It is of the usual form, the design being in the form of a meander. The rim is slightly flaring and the handle is devoid of decoration.

An isolated jaw was found four inches from the eastern wall, four feet from the northern wall, and 4 ft. 10 in. from the ceiling-beams. Northeast of this jaw, a jar-cover was discovered (J-H-3677): this is of sandstone, of the usual flat, circular form.

A pitcher of gray ware (K-H-3619) was lying on its side when disclosed. This pitcher is of the type having a long cylindrical top. The decoration, as shown in plate III, is of the interlocking fret pattern. The handle is decorated, and the edge of the rim is ornamented with a series of dots. The specimen is 18 cm. in depth, and averages 8.5 cm. in diameter at the rim.

A gray-ware bowl (L-H-3618) which, when brought to light, was lying in a natural position, averages 12 cm. in diameter at the rim, and is 6 cm. in depth. The decoration is confined to the inner rim, as shown in plate III.

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A pitcher (M-H-3678) was found lying in a slanting position, the mouth being uppermost. As shown in plate III, this pitcher is of gray ware, of the type having a finely polished surface, the general appearance being that of a very much finer grade of earthenware than is usually found in this region. The design is in two bands, and the handle and rim are decorated. The greatest diameter is 14.3 cm., the diameter of the mouth averaging 7 cm., and the depth 16.4 cm.

Just west of pitcher M, a lower jaw was found; this was situated 1 ft. 2 in. from the southern wall, 1 ft. 4 in. from the eastern wall, and four feet from the ceiling-beams. Another jaw was lying against a post in the southeastern corner, nine inches from the eastern wall, four inches from the southern wall, and five feet from the ceiling-beams.

Skull No. 6 was lying, with the face upward, at a point four feet eight inches below the ceiling-beams. The greater part of the skeleton had been scattered, but most of the cervical vertebræ were in place.

North of skull No. 6 a number of pieces of pottery were uncovered, the first a bowl (N-H-3613).

Southeast of bowl N, another bowl was found (O-H-3612; pl. III),resting in an upright position, as was the bowl just described. Bowl O is of gray ware, with black decorations on the interior surface and a band of black on the edge of the rim. The design is formed by a band on the inner rim; the bottom space contains three circles, the lines forming them being of a wavy character. This bowl is somewhat irregular in shape, averaging 16 cm. in diameter at the rim, with a depth of 6.3 cm.

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West of bowl O, a gray-ware pitcher was uncovered (P-H-3614), resting on its side. Plate III shows this pitcher to be of very unusual shape; the bottom part, as well as the neck, being ovoid in form: the lower portion is contracted on both sides at the central part, — a feature giving it the appearance of a two-lobed vessel. The handle is composed of four strips of clay, in imitation of the crude handles of baskets. The handles of most pitchers of this type have their under surfaces smoothed; but this specimen shows the separate strands of clay on the under side as distinctly as on the upper. The decoration of the vessel is confined to two bands: one spanning the bowl, and the other a space directly below the rim. The handle is decorated with four wavy lines, and there is a line of black on the edge of the rim. The greatest breadth of the bowl is 19.5 cm., and its greatest width 14.5 cm. The neck at the opening is 9 cm. long and 6 cm. wide; the depth of the pitcher is 20.5 cm. A great many vessels having sides compressed through carelessness in the firing are found in this region; but from the uniform contour of this pitcher, and its general appearance, the conclusion is inevitable that it embodies the conception of its maker.

A bowl of gray ware was resting against and partially covering the mouth of the pitcher P. This bowl (Q-H-3610), as shown in plate III, has four wavy lines forming a band on the inner rim; there are a band of black on the edge of the rim and a large cross on the bottom, this being the only decoration on the exterior. The interior has a peculiar brown finish, which is unusual; whether this was caused by grease, or by some slip dissimilar to that usually used, cannot be stated. This specimen is 11 cm. in diameter at the rim and 4.7 cm. deep.

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To the northeast of bowl Q, and resting against it, was a gray-ware pitcher (R-H-3615). This pitcher, as shown in plate III, has a dull brownish-gray finish. The decorations forming bands around the lower part, and below the rim, were evidently black when they were applied; but they have changed from some cause, and at the present time have a decidedly reddish hue. The handle is of the rod type, being formed of three strips of clay: the under surface has been smoothed until the division-lines have been obliterated. Each of the three strips forming the handle is marked by a line that extends from the rim to the point where it joins the vessel. The greatest diameter of this vessel is at the bowl-part, which measures 15 cm.; at the rim, the edge of which is decorated, it averages 8 cm. in diameter, the depth being 16 cm.

Northeast of pitcher R, and resting against it, was a small pitcher of gray ware (S-H-3616), which is shown in plate III. It has two bands composed of interlocking scrolls, — one about the upper part of the bowl and the other below the rim. The handle is solid and undecorated; but there is a line on the edge of the rim. The pitcher is 11 cm. in diameter at its widest part, which is the upper portion of the bowl. The cylindrical top is contracted toward the rim, where it averages only 7 cm. in diameter; the depth is 11.6 cm.

West of pitcher P, and resting against it, were the fragments of a bowl of gray ware (T-H-3631). The interior is decorated with an elaborate design; but the entire inner surface has been discolored in some way, presumably from use as a food-vessel. This specimen is 24 cm. in diameter at the rim and 11 cm. deep.

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North of bowl T, and resting thereon in such a way that the pressure of the earth above had crushed it, was another gray-ware bowl (U-H-3630). The decorations on this vessel are confined to the interior surface, with the exception of an irregular black band on the bottom. The decoration of the interior surface of this bowl may be seen in plate III, likewise the open "life line" on the rim. The peculiar discoloration on the interior surfaces of these vessels is quite marked, the present specimen having a decided buff-color. The bowl averages 20 cm. in diameter, and is 7.5 cm. in depth.

South of bowl T, its mouth resting against this bowl, was a small pitcher (V-H-3611).

Another pitcher of gray ware (W-H-3620) was resting on the rim of bowl T. This pitcher, as shown in plate III, is of the tall cylindrical-top form, having decorations in black. The handle is a solid piece, decorated; and the rim is ornamented with a series of dots. The upper part of the bowl of this vessel is 11.7 cm. in diameter, the diameter at the mouth being 8.5 cm. and the depth 17.6 cm.

At a distance of 1 ft. 10 in. from the southern wall, three feet from the eastern wall, and 4 ft. 1 in. from the ceiling-beams, an object was found, which, owing to the amount of débris attached to its surface, appeared to be an ordinary cotton-wood-limb; further investigation revealed three other pieces, which show it to be a flageolet of extraordinary size. This musical instrument (pl. 1, 1) was in four pieces when found. From the space between the note-openings, it would seem that a small portion is missing. In its present condition the flageolet measures 1 m. 8 cm. in length; it averages 4.2 cm. in diam-

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eter, decreasing in size at the mouth-end, and increasing gradually toward the opposite end. The hole drilled through the stem averages in diameter 1.8 cm. at the mouth-end, and 2.5 cm. at the point directly below the second hole from the bell-end, and is nearly 3.5 cm. in diameter at the end just mentioned. The flageolet is made from a cottonwood-root. The mouthpiece has been destroyed by rats, but it was evidently formed like the end of the small flutes found in this room. The finger-holes, averaging 1 cm. in diameter, are carefully drilled. The only absolute interval that could be measured is that between the first and second holes from the bell-end, the distance being 10 cm. There are no decorations on the surface, nor has the surface been carefully smoothed. Small projections formed by knots are in evidence, in some places rising to a height of more than two millimeters above the general surface.

The next object uncovered was a bowl (X-H-3628; pl. III) of gray ware. The decoration is in the form of a band on the inner rim, and there is an open "life line" on the edge of the rim. The interior surface of this bowl is discolored to so great an extent that the design is almost obliterated. The specimen is 14.3 cm. in diameter and 6.2 cm. in depth.

Resting inside of bowl X was an incurved bowl (Y-H-3617). This specimen possesses unusual features. It is of gray ware, and the decoration is confined to the inner surface, with the exception of a band which spans the outer rim. A handle is attached near the rim. The rim is exceptional, as the design on the inner curved portion extends within five millimeters of the edge. The reason for this feature is hard to understand; for in looking from above the entire upper portion of the design

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is concealed by the overhang of the rim, the general effect being shown in plate III. The greatest diameter of this vessel is 10.1 cm., the opening being 7 cm. in diameter, and the depth of the bowl 5 cm.

Southwest of the two bowls just described, another bowl of gray ware was found (Z-H-3629). This contained the remains of cord and of what was once evidently food. The specimen is of gray ware, decorated on the interior. Its diameter at the rim averages 14.5 cm., and its depth is 6.5 cm.

Resting inside of bowl Z was another bowl of gray ware (A1-H-3627). This vessel also contains what appears to be the remains of food. The specimen is decorated on the inner rim, as shown in plate III. It is 11.5 cm. in diameter at the rim and 6 cm. deep.

After removing the objects above described, skull No. 7 was found. It was lying with the frontal bone resting against the post in the southwestern corner of the room, at a depth of 4 ft. 7 in. from the ceiling-beams. The lower jaw was not found with this skull.

Skull No. 8 was resting in an unnatural position, the teeth being uppermost. It was 4 ft. 6 in. from the ceiling-beams. As in the case of skull No. 7, the lower jaw was not with the skull.

A lower jaw was discovered in the southwestern corner, seven inches from the southern wall and three inches from the western wall, and at a distance of 5 ft 5 in. below the ceiling-beams.

Another skull (No. 9) was resting face downward, four feet below the ceiling-beams.

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The next object of pottery unearthed was a gray-ware bowl (B1-H-3624). As may be seen in plate III, there is a decoration in black on the inner rim, also a line of black on the edge of the rim. The rim-diameter is 15 cm., and the depth 5.7 cm.

Another lower jaw was found 4 ft. 4 in. from the southern wall, 1 ft. 3 in. from the western wall, and five feet from the ceiling-beams.

East of the jaw just mentioned, a fragment of a corrugated jar (C1-H-3525) was found.

The next vessel (D1-H-3622) discovered was a pitcher of gray ware. The entire exterior surface, with the exception of a small area at the base, is decorated, as may be seen in plate III. Its greatest diameter, which is at the upper part of the bowl, is 12.1 cm.; the diameter at the rim averaging 7.5 cm., while the depth is 15.3 cm.

The next skull uncovered (No. 10) was lying on the occiput, but it evidently had been crushed, as the bones of the head were broken. Unlike most of the skulls, the jaws had held together and were in their natural positions: from them (the highest part of the skull) to the ceiling-beams, the distance was 4 ft. 11 in.

South of skull No. 10, a leg and foot were found. They were in a desiccated condition, and fragments of cloth were wrapped about them. These specimens were lying on the same level as skull No. 10, and probably belonged to the same body.

Skull No. 11 was found resting on the occipital and parietal bones, with the teeth uppermost. It was 5 ft. 1 in. from the ceiling-beams.

Skull No. 12, when discovered, was in an upright position, resting on the occiput. From the frontal bone to the ceiling-

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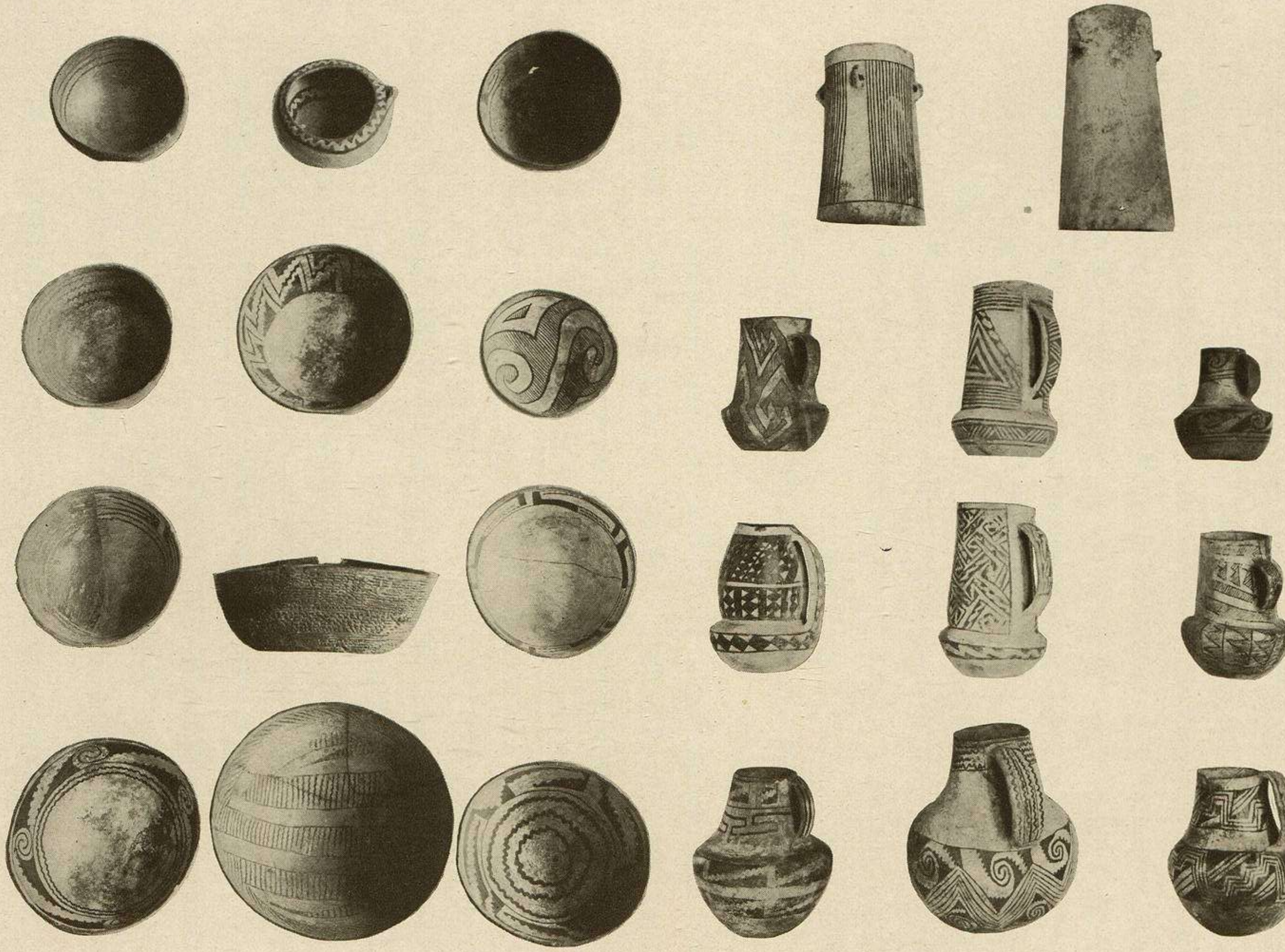

H–3610
H–3618
H–8628
H–3635

H–3617
H–3624
H–3656
H–3630

H–3627
H–3675
H–3645
H–3612

H–3637
H–3676
H–3623
H–3615

H–3620
H–3619
H–3614

H–3621
H–3616
H–3622
H–3678

MORTUARY POTTERY

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beams was a distance of 4 ft. 10 in. The body extended toward the west, and many of the bones were in place. The lower jaw, however, was not with the cranium.

A cylindrical jar of gray ware (E1-H-3621) was found near the eastern wall. This jar, as shown in plate III, is of the undecorated variety, with three handles placed in a horizontal position, and equidistant. The specimen is 12.5 cm. in diameter at the base, and tapers toward the rim, the diameter at that point averaging 8.8 cm.; its depth is 23.8 cm.

The next objects found were two sandstone jar-covers. These were in the northwestern corner, one foot from the northern wall, and resting against the eastern wall; they lay 5 ft. 2 in. below the ceiling-beams. Associated with them were shell and turquoise beads, which seemingly had been grouped around the posts in the corner.

On the removal of the above-mentioned specimens and the débris about them, a floor appeared. This was made of boards which averaged a foot in width and from three-quarters of an inch to an inch in thickness. These boards were laid side by side, in an east and west direction; and the floor thus formed no doubt presented a flat surface when it was new. When found, the boards were somewhat decayed, and were warped, from the effect of the water, to so great an extent that the surface was very uneven. The boards curved upward from the center, owing to the decaying of the bodies in the sand below them and to the pressure of the material above. From the appearance of the boards, it was evident that they had been made for the purpose indicated. In the eastern end of one of them, a hole about four

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inches in diameter had been cut, for what reason, it is impossible to say.

Under the floor, at a distance of 5 ft. 5 in. below the ceiling-beams, skull No. 13 was found resting on its right side. The body extended toward the southwest, and the bones were in place.

Scattered about the lower part of the leg-bones were 2997 disk-shaped beads of turquoise. Over and about the right ankle were 698 beads of the same form and material. Around the upper part of the left arm were grouped 1628 similar beads, and with these were a small turquoise set and a large turquoise pendant. Scattered about the skeleton were 567 beads of the kind described, and one having the edge rounded. There were also three turquoise sets made for use in inlay work. With these were nine turquoise pendants, ranging in length from 8 mm. to 4.5 cm. One of these is interesting in that it has been drilled from each side to the extent that the thin wall that remains is translucent. Besides the objects mentioned there were found a piece of turquoise matrix, three of the disk-shaped shell beads, and a small piece of shell.

Only two pottery vessels were found beneath the wooden floor, both of them being bowls.

Bowl H1-H-3635 on discovery was resting against the northern wall. This bowl is of gray ware, as shown in plate III. It averages 16.5 cm. in diameter at the rim, and is 6.5 cm. deep. It is decorated on the inner rim, and there is an open "life line" on the edge of the rim, the decoration being in black.

Another bowl (I1-H-3634) was unearthed near bowl H1. This bowl is of black ware, undecorated. It averages 11.7 cm. in diameter at the rim, and is 4.9 cm. deep.

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The next skeleton found (No. 14) was in situ. The head was in an upright position, and was 7 ft. 9 in. from the ceiling-beams. The face was turned toward the southeast, and the lower jaw was in place. The upper jaw was broken, and had fallen apart. The right side of the cranium was crushed, and there were two holes and a gash in the frontal bone. The skeleton, which was intact, was extended about north and south. The arms extended along the sides of the body. The legs were spread and bent upward, the feet being close together, and resting against the southern wall.

In view of the fact that the objects found with this body were in place, they will be considered before a general résumé of the specimens found with the other bodies is given. The skeleton itself was resting on a layer of wood-ashes which had been spread on the leveled floor of yellow sand. From the general care bestowed on this body, and from the character and quantity of the objects found with it, the deceased must have been a person of rank.

Apparently, an ornament made of turquoise beads once either hung from the neck, or was fastened to the clothing at the breast, for here 1980 such beads were found. These are of the disk-shaped type, and range from very small beads to large ones having a diameter of 8 mm. With them were a turquoise pendant 2.3 cm. in length and 1.6 cm. in breadth, and eight small turquoise pendants. These ornaments were scattered through the sand in such a way that the form of the object of which they were once parts could not be determined.

Over the abdomen another mass of beads and pendants was found. In this mass were 2642 small turquoise beads similar

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to those found on the breast, also 168 small turquoise pendants, and four turquoise pendants of unusual form, — two of the last-named made in crude imitation of a rabbit, a third in the form of a shoe, while the fourth is interesting, owing to the fact that it represents the object in the course of construction. With these specimens were three turquoise sets used for inlay work, and five jet inlays.

From the position of the beads found about the right wrist of the skeleton, it would seem that these once formed a wristlet. There were 616 of the disk-shaped turquoise beads, 147 small turquoise pendants, one small flat turquoise bead having the edges rounded, and one turquoise pendant having the usual perforation at one end, and another hole drilled for a distance at the opposite end. There were also four turquoise sets, one shell bead, and two small stone beads. Special mention should be made of two carved pieces of turquoise. These are approximately the same length (1.2 cm.), one representing a bird, and the other having a flat surface with incised lines. At one end of the latter specimen, which may have been meant to represent an insect, is an indication of a head. Both of these objects are drilled on the under side for suspension.

Surrounding the left wrist were 2384 disk-shaped beads, 194 pendants, and four cylindrical beads (all of turquoise), one of which is 1 cm. in length and 6 mm. in diameter, the other three being smaller. There were five pendants of unusual form, — two in the shape of birds, one in the shape of a human foot, one having a bifurcated base, and the fifth of irregular shape. There was also a pendant which had been drilled and broken, with a

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second hole drilled in the opposite side. With the turquoise beads were five shell pendants of irregular form.

Over and around the ankle were 322 disk-shaped turquoise beads, ranging from large to very small, as was the case with each group of beads found with this skeleton. With the beads were five small turquoise pendants, also two cylindrical turquoise beads.

The left ankle was surrounded with a mass of disk-shaped turquoise beads, numbering 432 in all. With them were eight small turquoise pendants and two of the disk-shaped turquoise beads having the edges rounded, eight very small shell and stone beads, and a fragment of a cylindrical bead made of shell. In addition to the foregoing, a turquoise set or inlay was found in the mass; but it is quite probable that this specimen had fallen from an upper level, as it would be impossible to use such an object in connection with the turquoise beads, unless, perchance, it may have formed part of the contents of a medicine-bag which was buried with the body.

The presence of so many ornaments made of turquoise would seem in itself sufficient evidence for concluding that this person had been of high rank. It is to be regretted that the cords, or perhaps sinew, on which the turquoise pieces were strung, had decayed, thereby removing all traces of the form and character of the ornaments attached respectively to neck, breast, waist, wrists, and ankles.

The ornaments already mentioned contribute interesting material for study of the decoration used by the old people; but a cache of objects discovered just west of skeleton No. 14 revealed

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a number of ornaments of new forms, and furnished a mass of shell and turquoise beads.

Four inches from the right knee, on the western side of the body, a shell trumpet (K1-H-3653) was found. This trumpet (plate IV) is made from the shell of a *Strombus galeatos* Swainson. The lip of the shell is cut away in the manner noted in the case of a shell from room 13 of this pueblo. Two holes are drilled near the edge of the lip, at the central part, probably for the attachment of a carrying-cord; and a third hole is drilled near one of these. A little farther from the edge is a fourth hole more than two centimeters from the hole nearest the mouth-piece. The shell evidently cracked while in use; for, on each side of a break near the whorl-end, holes are drilled, evidently for the purpose of mending or strengthening the shell at that part. The mouthpiece of the trumpet is ground, to some extent; but there is no evidence of the specimen having had a mouthpiece of clay, and none was found with it, although two trumpet mouthpieces were found in the débris in the room. This trumpet was, when found, 7 ft. 4 in. from the ceiling-beams. It rested in a haliotis shell (L1-H-3651). This shell shows no signs of having been worked. It rested on a shell of the same kind (M 1-H-3650). North of these shells, and lying against M1, was a third haliotis (O1-H-3654). Lying on edge in shell O1, were twenty-six perfect shell bracelets and fifteen fragments. These bracelets, averaging 8.5 cm. in diameter, are probably made from pectunculus shells. Another haliotis shell (Q1-H-3652) was found a little above, and slightly to the east, of the deposit of shells just mentioned. Under this shell was brought to light a peculiar deposit of turquoise sets. At first, in clearing away

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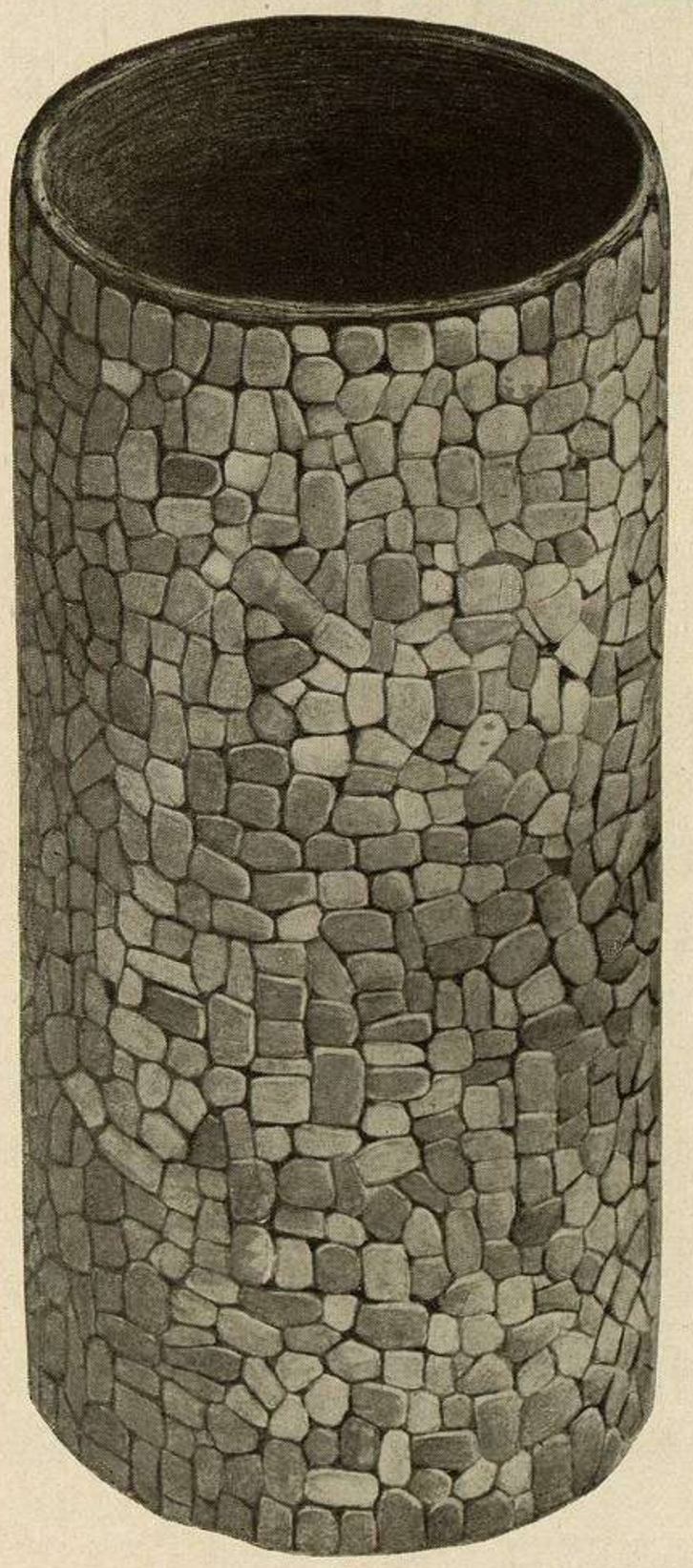
Shell trumpet found with skeleton 14



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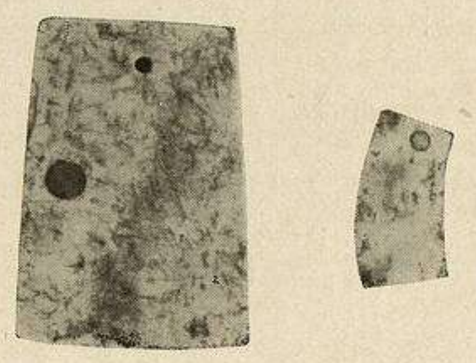

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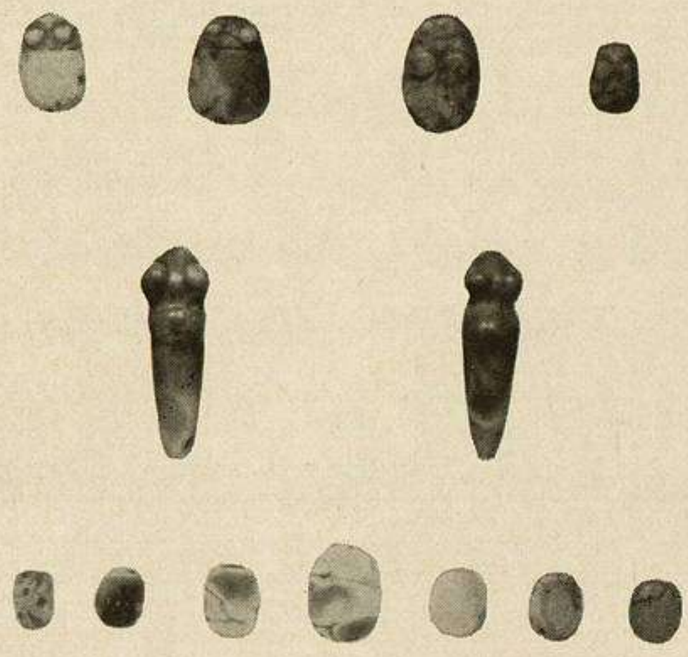

3

1. Cylindrical basket covered with mosaic of turquoise. 2. Turquoise pendant and set, showing inlays of the same material. 3. Turquoise frogs and tadpoles

OBJECTS FROM BURIAL ROOM, PUEBLO BONITO

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the surrounding sand, the small turquoise pieces seemed to be in place: subsequently, as the sand was brushed from about them, many fell from their original position. It required several hours to determine the shape of the object covered by these turquoise pieces; but, owing to the fact that fragments of the material on which the turquoise had been fastened still remained, it was possible to ascertain that the object had been a cylindrical basket, three inches in diameter and six inches in length. The basket-work had decayed; but the fragments showed conclusively that it had been made of very slender splints over which a layer of some material, probably piñon-gum, had been placed, this being the medium that held the turquoise pieces in position. A restoration of this specimen is shown in plate IV, 1, the individual pieces being represented as adjusted in the manner noted by the writer in uncovering the specimen. The cylinder was practically filled with sand, and was also covered by the same material, which had drifted over it. Thus, though the basket-work had decayed, the several inlays were held in place by an equalization of pressure. This condition made it possible to determine, not only the general form of the object, but also the irregular arrangement of the various pieces of turquoise. In his legends concerning the Navaho Indians, Dr Washington Matthews shows that several references to "turquoise jewel-baskets" are made by them. But whether their traditional knowledge of the subject is of mythical origin, or whether their ancestors saw such baskets in use by the Pueblo Indians in the early days, cannot now be stated with certainty; but the Navaho legend is none the less interesting on this account.

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There were 1214 pieces of turquoise forming the mosaic which covered the cylinder, and so closely were these placed, that hardly an opening was left in the whole surface. Partially filling the cylinder, and lying directly below its mouth, was a mass of turquoise and shell beads and pendants. In this deposit there were 2150 disk-shaped turquoise beads. With these were 152 small turquoise pendants, of various forms, and twenty-two large pendants of the same material, the largest of which measured 3.6 cm. in length, 2.7 cm. in width, and 3 mm. in thickness. One of these (H-3769) is of irregular form, having the edges on all sides notched. Another (H-9250) is carved so as to give the appearance of a bird with a crest. A third pendant is crescent-shaped; this was made from a fragment of a disk-shaped bead. Still another (H-3852) is in the form of a bird, the head and bill being outlined by a deep incision; there is also an incised line about the neck.

Associated with the turquoise beads and pendants were 3317 shell beads and small pendants. Among these were a few beads made from olivella shells, but most of them were disk-shaped. There were also seventy shell beads of cylindrical form, and eight specimens of the same kind having holes drilled in the sides, in which turquoise sets no doubt had been inlaid. Still other objects unearthed were sixty-eight large shell pendants of irregular shape, most of them of the flat form; nineteen of these have holes drilled in the sides for the reception of turquoise inlays. This fact might be deemed purely conjectural, were it not that a pendant of similar form still retains one of the turquoise sets in place. Two of the shell pendants found in this deposit are in the shape of moccasins; these are drilled for suspension.

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Three cylindrical beads of shell, averaging three centimeters in length and eight millimeters in diameter, were found. These beads are similar to specimens discovered in the same room, each provided with a bird-bone passing through the central opening (fig. 3). The deposit contained also four shell pendants representing bird-forms: one of these specimens still retains a piece of turquoise inlaid in the side. A fifth specimen is of the ordinary form of pendants drilled for the reception of an inlay, and still retains a piece of turquoise in a groove cut just below the drilled portion.

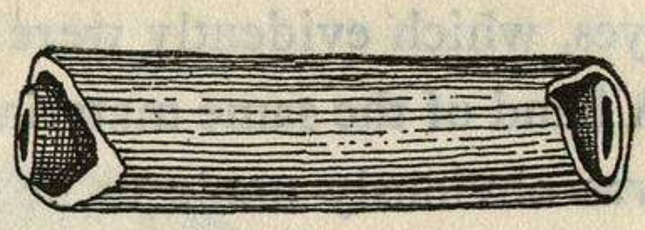

FIG. 3 — Shell bead with bird-bone inserted.

In the center of the mass of shell and turquoise ornaments, below the turquoise mosaic cylinder, an object having an animal form was found. This figure (R1-H-3657) is made of a soft but very compact stone. The greater part is of a light pink color; but there is an area of chalky white on the under side, extending through to the tail. This latter part is so much disintegrated that the material rubs off at the slightest touch. The object in its entirety is 8.7 cm. in length, and 3.3 cm. in width at the widest part, that is, across the shoulders. It is 1.6 cm. in thickness at the shoulder, tapering from this point to the nose, also to the wedge-shaped tail. The general form of the object is shown in figure 4. The body is marked off

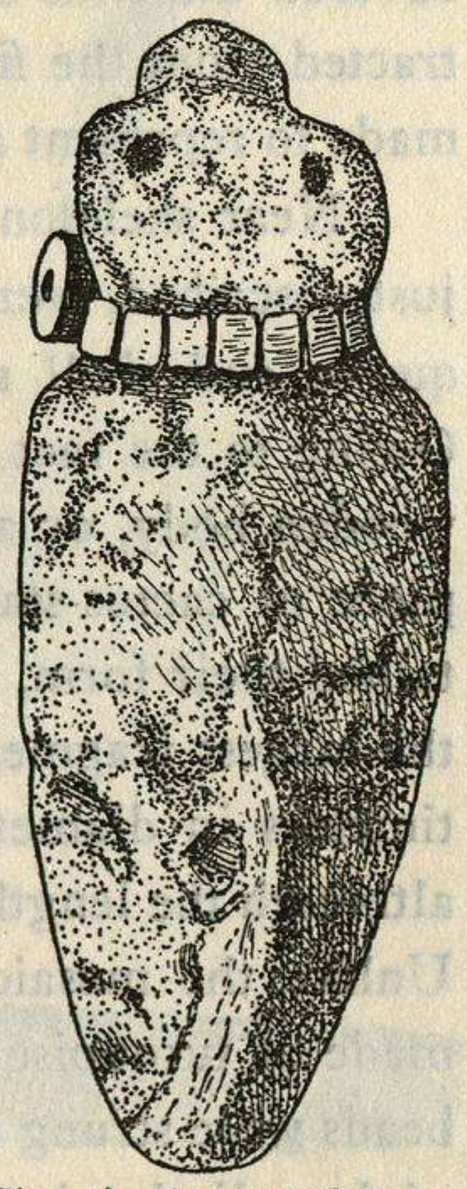

FIG. 4 — Incrusted stone ornament found with skeleton 14.

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from the head by a deep groove on each side. The head is carefully carved. One feature is a shovel-like projection, evidently made to represent a flat nose. There are pits forming eyes, which evidently were once inlaid with pieces of turquoise. A band of the same material passes across the neck. This object was obviously made to be used as a pendant. To prevent the cord from wearing away the very soft material, the makers inserted a bird-bone in a hole drilled just above the neck; the opening on each side was countersunk, and the space was filled with gum. Over each end a large turquoise bead was placed, one being in position when the object was found. These completely covered the ends of the bone, which otherwise would have detracted from the finish of the figure. Whether this object was made to represent a real or a mythical animal is not determined.

Near skeleton No. 14, but not associated with the deposit just described, were the remains of another object made of turquoise and shell mosaic inserted on basket-work (H-12758). Owing to the fact that the basket-work had been woven over a wooden body, or at least over a form of fibrous material (as a piece of cactus-stalk), several fragments of the object still retained their form, and could be removed. From the contour of the largest fragment, the object must have been about four centimeters in diameter and more than six centimeters in length, although the length of the portion found is but three centimeters. Unlike the mosaic cylinder above described, this specimen is made of turquoise beads and ovoidal thin pieces of shell. The beads were strung on a cord and placed on edge against the body of the cylinder, in parallel rows separated by two rows of the thin shell pieces which overlapped like shingles. The number of

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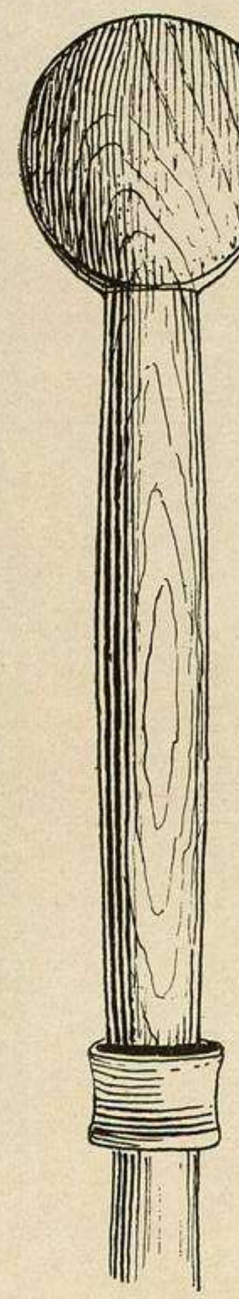

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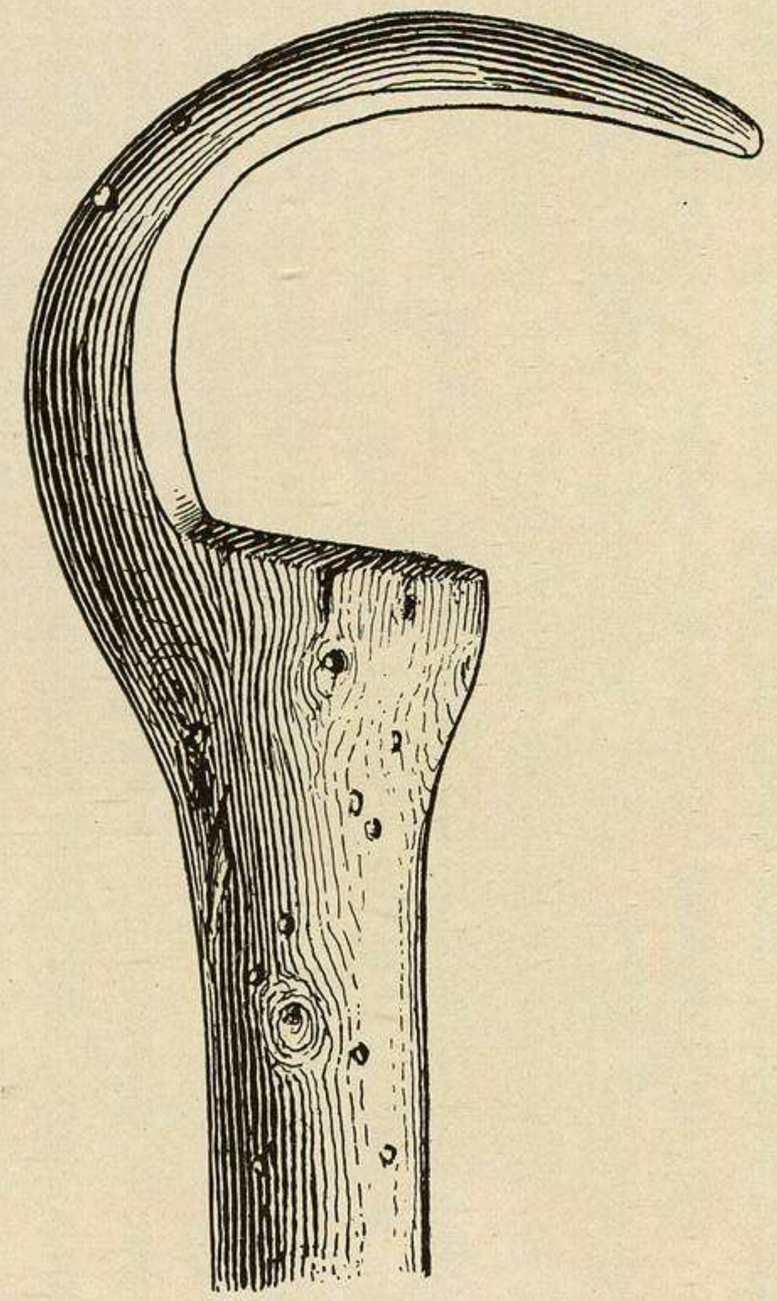

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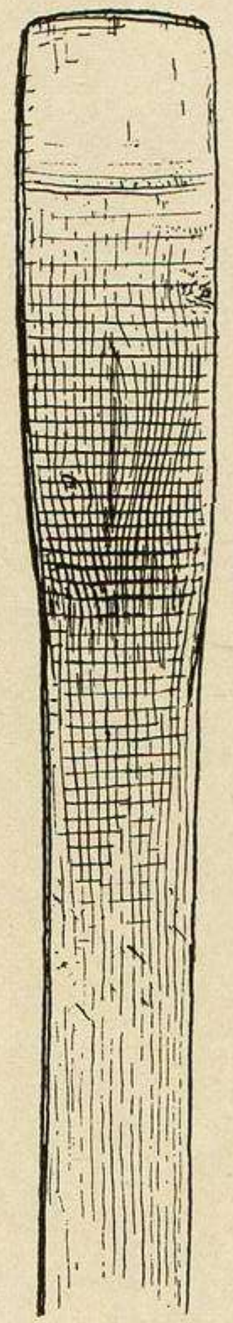

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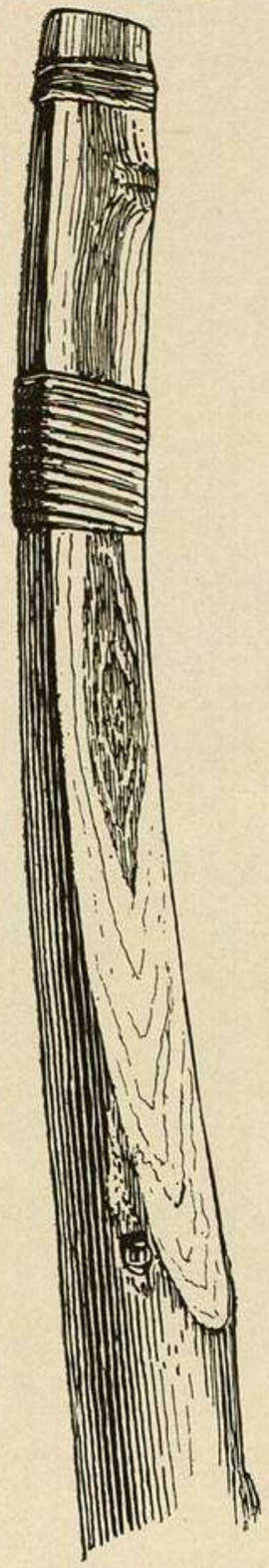

Type 4

TYPES OF CEREMONIAL STICKS

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beads in each transverse row was from six to seven, according to the thickness of the pieces. There are the remains of three of these rows of beads, and of three of the alternating rows of shell which occupy more than half the diameter of the object. With this specimen were a number of beads very much larger than the ones which remained in place, the former averaging six millimeters in diameter, while the latter are under four millimeters. Sections of the larger beads were found, showing that they had been strung in the same manner as the smaller ones. How they were applied is, of course, conjectural: possibly they formed a row at each end of the specimen. There were discovered more than five hundred loose beads that had formed a part of this interesting object, which was used no doubt ceremonially.

With skeleton No. 14 were unearthed a long inlay of red stone, several fragments of shell ornaments, pieces of turquoise matrix, and small turquoise sets, which were used no doubt in ornamenting the shell pendants.

Nine inches east of the skull, in a standing position on the same level, was one valve of a bivalve shell (P1-H-3649). Nothing was found with it.

Measurements Indicating the Positions of the Skulls

No. 1. 1 ft. 8 in. from W. wall and 8 in. from E. wall.
2. 3 ft. 3 in. from N. wall and 2 ft. 7 in. from E. wall.
3. 2 ft. 7 in. from N. wall and 3 ft. from E. wall.
4. Against E. wall and 2 ft. 2 in. from N. wall.
5. 4 ft. from N. wall and 1 ft. 3 in. from E. wall.
6. Against S. wall and 1 ft. 8 in. from E. wall.
7. 7 in. from S. wall and 4 ft. 11 in. from E. wall.
8. 1 ft. 9 in. from S. wall and 4 ft. 5 in. from E. wall.

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9. 2 ft. 7 in. from S. wall and 1 ft. 6 in. from W. wall.
10. Against W. wall and 4 ft. 7 in. from S. wall.
11. 11 in. from N. wall and 2 ft. from W. wall.
12. 1 ft. 4 in. from N. wall and 1 ft. from E. wall.
13. 2 ft. 6 in. from S. wall and 1 ft. 4 in. from E. wall.
14. 1 ft. 5 in. from N. wall and 2 ft. 5 in. from W. wall.

The lower jaw of skull No. 1 was 2 in. below it.

The lower jaw of skull No. 2 was 1 in. E. of it.

The following measurements indicate the respective positions of the specimens described, including the distance of each from the ceiling-beams.

A. Corrugated bowl, (H-3656) 2 ft. 7 in. from N. wall, 1 ft. 5 in. from E. wall, and 4 ft. below ceiling-beams.

B. Ceremonial object (H-3673), 2 ft. 5 in. from N. wall, 11 in. from E. wall, and 4 ft. 2 in. from ceiling-beams.

C. Pitcher (H-3674), 2 ft. 8 in. from N. wall, 6 in. from E. wall, and 5 ft. below ceiling-beams.

D. Pitcher (H-3623), 2 ft. 10 in. from N. wall, 1 ft. 4 in. from E. wall, and 4 ft. 9 in. from ceiling-beams.

E. Shell bracelet (H-3632), against E. wall, 3 ft. 4 in. from N. wall, and 5 ft. below ceiling-beams.

F. Cylindrical jar (H-3637), 3 ft. 9 in. from N. wall, 9 in. from E. wall, and 4 ft. 3 in. from ceiling-beams.

G. Bowl (H-3645), same position as F.

H. Bowl (H-3675), same position as F.

I. Pitcher (H-3676), same position as F.

J. Jar-cover (H-3677), 2 ft. from E. wall, 3 ft. 10 in. from W. wall, and 4 ft. 10 in. from ceiling-beams.

K. Pitcher (H-3619), 1 ft. 5 in. from E. wall, 3 ft. 6 in. from N. wall, and 5 ft. from ceiling-beams.

L. Bowl (H-3618), 3 ft. 1 in. from N. wall, 1 ft. 9 in. from E. wall, and 5 ft. 1 in. from ceiling-beams.

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M. Pitcher (H-3678), 1 ft. from S. wall, 1 ft. 4 in. from E. wall, and 4 ft. 1 in. from ceiling-beams.

N. Bowl (H-3613), 2 ft. from S. wall, 1 ft. 10 in. from E. wall, and 5 ft. below ceiling-beams.

O. Bowl (H-3612), 1 ft. 9 in. from E. wall and 5 ft. 2 in. from ceiling-beams.

P. Pitcher (H-3614), 2 ft. 4 in. from E. wall, 1 ft. from S. wall, and 5 ft. below ceiling-beams.

Q. Bowl (H-3610), 1 ft. 7 in. from S. wall, 2 ft. 8 in. from E. wall, and 4 ft. 10 in. from ceiling-beams.

R. Pitcher (H-3615), 1 ft. 8 in. from S. wall, 2 ft. 6 in. from E. wall, and 4 ft. 11 in. from ceiling-beams.

S. Pitcher (H-3616), 2 ft. 2 in. from S. wall, 2 ft. 5 in. from E. wall, and 5 ft. 2 in. from ceiling-beams.

T. Bowl (H-3631), 11 in. from S. wall, 3 ft. from E. wall, and 5 ft. 2 in. from ceiling-beams.

U. Bowl (H-3630), 1 ft. 4 in. from S. wall, 2 ft. 11 in. from E. wall, and 5 ft. 2 in. from ceiling-beams.

V. Pitcher (H-3611), 7 in. from S. wall, 3 ft. 2 in. from E. wall, and 5 ft. 1 in. from ceiling-beams.

W. Pitcher (H-3620), 11 in. from S. wall, 3 ft. 4 in. from E. wall, and 5 ft. 4 in. from ceiling-beams.

X. Bowl (H-3628), 1 ft. 6 in. from S. wall, 3 ft. 10 in. from E. wall, and 5 ft. 3 in. below ceiling-beams.

Y. Bowl (H-3617), found in bowl X.

Z. Bowl (H-3629), 1 ft. 2 in. from S. wall, 4 ft. 4 in. from E. wall, and 5 ft. 4 in. from ceiling-beams.

A-1. Bowl (H-3627), found in bowl Z.

B-1. Bowl (H-3624), 3 ft. 2 in. from S. wall, 2 ft. 4 in. from E. wall, and 5 ft. 3 in. below ceiling-beams.

C-1. Jar fragment (H-3625), 4 ft. 5 in. from S. wall, 1 ft. 11 in. from W. wall, and 5 ft. 1 in. below ceiling-beams.

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D-1. Pitcher (H-3622), 3 ft. 7 in. from S. wall, 7 in. from W. wall, and 5 ft. below ceiling-beams.

E-1. Jar (H-3621), against N. wall, 1 ft. from E. wall, and 4 ft. 2 in. from ceiling-beams.

H-1. Bowl (H-3635), against N. wall, 2 ft. from E. wall, and 5 ft. 10 in. from ceiling-beams.

I-1. Bowl (H-3634), 1 in. Southwest of bowl H-1, 2 ft. 3 in. from E. wall, and 6 ft. 2 in. from ceiling-beams.

K-1. Shell trumpet (H-3653), with skeleton No. 14, 7 ft. 4 in. from ceiling-beams.

L-1. Haliotis shell (H-3651), with K-1.

M-1. Haliotis shell (H-3650), with K-1.

O-1. Haliotis shell (H-3654), with K-1.

P-1. Shell bracelets (H-3649), with K-1.

Q-1. Haliotis shell (H-3652), with K-1.

R. Animal figure (H-3657), with K-1.

In the northeastern corner of the room, grouped about the post at various depths, were 983 turquoise objects, as follows: disk-shaped beads, 926; one bead of the same type, with rounded edges; three cylindrical beads; and forty-seven small and six large pendants. The most interesting of the larger pendants (H-10417) is shown in plate IV, 2. This was found near the post in this corner. The specimen has a turquoise front and a back of trachyte. It is 3.8 cm. long, 2.3 cm. wide at the top, 2.7 cm. wide at the bottom, and has a thickness of three millimeters. It is drilled at the narrow end for suspension. In the left side, another hole (four millimeters in diameter) is drilled, the side of which is beveled. In this hole a piece of turquoise, fashioned with edges angulated perfectly, is adjusted with all the skill of a modern lapidary. The hole is drilled through both layers; but the turquoise inlay extends only to the trachyte

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stratum. Other pieces of turjuoise and shell treated in the same manner will be described, but none of them approaches in workmanship the specimen under consideration.

Four pendants are matched ear-drops. Both of these pairs of pendants have turquoise matrices, while the larger pair has a backing of trachyte. The smaller pair averages 2.8 cm. in length, and 2 cm. in width at the widest part; the larger, 3.3 cm. in length, and 2.2 cm. in width at the lower part. Besides the pieces mentioned, there were found in the northeastern corner twenty-six pieces of turquoise, many of which had been worked, twenty-seven turquoise sets, six sets made of stone and jet, and a small shell bead, also two fragmentary reed arrows provided with wooden foreshafts.

Around the post in the northwestern corner were discovered turquoise objects as follows: fifty-one disk-shaped beads, four large pendants and a small one, five worked pieces, also a piece of malachite, and a disk made of haliotis shell. This disk (H-3680), which is concavo-convex, is five centimeters in diameter. The inner edge is decorated with a series of incised lines. A fragment of a reed arrow-shaft was also found in this corner.

In the southeastern corner the following turquoise objects were brought to light: 586 of the disk-shaped beads, fifty-one pendants of small or of medium size, six large pendants, seven turquoise sets, and sixty-five pieces of worked material and matrix, also a jet inlay and a thin shell pendant made of haliotis shell. To the foregoing should be added three turquoise beads, the diameter of which averages 1.5 mm. The holes through these beads are so small that they cannot be strung on an ordinary pin.

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In the southwestern corner of the room, forty-two pieces of malachite were found, fragments of shell bracelets, and a bracelet made of bone (H-9270), but no turquoise ornaments. The bone bracelet is 5.6 cm. broad on the longer axis. The bone is 1.6 cm. in width, and has an average thickness of a millimeter. At each end is a drilled hole, through which a cord was probably passed to fasten the bracelet to the wrist. Bracelets of this kind have been found in a fragmentary condition in other parts of the ruin, but, judging from their scarcity, it would seem that they were not in general use.

In referring to the objects found when this room was entered, mention was made of a burial-mat, the ends of which protruded from the sand in the southwestern corner (see page 197). When removed, this mat proved to be made of thin osiers fastened together at three points by means of a two-strand yucca cord which passed through holes provided for the purpose. Why the burial-mat was placed in this position, instead of being wrapped about one of the bodies, is conjectural, but it had no doubt ceremonial significance.

Among the interesting objects found in the general débris surrounding the skeletons in this room were two tadpoles, five frogs, and seven buttons; all of these objects being made of turquoise. The tadpoles (plate IV, 3) are 2.5 cm. in length, and the larger is eight millimeters in width at the head, which is flat and pointed. The eyes are represented by protuberances which project more than a millimeter from the general surface. These large eyes are typical of the frog family as represented by the old Pueblo people. Directly back of the head is a constriction forming the neck; and back still farther on the body,

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in both specimens, is a kind of lump, or shoulder. From this point the body tapers gently to the tail. Both specimens are drilled on the under part for suspension, the drilling following the longer axis of the body.

Four of the frog-forms in turquoise above mentioned are shown in plate IV. Two of these have the eyes in their natural position, and in each there is an incised line marking off the head from the body. In these two specimens, the eyes and the lines forming the neck are the only physical characteristics retained. In room 38 was found a frog made of jet, having turquoise eyes, a band of turquoise across the neck, and legs carved in relief. This specimen is the highest type of frog discovered in Pueblo Bonito; that is, the most realistic representation. It is flattened and of the same general form as the two turquoise specimens now under consideration. In the turquoise frog it will be noticed that the body is rounded and that the head is smaller than the opposite end. The other two frogs shown in the same plate have the eyes carved in relief, but no care was taken to place them in their natural position; nor have the bodies the taper noticeable in the other two specimens. The largest of these four frogs measures 1.3 cm. in length, 9 mm. in width, and 4 mm. in thickness; while the length of the smallest is 8 mm., the width 5 mm., and the thickness 3 mm. In the seven pieces of turquoise of similar form, represented in plate IV, 3, none show the physical features of the frog. In shape and general technique they are exactly similar to the other specimens, and to the Indian mind they typified the frog, no doubt, in as great a degree as did the more elaborate ones. Each specimen of this form is drilled laterally through the central part of the body for suspension.

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The specimen from room 38, representing the highest type of frog, and the specimens from room 33, constitute an interesting series. The jet frog shows most of the physical features in relief; the next graduation shows the eyes and the neck division only; in the next stage the eyes remain, but not in their natural position; while in the fourth and last stage is represented a mere utilitarian form that would not be suggestive of the frog, were it not for the fact that the other specimens are in evidence.

Another specimen, made entirely of turquoise, found associated with the skeletons in the room, is a pear-shaped object made by combining three pieces (H-10425). This is 2.8 cm. in length, 1.8 cm. in width at the widest part, and 6 mm. in thickness. The stem part is rounded, but the lower part of the body is perfectly flat. There are evidences that it once was covered with a mosaic. The turquoise used is of the matrix variety, and, from the general color, it is reasonably certain that all three sections were cut from one piece. The only plausible explanation why the ancient workers should have taken great trouble to square the edges of the sections in forming an object of this kind is, that the shape of the original piece would not admit of cutting out an object of the size desired. The labor spent on this specimen must have required a great many days, for each face at the joints is perfectly smooth and polished; and so carefully has the work been done, that, at a distance of a few feet, the lines where the pieces join can hardly be seen. Without doubt the present object is one of the most perfect specimens ever found in the Pueblo area, demonstrating conclusively the skill of the old lapidaries.

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A cylinder of hematite inlaid with turquoise (H-10420) is shown in fig. 5. When entire, evidently this object represented a bird. The wings are indicated by pyramidal pieces of turquoise so let into the surface of the hematite that their edges are practically flush therewith. Both pieces are rounded to conform with the contour of the cylinder. There was evidently a mosaic band at each end of the cylinder, and vestiges of the gum that held these bands in place are still visible. One end of the hematite portion is rounded, and is evidently complete. The opposite end is drilled, and, from its appearance, it seems quite probable that there was once another piece attached thereto. When the material from this room was being studied, a drilled piece of dark red stone (that had been considered a bead) was fitted to the hematite cylinder, and proved to be the missing part. Having this connecting piece, it was an easy matter to find the remaining portion, which was a pointed piece of turquoise bearing a bird-figure carved in relief. Originally the object must have been one of great beauty: even in its present state, it proves the skill of the old Pueblo makers as workers of stone. In its entirety this specimen measures 5.4 cm. in length, and 8 mm. in diameter at the widest part.



FIG. 5 — Hematite cylinder ornamented with turquoise.

A portion of a mosaic object was taken from the débris. The work was done on a haliotis shell, and, although the specimen is merely a fragment, it shows the manner of using the large turquoise sets, a great many of which were found in this room. The design is formed by combining turquoise, jet, and

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shell, the pieces being attached to the shell by means of gum. The general technique of this object is similar to that shown in connection with the mosaic band on a scraper found in room 38 of this ruin.[1] In describing the shell trumpet unearthed in this room (see page 226), mention was made of a mouthpiece (H-12787; fig. 6) found with the skeletons. It is made of some composition, chiefly gum. The mouthpiece is irregular in shape, the longer axis being 2.5 cm. in length. The opening is rounded and the sides are covered with crude turquoise mosaic. The under part shows the contour of the shell to which it was attached. A specimen similar, but somewhat larger, was found in room 48.

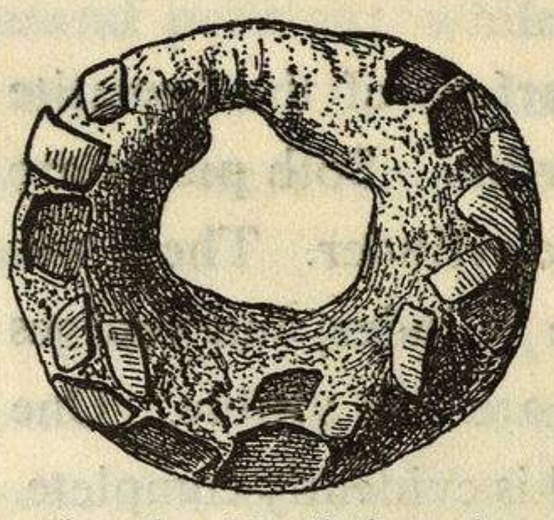

FIG. 6 — Mouthpiece for shell trumpet, incrusted with turquoise.

In considering the general objects of turquoise taken from this room, the pendants first will receive attention. There were 503 perfect specimens and nine broken ones found with the bodies, excluding the specimens already described as having been found with skeletons Nos. 13 and 14, or in the corners of the room. These 503 objects comprise 71 large pendants and 432 small ones. A series of the large pendants is shown in plate VI. In the first group are represented four matched pairs and one single pendant. The pair in the upper row are more nearly free from the trachyte matrix than are any of the other specimens. They are 3.2 cm. long, 2.5 cm. wide, and average 3.5 mm. in thickness. As is the case with all the specimens shown on this plate, with exception of the pair represented in the center

[1] Ceremonial Objects and Ornaments from Pueblo Bonito, *American Anthropologist*, n.s., VII, No. 2, 1905.

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LARGE TURQUOISE PENDANTS FOUND IN VARIOUS PARTS OF THE ROOM

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of the upper and lower rows, these pendants are drilled for suspension. The surface is heavily mottled with trachyte, and the backs of both specimens consist entirely of a layer of this material. The pair represented in the lower row on the plate is similar to the pair just described, both in appearance and in being composed equally of turquoise matrix and pure trachyte. The pair shown with the central pendant are the largest found in this room. The back of each is solid trachyte. These specimens measure 4.8 cm. in length, 3.7 cm. in width at their widest part, and 5 mm. in thickness at the center, the thickness decreasing toward the edges. The central pendant is of very light turquoise interspersed with matrix. It is entirely different in character from the other specimens on the plate, in that it is more nearly round in form, and of greater thickness for its length, than any of the other pendants. The four pendants represented in the center of the right half of plate VI were found in the northeastern corner, and are described with the other objects found in that part of the room. The pair in the upper row are free from matrix, and both sides, as well as the edges, are highly polished. The central pendant is of irregular form, and is pitted with bands and veins of trachyte. The pendants on each side of the central one in the lower row are interesting on account of their size, and also as showing the great variety of tints in the turquoise from this region. Among the other large pendants which were probably used as ear-drops are a number that are matched and evidently formed pairs. These are of various forms and sizes; but the plate already described gives a very comprehensive idea of the general form and the variety of the pendants found in the room.

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In plate VII, 1, is represented a series of turquoise pendants, beads, ornaments, and inlays. The small pendants give a fair idea of some of the forms made of this material. The only specimen that needs special mention is the one illustrated in the lower part of the plate. This pendant (H-3735) is a flattened cylinder 3.2 cm. in length and 1 cm. in diameter on the average. There is a large hole drilled in the upper part, as shown in the illustration. Just above the hole, in the end, two holes are drilled, both of which meet the larger one. A bead or other object was evidently fastened to the top of this piece.

The turquoise beads discovered numbered 24,932; of these eight were of cylindrical form with the edges rounded, and sixteen were of the figure-eight form, the remainder being of the disk-shaped type, three of which are shown in the second row of plate VII, 1. Just above these are shown two of the same form with the edges rounded.

With the groups of beads, a great many pieces of turquoise that had been worked, and small pieces of matrix, were discovered, numbering in all 1052 pieces; also 451 turquoise sets or inlays, probably used in mosaic work. A series of these is shown in the lower part of plate VII, 1. Some of them are very small, while others measure 2.3 cm. in length. The set in the right-hand corner is mended with a piece of turquoise in the same manner as the pendant found in the northeastern corner of the room (pl. IV, 2). In this instance, a pendant was used, no doubt, to form the inlay, the hole drilled for the suspension of the object being filled with a turquoise set.

In plate VII, 1, three ornaments of turquoise are shown; the one at the top (in the center) representing a bird, while the one

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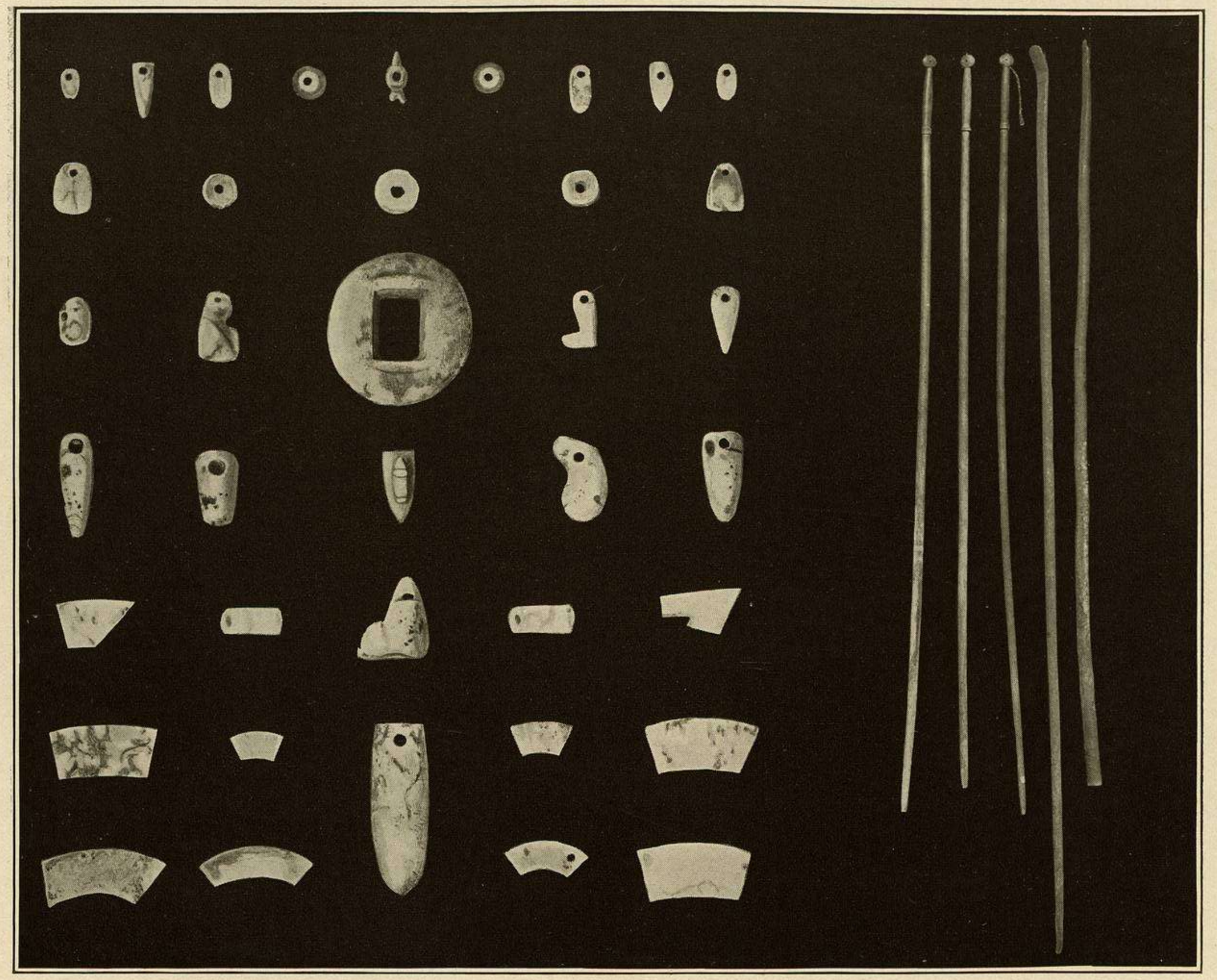

1 2

1. Examples of turquoise beads, pendants, and inlays found with the skeletons. 2. Ceremonial sticks found between ceiling beams in southwestern corner of room

OBJECTS FROM BURIAL ROOM

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directly below the circular piece has a bird carved on the surface. In studying the material taken from the room since this illustration was made, it has been found that this object was a part of the hematite cylinder, and may be seen in the illustration of that object in figure 5. The circular figure above the specimen just described is a thin piece of turquoise having a rectangular hole in the center. The edges of this hole are beveled, and it is quite evident that it once contained a set. On the opposite side of the piece are the remains of gum, which would seem to show that the whole surface was once covered with mosaic. Another specimen of similar form, and about the same size, was found in the room, but it was in fragments.

Among the shell objects unearthed in removing the skeletons were 2042 beads of various forms, most of these being of the disk-shaped and figure-eight types, and specimens made of olivella shells. There are twelve beads of a long cylindrical type; these average a centimeter in diameter, and the longest one is 4.5 cm. in length. They are so drilled that only a thin wall remains. Provision was thus made for the insertion of a bird-bone, and three of the beads still retain the bone-sections. One of these is shown in figure 3. One is in a fair state of preservation, but the other one is so far disintegrated that only a fragment of the shell remains.

Other objects secured were ten disks of haliotis shell, similar to the one described as taken from the northwestern corner of the room, eight pieces of shell that had been worked, eighty-nine fragments of shell bracelets, seventeen shell pendants of various forms, two large beads made from oliva shells, and an inlaid shell (H-12783). This object was evidently once a pendant, but the

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hole is filled with a shell set in the same manner as that shown in some of the turquoise pieces. A large bird-form made of shell was also found. The wings are represented as outstretched as in flight, the tail as having a notched base, while the head also is well formed. From tip to tip of the outstretched wings it measures 6.2 cm., and from the head to the end of the tail 4.7 cm. A hole is drilled through the head, another hole where the wings join the body, and the third at the bifurcation of the tail. This object seems to have been merely a form on which a mosaic figure was developed. From the curvature of some of the sets, and from the angular form of others, it would seem that the surface had not only been covered with turquoise, but that the whole figure had been outlined with a broad band of the same material. The hole at the point where the tail joins the body is filled with gum, and the whole upper surface of the shell still retains a layer of similar material.

In the débris there were 173 sets or inlays made of stone and jet, and also a few beads made of red and gray stone.

In figure 7 a fragment of a jet ring is shown. From the contour of the fragment, the ring must have been about 2.3 cm. in diameter, and the width of the band 1.4 cm. The most interesting feature of this specimen is a repaired portion. On each side, the surface was cut away, for the width of nine millimeters, to a depth of a millimeter. In the cavity a rectangular con-



FIG. 7 — Fragment of jet ring with jet inset.

cavo-convex piece of jet is glued. This inset had fallen from its original position when the

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specimen was found. There are evidences that a similar piece of jet had been adjusted to the opposite side of the specimen.

The only object of metal found in this room is an inlay or set made of iron pyrites. This specimen is 1.6 cm. in diameter and 2 mm. in thickness. Another specimen was discovered by an Indian who was shoveling the dirt from room 33, and it is safe to assume that he found it in that room. It is slightly smaller than the other specimen, but is of the same thickness. Objects made of iron pyrites are rare among the Pueblos of the Southwest, and there is but little evidence that the ancient inhabitants utilized this material to any considerable extent, although its use in Old Mexico in the manufacture of mirrors, beads, etc., is well known.

Among the general objects found buried with the bodies were fragments of canyon walnuts, piñon-nuts, a number of seeds, a circular piece of gourd-rind having a hole drilled through the central part, fragments of textiles that no doubt had been wrapped about the bodies, a perfectly transparent quartz crystal and another crystal chipped into the shape of a crude knife, pieces of gypsum, a piece each of limonite, azurite, mica, and of pink stone used in making inlays, pieces of yellow ocher, of gypsum, of arrow-shafts, and of chalcedony (some of the last named having been worked), six arrow-points of chalcedony and obsidian, pieces of chalcedony ground by the action of a turkey's gizzard, a few fragments of pottery, a small circular mat made of yucca cord (which may have been used as a jar-rest), a number of fragments of animal bones (some of which had been broken to obtain the marrow), and the fragment of a bone awl.

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The room under consideration is very small compared with the rooms in the northern part of the building. It is situated in a section where there evidently was a great deal of reconstruction work, to which fact, no doubt, may be attributed the presence of so many small rooms grouped about room 33. The length of the northern wall of the room is 6 ft., of the southern wall 6 ft. 3 in., of the eastern wall 5 ft. 10 in., and of the western wall 6 ft. 10 in.; that is, the room is almost square. The doorway in the eastern wall is 2 ft. 3 in. from the southern wall. It is of the ordinary rectangular type, — 1 ft. 10 in. high and 2 ft. 3 in. wide, — provided with poles for a lintel. This is the only entrance to the room. The sides of the doorway are plastered, as are all of the walls. There are no decorations on the walls, nor are there evidences of the room having been made for a burial-chamber. In the southwestern corner is a post that was placed under the crossbeams, which extend north and south, as a precautionary measure. These beams enter the northern and southern walls; but, in adding new rooms above this series, the builders evidently thought it advisable to strengthen the floors with posts. The top of the post mentioned had fallen against the western wall. Its base stands about a foot from both the western and the southern wall. The largest post in the room was found under the beam in the northwestern corner. Its distance from the walls is about the same as in the case of the post in the southwestern corner. In the northeastern corner are two posts, one of which supports the ceiling-beam, standing three inches from the eastern wall and a foot from the northern wall; the other post is four inches west of the one just mentioned, about the same distance from the northern wall, and extending through

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the ceiling into the room above. A post in the southeastern corner at the base is six inches from each wall, but has fallen against the eastern wall. The ceiling is composed of thirteen beams, of various sizes, over which is a layer of cedar-bark. In the southwestern corner, at a distance of 1 ft. 6 in. from the ceiling-beams, were five willow-sticks protruding from the wall, and forming a sort of rack; but nothing was found in it. The room in its entirety is in a very good state of preservation, the only defect being a slight bulge in the ceiling.

CONCLUSIONS

The use of this room for burial purposes was evidently a secondary one. It is in an old part of the building, where many of the rooms had been abandoned and others reconstructed. The surrounding rooms had been taken for burial purposes and for the storage of ceremonial material. Although skeletons were found in rooms in other parts of the pueblo, none presented conditions similar to those existing in the case under consideration.

As no burial-mounds were in evidence near Pueblo Bonito, and as there were comparatively few rock burials in the vicinity, intramural inhumation was to be expected. But when it is considered that valuable jewelry and ceremonial paraphernalia were buried with practically all of the bodies in this series of rooms, it would seem that in life the deceased must have belonged to the priesthood, and have been buried within the walls of the pueblo both as a mark of respect and as a means of protecting their graves from possible spoliation at the hands of semi-nomadic tribes. The Navaho and the Ute prize ornaments of turquoise above all other possessions; and their greed for this

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material, both for personal ornament and for use as a medium of exchange, would cause them to go to almost any extreme to obtain it. From the exploration of burial-mounds near pueblos of the Chaco group, it is known that practically no turquoise was buried with the bodies, the non-perishable material being confined almost exclusively to fictile productions. This fact suggests that the pueblos of this region, probably without exception, contain the remains of those who were either members of the priesthood, caciques, or who held other positions of importance in the community. This is known to be true of Pueblo Bonito and of Peñasca Blanca; for in both these pueblos masses of turquoise ornaments have been found associated with bodies buried in the rooms, and further research in these and other ruins should result in similar discoveries.

The series of burial-chambers that includes room 33 at one time was connected with room 28, which adjoins room 32 on the south. The doorway connecting these rooms was filled with masonry which appeared to be part of the original wall. This may have been done when the pueblo was abandoned. The doorway between rooms 32 and 33 was open, as were all of the other doorways of the group. The rooms themselves show no evidence of having been prepared for burial purposes, and there are no decorations on the walls.

Owing to the havoc wrought by the inflow of water, the only preparations for burial that could be noted were those in connection with skeletons Nos. 13 and 14. In this instance the floor had been covered with a layer of yellow sand on which a layer of wood-ashes had been placed. The bodies were placed near each other, and, from the positions in which they were

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found, it would seem that they had been buried at the same time. The skull of one of them was crushed, — a feature which suggests an accident in which the two persons, and perhaps others buried in this room, may have lost their lives.

The floor that separated the burials is worthy of notice. It was made of boards that had been shaped and smoothed until of uniform thickness; these were adjusted so as to cover completely the floor-space presented by the sand placed over the first burials. The boards bore no evidences of ornamentation; the only feature worthy of note was the hole cut in the eastern end of one of the boards. This may have been an opening of symbolic character, similar to the *sipapu*, the entrance to the underworld, that plays so important a part in the mythology of the Hopi. But, whatever the purpose of the opening or the import of the floor, here is evidence of the skill of the ancient people in working wood, which, with their primitive stone, bone, and shell tools, was a task requiring no little dexterity. In studying this and all other classes of work, the fact must be borne in mind, that, so far as can be learned, they had no metal implements.

Unfortunately, the twelve burials above the floor were disturbed to the extent that the positions and the character of the objects buried with the several skeletons respectively could not be determined. The fact that so many bodies were placed in so small a room, and that they had been covered with sand as they were buried, presents a phase of intramural burials somewhat uncommon. Apart from this feature, the burials furnish but meager data for study.

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The materials found with the bodies were in an unusually good state of preservation, especially as the effects of surface drainage in the room were so apparent. In most cases the objects made of wood (a really remarkable series) were fortunately intact.

To students of Pueblo life, the flageolets are undoubtedly the most interesting specimens. Instruments of this nature have been found in other ruins, including cliff-dwellings, and fragments were unearthed in other parts of Pueblo Bonito; but the series taken from this room furnishes conclusive evidence of the type of flageolet used in this pueblo, and demonstrates also the style of decoration employed and the application of the decorative elements. Judging from the prevalence of Flute observances and the large Flute fraternity among the Hopi, it may be safe to assume that certain persons at least, if not all of the men buried in this room, had been members of a similar order. Students of Pueblo rites and societies assert that the Flute clan is a very old one; and as the flutes used in the Hopi ceremonials of the present time are similar to those found in room 33, it may be that the type has been handed down from the early days; nor would it be surprising to find that the Flute societies had their beginning in the Chaco region, as many of the clan migrations have been traced from this group to their present home in the province of Tusayan in Arizona.

The ceremonial sticks also point to a Flute clan origin. Similar sticks are used to-day by members of the Hopi Flute societies in certain of their ceremonies; but the details of this similarity must be deferred to another time, when the great

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mass of ceremonial sticks found in the adjoining room is described.

Pottery vessels were buried with the dead in all parts of the Pueblo area, but none of the tribes were given to the practice of making special mortuary vessels. Sacrificial pottery was made in some pueblos to a greater or less extent, but this generally took the form of mere models, oftentimes unbaked. These are found especially in and about springs. Many pieces of this kind were discovered in the rooms of Pueblo Bonito, but under such conditions that it is hard to determine whether they were made for ceremonial purposes or for use as toys: none were found in room 33. The vessels buried with the bodies are of the common forms, such as were found in the living-rooms. There was one exception, namely, the cylindrical jars; but judging from the numerous specimens of these vessels taken from room 28, and from the fact that none were found in the mound or rock burials, they were used, no doubt, primarily in ceremonies, probably constituting part of certain altar paraphernalia.

Turquoise was one of the most common materials employed in the pueblos for ornamental purposes. The major portion of the supply used by this group of towns came from Los Cerillos, near Santa Fé. There are evidences of great mining activity in the prehistoric period, and the mines are worked, to some extent, at the present time. This turquoise is found in a trachyte matrix; many of the veins are very thin, as shown by the backing of stone on some of the large pendants. The great quantity of ornaments in room 33, made from this material, presents a wide range of forms; many variants of known types are available, while pendants of new forms were also found.

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The mosaic and the incrusted objects from this region, although not new to science, show the high degree of skill attained by these people and their esthetic tendencies. Their idea of proportion and of color-values is evidenced by the careful portrayal of detail in the incrusted objects, as illustrated, to some extent, by the objects from this room, and still more by the series obtained from other rooms of the ruin. The mosaic cylinder — the only incrusted basket that has come to the notice of the writer — is especially interesting. The covering of ceremonial packages, and the incrusting of trumpet mouthpieces, suggest the extent to which the embellishment of ornaments and ceremonial objects was carried.

A final survey of the objects discovered in this room tends to prove that the burials were made at a time when the esthetic arts of the ancient people were at their height. These specimens are in keeping with the most ornate productions from other parts of the ruin, and, viewed as a whole, these productions afford conclusive evidence that the people of Pueblo Bonito reached as high a degree of proficiency in the arts as those of any other pueblo in the Southwest. Further investigation doubtless will establish the fact that the arts of the Chaco Canyon group mark the zenith of Pueblo estheticism.

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TRIBAL STRUCTURE: A STUDY OF THE OMAHA AND COGNATE TRIBES

BY

ALICE C. FLETCHER

WHEN the natives of America were first encountered by the white race, the name bestowed on the people, and the terms used to designate the groups into which they were divided, were all necessarily borrowed from the Eastern continent, and represented conditions which obtained among the peoples of that region. The employment of the designation "tribe" for the different groups that spoke different languages and occupied different localities, served its purpose fairly well, and still serves the student of ethnology. Tribes have been classed into dialect groups, and these related groups have formed linguistic stocks. In all this classification on the basis of language, the term "tribe" has been convenient and serviceable, and has not led to any confusion.

When the tribe was more closely examined, it was found that the people composing it were divided into groups, and these groups were designated as "bands," "clans," "septs," and "gentes." All these terms had their definite European meaning; they had arisen out of social conditions, which, upon close observation, are not to be found on this continent.

The term "band" is of so general a character that it can be made to mean much or little, and be applied in an elastic manner

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to almost any group of people associated together for any purpose, either of a temporary or of a more permanent nature. It can hardly be used as a distinctive designation to indicate the character or composition of any group. It is entirely negative, and leaves the group to which it is applied without any distinctive designation by which to classify it.

The terms "clan," "sept," "gens," however, have each a definite meaning. They have come into use as designations of an organized group of people subject to certain conditions and to the control of certain officials. They have been, and are still, applied to the subdivisions which exist in the tribe as it is found in this country; and the question as to whether or not they can properly be given to the subdivisions of the American tribe is one that has engaged the attention of students. It is the purpose of this paper to present a picture of the tribal structure of a small group of cognates which has been under the observation of the writer for more than twenty-five years, and to note, in passing, how far these terms are applicable to the subdivisions of these tribes.

A clan is defined to be "a body of kindred having a class name, and ruled by an hereditary chieftain." Some years since, Major J. W. Powell, then director of the Bureau of American Ethnology, suggested that the term "clan" be employed specifically to indicate descent through the maternal line rather than to indicate a form of government. Following this suggestion, the word has since been so used by many American writers, and has proved to be a convenient term.

A sept is stated to be "a group of persons claiming descent from a common ancestor, and subject to the authority of an

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hereditary chief." This word is rarely used by American writers, except in a loose way, as a synonym for clan.

The term "gens" has a more definite meaning, as its use in ancient Roman society is well known. It may be said to represent a group of families claiming descent from a common ancestor from whom the gens took its name. Common religious rites bound the members of the gens together, and descent was traced solely through the father. This term Major Powell proposed should be used to indicate those American kinship groups which traced their descent through the paternal line, and it has since been so used by several American students.

It has been asserted by an eminent scholar, that "the Grecian gens, phratry, and tribe, and the Roman gens, curia, and tribe, find their analogies in the gens, phratry, and tribe of the American aborigines. In like manner, the Irish sept, the Scottish clan, the phrara of the Albanians, and the Sanskrit ganas, without extending the comparison further, are the same as the American Indian gens, which has usually been called a clan." At the time when Dr Lewis H. Morgan made this statement, thirty years ago, there had been few careful studies made of any of the native tribes of America. His broad generalizations served a good purpose: they stimulated the research which has, in a few instances, necessitated qualification of some of his statements.

There are points of similarity among the organizations mentioned by Dr Morgan in the quotation given above, but there are also points of divergence; and these latter, in some instances, are important factors in determining the tribal structure.

The tribes considered in this paper in reference to their tribal structure are the Omaha and its close cognates, — the Pon-

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ka, Osage, Kansa, and Quapaw. All of these tribes belong to the Siouan linguistic stock. Their habitat, when they were first encountered by the white people, was west of the Mississippi and the Missouri rivers. While the tribes followed the buffalo, in their tribal hunts, as far west as the foothills of the Rocky mountains, their villages were located in the rolling country near the rivers mentioned. The tribes were hunters, and depended upon the game for food, and on pelts for clothing; but they also cultivated the maize, and raised beans, melons, and other vegetables with which they varied their diet. Their traditions all refer to their having migrated from the eastward, and considerable evidence has been obtained which bears out these traditions. Their traditions also declare that they were once one people. Their languages confirm this statement, as they have not yet differentiated so as to be wholly unintelligible to one another. Their tribal organizations are similar, and give evidence of having been modeled on a common plan, which may have been the plan of the parent organization from which these tribes split off, probably under circumstances not unlike those which brought about the separation of these cognates from one another.

The Omaha tribe will be taken to exemplify the tribal structure of the group, while the other tribes will be referred to in less detail.

The Omaha word for "tribe" indicates the native view of the organization. This word is *u-ki'-te*. As a verb, it means "to fight"; as a noun, it means "the tribe." It is the only word in the language which means the battling of warriors fighting for the protection of people, the conflict being of such a character that in it honors could be won. It would seem, from a study of the

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term, that the word for "tribe" meant those who fought together against the incursions of outsiders, in order to maintain themselves as a body. Around the group of families composing the tribe stood this cordon of warriors, who by their valor made safe the community from outside enemies. A detailed study of the duties of the men of the tribe bears out this interpretation of the meaning of *u-ki'-te*, the word for "tribe"; that is, a group of people girded about by those who with their lives defended the integrity of the group.

The distinctive name "Omaha" is a descriptive term meaning "against the current," or "up stream," and is the complement of the name "Quapaw," which signifies "with the current," or "down stream." These names refer to the accidental parting of the two tribes, — an event which could not have taken place after the beginning of the sixteenth century, as, early in that century, Spanish adventurers encountered the Quapaw bearing this name, which referred to the manner in which they became separated from their kindred, the Omaha. This event must have occurred some time previous for the name to have become fixed on the people. The names "Ponka," "Osage," (a corrupt form of the native term *Wa-zha-zhi*), and "Kansa," are all old designations which appear as the names of cognate tribes, and also as the names of groups within these tribes. All of the tribes are divided into bands or groups, which together go to make up the tribe. These groups bear a general name which means "village." This name is applied by the Omaha to all white settlements, — to the little towns which border their reservation in Nebraska, as well as to cities like Washington and Chicago. Besides this general name, each group has a particular name. These particular

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names refer to rites, religious in character, which are under the special charge of the group. Some of these names are tropes, and all are more or less metaphorical.

The question arises, Which of the terms — "clan," "sept," or "gens" — can be best applied to the to*n*-wa*n*′-g*th*o*n*,[1] or village, of the Omaha tribe? The to*n*-wa*n*′-g*th*o*n* is a band of kindred who trace their descent through one parent only, — the father; but they are not ruled, nor do they appear ever to have been ruled, by an hereditary chieftain. They are not, therefore, strictly speaking, a clan. The term "clan" bearing the significance suggested by Major Powell does not apply to them, as they acknowledge only paternal descent. Clan must therefore be ruled out as applicable to the Omaha to*n*-wa*n*′-g*th*o*n*. Nor will sept do; for the people do not claim descent from a common ancestor, nor are they under the rule of an hereditary chief. Gens in some ways comes nearer to the conditions found among the Omaha to*n*-wa*n*′-g*th*o*n;* but, unlike the Roman gens, the Omaha village does not trace its descent from a common ancestor, nor is the group named after any individual. The members of the group, however, practise a common religious rite, and trace their descent through the father only. Because of these two points of resemblance, and following the suggestion made by the late director of the Bureau of American Ethnology, the term "gens" has been applied to the Omaha to*n*-wa*n*′-g*th*o*n*, with the restriction that the resemblance to the Roman gens ceases with the two points of resemblance mentioned above. In this restricted sense the term "gens" is used in this paper.

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1 All vowels have the continental sound; italicized n is nasal, like *en* in French; italicized th has a lisping sound of th.

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The Omaha tribe is divided into two parts: five gentes belong to each part. This division of the tribe into two parts is common to all the cognates, except the Ponka. The Ponka tribe did not separate from the Omaha tribe until some time within the past two or three hundred years. It is said that the Ponka were formerly a gens of the Omaha tribe, and that, when the separation took place, the sub-gentes of the Ponka gens became the gentes of the Ponka tribe. This statement, however, is not definitely known. The Omaha speak of the Ponka as an "orphan," because of the fragmentary condition of their organization and tribal ceremonies. Looking at the Ponka tribe, after a study of the Omaha, one can detect the outlines of the organization, so clearly defined in the latter tribe, reflected in the former, as though seen in a shattered mirror.

The Omaha camped in a circle, as did the other cognates, when they camped in a ceremonial order. This method of camping as well as the circle thus formed was called *Hu'-thu-ga*, — a name common to some of the cognates. Its opening was toward the east. Only when on the annual tribal hunt did the Omaha tribe camp in this manner. When the people were at home in their village, this order was not maintained. When the tribal rites took place, the Hu'-thu-ga was always actually oriented: at other times the opening was in the direction toward which the people were moving — but the opening was always *symbolically* toward the east. This was effected by turning the tribal circle as on a hinge placed at the side opposite the opening, so that, if the opening chanced to be to the west, when one entered the circle, he would find the five gentes whose place was on the north half of the circle when the opening faced the east still on the north, just

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as if the opening was actually at the east. This interesting fact shows how fixed in the minds of the people was the order of the oriented Hu′-thu-ga, so that, when pitching their tents on the wide prairie, the order of the Hu′-thu-ga was always as though the east was before the opening in the line of tents.

Such persistence in an order must take its rise from some equally persistent ideas — ideas that will probably be found to be fundamental to the organization of the tribe. The organization of the Omaha tribe, upon close study, is found to rest upon certain religious ideas which seem to lie at the root of their beliefs and customs. These ideas refer to the conception of how the visible universe came into being, and how it is maintained.

The primary belief of the Omaha, which is shared by all its cognates, seems to be that an invisible, continuous life permeates all things, seen and unseen. One of the primal manifestations of this life is movement: all motion or action, whether of mind or body, is because of this permeating, invisible life. Another is permanency of structure and form, as seen in the physical features of the landscape — mountains, plains, rivers, lakes, etc. Such forms were the outward manifestation of this invisible life and power. But the invisible power had a psychical aspect as well as a physical side. The former was conceived of as similar to the will-power of which man was conscious within himself, and by which he brought things to pass, set things in motion, and determined his own actions. Moreover, because of this mysterious and continuous life which ran through every thing, all things were related to each other and to man, — the seen to the unseen, the dead to the living, a fragment of any thing to its entirety. This union of life, and power to bring to pass, the Omaha called

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"Wa-ko*n*′-da." The word does not denote "a great spirit," and while it is somewhat of a vague entity, yet there is an anthropomorphic coloring to its conception. This is shown in the prayers offered and the appeals made for compassion and help, and in the ethical quality attributed to certain natural phenomena, as well as in the approval by Wa-ko*n*′-da of the practice of certain virtues by man, as truth-telling, justice, faithfulness to friends.

Anthropomorphism was a controlling factor in the Omaha mind which caused him to project human conditions upon nature. He everywhere recognized the operation of male and female forces. The Above was masculine, the Below was feminine: the sky, therefore, was father; the earth, mother. The heavenly bodies partook of sex, — the sun was masculine, the moon feminine; so the day was male, the night female. The union of these two was regarded as necessary in the perpetuation of all living forms. They were not only necessary to the continuance of man's life, but they secured the maintenance of his food-supply. This order or method for the perpetuation of life in all its forms was believed to have been arranged by Wa-ko*n*′-da, and man had to obey it, if he was to live. To keep the belief in this order ever present and alive in the minds of the people, it was symbolized in religious rites, in social usages, and in the tribal organization. Looking at the Omaha tribe in the light of these beliefs and ideas as to their enforcement upon the attention of the people, we find that the two divisions of the tribe represented the dual cosmic forces; one representing the sky-people, the other the earth-people. The north half (turned as when the opening of the Hu′-thu-ga was toward the east) was called the "In-shta′-*th*u*n*-da," a metaphoric

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term which may be roughly translated as "the flashing eye," and which referred to the phenomenon of the lightning. This was the general denomination of the division representing the sky-people. The southern half of the Hu′-thu-ga was called the "Ho*n*′-ga she-nu" ("the Hon-ga people"). Ho*n*-ga means "leader," and is a term that occurs in all the cognates, and refers to the gens, or group of gentes, having charge of the material welfare of the people.

Each of the five gentes which made up the northern half of the Hu′-thu-ga, and also of the five which made up the southern half (always speaking as when the opening is oriented), had its designation, its rites, its place, its set of personal names. These two divisions of the tribe were not phratries; they were not based on ties of blood or a common rite, but on mythic ideas concerning the creation and the means by which life must be continued on the earth. Myths relate that human beings were born of a union between the sky-people and the earth-people; and in accordance with a general belief that the creation of any natural form, or institution, or society, must be ceremonially rehearsed in order to insure its continuance, so the union of the sky-people and the earth-people was conceived to be necessary to the existence of the tribe, and we find this idea fundamental to its structure.

There was a teaching or explanation preserved among the old men of the tribe, which said that the division of the tribe into the In-shta′-*th*u*n*-da and Ho*n*′-ga she-nu was for marital purposes, — an explanation which bears out the mythic symbolism of these two divisions.

It is possible that this symbolic arrangement may throw light on the force which made possible the artificial practice of

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exogamy; and in this connection it is an interesting fact, that, of the marriages in existence twenty-five years ago, a good majority represented a union between members of gentes belonging to the two divisions rather than between members of gentes which belonged to but one of the divisions. Amid all the changes that have taken place involving the loss of ceremonies and rites, exogamy is the one ancient custom that is still faithfully observed in the tribe.

In the government of the tribe, two tribal pipes were used, representing the dual forces denoted in the two divisions. There were also two principal chiefs within the governing Council of Seven, who also represented the dual character of the tribe.

Each gens in the tribe had its rite or rites, of which it was the special custodian; and the keeper or priest belonged to the gens having the rite in charge. In these different rites there was always some symbol — generally an animal form — which occupied a prominent place, and stood for the leading idea in the rite. This animal, as the symbol of the rite, became taboo to those who practised the rite. Some part of the animal that was a symbol in the rite of a gens might not be touched or eaten by members of the gens, as the animal because of its symbolism was held sacred. All these rites were spoken of as *Ni′-ki-e*, a composite word made up of *ni′-ki* (from *ni′-ka-shi-ga*, "people") and *i′-e* ("words" or "speech"). From the same word *ni′-ka-shi-ga* is derived the word *ni′-ka-ga-hi* ("chief"), *ni-ka*, part of the word, meaning "people," *ga′hi* "thrown upon"; the word meaning literally, "he upon whom the people are thrown, or who carries the people." *Ni′-ki-e*, therefore, signifies the words or

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utterances of the people, or of the chief, who is the voice of the people.

Sometimes, when a person was asked by a stranger who was not familiar with the names of the gentes, to what gens he belonged, he would reply by mentioning the symbol of the religious rite of his gens, the taboo. So, he might say, "I am a buffalo person" or an "elk person"; but in no case would the reply be understood as meaning that the man thought of himself as a buffalo or an elk, or as descended from one. It would be recognized that to his gens that animal was a symbol in the rite which was in charge of the man's gens. Each gens had its set of Ni′-ki-e names, all of which referred to the Ni′-ki-e rite of the gens. These names were bestowed upon the child after it was able to walk alone freely and steadily, and in a ceremony in which the cosmic forces were recognized. The ceremony during which the child received its gentile name was practically the same in all the cognates. The Omaha ritual has been secured in nearly complete form, and presents many interesting and suggestive phases of Omaha beliefs — phases which throw light on the fundamental ideas of the tribal organization. After the child had been given its Ni′-ki-e name, his hair was cut to symbolize the animal form which was the peculiar symbol in the religious rites of his gens.

An interesting problem as yet unsolved is to ascertain the psychical relation between the animals which form so dramatic a part of the rites of the gentes, — which furnish the taboos, are referred to in the personal names, are typified in the cut of the children's hair, — and the ethical teachings and religious consolation received by the people in the practice of these rites.

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That an ethical stimulus and a religious sustaining force exist for the Omaha and cognate tribes in the ceremonies in which these animals bear so important a part, cannot be questioned; but *how* these ceremonies and animals appeal to man, how it comes about that they *can* so appeal, is a problem which will one day be solved, and its solution will help to unravel many difficult questions touching the religions of mankind.

The reason why the Omaha and cognate tribes camped in a circle has been stated to be in order to have a safe place into which to drive their ponies at night, and that this arrangement enabled the people to defend themselves better against enemies than any other form of camping; but the Hu′-thu-ga was something more than a mere camp arranged for the safety of ponies. It was an order that probably antedated the possession of the horse. It was an order which permitted each gens to have its place in relation to its rites, — rites which had a share in promoting the tribal welfare. All the rites of the gentes on the north side had to do with the creative forces and with the securing of supernatural aid. These rites enforced the belief that the life and death of each person were in the keeping of a power greater than man, — a power that could punish an offender, — the only power that could give authority to the words and acts of the governing Council of Seven. Such were the rites and duties belonging to the division which represented the sky-people.

The rites and duties belonging to the opposite side, the earth-people, all had a direct relation to the physical welfare of the tribe. These rites pertained to the warrior as the protector of the tribe, to the hunter as the provider for the family, and to the maintenance of social order. The control of war, the quest

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of food, and the direction of the governing council, were all vested in the gentes which made up the south side of the Hu′-thu-ga.

The duality of the tribe was also represented in the only form by which an orator could address the tribe. He could not say, "Ho! Omaha!" but must say, "Ho! I*n*-shta′-*thun*-da, Ho*n*′-ga-she-nu, ti-a-g*thon* ka ho*n*!" I*n*-shta′-*thun*-da and Ho*n*′-ga-she-nu were the names of the two divisions of the Hu′-thu-ga; ti-a-g*thon* ka ho*n* means "both sides of the house." This form of address emphasizes the meaning of the term Hu′-thu-ga as given by the old men, who said that "the word carried the idea of a dwelling." An old Omaha, speaking of the opening of the Hu′-thu-ga at the east, said: "It represents the door of a dwelling. Through it the people go forth in quest of game, and through it they return with their supply of food, even as one enters the door of one's own home. The warriors pass hence to defend the tribe from its foes, and here they are welcomed when they come back victorious."

The Hu′-thu-ga, regarded as the dwelling of the entire tribe, presented the type that was to be reproduced in the dwelling of each member of the tribe, wherein were to be united the masculine and feminine forces, drawn from two distinct groups or regions, as symbolized in the Hu′-thu-ga by the union of the earth and sky people. The regulation of mating by exogamy seems to have been demanded in order to typify what was believed to be a cosmic regulation. By this splitting of the family, it became possible to interweave the split parts so as to bind together the different gentes composing the tribe by a natural tie of kinship. This natural tie of kinship that bound

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together the gentes of the Omaha tribe came through the mother in the tribe. Descent in the gens was traced only through the father: the father held the gens together, distinct from every other gens. Through the father, the child inherited his name, his place, his share in the rites of his gens; but it was through his mother that his kinship was extended beyond his birth gens, and he thus became conscious of being a part of a great kinship community.

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THE DATES AND NUMBERS OF PAGES 24 AND 46 TO 50 OF THE DRESDEN CODEX

BY

CHARLES P. BOWDITCH

IN order to discuss this subject intelligently, I shall be obliged to repeat some of the elementary facts of Maya study, assuming however that the reader is acquainted with the Dresden Codex and with the works of Förstemann, Seler, and others.

The very close connection which exists between page 24 and pages 46-50, and which will appear from what follows, is strong evidence that there never was a break in the Dresden Codex. Dr Förstemann, however, believed that there was such a break when he wrote in 1880 [1] and in 1886,[2] and he apparently still held this belief in 1901, if I understand him rightly,[3] although he then discarded the idea of the two parts being independent manuscripts.

The chief reasons which Dr Förstemann advanced for his opinion that the two parts of the Codex were never joined together, are

1. That there was a separation between them when Aglio, who copied the Codex for Lord Kingsborough's work, undertook his task.

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1 *Die Mayahandschrift der Königlichen öffentlichen Bibliothek zu Dresden*, pp. 4 and 5, Leipzig, 1880.

2 *Erläuterungen zur Mayahandschrift der Königlichen öffentlichen Bibliothek zu Dresden*, p. 1, Dresden, 1886.

3 *Commentar zur Mayahandschrift der Königlichen öffentlichen Bibliothek zu Dresden*, p. 47, Dresden, 1901.

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2. That the two parts of the Codex treat of different subjects and that their pages are differently divided.

I do not think that these reasons are sufficient, since also pages 1-2 (and their reverses 44-45) were separated from the rest of the first part, either being torn apart intentionally or being separated by wear, and they were actually placed in a wrong position in the first edition of the reproduction of the Codex: and yet there is no question that these pages belong in the places now assigned to them. It is therefore very possible that the separation of the parts of the Codex between pages 24 and 46 was caused in the same way. Indeed, Dr Förstemann suggests this possibility, and even that Aglio tore them apart so as to work more easily with the pages. Moreover pages 24 and 46-50 treat, not of different subjects, but of identically the same subject (as shown by Dr Förstemann himself) and therefore Dr Förstemann's second reason does not apply to them. And, more than this, if the pages should be separated on account of different subjects or of different spacing of the leaves, then a division should take place between pages 23 and 24; but this is absolutely impossible, as the reverses, or pages 25-26, are devoted to the very same subject — the new year ceremonies.

It is very probable that the two parts of the Codex should never have been separated and that pages 1-24 are followed by pages 46-60, and that then the opposite side is to be read, running from 61-74, followed by 25-45. But as many articles have been written upon the Codex with its present numbering, it would be wise not to make any change, but merely to remember that the manuscript was originally in all probability in one piece.

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Taking up pages 46-50, we find, as has been very clearly shown by Dr Förstemann, that on each page a period of 1.11.4. (584) days is shown — the time that elapses in a synodical revolution of Venus [1] (the exact time being 583.92 days). On the five pages, therefore, five such revolutions are shown, equal to 8.2.0. (2920 days, or 8 years of 1.0.5. (365) days each). This period is shown in the black line of numbers running through the centres of the pages, each black number being equal to the sum of the preceding black number and the red number found beneath this sum at the bottom of the page. These red numbers at the bottom of the page are always the same on all five pages; namely, 11.16. (236), 4.10. (90), 12.10. (250), and 8. These numbers divide the revolution into four parts, the longer two of which have been supposed to represent the periods when the planet is visible, and the shorter two the periods of invisibility at the superior and inferior conjunction respectively.

The upper thirteen rows are filled with day signs, each sign in each row being distant from the preceding sign by the number of days recorded in the red numbers at the bottom of the page and below the day reckoned to.[2] When the end of the row is reached on page 50, the day in the first place on the next row on page 46 is distant from the last day in the preceding row by the number of the days given in the red number at the left-hand lower corner of page 46. And this is also true when we reach

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[1] As the synodical revolutions of Venus are the only revolutions of Venus treated of in this article, I shall not hereafter repeat the word "synodical", in speaking of them.

[2] The words "distant from" or "distance from" are used to denote the number of days from one day to another, not counting the day reckoned from, but counting the day reckoned to; thus the "distance from" 1 Kan to 6 Muluc is 5 days. While "interval" between two days means that neither day is counted; thus the "interval" between these two days is 4.

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the end of the whole series, for the first day of the first row on page 46 (though obliterated) can be proved by counting backward to be 3 Cib, which is distant from the last day I Ahau of the thirteenth row on page 50 by the red number 236 found in the left-hand lower corner of page 46. Thus the series reenters into itself.

If then the five pages, reading from left to right, show a period of five Venus revolutions, or 8 years, reading across one row of day signs, the whole thirteen rows show $13 \times 5 = 65$ Venus revolutions of 584 days, or 104 years of 365 days.

The calculations up to this point are exact, but one or two apparent errors occur in the month days, of which I shall now speak.

On the line immediately below the day signs is a row of month signs, each accompanied by its number. The first of these on page 46 is the month Yaxkin, and the number, which is erased, can be found to have been 4, if the rule is followed here which is followed in 57 out of 60 of the other month dates. Starting then with 4 Yaxkin, each month date is distant from the preceding month date by the red number which is found at the bottom of the page under the date reckoned to. And the first day of the month series, 4 Yaxkin, is distant from the last day of the same series, 13 Mac, by 11.16. (236) the first number in red at the bottom of page 46; that is, the month series reenters into itself as the rows of day signs run into each other, making the whole day and month series a continuous one.

Immediately below the black numbers in the centres of the pages is a second row of month signs, each accompanied by its number. The first four dates are 8 Zac, 18 Muan, 4 Yax, 12

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Yax, the black numbers being very clear. The red numbers are 11.16., 4.10., 12.10., and 8, as has already been said. Now, 8 Zac + 4.10. = 18 Muan; but 18 Muan + 12.10. = 3 Yax, and not 4 Yax; whereas 4 Yax + 8. = 12 Yax. There is evidently some error here, and we find that the last date of this row on page 50 is clearly 18 Kayab. If this row re-enters into itself, the first date would be 9 Zac, since 18 Kayab + 11.16. = 9 Zac, and 9 Zac + 4.10. = 19 Muan. If then we read 9 Zac and 19 Muan instead of 8 Zac and 18 Muan, the whole row runs on regularly, as did the last one. It is very dangerous to assume that mistakes have been made in the Codex, but this seems to be a case where the scribe was in error. Still it is not impossible that the change from 9 Zac to 8 Zac and from 19 Muan to 18 Muan was made intentionally. If this is so, however, it is hard to say why all the dates following the second should be given as if no such change had taken place. It can hardly be for the purpose of calling attention to intercalary days, since two days, and not one, are needed in a period of eight years.

Immediately over the red numbers at the bottom of each page is a third row of month dates, each with its number attached. Each of these dates is distant from the preceding one by a number of days equal to the red number at the bottom of the page below the date reckoned to, and the series re-enters into itself as did the first series. The first date on page 50 should be 0 Yax or 20 Xul, according as the months begin with 0 or 1; but as this date has been treated of by me in a pamphlet entitled *Was the Beginning Day of the Maya Month Numbered Zero (or Twenty) or One?* I shall not dwell on it here.

Practically then, we have here in the lower red numbers,

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certain numbers which added together give 1.11.4. (584) on each of the five pages and each number marks the distance,

1. From one day sign in each of the first thirteen rows to the next one in the same row.

2. From one month date in each of the three rows of month dates to the next one in the same row.

3. From one black number in the centres of the pages to the next black number.

We have here in the centres of the pages a series of black numbers, which tell the distance of each column of day signs or month dates from the beginning, and reach at the end of page 50 the period of 8.2.0. or 2920 days, equal to 5 Venus revolutions or 8 years of 365 days each. We have 13 rows of day signs which form a single series and which carry forward the previous series of black numbers thirteen times, thus recording 65 Venus revolutions or 104 years. We have 3 rows of month dates, each containing a series of dates re-entering into itself, which are to be used in turn with each row of day signs above them.

But there is apparently no direct connection stated on pages 46 to 50 between the different rows of month dates. We find that the dates reckoned from (and therefore the last date of each on page 50, as each row re-enters into itself) are as follows:

1st row, 1 Ahau 13 Mac ⑭ [1]

2d row, 1 Ahau 18 Kayab ①

3d row, 1 Ahau 3 Xul ㉘

while the first days of each series are the days following these, or

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[1] The numbers surrounded by a circle, which follow a date, show the number of the year as given in the Archaic Annual Calendar of J. T. Goodman.

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1st row, 2 Ymix 14 Mac ㉞
2d row, 2 Ymix 19 Kayab ①
3d row, 2 Ymix 4 Xul ㉘
It will now be necessary to consider page 24.

In Table I, I give a reproduction in print of the numerical part of page 24. The page is in general very clear, the chief exceptions being at the top and in the two lower corners. The order of reading the numerals is from the right lower corner to the left, for four terms, then for four terms from right to left on the next row above, and in the same manner on the third row from the bottom. The term G 5 is 8.2.0., 9 Ahau. This is the same number as the last black number in the centre of page 50. The day from which 8.2.0. is counted must be 1 Ahau, and the first day of the series must be 2 Ymix. But 8.2.0.= 2920 days = 8 years of 365 days = 5 Venus revolutions of 584 days, exactly the term set out in detail on pages 46-50, and 9 Ahau is the day sign we find by calculation to be the last day sign of the first row of page 50. The second term, F 5, is 16.4.0., 4 Ahau, which is distant from the first term by the number 8.2.0., and which is the last day sign of the second row of page 50. This difference appears also between the 2d and 3d terms, the 5th and 6th, the 6th and 7th, the 7th and 8th, the 8th and 9th, the 9th and 10th, the 10th and 11th, and the 11th and 12th. In fact the only place in rows 3, 4, and 5, where this difference does not occur is between the 3d and 4th, and between the 4th and 5th terms; and here the distance between the 3d and 5th (that is the space of two normal terms) is twice 8.2.0. The 4th term as given is 7.17.0. from the 3rd, and the 5th is 8.5.0. from the 4th.

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TABLE I

	A	B	C	D	E	F	G
				[1]			
				[1]	[15]	[10]	[5] [1]
				1	[16]	[10]	[5]
1					6	16	8
				14	0	0	0
				0			
				1 Ahau	1 Ahau	1 Ahau	1 Ahau
				1	9	4	1
				5			
2					11	12	5
				14			
				4	7	8	5
				0	0	0	0
				1 Ahau	1 Ahau	1 Ahau	1 Ahau
				4	4	4	3
3				17	9	1	13
				6	4	2	0
				0	0	0	0
				6 Ahau	11 Ahau	3 Ahau	8 Ahau
			9	9			
				3	2	2	2
4			9	9	4	16	8	0
			16	9	16	14	12	10
					0	0	0	0
		6					
		2	0	16	13 Ahau	5 Ahau	10 Ahau	2 Ahau
					1	1		
5							16	8
		0	0	0	12	4		
					5	6	4	2
	4 Ahau		1 Ahau	1 Ahau	0	0	0	0
	8 Cumhu		18 Kayab	18 Uo	7 Ahau	12 Ahau	4 Ahau	8 Ahau [2]

[1] The numbers in brackets are erased by wearing or by injury.

[2] This date appears to be 8 Ahau, but there is a faint outline of a fourth dot above the other three dots.

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If, however, the 4th term were 1.12.8.0. instead of 1.12.5.0., the differences would be the normal sum between the 3d and 4th, and 4th and 5th terms. Three dots over the —— of the uinal number would bring everything into harmony. Although I am not in favor of assuming error on the part of the Maya author, this seems to be a case where it would be safe to make the change from —— to ⁘ especially as there is ample space for the insertion of these dots. And this view is upheld by reference to the day signs beneath the numbers. These day signs are regularly 2920 days apart. As 2920 is exactly divisible by 20 (the number of days in a month or uinal), Ahau, the day counted from, reappears in each case. And as 2920 divided by 13 gives a remainder of 8, each day number is 8 in advance of the preceding day number. Thus 9+8=17. Strike out 13 and we have 4 as the day number of the 2d term, F 5. So also 4+8=12, the day number of the 3d term; and 12+8=20−13=7, the day number of the 4th term; while 7+8=15−13=2, the day number of the 5th term, and so on through the 12th term in D 3. Notice also that these days reappear in the last columns of days on page 50 as we should expect them to. Thus, though the numerical part of the 4th term does not have the proper difference from the preceding and succeeding terms, yet the day and its number have this difference. The numerical part of the 4th term does not agree with its day and its number, and one or the other must be wrong. In fact 1.12.5.0. (the number given) counted from the original date of 1 Ahau would give 12 Ahau, while 1.12.8.0. (which would be 8.2.0. from term 3) would give 7 Ahau, the day number found in D 5. This then would seem to be a proper correction to make.

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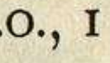
Row 2 has apparently no connection with the difference of 2920 and I omit all discussion of this row for the present.

Parts of all the numbers of Row 1 are erased, but Dr Förstemann has, without much doubt, given the true numbers.

In all the terms of Row 1 we find that the day sign is 1 Ahau, and this shows that the numbers of these terms must all be multiples of 260 from the first date reckoned from, which is also 1 Ahau. The last (left hand) term of Row 3 is 4.17.6.0. = 12 times 8.2.0. and has the day sign 6 Ahau below it. If then the same difference of 8.2.0. is used between the last term of Row 3 and the first term of Row 1, the latter would be 13 times 8.2.0. or 5.5.8.0., 1 Ahau. We actually find  which, to be symmetrical, must be 8, then a 0 and then a 1, the two upper numbers and the Ahau being erased.

Now it is common to find in the long series of numbers, on other pages, that in the first part of the series one term differs from another by a small difference; this is carried on until a higher term is reached, when the higher term is used as a difference and so on. Thus on page 59, 3.18. (78) is used as a difference until 10 × 78 or 2.3.0. (780) is reached, when 780 is used as a difference. On pages 71-73, 3.5. (65) is used as a difference, until 28×65, or 5.1.0. (1820) is reached, when this number is used as a difference in the continuation of the series.

If then 13 times 8.2.0. or 5.5.8.0. were used as a difference after this sum is reached, we should have for the three following terms: 10.10.16.0.; 15.16.6.0. and 1.1.1.14.0. Now we find actually in Row 1: 16.0., 6.0. and 1.14.0. as the lower terms of these numbers, and it is therefore probable that the series is continued as given on Table I.

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The number 5.5.8.0., found in G 1 and used as a difference in reaching F 1, E 1 and D 1, is the high number reached on pages 46-50. It is 13 × 2920 = 37,960 = 104 years = 65 Venus revolutions = 2 calendar rounds of 52 years each; and the highest number 1.1.1.14.0. is four times as great and = 260 Venus revolutions = 416 years = 151,840 days.

There are also month and day dates given on page 24. They are 4 Ahau 8 Cumhu, ⑦ 1 Ahau 18 Kayab, ① 1 Ahau 18 Uo ㊶. Of these the first two alone are recorded by the long count. Which date, if either, can fairly be considered as the present time, referring of course to the time at which the original Codex was written and the calculations made?

In the lower part of Column B we find 9.9.16.0.0., which counted forward from 4 Ahau 8 Cumhu ⑦ — the date far in the past and the zero point of the great majority of dates in the inscriptions and codices,— gives again the date 4 Ahau 8 Cumhu ⑦, found in Column A. In Column C is the long number 9.9.9.16.0. and this counted forward as above gives I Ahau 18 Kayab ①, found in Column B. The date in Column C, 1 Ahau 18 Uo ㊶,[1] has no long number attached to it and on this account I think cannot be considered as the present. Neither can 4 Ahau 8 Cumhu ⑦ be so considered, for I think this date, with its long number, was inserted here merely to show how near the then present time 1 Ahau 18 Kayab ① was to the end of the great period which is reached with another 4 Ahau 8 Cumhu ⑦,

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[1] Dr Förstemann changes this date to 1 Ahau 18 Zip, and on this change founds a great deal of his discussion of this page. This change is an error, for, as will be seen, no number given on this page leads to 1 Ahau 18 Zip; but two numbers lead to 1 Ahau 18 Uo.

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at the end of 9.9.16.0.0. = 1,366,560 days = 12 × 312 years of 365 days each = 2340 Venus revolutions = 72 calendar rounds. This great period is composed of many other interesting factors.[1] The number of days from 1 Ahau 18 Kayab ① before this great period point is reached is shown in Column A, in the number 6.2.0. This number added to 9.9.9.16.0. gives 9.9.16.0.0., found in Column B.

My opinion is that the date 9.9.9.16.0., 1 Ahau 18 Kayab ① is the present with reference to the time of writing the Codex, and is the date from which the whole calculation starts. This opinion is supported by

1. The fact that 1 Ahau 18 Kayab ① is the date from

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[1] It may be well to show here how division may be performed through subtraction by the use of Maya tables such as we find on page 24. Let the question be to find how many Venus revolutions of 1.11.4. (584) days are contained in 9.14.15.6.0.

It has been seen that the long number 9.9.16.0.0. equals 12 times 312 solar years. As in the Maya system the solar is five-eighths as long as the Venus revolution, there will be five-eighths as many Venus revolutions as there are solar revolutions in a given number of days. There will be, then, in

9. 9.16.0.0.	2340 Venus rev'ns.

Subtracting this from the first number, there remains 4.19.6.0.
Now look over the table of page 24 and find the next smaller number to this remainder. This is found in D3, viz: 4.17.6.0., which contains 12×5 Venus revolutions, since each term represents five Venus revolutions, and 4.17.6.0. is the twelfth term. Subtracting this number from the former remainder

4.17.6.0.	60 Venus rev'ns.

there remains 2.0.0.
The last remainder contains one revolution. Deducting therefore

1.11.4.	1 Venus rev'n.

there is left 7.16.
or 156 days. Thus the answer to the original question is 2340+60+1=2401 Venus revolutions and 156 days.

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which the second row of month dates on pages 46-50 is reckoned and the date with which the row ends. It is also the only date given on page 24, which begins one of the month rows on pages 46-50.

2. The fact that 18 Kayab coincides with our June 19, if Landa is right in saying that the beginning of the Maya year coincided with July 16. Now, June 19 is almost exactly the summer solstice, and is a very natural date with which to begin an astronomical calculation.

3. The fact that the numbers in Row 2 of page 24, except that of G 2, have a meaning when calculated from 1 Ahau 18 Kayab ①, but have none, so far as I can see, if calculated from any other date.

4. The row of month dates on pages 46-50, which counts from the date, is given in immediate proximity to the black numbers which enumerate the number of days which have passed from the beginning of the calculation.

5. The glyphs which, in Dr Förstemann's opinion, represent the gods presiding over each division of the Venus revolution, are placed, one set above and one set below the row of month dates which have 1 Ahau 18 Kayab ① as their starting point.

We will then start with 1 Ahau 18 Kayab ①, and take up the discussion of Row 2. In E 2 we find the number 9.11.7.0. (68,900). This is equal to three calendar rounds plus 11,960, the latter being the number to which the long series on pages 51-58 leads up. Counting forward 9.11.7.0. from 9.9.9.16.0., 1 Ahau 18 Kayab ①, we reach 9.19.1.5.0., 1 Ahau 13 Mac ㉞, the very date from which the first row of month dates on pages 46-50

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is reckoned and with which it ends. This begins to show a connection between these rows of month dates which was not apparent before. In the Temple of the Foliated Cross at Palenque we find an Initial Series of 1.18.5.4.0., 1 Ahau 13 Mac ㉞, — a date 61 calendar rounds before our date as calculated here.

In F 2 we find 4.12.8.0. = 33,280. Counting forward this number from 9.9.9.16.0., 1 Ahau 18 Kayab ①, we reach 9.14.2.6.0., 1 Ahau 18 Uo ㊶, which we found at the foot of Column C without any long number. If we count forward again this same number 4.12.8.0 we reach 9.18.14.14.0., 1 Ahau 3 Xul ㉘, a date from which the third row of month dates on pages 46-50 is reckoned and with which it ends.

On D 2 we find 1.5.14.4.0. = 185,120 days. This also equals the sum of the two numbers found on D 1 and F 2; thus, 1.1.1.14.0. + 4.12.8.0. = 1.5.14.4.0. Counting forward this number from 9.9.9.16.0., 1 Ahau 18 Kayab ①, we reach 10.15.4.2.0., 1 Ahau 18 Uo ㊶, and again counting forward the same number, we reach 12.0.18.6.0., 1 Ahau 3 Xul ㉘,as before. As the numbers in D 2 and F 2 both count forward to the same date (as they must do since 1.5.14.4.0.=8 calendar rounds+4.12.8.0.), the date 1 Ahau 3 Xul ㉘, can be reached by counting forward from 1 Ahau 18 Kayab ① to 1 Ahau 18 Uo㊶ with either of these numbers, and counting forward again from 1 Ahau 18 Uo ㊶ with the other. This would give a possible value to 1 Ahau 3 Xul ㉘ of 10.19.16.10.0.

I am inclined therefore to place the dates in the following order in the long count:

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									(Possible dates)
4 Ahau	8 Cumhu	(7)							
	(date far in the past)			13.	0.	0.	0.	0.	
1 "	18 Kayab	(1)	Column B	9.	9.	9.	16.	0.	
4 "	8 Cumhu	(7)	" A	9.	9.	16.	0.	0.	
1 "	18 Uo	(41)	" C	9.	14.	2.	6.	0.	(10. 15. 4. 2. 0.)
1 "	3 Xul	(28)		9.	18.	14.	14.	0.	(10. 19. 16. 10. 0.)
									(12. 0. 18. 6. 0.)
1 "	13 Mac	(34)		9.	19.	1.	5.	0.	

It is impossible to say at present what the meaning is of the number 1.5.5.0., found in G 2; but there are several striking coincidences connected with it. This number is equal to 9100 days, or five times the well-known period of 5.1.0. (1820) days. This is 25 periods of 364 days or 25 days less than 25 years. It is also a coincidence that 25 is the number of intercalary days required after the passage of 104 years, (a period which is given in G 1, as 5.5.8.0., immediately over 1.5.5.0.) in order to bring the seasons and calendar into harmony. If this were done by calculation without the actual insertion of the intercalary days, one method of accomplishing it would be by counting back the necessary number of days and finding the month day reached thereby. Thus if, at the end of 104 years when the date 1 Ahau 18 Kayab (1) was reached, the priests wished to know what needed to be done in order to bring the calendar into harmony with the seasons, they would see that by counting back 25 days from 18 Kayab and reaching 13 Pax, and then counting forward again to 18 Kayab, the day 18 Kayab would again coincide with the summer solstice. Now, as a matter of fact, this day 13 Pax would be reached by counting forward 1.5.5.0. from 18 Kayab. This is necessarily so, since the sum of 1.5.5.0. and 1.5.

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(25) equals 1.5.6.5., or 25 years of 365 days each. Surely it is a striking coincidence that, where the number recording 104 years is given, there is found directly below it a number which, on being counted forward, brings the month day to which it would be necessary to count back in order to insert the 25 intercalary days needed to bring the calendar and seasons into unison. This correction could be calculated at the end of each 104 years.

The same result would also follow if we consider the 104 years as ending with the other dates found as the starting and ending points of the other rows of month dates; namely, 1 Ahau 13 Mac ㉞ and 1 Ahau 3 Xul ㉘. The date 13 Mac would represent March 26, within five days of the vernal equinox, if Bishop Landa is correct in his statement that the Maya year began on July 16.

Another interesting coincidence is the following.

We have found on page 24 the date 1 Ahau 18 Kayab ① stated as	9. 9. 9.16.0.
and again on page 46 the same date is the point from which the second row of month days, which ends with 1 Ahau 18 Kayab ① on page 50, takes its start. By counting forward the distance which is probably recorded on page 24, D 1	1. 1. 1.14.0.
the day reached is 1 Ahau 18 Kayab	10.10.11.12.0.
If, now, the additional number of days recorded in G 2	1. 5. 5.0.
is counted forward, there is reached the month day 13 Pax	10.11.16.17.0.

In this long period within 108 days of 2612 Venus revolutions

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have passed, calculating 584 days to a revolution. But the true length of a Venus revolution is not 584 days but 583 $\frac{822}{1000}$ days; so that there is an error of $\frac{8}{100}$ of a day in each revolution. The Mayas however did not use decimals, and, if they corrected their calculation of the Venus revolutions, as I think they did, it would probably have been accomplished by calculating an error of two days in 25 revolutions, this bringing the same result as if an error of $\frac{8}{100}$ of a day had been reckoned in each revolution. In 2612 revolutions there are 104 times 25 revolutions and 12 revolutions over. The error in 2612 revolutions would then be twice 104, or 208 days, to which another day could be added for the extra 12 revolutions, making an error of 209 days in all. That is, on reaching 13 Pax, it would be found that the position, which by calculation Venus should have then reached, had actually been reached 209 days before, or on 4 Xul, this month day also being the first day of the third row of month days on pages 46-50. This is true however of the month day only, since the day reached would be 13 Cib 4 Xul, and not 4 Ymix 4 Xul. This discrepancy may however be accounted for on the supposition that the priests, in calculating the error of the Venus revolutions, were only anxious to discover the true position in the year and not in the calendar round.

Still another coincidence is connected with 1.5.5.0. Page 24, D 2, gives the number 1.5.14.4.0., equal to 185,120 days, or 317 Venus revolutions less 8 days. The error here would be 24 days for the 300 revolutions, and, approximately, 1 day for the other 17 revolutions, making 25 days in all. The position of Venus which had been calculated as occurring at the end of 1.5.14.4.0.

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days, had actually been reached 25 days earlier, and the same month day is reached by counting forward 1.5.5.0. days (the number in G 2) as by counting back 25 days.

The only explanation, then, which I have to offer for this number 1.5.5.0., and I offer it with a great deal of doubt, consists of three parts:

1. The writer wished to show that, by counting forward 25 times 364 days, he reached the same month date as if he had counted back 25 days; and that he selected the number 25 as a multiple of 364, simply because it was the number of intercalary days needed in 5.5.8.0., (the number directly above 1.5.5.0.), and because one method of intercalating these days would be to go back and count them over again — practically the same method adopted in the case of the Roman bissextile.

2. The writer wished to show that, on passing over the number of days set down in D 2, 1.5.14.4.0., the error in the observed point of the revolution of Venus was corrected by counting back 25 days.

3. He further wished to show that on reaching 13 Pax, 10.11.16.17.0., (reckoning with the second row of month days on pages 46-50 which start from the date 1 Ahau 18 Kayab ⓵), the error in the calculation of the Venus revolutions was such that the correction of the error brought back the count to 4 Xul, the first month day of the third row of month days on these pages.

Taking up the rows of glyphs which lie between the rows of month dates, we find none on page 46 which have numbers connected with them. But the following are found on the other pages:

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Page 47,	above	the	black	numbers,	Column 3	Figure 1
	"	"	"	"	" 4	4 katuns
	below	"	"	"	" 4	Figure 2
48,	"	"	"	"	" 1	4 katuns or 4 Zac
	above	"	"	"	" 2	Figure 3
	below	"	"	"	" 3	" 4
49,	above	"	"	"	" 4	" 5
50,	below	"	"	"	" 1	" 6
	above	"	"	"	" 3	" 7
	below	"	"	"	" 4	" 8



Fig. 1



Fig. 2



Fig. 3



Fig. 4

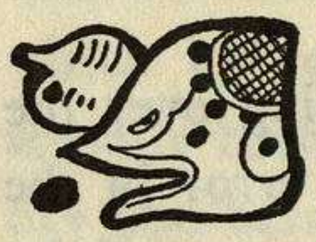

Fig. 5

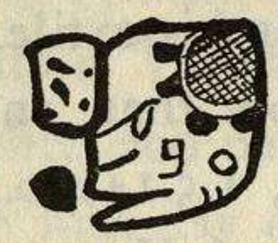

Fig. 6

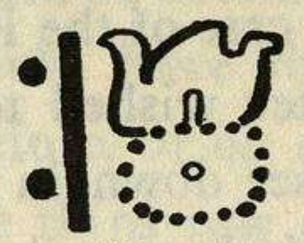

Fig. 7

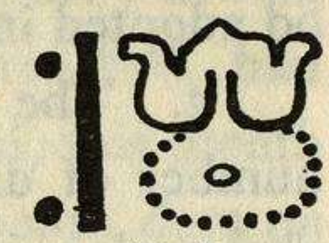

Fig. 8

It would seem as if these glyphs might have a numerical or calendrical meaning. They form part of two rows of glyphs — one of which is the second row above, and the other is the second or third row below, the rows of black numbers in the centres of the pages. In most cases, if a glyph appears in the first, second, third, or fourth column of the upper of the two rows, the same glyph also appears in the next following column of the lower row. Thus figure 5 appears in the fourth column of page 49, and figure 6 in the first column of page 50, and these glyphs are nearly identical. Also figure 1 appears in the third column of the upper row of page 47, and figure 2 in the fourth column of the lower row of the same page. The lower parts of figures

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1 and 2 are not exactly alike, but the upper parts and the numbers attached to the glyphs are alike.

Taking up figures 1 and 2, we find that the number of days, counted through Columns 3 and 4 of page 47, are as follows, according to the number of the rows of day signs on the top of pages 46-50 (each of which rows equals 8.2.0.), which we have counted. The numbers reached, counting from the beginning, are

	COLUMN 3				COLUMN 4			
1.		3.	4.	0.= 1,160		3.	4.	8.= 1,168
2.		11.	6.	0.= 4,080		11.	6.	8.= 4,088
3.		19.	8.	0.= 7,000		19.	8.	8.= 7,008
4.	1.	7.	10.	0.= 9,920	1.	7.	10.	8.= 9,928
5.	1.	15.	12.	0.=12,840	1.	15.	12.	8.=12,848
6.	2.	3.	14.	0.=15,760	2.	3.	14.	8.=15,768
7.	2.	11.	16.	0.=18,680	2.	11.	16.	8.=18,688
8.	3.	0.	0.	0.=21,600 [1]	3.	0.	0.	8.=21,608
9.	3.	8.	2.	0.=24,520	3.	8.	2.	8.=24,528
10.	3.	16.	4.	0.=27,440	3.	16.	4.	8.=27,448
11.	4.	4.	6.	0.=30,360	4.	4.	6.	8.=30,368
12.	4.	12.	8.	0.=33,280	4.	12.	8.	8.=33,288
13.	5.	0.	10.	0.=36,200	5.	0.	10.	8.=36,208

If the glyph 4 katuns in Column 4 means that at this point 4 katuns have passed, it will be seen that there are but two dates in Column 3 in which 4 katuns have been reached; namely, No. 11 (4.4.6.0.=30,360) and No. 12 (4.12.8.0.=33,280) except No. 13, when 5 katuns have been reached and passed. In the same way, in Column 4 these distances are 4.4.6.8. and 4.12.8.8. which equal 30,368 and 33,288 respectively.

[1] It is interesting to note that this is exactly 3 katuns.

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If the glyphs, figures 1 and 2, are confirmatory of the 4 katuns glyph, meaning that the distance reached is 4 katuns or over, and is divisible by 13, as would appear to be the case judging by the number attached to these glyphs, we must take in Column 3, No. 12 = 33,280, which equals 13 × 2560, whereas in Column 4, we must take No. 11 = 30,368 = 13 × 2336. $2560 = 5 \times 2^9$, while $2336 = 4 \times 584$.

As these pages deal with the Venus revolution, it would seem therefore that the latter number is the one to be considered. Here, then, we have a possible statement that at this point 30,368 days have passed, which equals 13 × 4 × 584, or 52 revolutions of Venus. If this be so, the glyph to which the 13 is attached would mean 4 × 584, or 4 revolutions of Venus.

Another possibility of the meaning of this glyph should be considered, namely that the 4 katuns and figures 1 and 2 are not confirmatory of each other, but that the glyph with 13 gives the number of days to be added to 4 katuns to give the distance reached. In this case the numbers denoted by figures 1 and 2 would be, in Column 3, No. 11 (4.6.0. = 1560) and No. 12 (12.8.0. = 4480), and in Column 4, No. 11 (4.6.8. = 1568) and No. 12 (12.8.8 = 4488)

Of these numbers, No. 11 in Column 3 (1560, which equals 13×120) is the only one of the four numbers divisible by 13 without a remainder. The only significance in this is that 120 equals one-third of a tun.

It would seem then that the author may have wished to declare that in Column 4 of page 47, after having passed through the day series of pages 46-50 ten times, and having reached the end of the second page on the eleventh round, 52 revolu-

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tions of Venus had passed. The date reached from 1 Ahau 18 Kayab ① would be 1 Lamat 6 Zip ㉝ ; from 1 Ahau 13 Mac ㉞ would be 1 Lamat 6 Kayab ⑬ and from 1 Ahau 3 Xul ㉘ would be 1 Lamat 16 Chen ⑦, — all of which appear in the rows of month dates.

Taking the dates for 1 Ahau 18 Kayab ①, 1 Ahau 13 Mac ㉞, as we have determined them in the long count, and taking the earliest date for 1 Ahau 3 Xul ㉘, of the three which are possible, we get the dates when the passage of 52 Venus revolutions would have culminated as —

1 Lamat 6 Zip ㉝ = 9.13.14. 4.8.
1 Lamat 6 Kayab ⑬ =10. 3. 5.11.8.
1 Lamat 16 Chen ⑦ =10. 2.19. 2.8.

the latter nearly coinciding with the Initial date found in Chichen Itza, of 10.2.9.1.9.

The number given in No. 12 (4.12.8.0.) is the number found in F 2 of page 24, and is the distance from 1 Ahau 18 Kayab ① to 1 Ahau 18 Uo ㊶, as is shown by 18 Uo appearing in Column 3 of page 47. This number $33{,}280 = 91 \times 365 + 65$ or 13×2560.

The so-called Bacab sign, or a sign like the Bacab sign, appears immediately below (as it does elsewhere) ; and the Bacab sign, in Dr Förstemann's opinion, is associated with the number 91.

Again, on page 48, figure 4 appears next but one glyph below 17 Mac. Here we find that we have reached within 8 days of the end of the 3d, 8th, 13th, etc., revolutions of Venus.

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If we consider that 1 full revolution of 104 years has passed
= 65 Venus revolutions
and two sets of 2920 days (5 Venus revolutions) or of the day signs at the top of the pages = 10 Venus revolutions
and three revolutions for the three pages, = 3 Venus revolutions
——
we have a total of 78 Venus revolutions.

This is a significant number. If the glyph attached to the number 6 refers to the number of revolutions which have passed it would equal 13 Venus revolutions. I have already expressed my suspicion that the Ben-Ik symbol equals 13. If this be true, the lower part of the glyph would equal 1 Venus revolution. But I have thought that figure 2 might equal 4 of such revolutions. The lower parts of figures 2 and 4 are very similar, if not identical; and if this lower part equal 1 Venus revolution, and if figure 2 equal 4 such revolutions, then the upper part or figure 9 would have the meaning of 4.


Fig. 9

Now, in 78 Venus revolutions, the error would be 6¼ days and here we find the glyph which may mean 78 synodical revolutions in the third column,— 8 days before the calculated end,— an error of but 1¾ days.[1]

On page 49, Column 4, and page 50, Column 1, appear the two similar glyphs, figures 5 and 6. This is a Bacab sign so-

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1 It should be noted here that figure 3, which appears in column 3 of page 48, above the black series of numbers, and which would naturally be the companion glyph of figure 4, has no Ben-Ik sign as a superfix.

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called, and we should naturally associate the number 91 with it; but neither the black numbers in these columns (6.8.16. or 7.2.12.), nor these numbers plus any multiple (up to 12) of 8.2.0. (2920), are divisible by 91. Neither is the black number immediately preceding 6.8.16. (namely 6.8.8.) nor this number plus any multiple (up to 12) of 8.2.0., divisible by 91. At present, therefore, the meaning of the Bacab with the number 1 attached to it cannot be determined.

The only other glyphs referred to above, which require to be considered, are those of figures 7 and 8. They look like 7 Mol, and, if this is the date, it may have some significance attached to it.

If, on page 24, as I suggest, the 1 Ahau 18 Kayab ①, from which the series of these pages counts, is 9. 9. 9. 16. 0.
then, at the end of the series on page 50, we shall
have, after 104 years or 65 Venus revolutions,
a further passage of time of 5. 5. 8. 0.

giving another 1 Ahau 18 Kayab ①, 9.14.15. 6. 0.

This equals 2400 Venus revolutions and 720 days. If we allow a variation or recession of 2 days in 25 revolutions, we shall have a recession of about 192 days. This would carry the date back from 18 Kayab to 6 Mol, and 7 Mol appears below 18 Kayab.

This distance also equals 3840 years of 365 days each + 720 days. 3840 years equal $36 \times 104 + 96$ years. Allowing an error of 25 days in each 104 years, and 3 days in each 13 years remaining, we get a correction of $36 \times 25 + 96 \div 13 \times 3 = 900 + 21 = 921 = 2$ years 191 days. If, then, we count back 2 years 191 days from 1 Ahau 18 Kayab ①, we reach 7 Mol, which is given

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here; and from this we must count forward a second time to 18 Kayab in order to bring the calendar into accord with the seasons. But practically the years may be neglected; and by counting back the 191 days and then re-counting them, we shall again bring 18 Kayab and the summer solstice together.

Here then we have the striking fact that by going back to the date of the end of the Venus revolution (corrected) and counting forward 191 days a second time the calendar and the seasons would be brought together.

In the lower parts of pages 46-50, there appear the following glyphs: on page 46, a glyph composed of a head with a uinal glyph below, and with a number 2 before it (figure 10); on page 48, the same head that was found on page 46, but now appearing with a superfix in the form of a knot, and with the number 3 before it, followed by a uinal glyph, with a net-like superfix and also with the number 3 before it (figures 11, 12). On page 49 practically the same glyphs appear, except that the knot is a subfix, instead of a superfix, of the head, the uinal glyph has no superfix, and the number before each glyph is 7 (figures 13, 14). On page 50 the two glyphs are again united as they were on page 46, with the number 10 before them. (figure 15).



Fig. 10 Fig. 11 Fig. 12 Fig. 13 Fig. 14 Fig. 15

Placing these together, on the assumption that the numbers belong to both glyphs where they are found together, the following table results —

Page 46.	2 head	2 uinal
47.	No corresponding glyphs	

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Page 48.	3 head	3 uinal
49.	7 head	7 uinal
50.	10 head	10 uinal

It would seem that these glyphs, occupying the same positions on the various pages, must have something to do with the lapse of time; but the glyphs on pages 46 and 50 alone show this. If, at the end of one period of 584 days, two of the periods represented by these glyphs had elapsed, ten of the same periods would have elapsed at the end of five periods of 584 days. We actually find the glyphs with two on page 46 and ten on page 50; and in both cases the united form of glyph is used. But why, after the lapse of three periods of 584 days, the number 3 is found on page 48, and after the lapse of four periods the number 7 is found, in both cases with the glyphs separated, I cannot tell.

Judging from the fact that the Venus revolutions are the subject of these pages, we should be led to suppose that on page 50, the passage of 2920 days would be likely to be recorded, so that, if the uinal represents 20 and the method of addition is used, the uinal part would mean $10 \times 20 = 200$, and the remainder of the glyph would represent $2920 - 200$ or 2720, or 10×272, the head meaning 272. Similar reasoning would give the uinals on page 46 as $2 \times 20 = 40$, and the remainder of the glyph as $584 - 40$, or 544, or 2×272, the head again meaning 272. But this plan does not suit the numbers on the other pages; for on page 48, where the lapse of 1752 days is given, if 3 uinals or 60 days is subtracted, 1692 days are left. Again, subtracting 3×272 or 816, there is a remainder to be accounted for of 876 days. On page 49, 2336 days have elapsed. Subtracting 7 uinals, 2196

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days remain, and again subtracting $7 \times 272 = 1904$, there is a remainder of 292, which may possibly be represented by a third glyph with the number 4 attached to it (figure 16). In this case the crouching figure would mean 73, or one-fifth of a year of 365 days. But this is all problematical.


Fig. 16

Before closing this article, reference should be made to the views that have been given by Dr. Förstemann in his *Commentar zur Mayahandschrift zu Dresden*, in regard to the meaning of these pages.[1] It is with some doubt that I venture to criticise any views of Dr Förstemann, since I have the greatest admiration for the work that he did in the line of deciphering the Maya hieroglyphs. While it may be true that the Mayas desired to find a number which would contain an even number of solar years, Venus revolutions and Tonalamatls, etc., as Dr Förstemann suggests, they still saw, I think, a deeper meaning in the hieroglyphs which we have under consideration. This further meaning was probably the rectification of errors which in a long series of years would show themselves with unfailing certainty in the calculations of the revolutions of heavenly bodies.

A considerable proportion of Dr Förstemann's remarks are based on a period of 1,352,400 days, which he calculates to be the distance from 4 Ahau 8 Cumhu ⑦ the starting point far in the past, to the present day 1 Ahau 18 Zip ㉑. In order to find this number, he has changed the date at the bottom of page 24 from 1 Ahau 18 Uo ㊶ to 1 Ahau 18 Zip㉑. This change must be considered untenable, as has been shown above.

It is owing to this change also that Dr Förstemann says

[1] Pages 46, etc., 106, etc.

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that the second row of numbers on page 24 is "without rule," except that he obtains certain results by adding and subtracting the first and second numbers and the second and the fourth. I have shown above the possible meaning of the numbers in the second row.

Another large part of Dr Förstemann's reasoning depends on his considering that the Mayas calculated the synodical revolution of Mercury at 115 days. As a matter of fact, we know that the snyodical revolution of Mercury is 115.877 days. It is almost impossible to believe that the Mayas, if they actually observed the planet Mercury, would have used this calculation, when in a single year there would have been three of these revolutions and the error would have been over 2½ days. Furthermore, Dr Förstemann speaks of a certain number being equal to 11,864 revolutions of Mercury, calculating that revolution at 115 days. The error in this number of revolutions would be 10,404 days, or nearly 30 years. I think this estimate of 115 days for a synodical revolution of Mercury must be abandoned.

In speaking of the date 1 Ahau 18 Kayab ①, Dr Förstemann calls attention to the fact that the Temple of the Cross at Palenque has a date one Tonalamatl before this, and says that the distance from 1 Ahau 18 Kayab ① to 4 Ahau 8 Cumhu ⑦, which date also occurs in the Inscription a short distance after the Initial series, is given in C1 D2 as 2200 days, the same distance as is given on page 24. The distance really given in C1 D2 is 8.5.0. and not 6.2.0. To account for this number of 2200 days, Dr Förstemann suggests that it may have been reached by adding the following periods:

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Solar year		365 days
12 revolutions of the moon at 29 2/3		356 days
Mercury revolution		115 days
Venus	"	584 days
Mars	"	780 days
		2200

In order to bring this about, it is necessary to take 12 revolutions of the moon at 29 2/3 days; and Dr Förstemann justifies himself in doing this, by stating that he found on pages 51-58, 6 revolutions of the moon to be stated in some places at 177 and in others at 178 days. It is to be noted that these two sums make 355, and not 356, and it is also true that the long series on pages 51-58 gives 405 revolutions of the moon in 11,958 days, which gives a litle over 29½ days for each revolution. Moreover, there would seem to be no reason for this computation, as these periods do not follow one another.

In speaking of the prevalence of the number 1 and the day Ahau in the Tonalamatl, he states that this number and this day are used very much more than any other number or day. This is true of the days, not only in the Dresden, but in the Tro-Cortesianus, but the number 1 in the Dresden is not used very much oftener than the number thirteen, and in the Tro, so far as a hasty calculation goes, it appears only twelve times, while 4 appears twenty-four times and 13 thirteen times, at the head of the Tonalamatl.

In Dr. Förstemann's comments on pages 46-50, there is a great deal of value and a great deal that will carry conviction. There are several points, however, which I think should be alluded to. He refers to a row of Akbal signs.[1] May it not be

[1] *Commentar zur Mayahandschriften zu Dresden*, p. 107. Translation, p. 183.

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that he is mistaken in this identification? Are not the signs really Chuen, and do they mean "close"? Xul has been used with this meaning heretofore by Dr Förstemann.

He also refers [1] to the second month sign in the first row of month signs on page 50 as being the 20th day of the 18th month Cumhu. I think that he, on further consideration, would have agreed with others that the date is really the zero day of the five supplementary days, Uayeb meaning, as I think, the beginning day of these days, though Dr. Seler thinks, (without sufficient evidence, in my opinion), that the meaning is the evening before that day.

Dr Förstemann also says [2] that, in the *Anales del Museo Nacional*, eight days are given as the time of the obscurity of Venus. In the volume to which he refers, Sr. Troncoso quotes from the *Anales del Quauhtitlan* that Quetzalcoatl did not go to heaven, when he disappeared from earth, but went to hell for eight days. This is not as clear a statement of the invisibility of Venus as it might be, though, of course, it is open to that interpretation.

Dr Förstemann [3] is in favor of reading the three rows of month dates one after the other from bottom to top — a direction directly opposite to that of the days signs. As a matter of fact, whenever the reading is from bottom to top, the glyphs have to be read almost, if not absolutely, invariably from right to left; but here the reading of the glyphs is clearly from left to right.

Dr Förstemann [4] sees a Mercury-lunar period inserted be-

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1 *Commentar zur Mayahandschriften zu Dresden*, p. 108. Translation, p. 184.
2 Ibid., p. 109. Translation, p. 185.
3 Ibid., p. 110. Translation, p. 186.
4 Ibid., p. 111. Translation, p. 187.

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tween two of these month series, and a Mars period between the other two. I think that Dr. Förstemann's reasoning is unsound. He says that the Mayas first counted by Venus years, then by Mars periods, then by Venus periods, then by Mercury periods for thirty years, and then again by Venus periods. It is difficult to see of what value such a computation would be. Moreover, the wonderfully constructed method of calculating and recording time which the Mayas had devised, would undoubtedly have been thrown out of gear by such a plan. The total period thus computed would not have been divisible by any of the periods used in its construction — solar, Venus, Mercury, and Mars periods — without a remainder.

In discussing what he calls the "god signs," Dr Förstemann [1] calls the katun sign with the number 4 attached to it. the God N, and the glyph with the number 13 the Moan sign, while he describes the glyph, which I have commented on as meaning 7 Mol, as unknown. I do not think that these interpretations are entirely correct, though it is very possible that the same sign may be the symbol of a god as well as a date. But the 4 katun of page 47 is very different from the 4 Zac which appears at the end of the 236 day period on page 48.

I regret that I am unable to agree fully with many of Dr Förstemann's numerical calculations, very ingenious and interesting as they are; but very little dependence can be placed on the wonderful results which can be obtained with numbers which have the same factors.

BOSTON, MASSACHUSETTS

[1] *Commentar zur Mayahandscriften zu Dresden*, p. 111. Translation, p. 188.

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NOTES ON RELIGIOUS CEREMONIALS OF THE NAVAHO

BY

ALFRED MARSTON TOZZER

THE NAVAHO AND THEIR RELATIONS WITH OTHER PEOPLES

THE Navaho together with the Apache form the southern extension of the great Athapascan family which stretches northward to the farthest tip of the continent. Traces of the affiliations of the Navaho with the northern Athapascan peoples are for the greater part lacking. There are very few, if any, similarities in material culture which can definitely be made out between the Déné of the north and the Navaho and Apache of the south.

On the ceremonial side of the religion we find nothing. In the mythology there may be a few faint traces of the early parentage of the Navaho. Dr Boas [1] sums up the matter when he says, "I was much interested in finding on a close examination of the Navaho legends that there was interwoven with a large mass of material foreign to northern tribes many tales undoubtedly derived from the same sources from which the northern tales spring. Most of them are so complex and curious that, taken in connection with the known northern affiliations of the Navaho,

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[1] Northern Elements in the Mythology of the Navaho, *American Anthropologist*, x, p. 371, 1897.

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they must be considered either as a definite proof of a survival of ancient myths or as proving a later connection."

Language serves to point out clearly and with certainty this affiliation of the Navaho and Apache with the northern Athapascan. Even on the side of language, much seems to show that there was a comparatively early breaking-away of the Navaho and Apache, or the main elements which later went to make up these peoples, from the parent stock in the north.

The colorless culture of the Athapascan has been pointed out many times and the receptivity of those of Athapascan origin, resulting in the different peoples composing this division taking on and borrowing, almost without change in some cases, the culture which is the prevailing type in the country where they find themselves. In the southward migration of the Navaho and Apache to their present home in New Mexico and Arizona and the adjoining part of Mexico, they left a culture not marked by any especially positive traits. They passed through a country far different in character from that of the north and one that possessed a distinct and far from negative culture of its own, — the culture of the Plains or a mixed culture of the Plains and the Basin Area, — and finally they came into their present habitat, again with a totally different environment on the physical side and one quite as distinct on the side of custom and belief.

We therefore rightly expect to find a curious result, with an Athapascan beginning, whatever that beginning was, the influence of the Plains type or a modified Plains type of culture as the second, and finally that of the Pueblo peoples as the third dominant power that contributed on the cultural side of the molding of the Navaho tribe. The last alone can be determined satis-

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factorily. But we may account for some features at least of the culture of the Navaho as the result of the middle stratum of influence.

The Navaho on the purely physical side are far from being a homogeneous people. Just as the Apache gradually suffered a certain amount of absorption with several tribes, especially to the south, so the Navaho in turn counted among their number from very early times certain small bands of peoples mostly from the eastward.

The origin legends of the Navaho represent them as a mixed people. The original clan, according to the traditional account, was added to from time to time by other clans of the Navaho, by a number of Ute (a family of whom remained, and founded a new clan), by bands of Apache who in turn founded clans among the Navaho, and by people from Zuñi, Jemez, and other pueblos driven from their homes by famine. These traditions have some historical basis of fact, as noted by Hodge.[1]

The Navaho were a nomadic, hunting people, not only at the start, but through their first period of influence from the outside; and they came finally into a territory occupied by a people given to agriculture and village life. Moreover, the Navaho were a people with very little social organization and in the Southwest they entered a territory where there was a well-defined social system. The Navaho were a people with no strongly de-

[1] The Early Navaho and Apache, *American Anthropologist*, VIII, p. 227, 1895. He states that about the year 1560 the Navaho tribe had nineteen clans distributed about as follows: one Athapascan (the original Navaho, evidently cliff-dwellers), three Apache, two Yuman, one evidently of Keresan stock, one possibly of Shoshonean, a single Ute family, one doubtless of Tanoan stock, three miscellaneous Pueblo clans, and six of unknown origin. "We may safely assume," he adds, "that at this period the language as well as the institutions and industries of the Navahos underwent the greatest and most rapid change."

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veloped religious ceremonials, and the country of their final adoption was characterized by a complexity of religious ritual. Thus we might go on pointing out the obvious and very striking contrast between that which we assume to have been the primitive form of culture of the Navaho and that into which they came.

Influence of Ceremonials of the Pueblo Peoples on those of the Navaho

On the religious and especially on the ceremonial side of the Navaho do we find the heterogeneous character very strongly brought out. Starting with practically nothing that may be said to be distinctive of the Navaho themselves, we find a large mass of ceremonials now practised by them, every act of which has been borrowed from another people. Dr Matthews seems to think that the Navaho borrowed little directly from the Pueblo peoples, but that both took their inspiration from a common source.[1] The Navaho, according to their legends, obtained much of their culture from the cliff-dwellers found inhabiting the pueblos now deserted. As these cliff-dwellers were probably the ancestors of the present Pueblo peoples we can say that the latter inherited their culture from their ancestors whereas the Navaho borrowed the same ideas in part at least. This was a one-sided bargain, as the Navaho had nothing to offer in exchange; they alone were the ones to reap a benefit from the transaction.

Obviously, however, a people with no distinct clan organization, and accustomed to a wandering life as hunters and, within very recent times, as shepherds, could not use these borrowed

[1] Navaho Legends, *Memoirs American Folk-Lore Society*, p. 41.

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rites without some adaptation, some alterations. The ceremonies of the Pueblo peoples were suited to a sedentary, agricultural tribe whose main religious life was centered around the act of obtaining rain for their crops in an arid country. It has only been within a comparatively few years that the Navaho have taken up agriculture, and an extensive rainfall was, therefore, not looked upon as the end and aim of life.

The contrast between a sedentary and a migratory people is well brought out in one respect in the examination of the kiva of the Pueblos and the *h*ogan[1] of the Navaho. The former always celebrate the secret part of their rites in a room set apart for the purpose in their village. The Navaho, on the other hand, usually build a new hut each time that an elaborate ceremony is to be celebrated. Permanency of structure is of little account among the Navaho.

The Navaho retained, however, enough of the religious ideas of the north to cause them to influence them in the south in one respect at least. In other words, the cure of disease became the fundamental feature of the borrowed rites. A ceremony intended for rain-making would naturally need some alteration in order to serve as a cure of disease. Dr Fewkes[2] notes in the case of the Hopi that it is difficult to separate the present object and real meaning of rites in interpretation. "The object of a ceremony," he adds, "may change when a people change their environment, or as their prayers change. Ancient rites are thus made to do duty for purposes wholly new and thereby become greatly modified, so far as their objects are concerned.

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[1] For convenience of reference, I have employed Dr Matthews's method of recording the Navaho names.

[2] Winter Solstice Ceremony at Walpi, *American Anthropologist*, XI, p. 104, 1898.

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The tendency always is to adapt old rites to new conditions, and interpret them accordingly." Thus we naturally expect to find among the Navaho much that shows the new purpose of their rites.

As this paper is not a comparison in any way of the ceremonies of the Navaho with those of the Pueblo peoples, it is not necessary to point out in any great detail similarities between the rites of the two peoples. To a certain point, both sets of ceremonies go along almost parallel. As previously noted, however, the change in the object of the rites must necessitate a different point of view.

It is interesting to note the frequent use of corn-meal and corn-pollen in the religious rites of the Navaho. This clearly points to the origin of the rite. Pollen is the symbol of fertility, and the rite at bottom is for rain. The Navaho took over the use of the corn and the pollen together with the other features; but the corn no longer served its previous purpose as a prayer for rain and the ripening of the crops: it was used for the cure of disease.

Mythology and Ritual

I shall not enter at this time upon a discussion of the complicated question of the precedence of ritual and myth, nor is it necessary to discuss Navaho mythology as a whole. It is, however, well to point out a fact noted by all writers on this question; namely, that all the main ceremonies of the Navaho are accompanied by myths which explain minutely the different acts in the various rites. They often do more: they account for the origin of the ceremony by stating how a god or hero wan-

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dered among other tribes, learned the rites, and returned to teach them to his people.

Since, as we know, the ceremonies of the Navaho are borrowed, their myths, which often fit perfectly the rites, must also have been adapted in great part from the same outside sources. It seems far more natural to think of the rite as being taken up prior to a myth explaining this rite. So that here at least we seem to find a rite selected first and then the myth which belongs to the rite taken; or, as in many cases, it seems evident a new one was invented to suit the ceremony in its altered form. The Navaho certainly adopted many of the myths of the Pueblo peoples as their own, but there is far more originality in many of the rite-myths of the Navaho than in the corresponding ceremonies themselves. This goes toward proving that the ritual is borrowed, and adapted to the conditions of an intrusive people, either before the myth explaining the former rite was taken possession of or a new one was created to meet more fully the altered form of the ceremony.

Shamans and their Duties

All the ceremonial life of the Navaho is in the hands of the medicine-man or shaman. His name in Navaho, *hatali*, means "the singer of sacred songs," "the chanter." The individual character of the chants seems clear in contrast to any idea of communal origin. These chants were probably at one time in the nature of incantations, and their recital served in a magic way to constrain the deities to act along certain definite lines.

It is difficult to say how firmly this class of shamans is bound together, and whether or not there are classes within the

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main division. It is certain that we do not have any well regulated societies of priests as among the Ojibwa, the Sioux, or the Zuñi. The office of shaman is in no way hereditary. The lack of any central control or government among the Navaho makes the power of the individual shaman rest entirely upon his success in curing individuals. There is no centralization of authority, and when a man does succeed in making himself famous in his capacity of doctor, his power is often very great. It is certain that some shamans are believed to have greater power than others, and naturally they are looked up to. They are the ones most frequently employed to celebrate the various ceremonies and they thus come in time to possess great wealth. According to Dr Matthews,[1] one shaman usually contents himself with knowing only one of the several nine-days ceremonies. The different rites are so complicated and the chants so numerous, that it is practically impossible for a man to perfect himself satisfactorily in the machinery of more than one of these long ceremonies.

These shamans are paid for their services by those in whose behalf the rites are held. The cost is sometimes heavy, amounting to two or three hundred dollars' worth of horses, sheep, deerskin, and other goods. All the family of the sick person contribute to the shaman's fee. It is the duty of the officiating priest to provide the permanent paraphernalia for the different rites, such as the undecorated masks and the various "medicines." He does little active work in the preparation, but directs the labor of the others and sees that all the necessary details are car-

[1] The Night Chant; a Navaho Ceremony, *Memoirs of the American Museum of Natural History, Anthropology*, v, ¶ 5, 1902.

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ried out, a failure in one of which will render the whole ceremony of no value. He leads in the chanting in many cases, and it is he who knows the order and the words of the large number of songs sung during the various rites.

When a person becomes ill, the first question to be answered is not so much the nature of the disease as its cause. Some law of the tribe has been broken, a spirit has been offended or neglected in some way; hence the disease is sent as a punishment. The diagnosis is often difficult, and a shaman is usually called in. It is he who is able to state the cause of the arrival of ill health, and he also is the one who suggests a means of propitiating the god, and hence there follows a removal of the malady. Sometimes it is necessary to go back some distance in the history of the individual in order to find out the time when the offence against the god was committed. In a case of one woman at least sixty years old, the shaman had to look back not only through those sixty years of life of the woman, but farther away still — to the time of the pregnancy of her mother. At that time, the latter had unwittingly looked at an eclipse of the moon, and had thus broken a tribal law.

Rite of *N*delni

The facts in regard to the breaking of some tribal taboo are often ascertained by the shaman in a rite called *N*delni, or "Shivering." He first washes his hands, and sprinkles lines of corn-pollen on the inside of his right hand, along the length of each finger, and in a zigzag from the palm to the lower arm. He then throws himself into a semi-trance state, or pretends to do so. The hand thus marked begins slowly to tremble and

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shiver in much the same way as when the elbow rests upon a nerve. In this case, however, the arm is held out straight from the body. The actions of the hand and arm become more violent. The shaman mutters a prayer, rubs his eyes, dips his fingers into water, and rubs his body. After the trembling becomes still more noticeable, the hand finally makes some movements which are interpreted as showing the cause of the illness. In one instance the hand dug into the earth, and this was interpreted as showing that the patient had been digging in a ruin where he had found a human cranium. He had touched it, thus breaking a tribal taboo, and illness had resulted. In this case, I am quite sure that the shaman was sincere in what he did. I have no doubt that in many cases there is much humbug.

Law of Exactness

Efficacy in the different rites can alone be obtained by exact repetition of the minutest details of the different acts, not only in the rites themselves, but in the preparation of the objects used in the ceremony. In Dr Matthews's paper on "A Study of Butts and Tips," [1] he shows the necessity of carrying out the most minute rules in making the reed cigarettes which are cut, filled, lighted, and offered to the gods. He gives another striking example of this necessity of careful detail in the preparation of klédze aze, or night medicine: [2] "The collector enters a field at night, in the rainy season, during a violent thunderstorm. He culls in the east of the field a leaf from a stalk that produces white corn. Passing sunwise, he culls in the south a leaf from

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1 *American Anthropologist*, v, pp. 345-350, 1892.

2 The Night Chant, ¶ 204, 1902.

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a stalk of blue corn; in the west, a leaf from a stalk of yellow corn; in the north, a leaf from a stalk of variegated corn. . . . Each of these things must be collected at the instant that it is illuminated by a flash of lightning." The same exactness of order is seen especially in the various chants which accompany the ceremonies. There is a long series of songs which must be sung in a prescribed order and in a prescribed way, otherwise the ceremony is of no avail. The ritual demands exactness, and it is this exactness which is the seat often of the power to be derived from the rite in question.

In the religion of the Hupa, another Athapascan tribe, the power rests in the exact repetition of certain formulæ. This feature among the Navaho may be found to have been inherited by them from their Athapascan ancestors.

Classification and Character of Ceremonials

The Navaho ceremonials may be divided into the major and minor classes, the nine-days ceremonies and the short rites, which vary greatly in character and importance. Although the fundamental feature of all is the cure of disease, yet planting and harvesting, desire for rain, house-building, birth, marriage, death, and travel are also factors in some of the rites.

The Navaho ceremonials consist of several elements, all of which are present in the longer rites, and many of which occur in the shorter and less important ones. These elements are sacrifice and prayer, masquerade, and the dance. As the ceremonials are the means taken to placate the gods, sacrifices naturally occupy the most important place in the ritual. Ceremonial objects — such as bits of feathers of certain birds;

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pollen; beads; the so-called "kethawns," which are round wooden cigarette-like objects; feathered sticks; food usually prepared according to some ancient formula; medicines of various kinds, including sacred drinks — are among the many objects offered. The sand pictures may also be considered under the same heading, as these are offered to the gods, or serve as a sort of holy place or altar where certain acts can alone take place.

In connection with the various offerings there are always prayers, which serve to point out to the deities the presence of the gifts in return for which the patient desires health. The other two constant elements in the ritual of the Navaho may be considered together; namely, the masks and the dances in which these are worn. Those who carry out the various requirements of the ritual are not the shamans, as might be supposed, but rather the gods, each impersonated by a man wearing a definite mask. These masks are made of deerskin and are furnished by the shaman. They are painted and decorated anew for each ceremony, and supposedly represent the countenance of the gods. When a man wears one of these over his face, he is supposed to be the god himself, and as such he is powerful to carry out the requirements of the different acts in which this special god figures. These masked men dance together on the last night of the long ceremonies in what might be called a "dramatization" of the myth on which the ritual is founded. The same gods are also represented by the figures in the sand pictures.

The festival nature of ceremonials in general among primitive people should be emphasized, together with their great importance on the social life of the tribe. Among a people like the Navaho, living family by family, disseminated over

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a wide stretch of country, with no towns and no settlements larger than those composed of two or three families at the most and these not permanent, there is little opportunity for congregation other than that furnished by the religious ceremonials. These are taken advantage of and made the occasion of large gatherings. Foot-races, gambling, and other games are indulged in, and, although few of the visitors take an active part in the rites themselves, they are present in large numbers to witness the public dances on the last night of the long ceremonies. Any participation in the more secret rites of the *hogan* necessitates a payment according to the amount of benefit that it is hoped will be derived from the rite in question. Consequently only those visitors who are ill and are at the same time able to pay something to the shaman, take advantage of the opportunity of having themselves treated.

Major Ceremonials

Similarities between those of the Navaho and those of the Pueblo Peoples. — The main ceremonies of the Navaho, as has been stated, are nine days long, and are composed of a constant succession of rites. The Pueblo peoples also have ceremonies of equal length. Dr Fewkes [1] reports twelve of these long ceremonies among the Hopi, with five variants, making sixty in all. Dr Matthews [2] states that he has known of seventeen different nine-days ceremonies among the Navaho. Most of the details in these long successions of different rites are similar, not only among the Navaho and Pueblo peoples, but

[1] Morphology of Tusayan Altars, *American Anthropologist*, x, p. 130, 1897.

[2] The Mountain Chant; a Navaho Ceremony. *Fifth Report Bureau of Ethnology*, ¶ 158, 1883-84.

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also in general, and they show striking similarities with the rites of the Apache. There are certain differences, however, in the long ceremonies of the Navaho and Pueblo peoples. Those of the former come only in late autumn and winter, whereas many of the rites of the Hopi, for example, come in midsummer. There is no sharp distinction between masked and unmasked dances among the Navaho, as among the Hopi. The seasonal element is not in great evidence among the Navaho. Among the Hopi, the different Kachina ceremonies, or masked dances, come from late December to July, and the nine-days ceremonies and the unmasked dances from August to November.

Several of the long ceremonies of the Navaho have been described in detail, and it does not seem necessary, therefore, to repeat what has already been treated at length. It may be interesting, however, to note some of the objects which are used in the Navaho rites, and their similarity to those used in the religious practices of neighboring peoples. The kethawns, or prayer-sticks, of the Navaho are the same as the pahos of the Pueblos. Many of them are identical, even to the facets cut at one end and on which are painted dots representing eyes and mouth. These are regarded as female among both peoples. Sex distinctions are made throughout the rites of the Navaho and Pueblo peoples. The plumed wands are found among the Navaho, the Apache, and the Pueblo peoples, and they are reported among the northern tribes on the upper Missouri.[1] Pollen and corn-meal, and their use as offerings and as purifiers, the bull-roarer, the sacred water and other liquids used as medicine, the use of masks, — all are found among the Navaho and

[1] Matthews, Plume Sticks among the Northern Tribes, *American Anthropologist*, II, p. 46, 1889.

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Apache and the Pueblo peoples in their religious practices. Thus the outfit of the Navaho shaman is very much like that of the priest among the Pueblos. The same general acts are carried out, such as the ceremonial bath, the cleansing by vomiting, the sweating, the ceremonial begging, the rites of initiation, the disposal of objects used in the ceremonies, often the carrying of the offerings to rude shrines, and the play of clowns, in addition to other minor similarities which need not be mentioned.

Night Chant

The most important of the nine-days ceremonies of the Navaho is the Night Chant (Klédze *Hatál*), or Yébitsai. It is always celebrated in the late autumn or early winter. The ceremony is composed of a succession of different rites, day after day and night after night, for the greater part of the nine days.

Both the number and the order of the different rites in the Night Chant are variable. In fact, we may say that there are wide limits in the celebration of the ritual of this ceremony. The number of rites depends upon the amount of money which the patient or patients are willing and able to pay the shaman and his assistants. There seems to be a minimum number which must of necessity be given, and all in addition to this may be omitted without bringing disaster to the ceremony. It follows, however, that the greater the number of extra rites performed, the greater the pleasure of the gods, and consequently the more effective the cure.

It is not my intention to repeat the data already given in Dr Matthews's most excellent memoir on this ceremony; but it might be well to point out certain other variants in the different

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rites making up this ceremony, which were witnessed by me in a single celebration of the Night Chant. This celebration took place in the Chaco canyon near Pueblo Bonito, in 1901.

In order to compare the ceremony as described by Dr Matthews with the one witnessed by me, I have arranged the various rites occurring on the different days in the two versions in parallel columns.

Comparison of the Principal Events of the Ceremony of the Night Chant as witnessed by Dr Washington Matthews and the Writer

Dr Matthews	A. M. Tozzer
FIRST DAY	
Evening: —	*Evening:* —
Circle kethawns.	Consecration of lodge.
Consecration of lodge.	Talisman of Yébĭtsai.
Talisman of Yébĭtsai.	Circle kethawns.
SECOND DAY	
Morning: —	*Morning:* —
Kethawns (4 cigarettes).	Sudatory out of doors, in east.
Sudatory, in east.	
Afternoon: —	*Afternoon:* —
Rite of Succor.	Kethawns (4 cigarettes, 4 kethawns, 2 long cigarettes, 2 cigarettes).
Dry painting.	
Evening: —	*Evening:* —
Rite of Evergreen Dress.	Rite of Evergreen Dress.
THIRD DAY	
Morning: —	*Morning:* —
Kethawns (4 to 10 cigarettes, 2 long cigarettes).	Sudatory out of doors, in south.
Sudatory, in south.	Kethawns (4 cigarettes, 2 cigarettes, 4 kethawns, 2 long cigarettes).

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Afternoon: —
Kethawns (4 cigarettes, 4 × 12 kethawns).

Evening: —
Offering of 4 × 12 kethawns in basket.

Afternoon: —
Preparation of medicine by girl.
Initiation of boy and girl.

Evening: —
Rite of Tree and Mask.

FOURTH DAY

Morning: —
Kethawns (8 cigarettes).
Sudatory, in west.

Afternoon: —
Amole bath.
Dog kethawns.
Rite of Tree and Mask.

Evening: —
Vigil of the gods.
Banquet.

Morning: —
Kethawn (1 long cigarette).
Sudatory out of doors, in west.
Kethawns (8 cigarettes).
Amole bath.

Afternoon: —
Kethawns (4 cigarettes, 4 × 12 kethawns).

Evening: —
Talisman of Yébĭtsai.
Offering of 4 × 12 kethawns in basket.
Vigil of the gods.
Banquet.

FIFTH DAY

Morning: —
Kethawns (1 long).
Sudatory, in north.

Afternoon: —
Small dry painting.

Evening: —
Initiation (first time).

Morning: —
Dog kethawn (1 long cigarette).
Sudatory out of doors, in north.
Kethawns (8 cigarettes).

Evening: —
Initiation (first time).

SIXTH DAY

Morning: —
First of large dry paintings.
Rite with painting.
Begging gods.

Evening: —
Rehearsal.

Morning: —
First of large dry paintings.
Manufacture of gourd rattle.
Rite with painting.
Begging gods.

Evening: —
Initiation (second time).
Rehearsal.

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SEVENTH DAY

Morning: —
Second of large dry paintings.
Rite with painting.

Evening: —
Rehearsal.

Morning: —
Second of large dry paintings.
Rite with painting.

Evening: —
Rehearsal.

EIGHTH DAY

Morning: —
Third of large dry paintings.
Rite with painting.
Toilet of the gods.

Afternoon: —
Initiation (second time).
Rite of Succor.

Evening: —
Rehearsal.

Morning: —
Third of large dry paintings.
Rite with painting.
Toilet of the gods.

Afternoon: —
Rite of Succor.

Evening: —
Initiation (third time).
Rehearsal.

NINTH DAY

Morning: —
Preparation of properties.
Kethawns (3 cigarettes).
Arrangement of masks.
Rite of Succor.

Afternoon: —
Preparation of dancers.

Evening: —
Rite of First Dancers.
Dances.
Work in lodge.

Morning: —
Kethawns (3 cigarettes).
Initiation (fourth time).

Afternoon: —
Preparation of properties.
Arrangement of masks.
Preparation of dancers.
Rite of Succor.

Evening: —
Rite of First Dancers.
Dances.
Work in lodge.

In comparing the two columns it will be seen that there is a settled order for certain rites in the ceremony, but some of the more or less auxiliary ones may come at various times during the nine days. I have spoken of the carefulness of detail and the

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necessity of a certain order. This applies to the various songs and chants and to the rites considered as units rather than to the ceremony as a whole. This point will be brought out by reviewing briefly some of the additions, omissions, and substitutions of the various rites as given by Dr Matthews in his account of this ceremony. I shall follow the order in which the different rites occur.

Those of the first evening were similar, although the sequence was different. In the sets of kethawns made and offered to the gods during the days of the ceremony there was often a change in the character and the number throughout the two parallel ceremonies.[1] These differences will be noted by comparing the two columns. The rite of succor and the small sand picture of the second day were omitted in the celebration which I witnessed. The patients did not feel that they could afford to pay the shaman the extra fee demanded. In the late afternoon of the third day there was a general clearing up of the *h*ogan. Several holes in the wall were stopped up, the floor was swept, and the ashes of the fire removed. After the hut had thus been cleared, a girl of about ten came in bringing a stone metate and mano or rubber. She took her place at the west of the fire, placed the metate on a sheepskin, and began to grind up the feathers of a yellow bird (sidibeta) furnished by the shaman. This was medicine to be administered later to the two patients and it was efficacious only when prepared by a virgin. In the evening of this day, the young girl who had ground the

[1] I have used kethawn as a general term, including the cigarette and the kethawn proper. By cigarette, I mean the reed which is filled and symbolically lighted; by kethawn proper, the solid wooden sticks which are designated as to sex.

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feathers and a young boy were put through the rite of initiation similar in every point to that described by Dr Matthews.[1]

The rite of the Tree and Mask came on the evening of the third day rather than on the afternoon of the fourth. The large sets of kethawns used in the basket, and made on the evening of the third day in Matthews's account, were prepared on the afternoon of the fourth day. The sets were, however, similar in number and character. These were administered on the fourth night. The picture of the Trembling Place, occurring on the fifth day in the earlier account, was omitted. The initiation rite was celebrated four different times, not including that when the boy and girl were initiated as contrasted with a twofold celebration in the older account. This repetition was probably due solely to the fact that there were more people at the later time who desired it and were able to pay the fee demanded. Dr Matthews states[2] that a person must go through this rite four times before he is allowed to impersonate one of the gods. I know from personal experience that a single celebration enables the initiate to participate in the rites, wear a mask, and personate one of the gods. I shall not pause to explain this initiation, as Dr Matthews's rite was exactly similar to the ones I witnessed. It is interesting to note, however, the presence of such a rite in the midst of a ceremony primarily for curing the sick.

I have described elsewhere[3] the character of the gourd rattle manufactured on the morning of the sixth day. This

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1 The Night Chant, ¶¶ 495-511.

2 Ibid., ¶ 507.

3 A Note on Star-Lore among the Navaho, *Journal of American Folk-Lore*, XXI, pp. 28-32, 1908.

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rattle contained holes made to represent stars, and was used in the chants sung during the last four nights of the ceremonial.

At odd moments during the latter days of the ceremony, certain individuals employed the shaman in their own behalf. These people had minor ailments and paid the shaman a small sum, or made him a gift, in return for which he endeavored to cure them. In one case, a woman became hysterical. Her friends assured me that the gods were angry because I had been granted certain privileges, and had visited their displeasure, not upon me, but upon a woman whom I had never seen before. Straightway I was advised to do my share toward curing this woman. She came into the *h*ogan, and lay down at the west of the fire. I covered her with several yards of calico which I had bought. The shaman then took two of the feathered sticks used in the sudatory, and the sand pictures, and rubbed the body of the woman, turning and twisting her until the hysterics disappeared. She then rose, took half the calico, and gave the shaman the other half. I was able to quell an epidemic of hysteria by announcing that I had no more calico.

Apart from the sand paintings, which I shall describe later, the only other important difference between the ceremony as described by Dr Matthews and that witnessed by me was in the sudatory or sweat-house. Dr Matthews[1] mentions the alternatives — four sweat-houses, one sweat-house, or the kó*n*nike or outdoor sudorific. I did not see the ceremony where the sweating rite occurs in a house built for the occasion. In the ceremony of 1901 the outdoor sudorific was employed. As Dr Matthews's notes are not full in regard to this variety of the rite, I add a

[1] The Night Chant, ¶¶ 243-256.

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few additional facts concerning the outdoor sweating ceremony. This act was performed four times — once each morning, beginning with the third day. Each time, two shallow grave-like holes were dug, about a hundred feet distant from the *h*ogan, first to the east, then, on successive mornings, in turn to the south, the west, and the north of the ceremonial *h*ogan. There were, as has been stated, two patients, and these occasioned the two holes. These were about six inches deep, five feet long, and two feet wide, with ends pointing east and west in the first instance. In my description, the directions will apply only to the first or eastern celebration. In the two holes a quantity of juniper and piñon was burned. After the fire had died down, seven layers of different woods and herbs were spread over the glowing coals. The roots of the plants all pointed toward the east, and therefore away from the *h*ogan. After the preparations were completed, the shaman, two assistants, and the two patients came from the *h*ogan to the two smoking green mounds. The latter two sat down, the woman behind the man, to the west of the two heaps of green, and proceeded to remove their clothes. The shaman carried a basket of ground corn in his hands from which he sprinkled a line of the powder in a circle around the two mounds, leaving openings two feet wide on the eastern and western sides of the circle. Directly inside the first circular line he sprinkled another of white corn-pollen. He then took from a second basket the twelve feathered sticks, which were also used around the sand paintings (see plate 1). He placed the six blue sticks at even intervals between the two lines of pollen on the north side of the circle. These were for the female patients, and were to keep off the evil spirits. The six black

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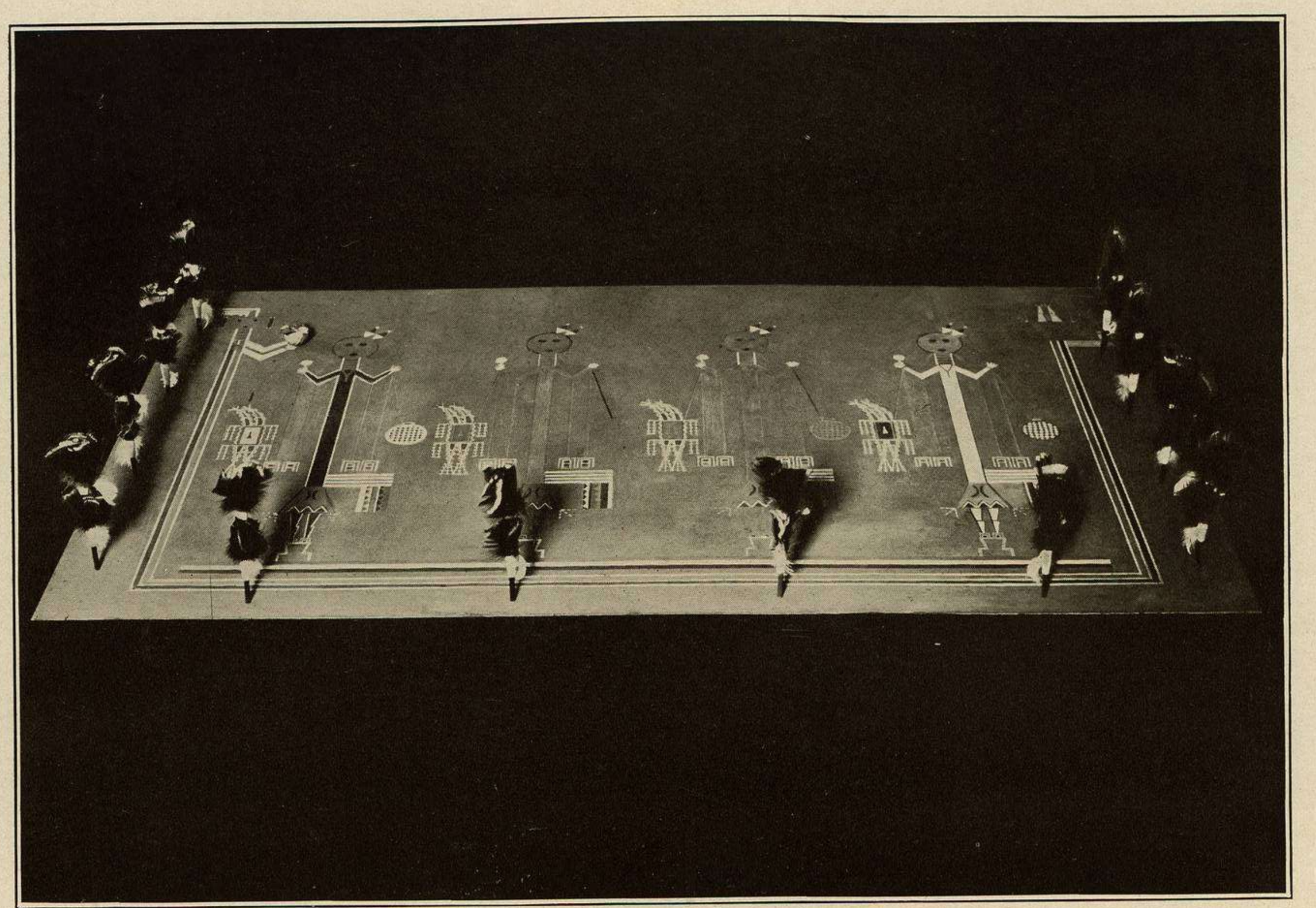

MODEL OF SAND PAINTING OF THE FOUR RAIN GODS

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sticks were placed on the south side of the circle, and were for the male patient. At this stage the two entered the circle from the western opening. The man lay down on the mound to the south; the woman, on the one to the north, both with their heads toward the *h*ogan. Two assistants then entered the circle from the western opening, using great care not to step on the lines of pollen, and covered the two patients with blankets. The shaman and his assistants sat on the ground to the south of the circle, and kept up a continuous round of singing. The shaman next placed a gourd in front of him which he filled with an herb (zaní*l*) mixed with water, and on top he sprinkled some ground yellow corn. In a cup he prepared another drink (kětlŏ), consisting of some bright green substance the nature of which has not been ascertained. When these preparations were complete, the singing was started, accompanied by a gourd rattle. After three seemingly distinct songs had been sung, the shaman entered the circle from the west, lifted the blankets from over the heads of the patients, and washed their faces with the contents of the cup. Another period of singing followed, after which two masked men came from the *h*ogan. They represented *H*astsé*y*al*t*i (the most important character appearing in the Night Chant) and *H*astsebaad (one of the important female gods).[1] The two entered the circle from the west and removed the blankets from the two patients. They were by this time in a violent perspiration. Each sat upright on the mound as *H*astsé*y*al*t*i took the cup prepared by the shaman and marked with the contents the bottom of the feet, the palms of the hands (which were held upright in the lap), the breast, the back, and

[1] For full description of these gods, see Matthews, The Night Chant, ¶¶ 26-31, 64-72.

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the heads of both patients, besides placing a particle in their mouths. He finally had them drink from the cup. The two patients then washed themselves with the remaining contents. *H*astsé*y*al*t*i next collected the twelve feathered sticks which had been placed around the circle. He selected the two which had stood on either side of the eastern opening of the circle, and gave the remainder to the shaman. With these two sticks, one in each hand, he rubbed down the legs, the arms, and the body of one patient after the other. Between each point of application, he held them up and pointed them to the east. The other masked man then repeated the same acts, with the same two feathered sticks, over the two patients. *H*astsé*y*al*t*i next took the gourd and made the patients drink from it, first the man, then the woman, and the same repeated. The two men representing the gods then returned to the *h*ogan. The others formed a procession and marched slowly in single file back to the same place. As soon as the two patients and the others had left the mounds, helpers gathered up the green shrubs and the evergreen, and carried all to a short distance to the north of the *h*ogan, where they deposited them on a bush. The coals were also raked into two piles at the eastern end of the shallow holes, and what fire remained was put out with water. The rite inside the *h*ogan at the completion of these acts was similar to that described by Matthews [1] when a sweat-house is used.

With the exception of the differences noted above and those connected with the sand pictures about to be described, the two celebrations of this Night Chant were exactly similar on the

[1] The Night Chant, ¶ 347.

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side of the rites themselves. I am unable to compare the two on the side of the songs and chants, which are given so fully in the account by Dr Matthews.

Sand Paintings

The sand pictures of the Navaho have been many times described and pictured. It is not my intention, therefore, to consider them in detail, their method of manufacture, nor the rites held in connection with them. I desire only to mention certain variants of the pictures which have come to my notice. These dry paintings or sand pictures are the most important single feature of the ceremonials of the Navaho. The largest of them are made on the three last days of the nine-days ceremonies. They differ in the different ceremonies, and often in the same rite.

Picture of the Four Rain-Gods. — In the celebration of the Night Chant in 1901, the first picture, coming on the sixth day of the ceremony, was entirely different from that of the "whirling logs" described and pictured by Matthews.[1] This latter is probably the usual picture made at this time, as Stevenson saw a similar painting of the "whirling logs" in 1885,[2] and Curtis gives a slightly different variant.[3] The sand picture made as the first of the three in the ceremony which I witnessed is, therefore, not the usual one painted at this time, and I have never seen it described. I cannot give any reason for its substitution in place of the usual picture. Plate I shows this painting, taken from a photograph of a model in the Peabody Museum;

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1 The Night Chant, ¶ 513, plate VI.

2 Ceremonial of Hasjelti, *Eighth Report, Bureau of Ethnology*, 1886-87, plate CXXI.

3 *The North American Indian*, I, p. 112, 1907.

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plate II, taken from a colored drawing, gives a better idea of the same picture.

The completed painting measured roughly nine by thirteen feet. Twelve feathered sticks (in*d*iá) or plumed wands were placed around three sides of the picture. These are shown in plate I. Dr Matthews [1] mentions that there were eight of these used around the pictures which he saw. In this set of twelve, six were painted black with white tops, and were for the male patient; the other six were colored blue with yellow tops, and were for the female. Each stick was decorated with two tufts of ten turkey-feathers each, tied around the stick and pointing upward. From each tuft of feathers there hung down one small feather taken from the breast of an eagle, the so-called "breath-feather." The shaman stuck these twelve wands in the foundation sand just outside the rainbow border, four on each of the three sides. The eastern side had no border, and consequently no feathered wands, as none other than good spirits lived in the east and no protection was needed from that quarter.

The model (plate I) also shows the small gourd vessel, with the sprig of cedar on top, resting on the hands of the rainbow goddess of the border.

The heads of the four figures of this painting point toward the east. The four main personages shown are the *H*astsébaka or simply Yébaka. In this special rite their function is connected more or less closely with the rain. The first figure, colored black, belongs to the north; the second, blue, to the south; the third, yellow, to the west; and the fourth, white, to the east. These gods are male, and are shown as wearing the blue painted

[1] The Night Chant, ¶¶ 279-284.

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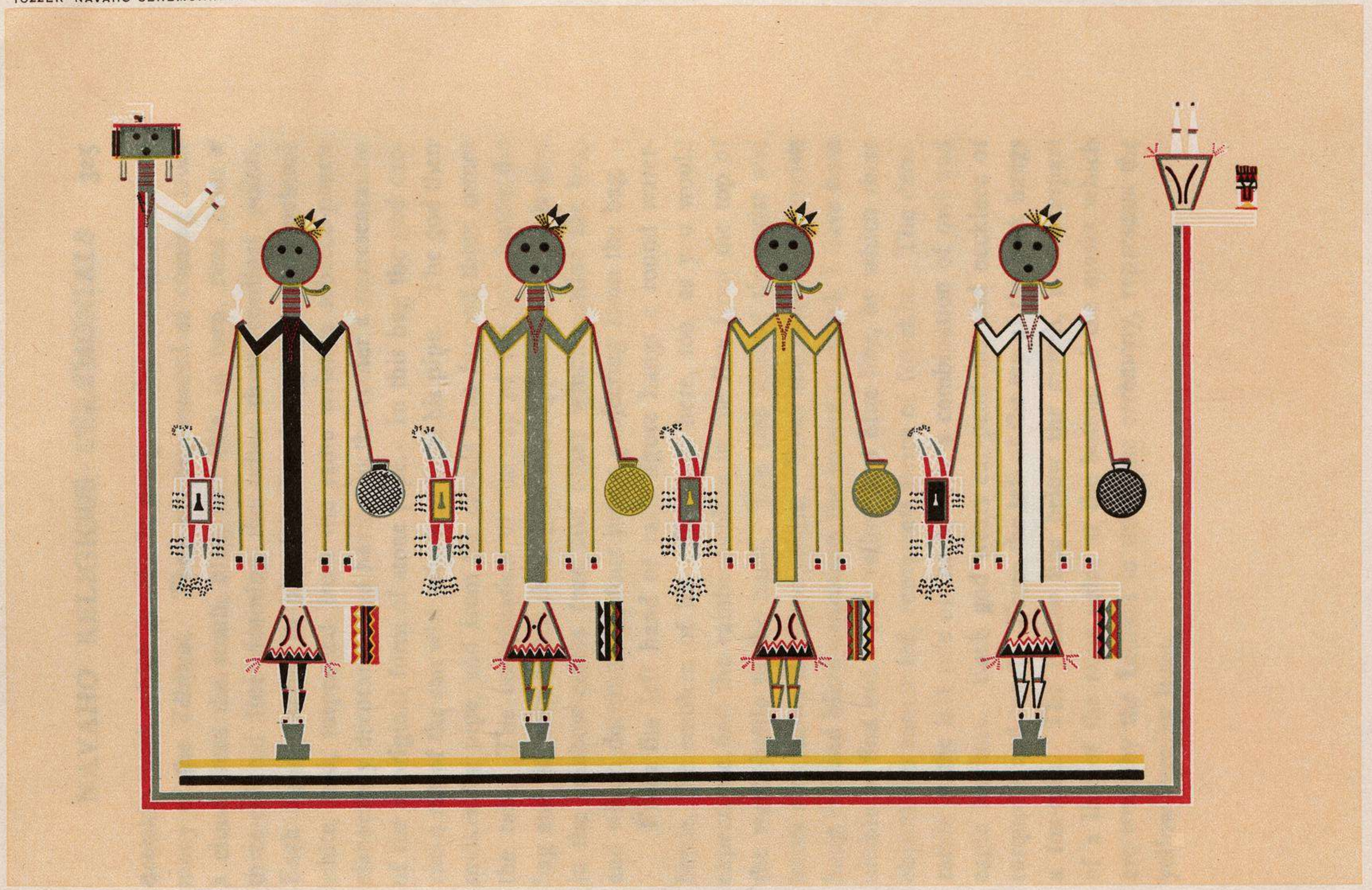

SAND PAINTING OF THE FOUR RAIN GODS

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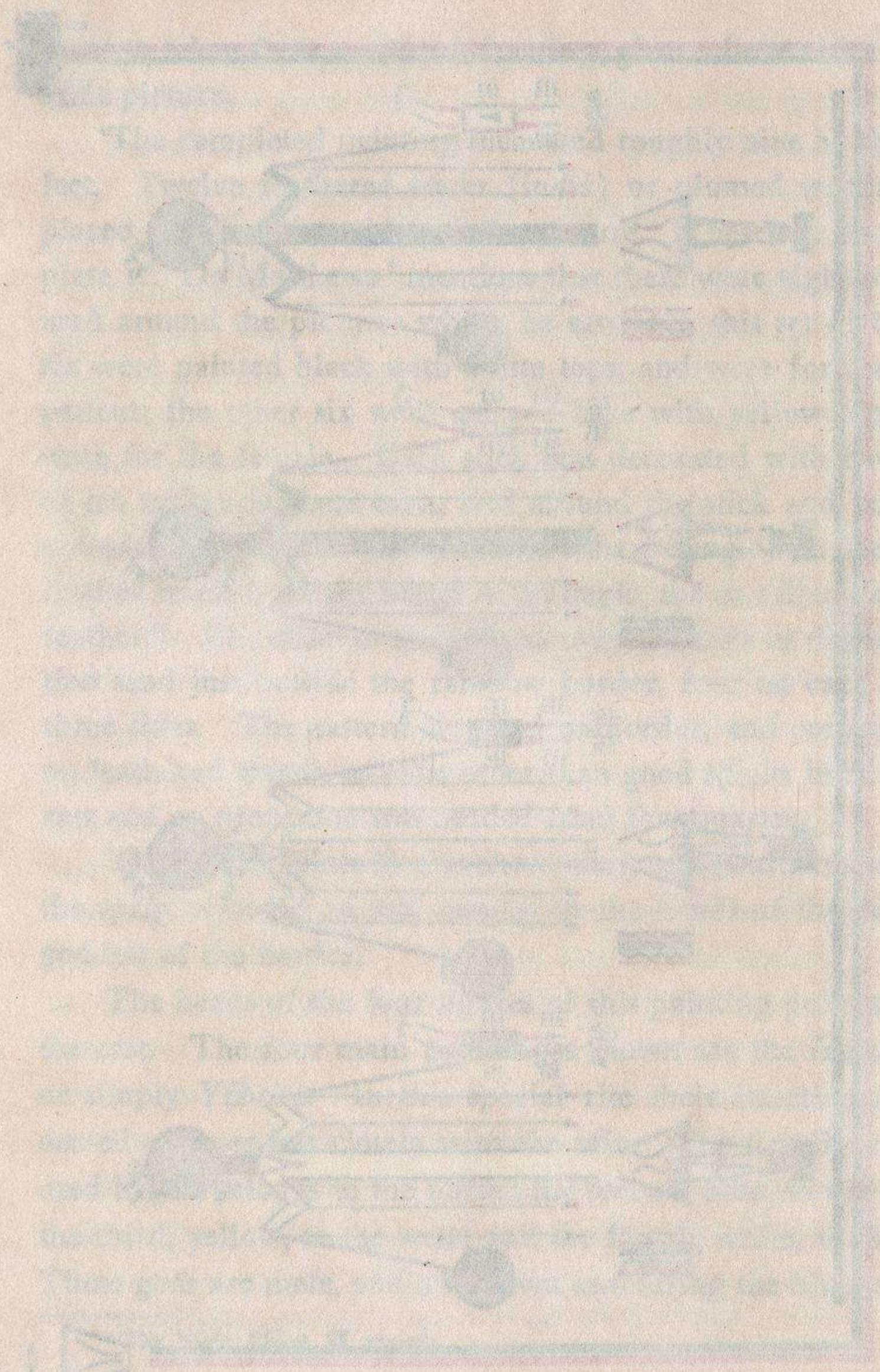

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deerskin mask which is seen in many of the rites of this ceremony of the Yébĭtsai. They are represented as coming from a cloud from the south, blue, and this, in turn, rises from a three-colored line denoting the other three cardinal points. Each figure carries in his right hand a gourd rattle painted white, and, suspended from the same wrist, a tobacco-pouch elaborately decorated, and having in the center a representation of the aboriginal form of stone pipe. In this bag the god carries a ray of the sun with which to light his pipe. The god then smokes the pipe, and from the clouds thus formed there comes the rain. The combination of the ray of the sun inside the bag and the rain which these gods are supposed to send, is seen in the rainbow-colors (red and blue) which outline the bag, and which decorate the four points projecting from the bag.

From the left hand of each figure hangs a round water-bottle, the emblem of his office, and here, too, as you would expect, we find the rainbow-colors in the line from the top of the water-bottle to the hand. The line around the wrist and knees also shows the same colors. From the elbows and wrists hang red and black ornaments the nature of which I have been unable to find out. The yellow and blue line, by which these objects are suspended, represents strips of fox-skin. The decoration at the left side of the head is a combination of owl and eagle feathers. Each god wears ear-pendants and necklace of turquoise and coral. From the left of the top of the neck hangs a fox-skin. The yellow line below the mouth, a counterpart of a line of the same color at the bottom of the masks which are worn by the Indians in this same ceremony, represents the yellow evening light.

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Coming to the lower part of the figures, we find hanging from the left side a bag. The four white lines which run from the bag to the figure are the cotton cords by which it is attached to the wrist. It is only in the decoration of this bag and the bottom of the skirt that the individual skill and inclination of the painter are allowed full play. Every other line in the entire picture is prescribed and unchangeable.

The red and blue stripe running around the north, west, and east sides of the picture, is still again the rainbow. It is pictured as female, with its head at the northeast, and feet and skirt at the southeast, corner of the painting. The head is square, and represents the square mask worn by a man impersonating a female god. This mask covers only the front part of the face, whereas the male mask fits over the entire head, and in the sand pictures is shown as round. From the top of the head of this rainbow goddess projects a turkey-feather, the white lines representing the strings by which the feather is tied on. The ear-pendants, the yellow line at the base of the mask, and the necklace are the same as are seen on the four other gods. The skirt and bag, together with the rainbow-colors at the wrists and knees, are also identical with those on the other figures. I have described elsewhere the rite carried out in connection with this painting. [1]

PICTURE OF THE NAAK*H*AI DANCE. — The second sand picture in the celebration of the Night Chant in 1901 also varied from that given by Dr Matthews, although it was not radically

[1] A Navajo Sand Picture of the Rain Gods and its Attendant Ceremony, *Proceedings of the International Congress of Americanists, Thirteenth Session*, pp. 150-156, New York, 1902.

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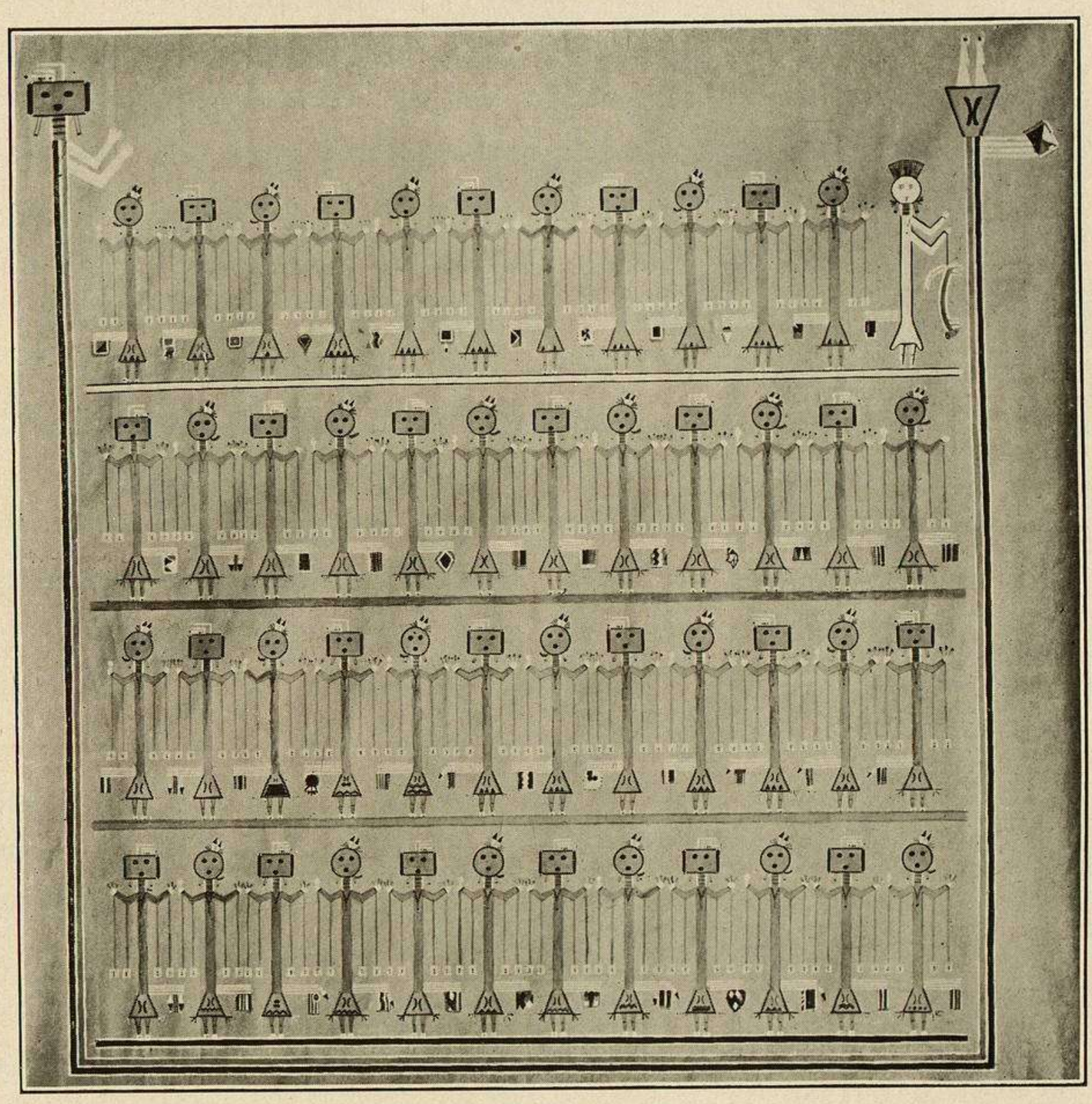

SAND PAINTING OF THE NAAKHAI DANCE

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different, as in the first case. Both Matthews [1] and Stevenson [2] show two rows of figures. In Stevenson's drawing the rows of figures are placed head to head; in the picture given by Matthews the figures all face the same way. Above the feet of the upper row in the former, and above the heads in the latter drawing, there is a double line of blue and yellow. Below the second row in both versions there is a line of black and yellow. The first line of figures shows six female dancers with square masks, and at the left of this line, To'neni̇̆li, the Water Sprinkler. The second line shows six male dancers with the round masks, and at the left *H*astsé́yal*t*i or Yébi̇̆tsai.

My variant of this picture is shown in plate III. There are four rows of figures, twelve in each line, representing alternately male and female dancers. Each row stands on a different colored line. The latter have the following colors, starting from the east or open side: the first, white, belonging to the east; the second, yellow, to the south; the third, blue, to the west; and the fourth, black, to the north. The only exception to the rule of alternate male and female figures is in the southeast corner, where *H*astsé́yal*t*i replaces the ordinary figure. The details of the figures are exactly the same as those in the drawing by Matthews. The bags alone show individual variation, according to the fancy of the painter. The rite in connection with this picture was exactly similar to that described in the other accounts.

PICTURE WITH THE "FRINGE MOUTHS." — The third picture (plate IV), which came on the eighth day of the ceremony,

[1] The Night Chant, plate VII.
[2] Ceremonial of Hasjelti, plate CXXII.

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was exactly like the one described and figured by Matthews,[1] by Stevenson,[2] and, with slight variations, by Curtis.[3] Even to the minutest details I could not detect the slightest change other than in the bags, which, as stated before, are allowed decoration according to the individual taste. It has been suggested that these bags may show an imitation of the porcupine-quill work of the Ute. It is clear that the Navaho were in intimate relations with the Ute. They have a myth accounting for the origin of the Ute, and showing them as an offshoot of the Navaho.[4]

Returning to the question of the striking similarity, I might almost say identity, of this picture as figured by Matthews and that shown on plate IV, it is interesting to note that Dr Matthews has the following to say on the point of the lack of variation of the same rite at any two times:[5] "The shamans declare that these pictures are transmitted unaltered from year to year and from generation to generation. . . . . It may be doubted if such is strictly the case. No permanent design is anywhere preserved by them and there is no final authority in the tribe. The pictures are carried from winter to winter in the fallible memories of men." To my mind this is not a matter of doubt. As proof of this I would say that Dr Matthews collected the material for his memoir twenty years before the picture which I give was painted. Still this sand picture — which he calls "the Gods with the Fringe-Mouths," and which came on the eighth day of

1 The Night Chant, plate VIII.
2 Ceremonial of Hasjelti, plate CXXIII.
3 *The North American Indian*, I, p. 122.
4 Matthews, Origin of the Utes, *American Antiquarian*, VII, pp. 271-274, 1885.
5 The Night Chant, ¶ 164.

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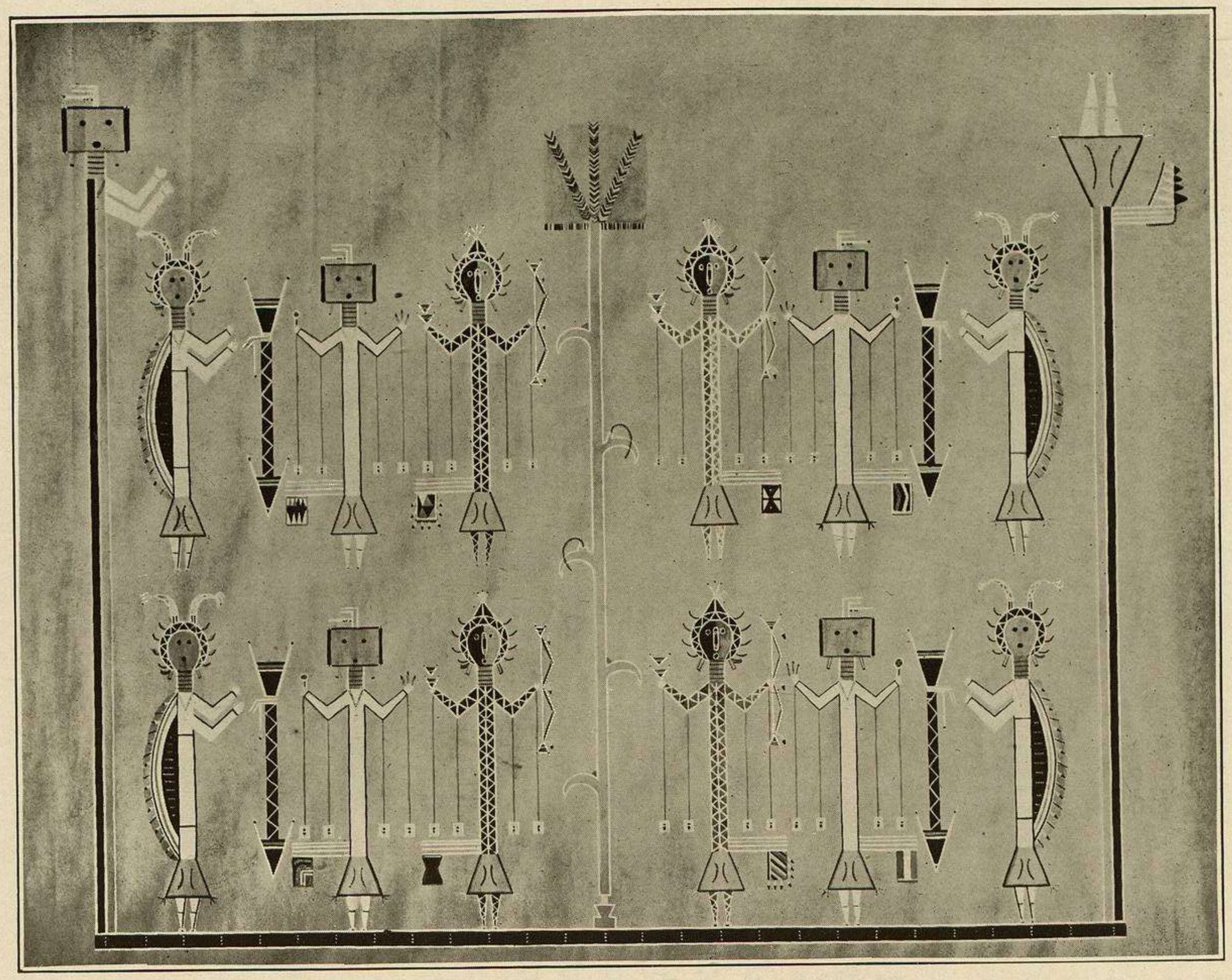

SAND PAINTING OF THE "FRINGE-MOUTHS"

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the ceremony — is the identical picture, even in many minor details, with one which was made on the eighth day of a similar ceremony witnessed twenty years after and at least a hundred miles to the east of where Dr Matthews worked. For two decades at least we can prove that the designs have remained unchanged; and the past twenty years have been lived in close contact with the whites, many of whom have done their utmost to make the Navaho put away and forget his former beliefs and ceremonies.

PICTURE OF THE GOD OF THE WHIRLWIND. — In addition to the sand pictures made in connection with the several nine-days' ceremonies, there are often smaller and far less elaborate sand pictures made to serve less important rites. Among the smaller sand paintings is one called Nĭltsebeyika*l*, or "Picture of the Whirlwind." Plate V is taken from a photograph of this sand picture on the floor of the *h*ogan, looking from the head to the feet of the figure: consequently the lower part of the body is in bad perspective. The figure represents the God of the Whirlwind. The head points toward the east. The face of the mask is a dark brown. It has across the top a white line, and on each side a red line broken by white dots, and the usual yellow line at the bottom. From the top of the mask projects a "breath" feather represented as being tied with white cotton strings. The neck is painted blue, with four transverse red lines. The usual coral and turquoise ear-pendants and necklace are indicated. The body of the figure is black with a white border. The usual red and blue lines from the wrists and elbows, to which are suspended the black and red objects outlined in white, are found. These lines represent strips of fox-skin. The bag

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at the side shows the usual elaborate design. The rainbow garters appear, but the feet are represented as bare, not covered with the usual moccasins. The upper of the two serpents at the top has a blue body and a yellow border and spots, and belongs to the south. The upper of the two serpents at the bottom has a yellow body and a blue border and spots, and belongs to the west. The lower of the two at the top has a black body and a white border and spots. He belongs to the north. The lower of the two at the bottom has a white body and a black border, and he is connected with the east. The law of contrasting colors is well brought out here. What is white with a black border in one case is black with a white border in another. The serpent at the right of the figure has a black body and a white border. The one at the left has a blue body and a yellow border, representing respectively the north and south. The god is shown dressed in a suit covered with stone arrow-points, two of which are shown fastened to the top of the mask, and five on either side of the body, the latter sets being outlined in white. The position of these along the body suggests a whirling motion. Sometimes a more elaborate picture is made with four figures in place of one, gods painted blue, white, and yellow, as well as black.

The rite of the Whirlwind God is said to be carried out to cure any one with a twisted body or bent leg. The sick person has arrow-points attached to his dress. Snakes are also used in an elaborate celebration of this special rite, which, however, I did not see. Sympathetic magic readily accounts for the God of the Whirlwind being prayed to in cases of bodily deformations. The rite held in connection with this picture

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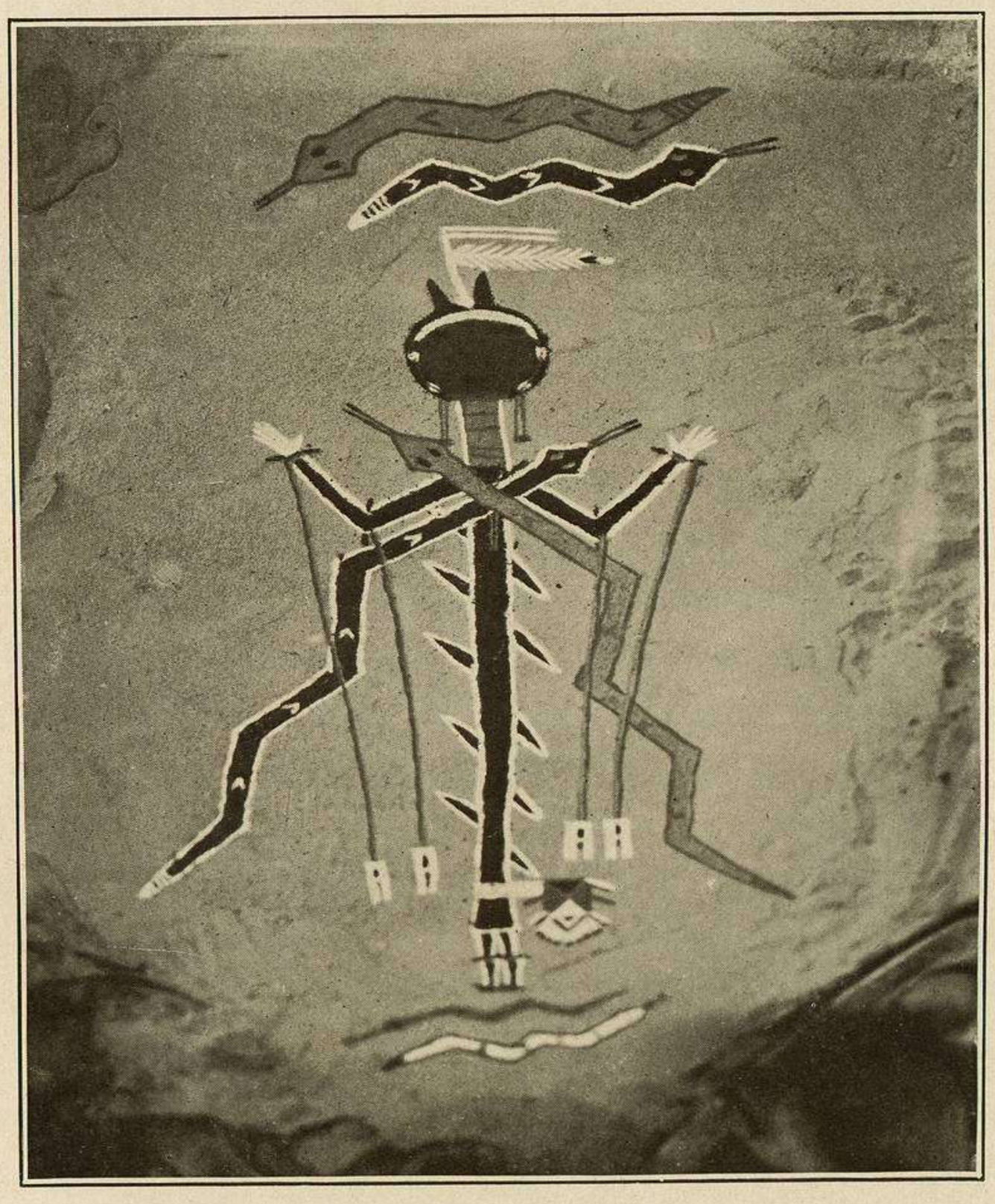

SAND PAINTING OF THE GOD OF THE WHIRLWIND

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differed little from the usual acts over one of the more elaborate sand mosaics. Pollen was placed as usual on the head of the figure and the heads of the snakes. Potions were offered to the figure and then given to the patient, and finally the latter took his seat on the figure, facing the east. The shaman then destroyed the heads of all the six serpents. Sand was taken from the different parts of the picture and rubbed on the corresponding portion of the body of the patient, thus obtaining directly the full curative power of the god himself.

It is interesting to compare the picture in connection with this rite with one given by Dr Matthews in the celebration of the Mountain Chant.[1] The serpents in this picture are also represented with spots. Four sets of two serpents each are shown. Each set is colored differently and belongs to a different cardinal point. There is in addition a single serpent at each side of the picture. The two pictures present few similarities, however, other than in the serpents.

PICTURE OF THE SUN AND MOON. — Another small and comparatively insignificant sand picture was noted. It was made out of doors under a clump of sagebrush. Plates VI and VII show the shaman in the act of preparing this painting. The small deerskin bags in the foreground contain the different colored sands. The figure at the right is that of the wife of the shaman, who is watching the operation. The picture is a representation of the sun and moon. The upper face is that of the sun, colored blue, outlined in yellow, and shown with two horns. The lower face is that of the moon, colored white, outlined also in yellow and with the two horns. The four yellow zigzag lines

[1] The Mountain Chant, plate XV.

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coming out of the top of each circle and the four straight parallel lines at the bottom are the roads over which the sun and moon travel in their course from east to west. There are four sets of minute lines of blue and yellow arranged at equal distances around each face. These are said to represent an eclipse. They do not appear in the photograph. This simple picture was made as a means of counteracting the evil effects which came to a woman who, when pregnant, had seen an eclipse of the moon. The sun and moon in eclipse are considered as dead. If they are seen in this condition by a pregnant woman, her child will become ill and his mouth will be drawn up on one side. The rite over the picture did not differ from those which have been described in connection with other sand paintings. Many of the acts were shortened, and some omitted.

SAND PICTURES AMONG OTHER PEOPLES. — It is interesting to compare the sand pictures of the Navaho with those of peoples surrounding them. The Navaho probably borrowed the idea of making pictures in different colored sands from the Pueblo peoples. That the Navaho developed this to a far greater elaboration than that found among other peoples seems clear after comparing the sand pictures, especially those of the Navaho, with those of the Pueblos. Among the former the sand mosaics are altars in themselves. There are few accessory objects used in connection with the picture. These are limited usually to the twelve feathered sticks and the bowl or gourd of some ceremonial drink (see plate I). Among the Pueblo peoples the sand picture is only one feature of their altars, and often not an important one. There is usually an elaborate reredos composed of carved sticks of various shapes and various uses,

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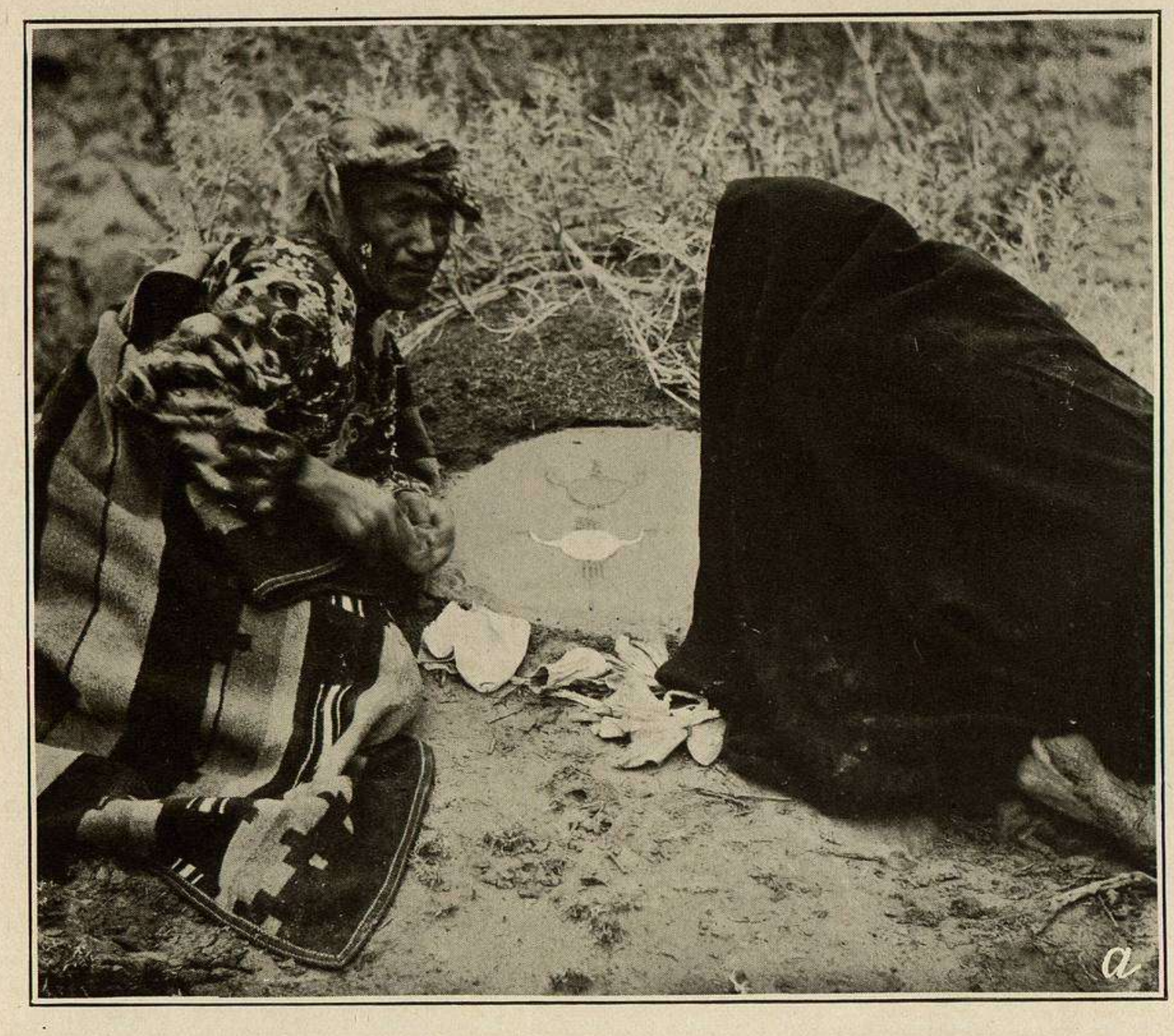



SAND PAINTING OF THE SUN AND MOON

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together with other objects. There are figures of gods at either side of the picture, or else these gods are represented by living people, as the Corn-Maid and the Snake-Boy in the Antelope altar of the Hopi. The Navaho gods are represented in the sand pictures themselves. This is seldom the case among the Pueblos. There is a large variety of objects placed around the sand pictures of the latter, including the stone fetishes. The palladia of the clan are often, although not always, present in the Pueblo altars. Here we have an example of another fundamental difference between the Navaho and the Pueblo rites. Among the former there is no clan ownership of ceremonial or other objects, no ancestral possessions, which among the Pueblo peoples are among their most valued ones. The Navaho are divided purely upon a geographical basis. The Navaho speaks of the place where his ancestors lived. This is the important feature. The Pueblo, on the other hand, mentions the clan to which he belongs and his share in the common ownership in that clan with all one line of ancestors.

Another striking difference between the sand mosaics of the two peoples is, that those of the Navaho are never allowed to remain for any length of time after they are completed. The rite in connection with them and in which they are mutilated, comes immediately after they are finished. Among the Pueblos, the sand figures often remain for several days before they are destroyed. The more or less permanent and altar-like character is evident in the latter. The Hopi make the greater part of their sand pictures in the summer, in connection with the ceremonies of the Antelope fraternity. They always begin at the edge of the picture, and follow a prescribed order: first the

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north, colored yellow; then west, with green or blue; south, with red; and east, with white. Among the Navaho, the east is white; the south, blue; the west, yellow; and the north, black. It will be noted that the Navaho colors correspond to different cardinal points, with the exception of white, which is also for the east. These are the colors used for the cardinal points on the earth. They differ slightly when used for the underworld. This ceremonial importance of color is marked among all the peoples of the Southwest, and a further development of it is seen in Mexico and Central America.

The sand pictures of the Navaho may be used not only as a sort of temporary altar, but also in other ways; as for dedicating a sweat-house, where the figures in sand are made on the top of the hut.

The sand pictures in general may be said to correspond, in part at least, to the figures painted in moist colors on skins by the Indians of the Plains.

The Apache, as stated before, have sand pictures; but they are far less elaborate than those of the Navaho. The rites in connection with them, however, are, in some points at least, singularly similar to the Navaho ceremonies; as, the coal purification, the seating of the patient on the picture, and the basket drum. The medicine-hat and the medicine-shirt of the Apache serve as curative agents. It is interesting to note that some of the designs painted on the latter are not dissimilar to certain elements of the figures on the sand pictures of the Navaho. With the use of these shirts there is far less need of elaboration in the designs of the sand mosaics.

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The Navaho speak of the Ute and the cliff-dwellers as painting pictures with colored sands; but, as Dr Matthews suggests, the latter may refer to one or more of the Hopi clans which occupied Canyon de Chelly within comparatively recent times.

It is interesting to note in connection with sand pictures that the Cheyenne and Arapaho make use of colored sands in their religious rites. The sand feature is, as in the case with the Pueblo peoples, only a component part of an altar, and plays a much more inferior rôle even than among the Pueblos. Dotted lines and straight lines made with different colored sands representing the morning star, are made in connection with the altars used in the Sun Dance. [1]

The Luiseños, the southernmost Shoshonean stock in California, also use colored sands in connection with several rites, including the girls' and boys' initiation ceremonies, when the world with the earth and sea are pictured in sand. [2]

Minor Ceremonials

The class of minor rites not connected in any way with the long ceremonies is a large one. These are more or less informal in their nature, and far less exacting than those of longer duration. They are usually carried out in the domestic *h*ogan, around the fire in the center of the room. In many of these rites, one of the less important and therefore less expensive shamans is en-

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1 Dorsey, The Cheyenne, *Field Museum of Natural History, Anthropological Series*, IX; also The Arapaho Sun Dance, IV.

2 DuBois, The Religion of the Luiseño Indians of Southern California, *University of California Publications in American Archæology and Ethnology*, VIII, No. 3.

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gaged. I have already described two of these minor rites in connection with the consideration of sand paintings in general.

RITE OF NITSEGEHATAL. — Another rite in which there is no sand picture is called Nitsegehátal. I was unable to verify the meaning of this term. It was given to me as signifying the Wing Dance, but I am not at all sure of the correctness of this. The rite began about nine o'clock in the evening and lasted until dawn. Four sticks (honésgis) about two feet long were placed around the fire, at the four cardinal points, and pointing away from the fire. These served as the ceremonial pokers and were used only at this time. The shaman then took a round pot (assa) containing a stew of corn and mutton (altánabez), and, after moving it along the length of each poker, placed it in a position at the north of the fire. A bull-roarer (sindĭnĭ) was then made, after which the patient was asked to enter the hut and take his place at the north of the fire. Feathers were tied to the hair of the sick man, and a line of corn-pollen was drawn across his forehead. The leader then went outside the hut and walked around the house clockwise, swinging the bull-roarer. He turned before reaching the door and retraced his steps contra-clockwise around the hut, never in each case completing the circle, but always leaving an opening at the east, in front of the door, untouched by his feet. When he entered the *h*ogan he touched the bottom of each foot of the patient and the other specified parts of the body with the instrument.

A basket was next utilized as a drum in the rite, which has been often described.[1] The singing now began, accompanied by a gourd rattle, and it was kept up until dawn. Pollen

5 The Night Chant, ¶¶ 287-291.

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(*t*aditdi*n*) was administered to the patient, who placed a small particle on his mouth, another on his head, and cast a third into the air. This was repeated once during the night, as was also the journey by the shaman around the house with the bull-roarer, followed by its application on the body of the patient. Just before sunrise the patient ate from the contents of the pot containing the stew. The leader then filled with water the basket which had served as a drum, and marched with it around the fire four times, followed by the patient. Their direction was clockwise, starting at the east. The patient left the *h*ogan just at sunrise, walking out, and greeting the sun by raising his arms over his head four times. The simple rite was completed, when the utensils were gathered up and the few spectators went through the self-administration of pollen.

SUMMER DANCE. — Dr Matthews states [1] that in none of the ancient Navaho rites is there a regular drum or tomtom employed. The inverted basket covered with a blanket serves the purpose of a drum in all the ceremonies described by him. This form of drum may have been the only one in the former rites of the Navaho, but at the present time there is sometimes used a drum made from a pot over which a piece of goat-skin is stretched (fig. 1). The drumstick is made of a piece of bent wood, and is similar to the stick used by some of the Pueblo peoples. The use of the drum itself is undoubtedly one of the results of close contact with these people. This drum was used in a short rite called *N*da, or "Summer Dance." It began at seven in the evening, and continued until eleven o'clock at night. The manufacture of the drum was the first act

[1] The Basket Drum, *American Anthropologist*, VII, p. 203, 1894.

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in this rite. An earthen pot which had not been used for any secular purpose was obtained, partially filled with water and a top of goat-skin was stretched over the mouth of the pot. This was done by four men working together, one of whom served as leader. Four minute holes were made in the head of the drum at the four cardinal points as the pot was

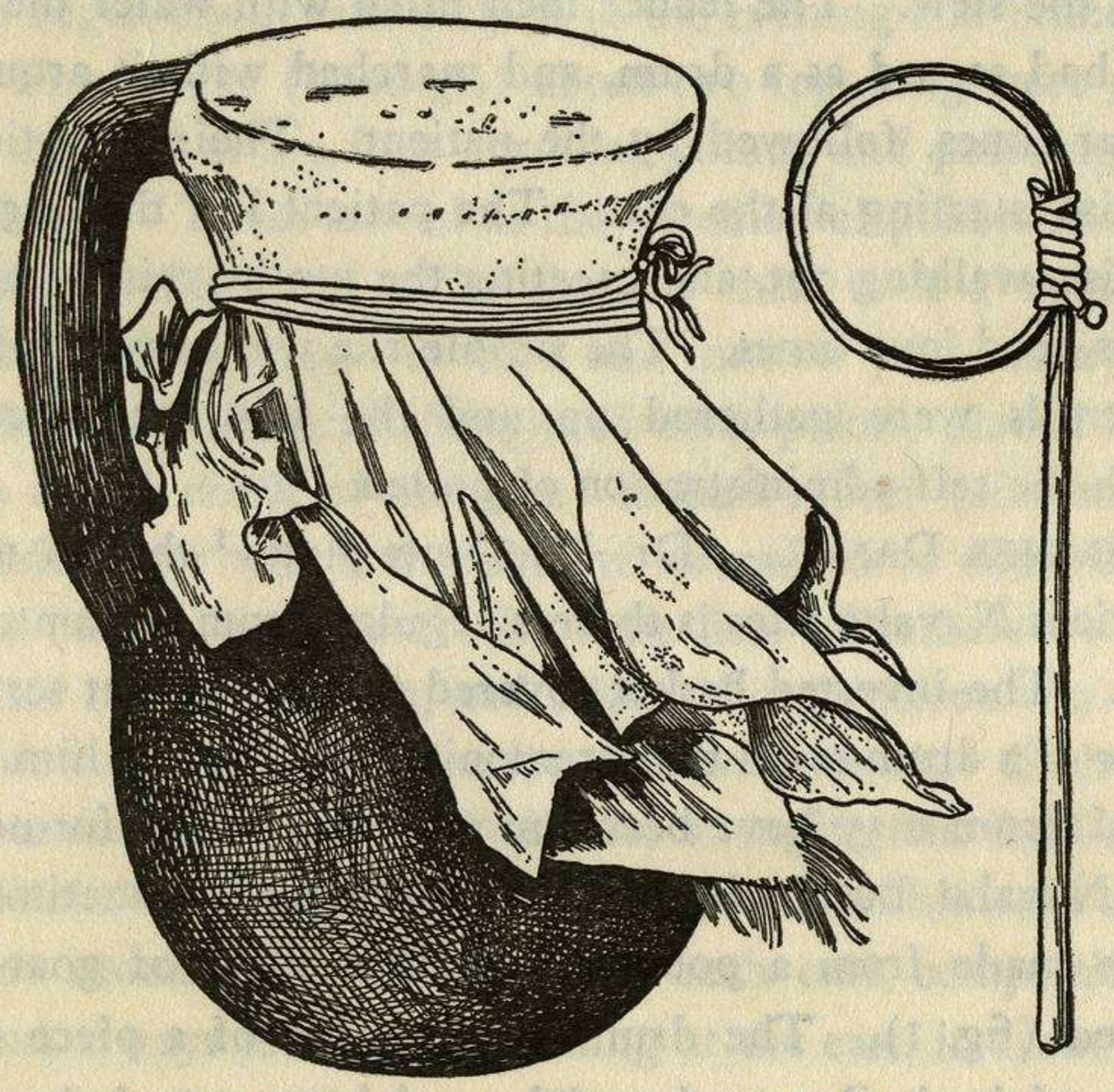

FIG. 1—Drum and drum-stick used by the Navaho.

held by the handle by the leader, who faced the east. The stick was then made. After a short chant the drum was struck by the leader four times, the hand pointing in turn to the east, the south, the west, and the north. The head of the drum and the sides were then sprinkled with pollen. Each of the four men administered pollen to themselves in the way described before.

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This ended the consecration of the drum, and it was delivered into the hands of one of the younger men of the tribe, who beat it throughout the remainder of the rite in which informal dancing was the principal feature. Men and women danced together side by side or facing each other. A woman had the privilege of capturing any man she could, and compelling him to dance opposite her in addition to paying her a small sum of money or making her some other present. Each woman carried in her hands a stick decorated at the top with a piece of cedar, below which there were two white eagle-feathers tied by two streamers of bayeta cloth. I am inclined to think that Spanish influence may be noted in the form of this dance. There was no special act in connection with the dancing, although it was stated that it was held in order to cure a sick man living more than a hundred miles to the south.

RITE OF CHARCOAL PAINTING. — I wish to describe one other of the shorter rites, as there are features in it which have not been recorded. The rite in question was to cure a man of a sickness which, it was thought, had come as a consequence of his having killed another Navaho in a fit of anger. The rite came at the very end of August, beginning just before noon and lasting until the middle of the afternoon. As a preparation for the ceremony, a quantity of willow-sticks (gaiił*t*baï) were burned and made into charcoal together with several pieces of pine-bark (dist*s*ébaatoz). These were burned in the regular fire of the *h*ogan. There were also burned on a flat stone two different kinds of weed (a*l*tadeglil). The ashes of two small feathers were added to those of the weeds. The leader then furnished a large piece of mutton-fat (aga) together with a small quantity of a

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mixture (*glanatsin*) of the fat of the mountain-sheep and several other animals. Two small balls were made of these fats, one being mixed with the ashes of the feathers and the two weeds, and the other combined with red sandstone (*tsi*) ground to a powder. The family of the patient presented the shaman with a large piece of calico, on which each article was placed as soon as it was prepared.

A small forked stick was then wound with a leaf of a cactus-plant and the whole, in turn, covered with a piece of deerskin colored with the red grease. Two braids of three cactus-leaves each were then made, and the ends of the braids tied together and the braids themselves placed side by side, making a double braided bracelet. A chain (*gaházdze*) was next made by tying together the long slender leaves of the cactus end to end, and finally the ends of the chain were tied together. Fifteen bow-knots (*woltad*) were made in fifteen other leaves, and these were all placed in a line on the calico before the shaman. He then prepared an infusion made of water and two herbs whose names I could not secure. This was made in a gourd ladle, and also placed on the calico. Finally a bowl containing water mixed with twigs of cedar was prepared, and the rite proper began. It seemed to be so entirely a family affair that the number of singers was restricted to the members of the immediate family of the patient. In this case there were three men in addition to the leader. The women present did not sing.

The shaman started the chanting and at the same time he took up one of the knotted leaves. After pressing it along the right leg and over the foot of the patient, he untied the knot with one pull directly over the big toe of the left foot. This

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act was probably similar to the use of the "circle kethawns" in the Night Chant. In the same manner as before, the other knots were untied over the following places on the patient's body: the right and left knees, the right and left hands, the breast, the back, the right and left shoulders, the right and left cheeks, and the right and left sides near the hip. A part of the contents of the gourd was then given the patient to drink in three potions, according to the song which was sung throughout the rite. After the patient had chewed up the herbs in the drink, he pressed them on the several parts of the body previously named, and bathed his entire body in the liquid remaining in the vessel.

The shaman next marked the specified parts of the body with pollen, after which there was a long period of singing. Finally, the bowl filled with cedar and water was taken by an assistant and the contents daubed on the several parts of the body of the patient, after which some of the contents was taken internally; and those present as spectators also took a sip from the bowl. The portion remaining was used to bathe the body of the patient. Sweet-grass (gloní*l*tsin) and a quantity of black seeds (hazeltaï) were given an assistant to chew. After they had been thoroughly masticated, he blew on his hands, waved them once in the air, and pressed on the body of the patient — one hand on his chest, the other on his back. He then blew three times into the face of the sick man, and finally went around the circle of spectators, blowing once in the face of each, or else on a special part of the body where a pain was felt.

The next act in the rite was to daub the usual parts of the body of the patient with the grease from the black ball made of

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the ashes. The faces of the spectators were also marked in the same way. The large mass of clear fat was then rubbed over the entire body of the patient and also along one lock of his hair. That remaining was eagerly seized by the rest of the family, and smeared on their own bodies as well as was possible without removing their clothes. The mothers took great pains to cover the bodies of their small children with the grease. This was but a preparation for the blackening of the entire body of the patient with the charcoal. Not an inch of skin was left uncovered except the upper part of the face, the grease acting simply as a means of holding the charcoal. The red ball of grease was next rubbed on the upper part of the patient's face above the chin. Two spots were made on each cheek from the contents of a deerskin bag. Red powder made of sandstone was then rubbed on the hair, after which a small pile of white ashes was placed at his feet. At certain parts of the song, the patient blew a pinch of the ash into the air.

A new pair of sandals was placed in front of him and a pinch of dust or dirt was sprinkled on each by the shaman, after which the patient put them on. The leader then took the double braided bracelet and went with it up and down the length of the right arm, finally tying it around the right wrist. The chain of cactus-leaves tied end to end was then hung over the left shoulder. The stick wound with the leaves and with a strip of deerskin was given the patient, and he walked out of the *h*ogan. These different objects were worn by him, and he was declared cured.

It will be seen from the preceding accounts of these minor rites that they all follow about the same line, and are similar

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in most respects to the individual rites which go to make up the longer and more complicated ceremonials. Sacrifice and prayer are the main components in all the rites. Dancing and masquerade are less common features in the minor rites.

In considering the ceremonials of the Navaho, especially in comparison with those of the Pueblo peoples, there is danger that we shall fail to give the former enough credit for their religious ideas. They borrowed, to be sure; but they were by no means simply borrowers: they adapted, they developed, and in many cases, especially in regard to the sand pictures, they did everything but actually invent the idea of the painting of pictures in different colored sands. After having once obtained the main religious ideas from their neighbors, they were successful in building up an elaborate ritual and a complicated mythology along quite different lines. At an early time, when they possessed little in the way of ceremonials, their willingness to borrow was great. Later, when the rich ritual of their own was developed from the adopted beginnings, their ceremonials were for the most part fixed. I have tried to show this comparative permanency in the case of the most interesting and most important feature of the religious life of the Navaho — the sand paintings.

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CERTAIN QUESTS AND DOLES

BY

CHARLES PEABODY

IN its simplest form the title means "demands and answers"; in the history of culture some of them may become customary and recurrent. In any religion the sacramental or sacrificial elements are of this character; the spiritual blessing follows upon prayer made good by offering. The formal demands for temporal benefits, however, are not necessarily sacramental, and it is of these the paper will most treat. With primitive people, secular formalities are more often controlled by religious ideas, and directed by religious leaders: so, in a society whose recurrent feasts are fixed by a hierarchy, any formalities, secular or religious, tend to follow the church calendar, and that order will here be observed.

Quest and dole do not necessarily accompany each other. As fruitless quests are of no use they disappear, and the words survive in literature, or are revived in hymns and carols used in reminiscent festivals;[1] but doles without quests are numerous. It is not unlikely that the quest is a later comer than the dole. Feasts to and for the dead are true doles among primitive people, and here the idea of the quest is present only in that of duty to the departed.

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[1] In one school in Cambridge the custom of the Christmas waits has been revived; the singing being in return for the Christmas greens and hospitality extended by friends.

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The principal actors in the game or drama are the poor, the helpless, and children, and it takes place much oftener in the country than in the city.

We shall take up the less known instances and the less familiar aspects of the greater occasions. Such customs as those connected with the children's dole from Santa Claus, the children's quest of eggs at Easter, many carnival rites, etc., have often been described, and need no extended description here.

The quest may be: 1, A demand in words of the applicant's choosing; 2, A demand in a set verse or prose form, with blanks to be filled according to the circumstances; or, 3, A demand in a conventional form, sung or said, partly appropriate to the occasion, and partly of general application.

The quest may be directed to a single individual, or (commonly) take place from door to door. It may or may not contain a bribe. If it should, the bribe may be: 1, A direct payment for the bounty; 2, Its own reward, that is, the bounty is in return for the pleasure the listener receives from the verse or the music; 3, A prayer for blessings temporal and spiritual upon the giver; 4, A compliment or bit of flattery; or, 5, A promise of action on the part of the speaker, for example, to go away if the demand is satisfied. The bribe may be made more intense: 1, By calling attention to the misery of the quester; or, 2, By a masquerade in the form of a historical or supernatural character whose importance justifies a dole.

The quest is often made more impressive by a threat, the converse of the bribe. It may be: 1, A prediction of misfortune; 2, Actual damage; 3, Uncomplimentary remarks; or,

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4, A veiled threat, such as is implied in the last class of bribes; that is, "If you won't give, we won't go away."

Doles, more numerous than quests, may be given: 1, From a superior to an inferior, as from rich to poor, prince to people, godparents to godchildren, priest to parish; 2, From an inferior to a superior, as compliments (the old-fashioned country surprise-party, etc.); or, 3, By some one acting for another, as a monk for his patron saint, priest as vicar of God, etc.

Doles may also be given: 1, For the quester's own use, or for a secondary use; 2, Through the quester to a beneficiary not concerned in the quest; or, 3, To the supernatural, the dead or their substitutes.

Finally, doles may consist: 1, Of objects, in kind or in money, asked for; 2, Of special appropriate conventional gifts, very often of cakes of particular form; or, 3, Of spiritual reward.

CHRISTMAS AND NEW YEAR'S DAY. — Whatever the origin of the solemnities at this season, — whether a solstitial feast of the prehistoric Eurafricans [1] and Eurasiatics, or a feast of the dead,[2] or a "druidical cutting of the mistletoe," [3] — whencever derived, the survivals known as the "hogmanay" quests are the most interesting of the countless rites we have received and still keep. They occur in western Europe, from the Isle of Man to France, and vary in time from late Advent till into January.

In the Isle of Man mummers begin their petition in these words: "Tonight is New Year's night, Hogunnaa," etc. This used to be sung on the eve of November 12, corresponding to

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1 Cf. H. Heinecke, *Revue des traditions populaires*, XI, p. 626.
2 Cf. M. Höfler, *Archiv für Anthropologie*, pp. 94 ff., 1905.
3 Cf. Murray's *New English Dictionary*, s.v. Hogmanay.

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October 31 or November 1 O. S., which Professor Rhys thinks was the Celtic New Year.[1] The custom is still kept up by mummers at that time. It will not be out of place here to call attention to the complicated evolutions of the mummers in Philadelphia on New Year's eve and to the importance that Celtic (Welsh) traditions have in the inheritance and place-names of southeastern Pennsylvania.

In Scotland,[2] on December 31, the children demand oaten bread or cake with the lines —

"My feet's cauld, my shoon's thin,
Gie's my cake and let me rin."

Here is the idea of poverty and the motive of going farther. Note that oats-straw and oats are traditional about Christmas, reminiscent of the straw of the manger.[3] In northeast Scotland on December 31 hogminay is demanded. Here the verse recounts the cold feet, etc., and the purpose of going farther; but the serious side of the quest has become a game, and the children explain that they are not real beggars.[4]

In parts of England,[5] on December 31 the children sing verses beginning —

"Hogmanay, trollolay
Hagmena, Hagmena,"

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1 Cf. J. Rhys, *Celtic Folk-Lore*, I, p. 316, where he quotes Vallancey in Kelly's *Manx-English Dictionary*.

2 Cf. Chambers, *Book of Days*, II, pp. 788, 789; cf. also Folk-Lore Society, northern counties, p. 77. On the Scottish borders, New Year's is the same as Cake Day. Cf. also Murray's *Dictionary*, s. v. Christmas, quoting Selden (1689): "The coffin of our Christmas Pies in shape long is in imitation of the cratch."

3 In the author's family, Christmas cakes, called "oat-straws," are always made.

4 Cf. W. Gregor, *Folk-Lore Society*, 1881, northeast Scotland, p. 162.

5 Cf. *Denham Tracts*, II, 95.

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demanding bread and cheese, and in return they are given farls of oaten cakes and cheese.

That there should be many ways of spelling "hogmanay" is not remarkable when two variants occur in the same song.

In Northumberland,[1] on Christmas eve, hogmena is asked for, and Yule doughs given; and in the same county hogmanay is the name of the cake given to children on New Year's. In some parts of Yorkshire [2] the name becomes the refrain: "Hagman heigh," which is an exclamation.

In the departments of the Orne,[3] Seine Inférieure, and Eure, on New Year's eve the children demand aguignettes from door to door with the piteous appeal of no cap to cover them. Near Rouen,[4] on January 6 the dole is asked for St Luke and St Thomas, instead of for the questers; this is somewhat rare in the hogmanay songs. In parts of Touraine,[5] on the eve of January 14 (St Hilaire) *le gui l'an neuf* is demanded. In the village of Tournon St Pierre, the *guilloneu* is given to the boys who make the quest. It is a long and narrow cake, and in case of refusal the boys sing the threat: "*Tourner la chambrière au feu.*" In Vierzon,[6] near Christmas *ai-gui-lans* (cakes of peculiar form) are sold; and in Vendée,[7] on December 31 the young men ask for the *guillanu* with the implied blessing, "*Mettez vos coeurs en Jésus Christ*," much like the "God rest you!" of the waits.

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1 Cf. County Folk-Lore, *Folk-Lore Society*, 1903, p. 79.
2 Cf. *Folk-Lore*, northern counties, p. 77.
3 Cf. H. Menu, *La tradition*, x, p. 49.
4 Cf. H. Sincère, *La tradition*, viii, p. 7.
5 Cf. L. Pineau, *Revue des traditions populaires*, xix, pp. 294, 295, 481.
6 Cf. Laisnel de la Salle, *Croyances et Légendes du Centre de la France*, i, p. 11.
7 Cf. J. de la Chesnaye, *Revue des traditions populaires*, xviii, p. 460.

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In Tarn-et-Garonne there is an interesting quest before Christmas for flour with which to make the bread to be blessed, — the *pains bénits*, that play such a rôle at the midnight Christmas-eve mass and in the subsequent distribution. This is the quest of the *Guilhonè*. Here[1] are found the tale of the cold wind and the threat of discontinuing the song. One of the uses of the *pains bénits* is —

> "Pain bénit, je te prends.
> Si la mort me surprend
> Sers-moi de sacrement."

In Franche Comté[2] a comic variant appears on New Year's. The gamins demand alms, etc., with the cry, "*La guille au nez*," evidently a popular etymology.

Of all the New Year's quests, this is perhaps the least influenced by Christian tradition, and therefore it is the most difficult to explain.

Various etymologies have been offered —

1. *Au gui l'an neuf,* from the supposed custom (see above) of cutting the mistletoe at New Year's. This sounds like a popular derivation based on several variant derivatives of a word which originally may or may not have had a corresponding sound.

2. The forms *roguignon* (Picardy), *hoguignète*, *hoguilanno* (Caen), *hoguilanne* (Saint Lô), are referred to *Hoc in anno*, that is, a New Year's gift or wish.[3]

3. *Hagmena*, from *hagman heigh*, or a call to the *hagman* or woodman in the winter time;[4] or,

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1 Cf. C. Daux, *Croyances et traditions Montalbanais*, p. 15. Cf. also Soleville, *Chants, Bas-Quercyy*, p. 277.

2 Cf. C. Beauquier, *Revue des traditions populaires*, XIV, p. 8.

3 Cf. H. Menu, *La tradition*, X, p. 49.

4 Cf. County Folk-Lore, *Folk Lore Society*, 1899, p. 282.

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4. *Hagmena*, from ἅγιον μῆνα, a reference to the Christmas season.[1]

5. *Guillaneu*, from Breton *equin an eit* (*le blé germe*).[2]

6. *Ai-gui-lan*,[3] from *gué gué o gué*, a joyous exclamation (*gué* or *gui*).

7. The Spanish forms *aguilando* and *aguinaldo* from a corrupt *Kalendae*, meaning first month or year.[4]

8. *Aguinaldo*, from Celtic *eguinand* or a *regalo* for New Year's.[5]

9. *Aguinaldo*, from Basque *aguindu* or Breton *eghinad d'e* or *Étrennes à moi*.[6]

The balance of evidence is, that the quest itself goes back to a pre-Christian solstitial ceremony that obtained throughout northern and western Europe, and that a name or names in some Aryan dialect or dialects were given, of which the Celtic form has survived in the many modern variants. Etymologically, then, the following variants and their connections may probably boast a common ancestor: *Hogmanay* (Scotland), *hagman heigh* (England), *hoguinané* (Normandy), *la guille au nez* Franche Comté), *le gui l'an neuf* (Touraine), *ai-gui-lan* (Vierzon), *guillanu* (Vendée), *guilhonè* (Bas Quercy), *aguilando* (Spain).

Finally, certain other names should be mentioned.

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1 Possibly ἅγια μήνη Modern Greek is a better analogy.
2 Cf. H. Carnoy, *La tradition*, XI, pp. 36 ff.
3 Cf. Laisnel de la Salle, *Croyances Centre France*, I, p. 55.
4 Cf. Murray's *Dictionary*, s.v. Hogmanay *ad fin.*
5 Cf. Zerolo, *Spanish Dictionary*, s. v. Aguinaldo.
6 Körting, *Latein-Roman. Wörterbuch*, Art. 376.

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In Tréguier[1] (Côtes-du-Nord), on December 26 (St Stephen) the children make a quest for *couignowa* or gifts. Now, these are also little fruit-cakes, and the word takes the form of *couignan* or *couignaneu* (Vannes). The usual derivation is from *couign* or corner, as these little three-cornered cakes were baked in the corners of the oven where the great round loaf would not reach.

In Lorraine the Christmas cakes are *cognés* and *cogneux;* in Bray, one name is *quignot*; in Arras, *queugnot*; and in French Flanders, *quéniole, cuniole*, and *keniole*. Here the derivation is made from *cunae* or cradle (*crêche*), as the Christ-child is often represented on them. Now, it is likely that all these forms are related, and it is not improbable that such forms as *quéniole* and *guilhonè*, *couignaneu* and *aguignette*, or *hoguinané*, may be descended from a common parent. Later, as the word took dialectic forms, and local Christian conditions modified the original processes, popular fancy seized upon certain resemblances suggesting appropriate etymologies.

Brief mention may now be made of customs at this season other than hogmanay.

The English waits are familiar to all.

In Porrentruy,[2] Switzerland, the boys sing *Noël*, *Bon an*, and *Les rois*, complaining of the cold, and wishing for the pardon of the listeners' sins. The fruit of the quest becomes, in turn, a sort of dole from the singers to the Christ-child. The Noëls of the Jura make a collection both interesting and charming.

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1 Cf. G. le Calvez, *Revue des traditions populaires*, I, pp. 18 ff.

2 Cf. A. d'Aucourt, *Schweizerisches Archiv für Volkskunde*, pp. 42 ff., 1899.

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In a collection of cake-molds from St Gall,[1] of the sixteenth, seventeenth, and eighteenth centuries, is one which represents a bearded man with a stick, and a goose in a basket. This familiar Santa Claus is explained as Noël, in the guise of the Wandering Jew, carrying a dole of geese to the poor.

In Montbéliard,[2] on New Year's eve the peasants go about disguised as the poor, demanding:

"Coupez au lard sans regarder (bis)
Mais prenez garde de vous couper."

They complain of cold feet, wish a happy New Year, threaten many rats in case their quest is not granted, and promise to go on.

In Germany, and especially in Scandinavia, there is an immense lore concerned with the Jul-cakes and Jul-bread doled to men or to the beasts of the field.[3] In Germany,[4] as elsewhere, on Christmas or Christmas eve a dole is left on the table as the portion of the souls of the dead.

In Corsica,[5] on December 31 the children go on a quest from house to house; food or money is thrown to them, and there ensues a scramble, a concomitant of many doles. The quest is called *Baracoucou*.

In Calymnos,[6] on Christmas, Easter, June 29 (Holy Apostles), September 1, and November 30 (St Andrew), the people

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1 Cf. A. Certeux, *Revue des traditions populaires*, XII, p. 375.

2 Cf. *Revue des traditions populaires*, VI, p. 19.

3 Cf. H. Heinecke, *Revue des traditions populaires*, XI, pp. 626 ff.; Wadensterna (*Globus*, LXXII, 1897, pp. 374 ff.); Höfler (*Globus*, LXXX, etc.). In Skansen, Stockholm, is an exhibition of the traditional cakes and breads of Sweden, and Professor Hammersted has collected much material. Cf. also O. Montelius, Solens Hjul, etc., *Nordisk Tidskrift*, parts 1 and 2, 1904.

4 Cf. A. Gittée, *La tradition*, VIII, p. 107.

5 Cf. J. Agostini, *Revue des traditions populaires*, XII, p. 523.

6 Cf. W. H. D. Rouse, *Folk-Lore*, X, pp. 180, 181.

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make cakes and lay them on the tombs; children, beggars, and strangers may eat them. This is a very primitive survival, as will be seen later.

The solstitial and equinoctial feasts are generally observed, and the dole to the dead occurs in suggestive form.

EPIPHANY. — In the west of England,[1] children are given cakes in remembrance of the gifts of the Magi.

In Normandy, on the Sunday following, the beggars hold a quest. They plead their poverty, wish the listeners Paradise, and demand *La part du bon Dieu*. The third Sunday after Epiphany bears the self-explanatory title of *Fête des Rois Maures*: so in the Beauce on January 6 the president of the omnipresent Epiphany feast presents a portion to the *bon Dieu*, and gives it to the first beggar applying.

In Argentan[2] (Orne), among other places, the *gâteau des trois rois* is thus dispensed: the youngest of the party, hidden under the table, calls, "*Phoebe Domine pour qui?*"

The cake is cut, and of course the one who gets the bean (*la fève*) is the lord of the feast. A part (*la part du bon Dieu*) is set aside for the poor. The interest centers in the entrance of the poor as God's representatives, to whom a dole or gift is made.

In the Indre,,[3] formerly, after *la part de Dieu* was *la part des absents*. This was kept, and the state of preservation betokened that of the members of the family afar.

Among the Walloons[4] there is a similar custom; and be-

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1 Cf. *Revue des traditions populaires*, IV, p. 40.
2 Cf. L. Bonnemère, *Revue des traditions populaires*, II, p. 55.
3 Cf. P. Sébillot, *Revue des traditions populaires*, III, p. 12.
4 Cf. J. Lemoine, *Folk-Lore au Pays Wallon*, p. 43.

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sides, if the bean is found in God's portion, an auction is held, and the proceeds are given to the first poor man who knocks.

In east Prussia,[1] boys in costume make a quest, singing the song of the Holy Three Kings, and asking for a gift. No plea of hardship, save that of "standing on stone," is made; but there is a veiled threat in a reference to a housewife who cuts so near as to endanger her finger.

In lower Burgundy,[2] on Candlemas (February 2), as well as on Shrove Tuesday, pancakes are made and given under the threat, "*Les moucherons vous mangent les yeux a Pâques*"; and in the Yonne[3] the young girls make a quest for themselves, including *la part â Dieu*.

Quests and doles of pancakes for Shrove Tuesday and the carnival are too numerous to mention extensively. Pancake eating at this time is still kept up in parts of America.

In southern England,[4] quests by the children are common; they contain a plea of a dry mouth or of dear food. The threat is sometimes characteristic —

> "If your hens don't lay,
> I'll send your cock away."

And the penalty of "Lent crocking," or throwing shards at the doors, was a very real one.[5]

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1 Cf. J. Von Meden, *Zeitschrift des Vereins für Volkskunde*, VII, pp. 315 ff.; and H. Frischbier, *Preussische Volksreime*, p. 212.

2 Cf. P. Salmon, *Revue des traditions populaires*, VII, p. 192.

3 Cf. N. Quépat, *Mélusine*, I, p. 316.

4 Dorset and Wilts (*Chambers*, I, pp. 236 ff.); J. W. Powell, *Folk-Lore*, XII, p. 81; P. Manning, Oxford (*Folk-Lore*, XIV, pp. 167 ff.); Suffolk (*Folk-Lore Society*, p. 113, 1895); Sheffield (*Denham Tracts*, II, p. 31).

5 This custom with us takes place on Halloween, with cabbage-stocks in place of shards. In Italy (Sorrento), it is considered a compliment, and is part of a New Year's wish.

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In Saintonge,[1] Mardi-Gras himself makes the quest for the boys —

"C'est mardi-gras qu' est à la porte
Qui demande des crêpes molles."

And in Verdun [2] (Meuse), on Ash Wednesday, herrings and imitation fritters are carried on fishpoles in a masquerade, and are grabbed for eagerly by the children. This is a *corè lé-zarengs* or *courir les harengs.*

In Prussian Saxony (Zeitz),[3] on Monday the boys, and on Tuesday the girls, go about striking with switches, and receiving presents or pretzels in return; and a similar custom is reported from Silesia.[4]

Finally, a whipping-quest is sung in Anhalt by the children for Ash Wednesday.[5] It is as follows:

"Ascher-Aschermitterwoch!
Eine Bretzel gieb mich doch!
Thust Du mich 'ne Bretzel geben
Wünsch ich Dich 'n langes Leben."

This trochaic dimeter, very common in popular poetry, is appropriate to the cracking or striking of the whips.

In the country reaching from the Jura northward down the Rhine, and to the east and west of the river, the first Sunday in Lent has long been connected with a fire and cake ceremony; after the bonfires there are general collations, etc.

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1 Cf. J. L. M. Noguès, *Mœurs Saintonge*, p. 57.

2 Cf. F. Fertiault, *Revue des traditions populaires*, IV, p. 160.

3 Cf. A. Petzold, *Zeitschrift des Vereins für Volkskunde*, X, p. 142. On the use of pretzels at this time, cf. Höfler, *Archiv für Anthropologie*, 1905, pp. 103 ff.

4 Cf. A. Baumgart ibid., III, p. 154.

5 Cf. O. Hartung, ibid., VII, p. 75.

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On March 21, 1090, part of the Larsch cloisters were destroyed by fire caught from a burning disk thrown by some one. Even to this day the fire ceremonies are kept up in that vicinity. After these the young folk demand and are given cakes and dried fruit (*Hutzel*).[1]

In Lorraine[2] first comes the quest for fagots, and then that for fritters —

"Ohé, la mère, préparez les beignets."

In Liege[3] a former curious custom is reported: "Les servantes revenaient manger le pain de leur père le jour des grands feux." The fires are still built. Compare with this the present custom in Couvin,[4] Belgium, of presenting waffles to the married children on this day, the *dimanche du grand feu*. In Malmédy,[5] Rhenish Prussia, the young men used to go about *en masse* with wafers in beribboned baskets to present to their sweethearts. In Alsace,[6] after the fires are over the quest is made thus —

"Jungfer gen is Küechle
S' gfriert mi a mim füesle
D' schilüssel hoer iklingle
D' pfanne hoer i krache
D' küechle sin gebache."

Various names are given the festival. The general title is *Dimanche des Brandons;* in addition, *Fête des Sanciaux* (Cher),[7]

1 Cf. F. Vogt, ibid., III, 1893, pp. 350, 351.
2 P. Ristelhuber, *La tradition*, III, p. 118.
3 Cf. A. Harou, *Revue des traditions populaires*, XII, p. 92.
4 Cf. C. Bihot, *Wallonia*, X, p. 40.
5 Cf. H. Bragard, ibid, XII, p. 66.
6 Cf. H. Carnoy, *La tradtiion*, V, p. 359.
7 Cf. Lainsel de la Salle, I, p. 38.

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Dimanche des Piquerez (Jura) [1] (*Piquerez-pois grillés*), *Funkensonntag*, *Küchlesonntag*, *Hutzelsonntagg* (Baden).

Attempts have been made to refer the origin of this festival to ancient or prehistoric times.[2] The time of this festival varies from February 8 to March 14; but it generally takes place on February 25 (O.S.), March 8 or 9 (N.S.). This brings it in close proximity to the vernal equinox, and the fires are probably a reminiscence of one of the old Pagan quarterly celebrations. The Roman Lupercalia, in the middle of February, are analogous in their striking ceremony to the whip rites of Ash Wednesday mentioned above. The crowning of the day with cakes is but a natural physical consequence, and there is a lack of historically significant cake-forms.

At Namur,[3] as lately as 1860, it was customary on March 12 (St Gregory) for the schoolboys and their master to make a strenuous quest for food. They went in procession, with two to represent the saint and his wife, and received a dole from the mothers of these children. As a reward, the wish was expressed that the givers be *notre cousine;* and as a curse, that the recusant go *aux pourris aguins*. They received *Matou* (cylindrical cakes) and *Koukebacks* (fritters).

With this may be compared the dole mentioned by Höfler [4] in the German Ulster region, where the children now represent the poor, who, in turn, represented the departed souls.

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1 Cf. C. Beauquier, *Revue des traditions populaires*, III, p. 73.

2 Cf. L. de la Salle; A Lang, *Folk-Lore Record*, I, p. 103. He compares the lustration of the fields in Rome, and the Hebraic, Roman, and East Indian distribution of sacred cakes (Liba).

3 Cf. L. Loiseau, *Wallonia*, II, p. 41.

4 Cf. art. Bretzelgebäck.

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In parts of England, the fourth Sunday in Lent is called "Mothering Day."[1] Children return to their mother's house and offer her food.

"I'll to thee a simnel bring[2]
'Gainst thou go'st a-mothering.
So that when she blesseth thee,
Half that blessing thou'lt give me."— HERRICK, to Dianeme.

In the Craonnais of France,[3] good children are given goodies by the mysterious *Mère mi-carême*. The author sees traces here of the Roman Cybele festival, the Hilaria on March 25. The idea is not far-fetched. Cybele as the mother of the gods may be faintly remembered in the English customs as well. In Franche Comté,[4] in the second week before Easter, the children quest from house to house, singing *La Passion*, and on wishing Paradise are given a dole as to *pêcheurs*[5] (sic).

HOLY WEEK. — In England,[6] on Palm Sunday it was the custom to throw cakes from the church-towers to the children; and in Belgium,[7] dainties (*oublies*) were carried in procession, and caught by the children. Sacred branches are still distributed from all Catholic churches. The cakes caught from them retained some of the imparted virtue.

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1 Dic Faiths and Folk-Lore, s.v. Mothering.

2 Simnels were also in vogue on Easter and in Holy Week. The name occurs in Lancashire as *simblin* (that is, Simblin Sunday, the fourth Sunday of Lent). It is curious to note that in Hingham, Mass., "simbals" are used for "doughnuts," without any idea of the original special day, or of the fine flour of which they were composed.

3 Cf. Bellier-Dumaine, *Revue des traditions populaires*, XIV, p. 247.

4 Cf. C. Beauquier, ibid., XIV, p. 175.

5 Query, "*pécheurs*"?

6 Cf. Chambers, I, p. 396.

7 Cf. Remsberg-Duringfeld, *Traditions et Légendes Belgique*, I, p. 212.

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In Silesia[1] the maidens are allowed to make the quest, and receive *Zuckergebäck* as reward.

In Poitou[2] the children play *capioté* (tag), and the child most *capioté* must pay a *cornue* (three-cornered cake), which is sold on Holy Thursday at the church-door, at the children's benediction.

In Sardinia,[3] on Holy Thursday, as well as at other times, a dole of *cocca* (soft bread) is given out at the priories to the Brothers and Sisters of the orders on pilgrimage.

In Franche Comté,[4] on Holy Thursday and Good Fridaf the sacristan distributes *pains bénits,* which are bought for ten or twenty centimes, and these are kept for their supernatural power. A curious custom at Easter is reported from Monmouthshire:[5] the master of the house walks about the fields with cake and cider, and distributes them, saying, "A bit for God, a bit for man, and a bit for the fowls of the air." This recalls *la part de Dieu*, and the birds as representatives of the dead, among the Permians.[6] In England[7] on Ascensioon Day, after a symbolic destruction of Satan, the priests

> "The wafers down doe cast,
> And singing cakes the while,
> With papers round amongst them put
> The children to beguile."

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1 Cf. Tetzner, *Globus*, 1900, p. 322.
2 Cf. L. Pineau, *Revue des traditions populaires*, IV, p. 368.
3 Cf. *Archivo Tradizioni Populari*, V, p. 22.
4 Cf. C. Beauquier, *Revue des traditions populaires*, XIV, p. 175.
5 Cf. H. C. Ellis, *Folk Lore*, XV, p. 221.
6 Cf. Sartori, *Speisung der Toten*, p. 34.
7 Cf. Faiths and Folk-Lore, s.v. Ascension Day, where is quoted Googe "Naogeorgus" (1570).

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At Whitsuntide, in Alsace at Bouxwiller [1] a boy hidden in leaves is marched about while the children demand food, principally eggs. If this is given, they promise to be content; if not, they threaten to send the marten to the chicken-coop. In Anhalt,[2] on Wednesday, the boys make a food-quest from house to house. Afterwards the youths and maidens dance about the May-tree, and there is a feast. Special cakes, *Dünnen Kuchen*, are in honor.

The Jura is as rich in songs of the May as in Noëls.[3] Near Neuchâtel, on the first Sunday the boys and girls go from house to house singing, and imploring the materials for the *croûtes dorées*. Instead of poverty, they plead the beauty of the season; they wish a blessing for the givers, and promise to go away.

In Armentières [4] (Nord), on May 1, *nieulles* (wafers) of all colors used to be thrown from the mayor's balcony.

The fires of St John (June 24) are the most striking of the prehistoric quarterly fire-feasts, and have been much commented on. Compare Sudermann's "Johannisfeuer" and Georg's speech in Act III.[5] Here it need only be remarked that in central France,[6] on St John's eve, every family contributes wood for the fires, and later takes a brand, has it blessed, and preserves it. This is known as a *camichon;* and in Paris in 1573, sweetmeats called *camichons* were in vogue on St John's Day.

In Girgenti,[7] Sicily, on the first Sunday in July (Feast of

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1 Cf. P. Ristelhuber, *Revue des traditions populaires*, XI, p. 324.
2 Cf. O. Hartung, *Zeitschrift des Vereins für Volkskunde*, VII, p. 82.
3 Cf. F. Chabloz, *Archives Suisses*, II, pp. 16 ff.
4 Cf. A. Capon, *La tradition*, III, p. 150.
5 Ed. Cotta, p. 97, Stuttgart, 1901.
6 Cf. Laisnel de la Salle, I, p. 83.
7 Cf. V. Sclafani-Gallo, *Archivo Tradizioni Populari*, VI, p. 76.

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St Calogero), the statue of the saint is carried in procession as it passes the balconies. Bread is thrown at its face and is scrambled for by the crowd, and a piece, whenever secured, is considered lucky.

In Champagne,[1] on August 10 (St Laurence) the houses are marked, *Aubade de St Laurent.* On the following Sunday they are again visited, and the lady presented with a bit of bun, in return for which she is expected to dole out food or money, failing which there is no dance for her at the forthcoming ball.

In Styria,[2] on August 24 (St Bartholomew) the mistress of the house gives to each member the *Bartelmäbutter* in memory of the woman who helped the saint in misfortune.

The ceremonies on October 31 (Halloween), November 1 (All Saints'), and November 2 (All Souls'), are largely connected with the commemoration of the dead. How far some of the autumnal harvest traditions and the autumnal prehistoric festivals may influence the ceremonies of the present time is not clear, but this is comparatively of small importance.

Communion with the departed by means of symbolic feasts is universal, and pertains to all time. For detailed examination we may consult Sartori's article, Die Speisung der Toten,"[3] and Höfler's articles.[4] A short summary of the matter is as follows: The dead, especially immediately after decease, need physical support, need sympathy, and need to be appeased, lest they come

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1 Cf. F. Fertiault, *Revue des traditions populaires*, VIII, pp. 470, 471.

2 Cf. K. Weinhold, *Zeitschrift des Vereins für Volkskunde*, VIII, p. 439.

3 Gymm. zu Dortmund, *Jahrbuch*, 1902, 1903.

4 *Zeitschrift des Vereins für Volkskunde*, pp. 80 ff., 430 ff., 1902; *Archiv für Anthropologie*, 1905, pp. 94 ff. (Bretzelgebäck); *Archiv für Anthropologie*, 1906 (XXXIII), pp. 263 ff. (Herz); *Archiv für Anthropologie*, 1906 (XXXII), pp. 130 ff. (Haar); *Archiv für Anthropologie*, 1907 (XXXIV), pp. 91 ff. (Sterbefällen). Cf. Also Hartland, *Legend of Perseus*, II, pp. 277 ff.

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back and make trouble for the survivors. The survivors also feel the need of sympathy, and miss the companionship of the member of the family or clan which they have lost: hence the customs of the dole of food to the dead. This may be given and set before the corpse in the house, or given on the way to the interment, or at the grave itself. A common meal is set at which the dead is supposed to be present, either before, during, or after burial. The place of the dead may be taken by a substitute (an animal or another person); in the latter case it is usually one who, like the deceased himself, is peculiarly under divine protection, — the poor, crippled, sick, beggars, strangers, and children. Anniversary feasts for the dead take place on or in recurrent days, weeks, months, or years. Through the establishment of All Saints' and All Souls' by the church, the mortuary feasts and doles in modern Europe have become crystallized around those dates. The following examples may prove interesting.

The custom of feeding the corpse before burial has been observed in Borneo and the Indian Archipelago, in Japan, China and Korea, India, Armenia, Russia, France (time of Louis XIV), northwestern North America, and Brazil. In southern Hungary, dried plums are put in the coffin to secure a good yield from the trees.[1]

In parts of Switzerland the poor offer to watch the corpse, and are given food and drink, especially at midnight. In Denmark[2] it was the custom to regard the corpse as host; and the guests on leaving addressed him, "*Dank für die Mahlzeit.*"

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[1] Cf. Sartori, p. 12.

[2] Ibid., p. 8.

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Among the Letts,[1] when the coffin is placed on the wagon, food and drink are placed on the coffin or under the wagon and then given to beggars. Among the Circassians,[2] sheep and oxen are placed on the grave and given to the guests and the poor; and the Roman *Silicernium*,[3] as distinct from other funeral rites, seems to belong here.

A list of animals and persons that may represent the dead is given by Sartori. This includes dogs, sheep, crows, ants, flies, priests, relatives, contemporaries, old men (?) (Rome), the first-comer, the poor, cripples, strangers, and children.

In Calymnos,[4] cakes called *kolyva*, bearing the image of the dead, are watched over in the house with two candles, then taken to church and there distributed. The eating of these cakes is repeated with similar ceremonies on the third, ninth, and fortieth days; at the end of three, six, and nine months; and of one, two, and three years.

The Calymnos custom of allowing beggars, strangers, and children to eat the food left at the grave, is due to the theory of substitution; elsewhere, if the idea of representation is not held, it is the highest sacrilege to partake of such food.

The time of commemoration is not confined to November 1. In China, on the fifteenth day of the seventh month, food is set for blind and weak souls. Amongst the Wallachs, on the name-day of the house-saint, places are left at the table for the departed ancestors; and among the Eranians, at the end of the year, the

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1 Cf. Sartori, p. 9.
2 Ibid., p. 19.
3 Cf. Forcellini Lex., s.v. Silicernium.
4 Cf. Hartland, II, pp. 288, 289.

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spirits returned in the hope of obtaining food and clothes; these were the perquisite of the priest and children.

In Portugal and among the Votjaks, Lent is the memorial time.

In this connection may be noticed the custom, very frequent in America, of sending the funeral flowers to the hospitals after the ceremony. Those carried to the grave are generally left as a fair covering, and are not distributed.

The flowers and viands placed on the altar on high feast-days are also given away, and carry with them, possibly, a certain odor of sanctity.

The Easter distribution of growing plants which have just been set in the church is a feature in many Boston parishes.

The dole of good things sent by the churches at Thanksgiving is analogous, if nothing more, to the All Souls' rites. This feast approaches All Souls' in time, and to the Puritan took the place of the somewhat riotous rejoicings of October 31, that are our inheritance from early years.

One may not forget the decorating of graves in the North and South on Decoration Day, the dole of flowers to the sea in New England in memory of lost sailors, and the recurrent decoration and visitation of private graves by members of the family.

Finally, some lines of the Cheshire (England) Souling Song are interesting.[1] It is a true quest-song, and contains most of the common elements.

The demand —

"A soul! a soul! a soul-cake!
Please, good Misses, a soul-cake!

[1] Broadwood and Fuller-Maitland, *English County Songs*, pp. 30, 31.

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An apple, a pear, a plum, or a cherry,
Any good thing to make us all merry.

Down into the cellar
And see what you can find
We hope you will prove kind
With your apples and strong beer.

I've got a little pocket
To put a penny in.
If you haven't got a penny,
A ha' penny will do."

The blessing —

"God bless the master of this house,
The misteress also,
And all the little children
That round your table grow;
Likewise young men and maidens,
Your cattle and your store,
And all that dwells within your gates,
We wish you ten times more."

The threat (veiled) —

"If you haven't got a ha' penny,
It's God bless you."

That is, it's hard luck you're in.

The plea —

"The lanes are very dirty,
My shoes are very thin."

The beneficiaries (sponsors for the questers) —

"One for Peter, two for Paul,
Three for Him who made us all."

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The purpose —

"And we'll come no more a-souling
Till this time next year."

The significance of a mortuary song is quite lost in the desire to be made all merry.

In Dunkirk[1] (Nord), on November 11 (St Martin) the children go a-questing, as follows:

"St Martin, boule, boule, boule.
Donn' des croquandoules."

These were formerly a sort of macaroon; now they are made of gingerbread.

In southeastern Bohemia,[2] women in white, known as *Barborky*, go about distributing good things to good children. This feast precedes that of St Nicholas, on December 6. On this date the saint is nearly as active in rewarding good children as his other self, disguised as Santa Claus or even the Christ-child (*Kriskringle*), is on Christmas eve.

In Dinant,[3] Belgium, at the time of St Nicholas, the famous *couques* or cakes of spelt-flour and honey, weighing from five to six kilogrammes, are given to the children; they represent the saint himself in form. The *couques* are much in vogue elsewhere in Belgium, at other seasons and in other shapes; for example, of St Lambert at Liege, Ste Perpète at Dinant, fishes, animals, bouquets and fruits, *bonshommes*, and old-fashioned ladies. The ancient molds which date from the twelfth century had forms of helmetted heads, Roman emperors, and mythological subjects.

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1 Cf. Desrousseau, *Flandre Franc*, I, p. 69.
2 M. Rybak, *Revue des traditions populaires*, XVIII, p. 87.
3 Cf. A. Hock, *Mélusine*, I, pp. 321 ff.

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In the Gossensass region[1] the children set out food for St Nicholas' donkey, and pray the good man for good things for themselves, pleading that they won't ask much.

In Moravia,[2] on December 26 (St Stephen) the Tcheks remember the servants with a special cake. It is also the day on which the servants take a leave of absence; elsewhere the Tchek girls make an ornamented cake, which is enjoyed by both girls and boys after the latter have cut it.

This résumé is incomplete enough; but doles at baptisms and marriages, special saints' doles, legacy doles, and doles of food as incantations, or the reverse, must also be omitted.

In general, it may be said that the variety of occasions, times, and seasons, is great, but that there is a striking homogeneity in method; that "psychic unity" and tradition have acted together to produce this result, and that even the higher civilization does not entirely do away with the quests and doles of older times.

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1 Cf. M. Rehsener, *Zeitschrift des Vereins für Volkskunde*, p. 396, 1896.
2 Cf. M. Rybak, *Revue des traditions populaires*, XVIII, p. 98.

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A CURIOUS SURVIVAL IN MEXICO OF THE USE OF THE PURPURA SHELL-FISH FOR DYEING

BY

ZELIA NUTTALL

DURING a recent visit to the town of Tehuantepec, on the isthmus of the same name, the writer was impressed by the remarkably beautiful purple color of the straight cotton skirts worn, at the market place, by some women who appeared to be in better circumstances than the rest. Like the other ordinary skirts so gracefully worn by the native women who are distinguished for their slender willowy figures, these purple skirts consist of a straight piece, about two and one-half or three yards long, formed by the sewing together of two widths of cotton stuff. This skirt, which is wound about the bare limbs, is usually finished by a deep fold at one side and is fastened by a separate belt or sash tightly drawn around the waist.

Hand-woven turkey-red skirts, with narrow black or white stripes, costing from three to five dollars in gold, are the ones in general use. The purple skirts were generally plain, but a few of the older ones exhibited very narrow black and white lines. In all of the many purple skirts examined by the writer, the two widths were united by a fine cross-stitching of orange or yellow cotton, an interesting detail which revealed a refined recognition of complementary coloring.

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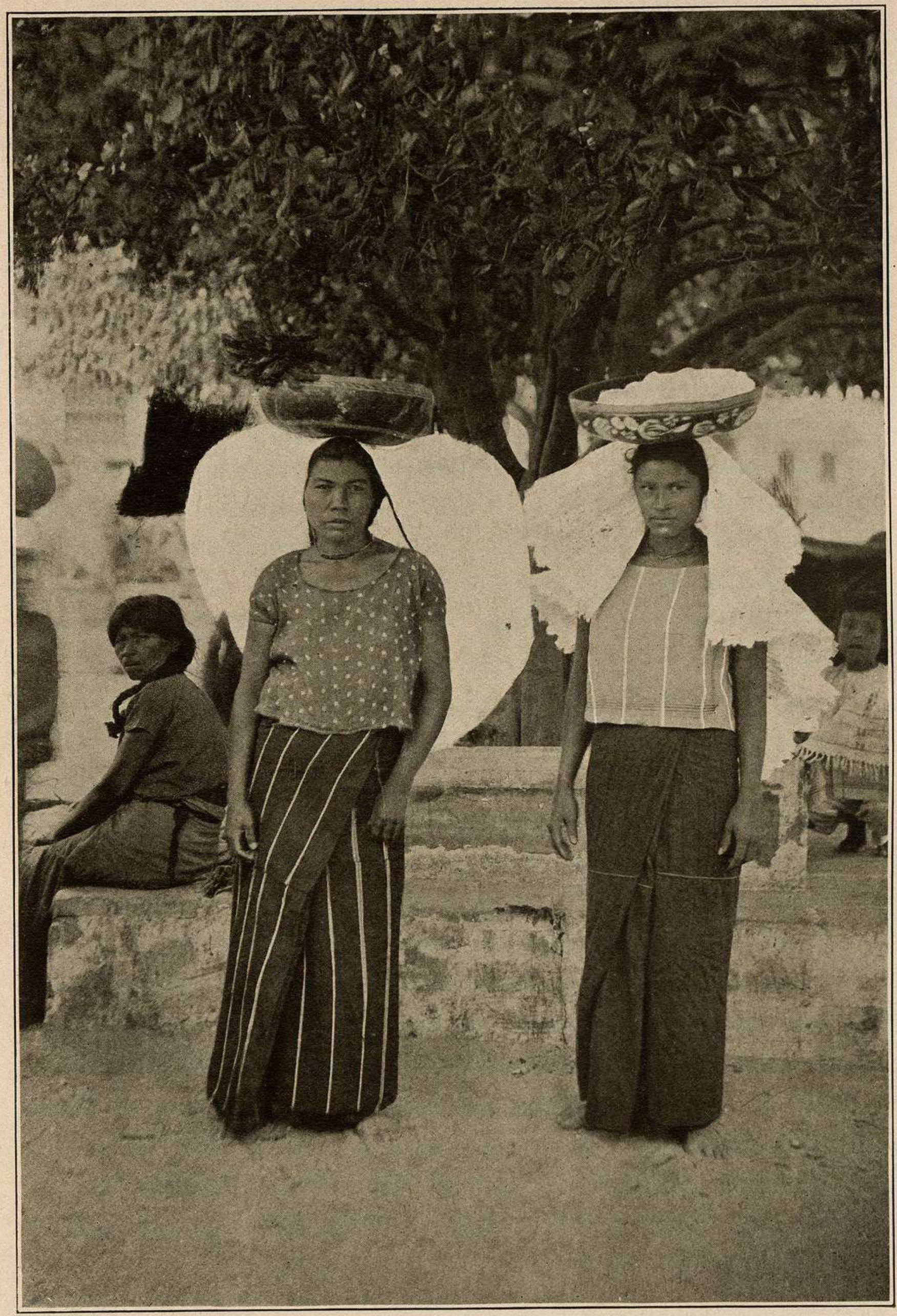

TEHUANTEPEC WOMEN IN NATIVE COSTUME

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Inquiries elicited the information that these purple skirts were named "*de caracolillo*," that they were dyed by means of a shell-fish, and that their fixed market value was not less than ten dollars gold. The mistress of a primitive weaving establishment, where the purple stuff is woven on hand looms, to order only, explained that the fixed rate for the dyed purple cotton thread was five dollars per pound, and that as a pound and a half was needed to make the regulation skirt, this left but two dollars and a half to cover the expense of weaving and of the fine cotton thread, dyed with indigo, of which the woof consists. She showed a picturesque basket full of purple skeins of loosely twisted cotton thread which had just been brought back to her, on mule-back, from Huamelula, a small town on the Pacific coast, whither she had sent it some months previously. Lifting one of the thick skeins, she slipped it over her brown left wrist, and proceeded to show how she, as a child, had seen the fishermen at Huamelula obtain the dye from the *caracol* or sea-snail.

In the spring, about the beginning of March, the latter started in boats laden with cotton skeins and went northward along the coast, visiting certain rocks which are exposed when the tide recedes. Slipping a skein over his left wrist, the fisherman wrenches one sea-snail after another from the wet rocks, blows on it, causing it to exude the dye-stuff which resembles a milky froth, and then dabs the cotton thread with numerous shells in succession, until it is thoroughly saturated. When each shell had yielded its small supply of liquid dye, some fishermen pressed it to the rock and waited until it adhered thereto, but others laid the shell in a pool. When treated thus the

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same shells yielded a second though diminished supply when the rocks were visited on the return journey. The *caracols*, however, had become so scarce now that the fishermen were often obliged to proceed as far north as Huatulco, or even Acapulco, in order to fill their orders and dye the cotton thread entrusted to them. The scarcity of the fish, the great numbers of them required to dye a pound of cotton, and the time, patience, and labor required, amply account for the comparatively high price of the *caracolillo* skirts. Although Tehuantepec matrons still consider one of these somewhat in the light that our grandmothers regarded a black silk dress, as associated with social respectability and position, fewer and fewer purple skirts are ordered every year, and the younger generation of women favor the imported and cheaper European stuffs. Not more than about twenty purple garments were woven at Tehuantepec last year, and it is probable that before long the industry will be extinct.

After having been moistened by the dye fluid, the cotton thread turned green, and, when exposed to and dried in the sun, the green turned purple and became permanent, fading only slightly after repeated washings and then assuming a pleasing delicate violet shade.

A disagreeable feature of the dye obtruded itself upon my notice, namely, the strong fishy smell, which appears to be as lasting as the color itself. This peculiarity, which, I am told, has been mentioned by a classical writer, would account not only for the disuse of the Tyrian purple, but also for the extravagant use of perfumes by the Roman emperors and all those who "wore the purple" in classical antiquity.

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SPECIMEN OF CLOTH DYED WITH PURPURA

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Having ordered a skirt to be woven for me, and having persuaded a graceful Zapotec woman to sell me one she had had in use, I departed from Tehuantepec, absorbed in thought upon an industry which was, to me, invested with all the romance and charm of historical and classical associations. Here was almost an extinct survival of an ancient, primitive method of dyeing similar to that practised by the Phenicians not only at Sidon and Tyre, but in the islands of Cythera, Thera, and Crete, which were also "main seats of the purple trade."

Whatever differences there might be between the American and the Mediterranean species of the shell-fish, it seemed to me that no purple could be more suggestive of royalty than the beautiful and intense violet of the native purple stuff which is worn today, almost as a badge of nobility, by some of the handsome Tehuantepec women. I had the impression, however, that it is the general belief among scholars that in the Old World the secret of obtaining the dye had long been lost and that only in comparatively recent times has the species of *Murex* which furnishes the Tyrian purple been identified from its description by Pliny.[1] The Tehuantepec survival of a primitive method of extracting the dye from an allied species of sea-snail seemed to me to be vested with a particular interest and value.

Once at home, among my books, I searched for documentary evidence concerning the industry I had observed, and ascertained

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1 "In the days of the Roman Conquests in the east the Tyrian purple was reserved under penal statutes for imperial use; its production declined and eventually both the material and the art of using it were lost. From Pliny's description modern investigators were enabled to rediscover the shell-fish which yielded the dye, but the colors furnished were neither so bright nor so permanent as those obtainable from much less costly dyeing material." — *Encyclopædia Britannica.*

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that the subject had been thoroughly treated by Professor von Martens, the late distinguished director of the Berlin Zoological Museum, in a monograph read before the Berlin Anthropological Society on October 22, 1898.

In this valuable contribution the writer referred, somewhat cursorily, to the testimony of the English Jesuit priest Thomas Gage, and the Spanish brothers George John and Antonio de Ulloa, who record that the port of Nicoya in Costa Rica was a seat of the purple industry in the seventeenth and eighteenth centuries. Their evidence deserves to be quoted at length and at first-hand. Thomas Gage wrote in 1836 as follows:

"About Chira, Golfo de Salinas and Nicoya, there are some farms of Spaniards, few and very small Indian towns who are all like slaves employed by the Alcalde Maior, to make him a kind of thred called Pita,[1] which is a very rich commodity in Spain, especially of that color wherewith it is dyed in these parts of Nicoya, which is a purple color; for the which the Indians are here much charged with work about the seashore, and there to find out certain shells, wherewith they make this purple dye. Purpura is a kind of shell-fish whose usual length of life is seven years. He hides himself about the rising of the Dog-star and so continues for 300 days. It is gathered in the spring time and by a mutual rubbing of one or other of them together, they yield a kind of thick slime like soft wax, but its famous dye for garments is in the mouth of the fish and the most refined juice is in a white vein. The rest of his body is void and of no use. Your Segovia cloth dyed therewith for the richness of the color is sold at five or six pound the yard, and used only by the greatest Dons of Spain and in ancient times only worn by the noblest Romans and called by the name of Tyrian purple. There are also shells for other colors, which are not known to be so plentifully in any other place as here."[2]

In their *Historical Relation of the Voyage to Central Am-*

[1] Pita is made of agave fiber.

[2] *A New Survey of the West-Indias*, London, 1655, p. 193.

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erica, published in Madrid in 1748, the Ulloa brothers give the valuable data of which the following is a translation:

". . . In the port of Nicoya . . . this shell is used for dyeing cotton threads which are subsequently employing for making and embroidering ribbons, laces, and other fine needlework.

"Different modes of extracting the dye fluid are employed. Some persons sacrifice the life of the animal in doing so. They extract it from its shell by placing it on the back of one hand and with a knife held in the other press it with a small knife, squeezing the dye from its head into its posterior extremity, which is then cut off, the body being cast away. After having treated a great number of shells in this way, and collected the dye in a vessel, the cotton threads are passed through this. . . . "[1]

Interrupting the Ulloa relation, I would mention here that the above appears to have been the method practised by Mediterranean people, for I have learned from Dr Arthur Evans of the existence, on the coast of Crete, of great heaps of broken *Murex* shells. Moreover, Professor von Martens mentions the broken shells of two varieties of *Murex* found in large quantities on the ancient sites of Sidon and Tarent, both ancient well-known centers of the purple industry. I recall also how some classical author describes certain women as "slowly stirring the purple dye in bowls."

It is obvious that this destructive method, besides impairing the purity of the dye fluid, would lead to the gradual extermination of the purpura in Mediterranean countries, and make the collecting of the shell-fish more and more laborious and hazardous. The industry was probably in its decline when a Roman emperor issued an edict exempting from taxation all fishermen who devoted themselves to collecting the *Murex*.

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[1] The illustration of the *Purpura lapillus* contained in vol. XVI of the *Encyclopædia Britannica* indicates that the purple is secreted in the small "adrectal purpuriparous gland."

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No doubt it was experience that led to the adoption of the more conservative method of procuring the dye, described by Thomas Gage, by my informant at Tehuantepec, and as follows by Ulloa — a further advantage being the greater purity and therefore intensity of the color obtained:

"Others extract the humor by means of compression without killing the animal. They do not extract it entirely from its shell, but squeeze it, making it vomit forth the dye. They then place it on the rock whence they took it and it recovers, and after a short time gives more humor, but not as much as at first. If the operation is repeated three or four times, the quantity extracted is very small and the animal dies of exhaustion."

Ulloa relates how, in 1744, he observed the first method described, adding that even in regions where the Indians have practice in catching the shell-fish and where these occur in great quantities, the industry was not commonly practised because, as a great quantity of shell-fish is necessary to dye even a few ounces of thread, the latter is seldom to be procured, and is held in high value on account of its scarcity. Ulloa records the curious current belief that the cotton thread varied in weight and color *according to the hour in which it was dyed*. He also adds that linen did not absorb the dye like cotton thread, and suggests the desirability of making a series of experiments not only with linen but with silk and wool. In conclusion Ulloa informs us that in Central America the dyed cotton thread was known as *caracolillo*, the name, be it observed, I found in use at Tehuantepec at the present time.

Returning to Professor von Martens' monograph, I shall now present the valuable data it contains, summarizing some parts and translating others in full.

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Through the courtesy of Dr Henry Pittier, formerly of San José, Costa Rica, Professor von Martens obtained specimens of the purpura and of cotton thread dyed therewith in Nicoya by the Indians, who "simply draw the thread across the mouth of the shell." Professor von Martens identified the shells as "the *Purpura patula* (Linnæus and Lamarck), which is plentiful in the West Indies and also occurs on the Pacific coast of Central America." He continues as follows:

> "Although the marine fauna of the western coast of America is so fundamentally different [to that of the eastern coast], this *purpura patula* introduces an Atlantic element into the Pacific which indicates (paleontologically speaking) a comparatively recent connection between both oceans."

Professor von Martens further teaches us that the *Purpura patula* resembles the *Purpura haemastoma* of the Mediterranean, which is still used by the fishermen of Minorca to mark their linen clothing.

A third variety of the same species is the *Purpura lapillus* of the North Sea, which was used in the sixteenth and seventeenth centuries by the peasantry of some parts of Scotland and Norway to dye their linen scarlet. The true purpura of the Phenicians and Greeks belongs to another but allied species of *Murex*, namely, *Murex trunculus* and *brandaris*. The Pacific coast variety was identified as a purpura in 1742 by the French conchologist Dezallier d'Argenville, who speaks of its use for dyeing purposes and designates it as the *Conque persique* of the Indian ocean. Bruguière in 1789 and Lamarck in 1803 distinguished the *Purpura persica* from the *Purpura patula* of the Pacific coast, Lamarck citing *P. persica* as the first and *P. patula* as the third variety of the *Purpura*.

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After referring to the testimony of Thomas Gage and the Ulloa brothers, which I have given above at greater length, Professor von Martens continues: "I am not acquainted with any earlier data concerning this purpura industry, but the foregoing authorizes the question whether the employment of the shell-fish for dyeing purposes was an independent and precolumbian invention of the Indians or was introduced by the Spaniards." Professor von Martens rightly concludes that the industry was practised in America in prehistoric times, because "at the period of its discovery the purple *Murex* dye had long been superseded in Europe by the use of the more brilliant scarlet obtained from the coccus insect, the only survival of the use of the shell-fish being that of the Minorca fishermen already mentioned. The latest record of 'purple hats and purple trains' is dated 1440, a few years before the Osman conquest, and is contained in a reference to the court at Byzantium which clung to the customs of antiquity. In 1467, Pope Paul II introduced scarlet as the color to be worn by cardinals as equals in rank to kings. Vasco de Gama presented to the first Indian king he met, as a present from his monarch, not a purple but a red kerchief from Venice; and also clothed himself in scarlet at this audience, in which he represented his king. . . . If the Spaniards had introduced this dyeing industry into America, they would surely have done so on the islands and coasts of the Carribean sea, in Hayti, Cuba, and Venezuela, where the 'purpura patula' abounds and where Spanish influence was felt earlier and more thoroughly than on the Pacific coast of Central America. The present survival in Costa Rica conveys more the impression of being an expiring survival than a thriving industry introduced by the Spaniards."

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Through Professor Eduard Seler and his talented wife,[1] Professor von Martens received information of the industry at Tehuantepec, and was shown not only a purple skirt from there but also kerchiefs with purple stripes such as are worn by the Huave Indians, to the southwest of Tehuantepec.

On examining some of the only precolumbian textiles in existence, those of Peru, which owe their preservation to the dry atmosphere of that country, Professor von Martens found, in the Royal Ethnographical Museum in Berlin, a garment and some bands with narrow stripes, the color of which is identical with that of the Huave kerchiefs. He also noticed the same in textiles from Chimboto, preserved in the Bolivar collection, and "other more bluish stripes (which hue may possibly be due to a different method of using the same dye), or red ones the color of which recalled the cochineal."

Professor von Martens' conclusion, based on the foregoing, is "that the dye of the *Purpura* shell was used in America in precolumbian times."

Before proceeding to state certain facts and my endorsement of Professor von Martens' conclusion, I should like to present the valuable information he gives us of the use, alongside of each other and in the New and the Old World alike, of two other shell products, namely, the conch-shell trumpets and pearls:

"It is well known that, among the ancient Greeks and Romans, and especially in poetry and mythology, the shell trumpet played a prominent part. Its use survives at the present day in certain localities in southern France, Elba,

[1] In her interesting book of travel, *Auf alten Wegen in Mexico und Guatemala*, Berlin, 1900, Frau Cecilia Seler mentions the purple skirts and purple industry of Tehuantepec. Both she and her husband record that the fisherman spat on the shell-fish in order to make it exude the dye, which statement must be based on misinformation, as it is obvious that this procedure would dilute and thus seriously affect the intensity of the dye.

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Corsica, and Sicily, for the summoning of fishermen and field laborers. In the last century the Corsican militia, under Paoli, employed them instead of drums or trumpets. European explorers found them in actual use in East India, Japan, and, by the Alfurs, in Ceram (East Indian archipelago), the Papuans of New Guinea, as well as in the South Sea islands as far as New Zealand.

"Although the shells used were of a different variety to the Mediterranean *Tritonium*, they were all of the same species, excepting in the East Indies where the *Turbinella* was employed. It is possible that the use of shell trumpets in the West Indies, Peru, and Brazil, as well as the use of the *Strombus gigas* by the negro slaves in the Danish West Indian islands, may have been introduced from the Old World.

"On the other hand, Professor Seler has shown me a precolumbian drawing, from Mexico, of a personage blowing a conch-shell trumpet. Moreover, Professor Seler has collected, in several parts of Mexico, prehistoic trumpets made of the *Fasciolaria gigas* and *Turbinella scolymus* from the Caribbean sea, and the *Fasciolaria princeps* from the Pacific ocean. The Jesuit priest Arriaga, at the beginning of the seventeenth century, describes the use of shell trumpets in Peru, and in the Bolivar collection belonging to the Berlin Ethnographical Museum there is a precolumbian trumpet made of *Strombus galeatus*.

"The Portuguese writer Suarez de Sousa, in 1589, and Marcgrave, about 1640, report on the use of trumpets in Brazil, made of what I surmise to be *Strombus goliath*, closely allied to *Strombus gigas*, which is found on the coast of Pernambuco."

Professor von Martens states his belief that the conch-shell trumpet could just as well have been independently devised at various times and in various places. He confesses, however, that the idea of employing the large conch-shell as a trumpet would not easily suggest itself, especially as a second opening had first to be made in the shell before it could be blown.

"The appreciation of pearls in America is unquestionably precolumbian. On his third voyage along the coast of Venezuela, Columbus saw Indian women wearing strings of pearls on their arms, and therefore bestowed the name

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Margarita upon this region. Balboa, who was the first European to reach the South sea [Pacific ocean], was immediately presented with beautiful pearls by an Indian chieftain. In the account of De Soto's voyage of discovery to Florida and Alabama in 1540, mention is made of temples, containing such quantities of pearls that the Spaniards were not able to carry all away with them.[1] The latter were presumably pearls from the fresh-water species named *Unio*. But those presented to Columbus and Balboa undoubtedly were derived from varieties of the species *Avicula* (*Meleagrina*), which since ancient times has supplied the pearls fished for in the Indian ocean, the Persian gulf, and the Red sea."

To the above interesting and exact information Professor von Martens adds:

"It is obvious that, having once been found by chance in a shell which had been fished for food, they would attract attention, and any one having leisure or being able to command the labor would easily have hit upon the plan to hunt for them systematically. Similarly the roaring sound heard when the large conch-shells are held to the ear would have naturally stimulated the hearer to make other phonetic experiments with such shells."

Continuing in the same strain, the learned Professor states:

"In the case of the *Purpura* sea-snail the first step may have been its collection for food, and when, subsequently, beautifully colored stains appeared on a garment which had come in contact with the living animal, the natural sequence would be further experimentation."

It can but strike one as strange that so eminent an investigator as Professor von Martens should not seem to have realized what an enormous gap exists between the primitive *but clothed* fisherman who first discovered pleasing stains on his raiment and the carrying out, by a great number of men, of a laborious industry which simply ministered to esthetic and luxurious tastes such as are usually indulged in by members of a privileged class in ancient and highly organized communities. In the same way

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[1] Mention should be made here of the quantities of fresh-water pearls which Professor F. W. Putnam found on altars in the mounds excavated by him in Ohio.

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Professor von Martens makes the extraordinary statement that he is "far from wishing to infer from their use of the purpura that the American aborigines are descended from the Phenicians," quite ignoring the distinction to be made between the separate problems of "the origin of the American race" and "the possibilities of precolumbian contact between the Old and the New World."

Having now presented what has been published concerning the purple industry in Central America, I shall revert briefly to certain points of particular interest. To Professor von Martens' conclusive evidence that the use of the shell-fish was not introduced by the Spaniards, but was in vogue in America in precolumbian times, I would add the following striking confirmation:

In the ancient Mexican codex which belongs to Lord Zanchu and has been named after me, a beautiful purple paint is profusely used. It contains pictures of no fewer than thirteen women of rank wearing purple skirts,[1] and five with capes and jackets of the same color. In addition, forty-six chieftains are figured with short, fringed, rounded purple waist-cloths, and there are also three examples of the use of a close-fitting purple cap. Moreover, the codex also contains representations of thirteen personages whose bodies and faces are painted purple, and of five whose bodies only are purple, their faces being painted with other colors. In one case it is a prisoner who is thus depicted. In another a wholly purple person is offering a young ocelot to a conqueror (page 47), an interesting fact, considering

[1] Eight of these skirts are perfectly plain, like those usually worn by the Tehuantepec women of today, while the other five are finished with handsome variegated borders and fringes.

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that ocelot-skins were usually sent to the Aztec capital as tribute by the Pacific coast tribes of southern Mexico.

On pages 1 and 14 of the codex, the priests, bearing either staffs, the sacred bundle for igniting the new fire, or torches, and conch-shell trumpets, are figured with purple body and face painting. It is noteworthy, in this connection, that the high priest who, on page 78, is shown as actually twirling the fire-sticks and performing the sacred rite, wears a closely fitting purple cap. Throughout the codex the same color appears in combination with others in ornamental designs and figures.

The shade of the purple paint used is identical with that of the purpura dye, and until it is demonstated to us that the native artists obtained this color from some now unknown mineral or vegetal dye, it may be assumed that they also used the purpura dye in preparing their paint and in depicting personages with body paint and garments dyed by means of the same shell-fish.

Professor von Martens has observed that in the New World as in the Old the purple industry is closely associated with the use of pearls and of the artificially devised conch-shell trumpet. I would likewise point out that, whereas we find it recorded that the enterprising Phenicians and their descendants established in the Old World not only stations for the purple industry, but also others for the mining of copper, gold, and silver, so we find that, in precolumbian times, the Zapotecs, whose descendants still use the purpura, were famed as miners, as workers in copper, gold, and silver, as weavers, and as enterprising traders who traveled far and wide, trafficking with these products and the cocoa-bean. In the home of these native merchants, the State of

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Oaxaca, which includes Tehuantepec and Huamelula, the present seat of the purple industry, copper was prepared for transportation in enormous quantities, in the shape of a kind of double scraper. Copper axes and other implements are also numerous. The ancient Zapotec goldsmiths and silversmiths are reputed to have been extremely skilful, and existing specimens in the collection of Dr Sologuren confirm their reputation.

Costa Rica, where, at Nicoya, the purple industry still survives, owes its name to its extraordinary mineral wealth. In Oaxaca, as elsewhere in Mexico, and in Central and South America, the natives themselves disclaim their independent discovery of all arts and industries, attributing them to a foreign culture-hero, identical with the personage who, according to Aztec tradition, landed at Panuco with a band of followers. These aliens, who became a ruling caste and from whom Montezuma claimed descent, instituted a tetrarchical form of government which was still in existence at the time of the Spanish conquest and was the counterpart of ancient Greek tetrarchies. They, moreover, established order and ruled communal life by means of an admirable calendar which embodies the artificial conception of the existence of four, the so-called "Empedoclean" elements, and an advanced application of the "science of numbers" in cyclical form.[1]

Whatever interpretation may be made of the foregoing data (and there will always be differences of opinion on so vast and intricate a subject), it can scarcely be ignored that, in the Old and the New World alike, are found, in the same close asso-

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[1] In my paper entitled "Some Unsolved Problems in Mexican Archæology," *American Anthropologist*, N. S., vol. 8, No. 1, Jan.-March, 1906, the above points are discussed at length.

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ciation, (1) the purple industry and skill in weaving; (2) the use of pearls and of conch-shell trumpets; (3) the mining, working, and trafficking in copper, silver, and gold; (4) the tetrarchical form of government; (5) the conception of "Four Elements"; (6) the cyclical form of calendar. Those scholars who assert that all of the foregoing must have been developed independently will ever be confronted by the persistent and unassailable fact that, throughout America, the aborigines unanimously disclaim all share in their production and assign their introduction to strangers of superior culture from distant and unknown parts.

Those who know how little the enervating climate of Mexico and Central America is conducive to sustained intellectual and physical exertions will not be inclined to doubt the truth of the native traditions. Nor will it appear likely to them that, under such adverse conditions, the aborigines should have been able to develop along parallel lines with the most alert and enterprising people of antiquity, the Mediterranean seafarers, and evolve not only the same tetrarchical form of government and artificial theories respecting the elements, but attain (though handicapped by a total ignorance of cursive numerals) a mathematical proficiency which created the admirable cyclical calendar system used by them, institute extensive trading and indulge in the identical luxuries, such as gold, silver, pearl, and precious stone ornaments, besides decorative textiles and purple dyes which entailed hard labor to the producer and pandered to a highly developed esthetic sense only.

It seems almost easier to believe that certain elements of ancient European culture were at one time, and perhaps once

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only, actually transmitted by the traditional small band of possibly lost or shipwrecked Mediterranean seafarers, than to explain how, under totally different conditions of race and climate, the identical ideas and customs should have arisen.

Both views, however, present obvious and seemingly insurmountable difficulties, and we must place our trust in time and further discoveries to solve the deeply interesting but baffling problem of precolumbian contact or no contact at all.

Casa Alvarado,
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GOTAL — A MESCALERO APACHE CEREMONY

BY

PLINY EARLE GODDARD

A SHORT account of a particularly interesting ceremony was obtained from an aged Mescalero, named Trias, through the influence and by the assistance of Marion Simms, a young man of education and wealth. Trias is the last priest of the chief rites of the ceremony. When he supplied the information in the fall of 1906 he was almost totally blind, and his memory was failing. The account rendered in the Mescalero dialect of the Apache was accompanied by nearly one hundred songs belonging to the ceremony, together with several of the prayers. The aged priest sang the songs first, since he seemed to remember both their order and content more readily when they were accompanied by the tune, and then repeated the significant words slowly and distinctly that they might be recorded.

It is in these songs that the chief value and interest both for the Indian participant and the white investigator center. It is hoped that they may be published in due time as texts with accompanying translations. Except in a few cases the refrains of meaningless syllables, in which as a frame the significant words are set, were not obtained. It is greatly regretted that the music can not also be presented. There was delay in procuring a phonograph, and when it did arrive Trias was at

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some distance from the agency, the weather was disagreeable, and unfriendly influences had changed the old man's attitude.

It would appear at first glance that the ceremony is only one of those most common and most widely distributed ceremonies for adolescent girls. Perhaps it is chiefly that, but a study of the songs indicates that it is also a dramatic representation of the creation and of the annual and diurnal re-creations which come to the world. Its celebration is expected to result not only in a fortunate life for the maiden about whom it happens to center, but in the general welfare of the community.

The Athapascan peoples of the southern division seem to possess in common that portion, at least, of the myth of origin which clusters about a divine woman and her culture-hero son, or sons, as given by Matthews in The Navaho Origin Legend. Both the San Carlos and the Mescalero Apache have practically the same story of the supernatural generation of the hero, and tell of the same exploits in nearly the same order by means of which the foes of mankind were conquered. IsdjanaLijn, the virgin goddess mother, is impersonated in this ceremony by the adolescent girl who is painted and dressed to represent her. In the songs and prayers, however, her equally divine son, Nayenezganin, usually occupies the first place. It was he who first built a sacred lodge and celebrated the ceremony.

That these two are connected with the sun and moon is made plain by direct assertion, as well as by the adjectives and phrases descriptive of them. Evidently they are much more than the chief luminaries which constitute but one form of their expression. They are the male and female forces which made and still maintain the world. It seems to be the art instinct, the

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love of balance and contrast, which lies behind this dualism, rather than the necessity for a generative pair; for the relationship is that of mother and son.

It would be difficult to find anywhere literary productions in which sense is sacrificed in a greater degree to pure mathematical art. Those familiar with Southwestern thought know how great a part the number four plays. It has abundant place in this ceremony. In addition, balance and parallelism are secured by dividing nearly all the songs into two equal parts, symmetrical but effectively contrasted. These contrasts are chiefly male and female, above and below, shimmering and steady shining, blue and white, large and slender, sunbeams and rainbows, flower and fruit, sky and earth. Often a song of six stanzas has its two parts of three stanzas each identical except for these contrasted words and the name of the sun or moon to which they are applied. The stanzas which make up the two parts are frequently identical except that other names for sun and moon are employed in them. The songs themselves are for the greater part arranged in sets of fours, which however are capable, in many cases, of extension to six.

The ceremony may be held at any time of the year. It begins with the building of a sacred lodge. Four trees are first selected for the main poles. The priest strews pollen around them in a sunwise direction and applies a circle of pollen to the trunks where the cutting is to take place. Pollen is used to form a cross in the holes dug to receive the posts. When the trees have been cut and trimmed they are placed parallel on the east side with their tops toward the south. Yellow flowers are placed on each, beginning at the butt and proceeding toward the tip,

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to which additional flowers are tied. While the poles thus prepared are held erect by helpers, the priest standing at the east sings four songs, the first of which is as follows:

Nayenezganin's male lodge-poles of blue are tied with a sunbeam.
IsdjanaLijn's female lodge-poles of white are tied with a rainbow,
The second time they are placed together.
Nayenezganin's male lodge-poles of yellow are tied with a sunbeam,
The third time they are placed together.
IsdjanaLijn's female lodge-poles of black [1] are tied with a rainbow,
The fourth time they are placed together.

Four additional songs are sung, probably to celebrate the completion of the lodge, which is accomplished by filling in between the main poles with others and with brush and weeds. The priest prepares a place for the fire, at the corners of which he places four painted stones. For tending the fire he provides four painted sticks.

Toward evening, when all is in readiness, the priest leaves his place back of the fire and goes out to meet the adolescent girl, who approaches from the east. She holds an eagle-feather in her hand. The priest conducts her to a place by his side within the lodge, four stops being made on the way. Eight songs are probably sung, four in going and four while returning. One of these Trias omitted, breaking the symmetry. The second song, evidently sung as the priest leaves the lodge, is as follows:

With the power which streams from the lodge of Djingonaaihn, I walk;
With the power which streams from the lodge of Isanagaihn, I walk;
With the power which streams from the lodge of Bikegojoni, I walk.

[1] The colors blue, white, yellow, and black are the world-quarter colors for east, south, west, and north in order as the posts in those directions are secured. This is different from the order followed by the Navaho, who use white for the east and blue for the south.

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With the power which streams from the lodge of Lenaaihn, I walk;
With the power which streams from the lodge of Isanagaihn, I walk;
With the power which streams from the lodge of Bikegojoni, [1] I walk.

The main part of the ceremony now begins. It consists of four nights devoted to prayers and songs, with frequent accompaniment of dancing by the girl. The priest is provided with small sticks, which he places about the fire in an erect position beginning at the east. Each stick marks the singing of a song. After four have been sung, he sings a tobacco song, smokes ceremonially, and utters a prayer. A stick is placed horizontally next to the four vertical ones. During the first night from twenty to thirty songs are sung, occupying only the early hours of the night. The next two nights the ceremony is the same, except the songs, which are those next in sequence. The fourth night the priest begins the songs again and sings those of the three previous nights all in their proper order. By employing four or six songs in a set he is able to prolong or shorten the time consumed so as to finish at dawn, whether the ceremony take place in the summer or winter. The general character of these songs is illustrated by the following selections:

The Seventeenth Song

Djingonaaihn, his child I make,
His face blue I make,
His body shimmering I make,
Beautiful I make.

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[1] Of the names used, Djingonaaihn and Lenaaihn mean respectively the ones who have position in the sky in the daytime and at night. Isanagaihn, which is employed as a secondary name of both sun and moon, seems to mean "swift or great traveler," and Bikegojoni may be rendered either as "his feet beautiful" or "his footprints beautiful."

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Isanagaihn, his child I make,
His face blue I make,
His body shimmering I make,
Beautiful I make.

Bikegojoni, his child I make,
His face blue I make,
His body shimmering I make,
Beautiful I make.

Lenaaihn, her child I make,
Her face white I make,
Her body shining I make,
Beautiful I make.

Isanagaihn, her child I make,
Her face white I make,
Her body shining I make,
Beautiful I make.

Bikegojoni, her child I make,
Her face white I make,
Her body shining I make,
Beautiful I make.

The Twenty-second Song

NiyeLndizganin a large sunflower put aside,
Nayenezganin, power became one-fold.
IsdjanaLijn a slender sunflower put aside,
IsdjanaLijn, power became two-fold.
Nayenezganin a large sunflower put aside,
Nayenezganin, power became three-fold.
IsdjanaLijn a slender sunflower put aside,
IsdjanaLijn, power became four-fold.
Nayenezganin a large sunflower put aside,
Nayenezganin, power became five-fold.

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IsdjanaLijn a slender sunflower put aside,
IsdjanaLijn, power became six-fold.
Nayenezganin a large sunflower put aside,
Nayenezganin, power became seven-fold.
IsdjanaLijn a slender sunflower put aside,
IsdjanaLijn, power became eight-fold.
Nayenezganin a large sunflower put aside,
Nayenezganin, power became nine-fold.
IsdjanaLijn a slender sunflower put aside,
IsdjanaLijn, power became ten-fold.
Nayenezganin a large sunflower put aside,
Nayenezganin, power became eleven-fold.
IsdjanaLijn a slender sunflower put aside,
IsdjanaLijn, power became twelve-fold.

The Thirty-seventh Song, Descriptive of Dawn

Djingonaaihn's child is to be born. His child is born.
With a face that is blue it is born.
With a body that shimmers it is born.
I reach the foot of the blue mountain of the sun.

Isanagaihn's child is to be born. His child is born.
With a face that is blue it is born.
With a body that shimmers it is born.
I am climbing the blue mountain of the sun.

Bikegojoni's child is to be born. His child is born.
With a face that is blue it is born.
With a body that shimmers it is born.
I have reached the summit of the blue mountain of the sun.

Lenaaihn's child is to be born. Her child is born.
With a face that is white it is born.
With a body that shines it is born.
I reach the foot of the white mountain of the sun.

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Isanagaihn's child is to be born. Her child is born.
With a face that is white it is born.
With a body that shines it is born.
I am climbing the white mountain of the sun.

Bikegojoni's child is to be born. Her child is born.
With a face that is white it is born.
With a body that shines it is born.
I have reached the summit of the white mountain of the sun.

The Fifty-third Song. Sung the last morning as the sun rises

The black turkey-gobbler, under the east, the middle of his tail; toward us it is about to dawn.
The black turkey-gobbler, the tips of his beautiful tail; above us the dawn whitens.
The black turkey-gobbler, the tips of his beautiful tail; above us the dawn becomes yellow.
The sunbeams stream forward, dawn boys, with shimmering shoes of yellow;
On top of the sunbeams that stream toward us they are dancing.
At the east the rainbow moves forward, dawn maidens, with shimmering shoes and shirts of yellow dance over us.
Beautifully over us it is dawning.
Above us among the mountains the herbs are becoming green;
Above us on the tops of the mountains the herbs are becoming yellow.
Above us among the mountains, with shoes of yellow I go around the fruits and herbs that shimmer.
Above us among the mountains, the shimmering fruits with shoes and shirts of yellow are bent toward him.
On the beautiful mountains above it is daylight.

The third portion of the ceremony begins with the painting of a red disk, to represent the sun, on the palm of the priest. Four sunbeams radiate toward the fingers and four more toward the wrist. This he applies four times to the crown of the girl's head. He then paints white lines outward from each corner of her mouth and puts yellow pollen on her forehead. All the

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women and children present are painted by the priest. The right sides of their faces are painted red and the left sides are dusted with pollen. Red paint is also applied to the soles of their feet and to their breasts. Appropriate songs are sung as the various things are done. The paints are praised in phrases similar to those attributed to the sun and moon.

Finally the priest approaches the girl and transfers the eagle-feather from his hand to hers. He lifts her up and leads her outside the lodge, four stops being made. There are special songs for the withdrawal. Before her where she stops facing the east a buffalo blanket is spread. On this the priest draws four tracks with pollen and four with red iron rust. The girl crosses the blanket, stepping on the painted foot-prints, and then runs four times around a basket, in which eagle-feathers have been placed. A number of children run about with her and pass her the feathers. She is then bidden to run to an indicated tree or bush. When she reaches this she is expected to go to her home. As she reaches this goal and turns, the four poles of the lodge are dropped to the ground with their tips toward her.

Later the girl brings a basket of fruit to the priest, who places some of it, together with pollen, in her mouth. Until this is done she is not allowed to eat. A horse or other valuable property is presented to the priest as pay for his services.

During the four nights of singing and prayer within the lodge, another ceremony is conducted without. Diverging walls are built out from the door of the lodge. Here a fire is maintained, about which dance men dressed to represent the gods of the mountains, called Ga^{n}hi. One of their number is dressed and acts as a clown. A special priest who knows the songs is in

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charge of the rites. A drum of cowhide is beaten to mark the time for the dancing.

Trias did not know this part of the ceremony. A very aged man who does know it, when approached readily agreed to give the desired information and to sing the songs. The next morning he was unwilling, saying the Ga^{n}hi had appeared to him and forbidden him to disclose the rites. From this decision he could not be shaken.

There is little profit in the discussion of the connections of a single ceremony of this sort when the religious life of the surrounding peoples is so little known. The erection of a sacred lodge which seems to typify the world, and the sentiment of many of the songs so frankly directed to the sun, suggest the Sun Dance of the plains. The great importance attached to the songs and the dramatic representations of the gods recall the healing ceremonies of the Navaho. The Mescaleros had other rites more suggestive of these, in which sand-paintings played a part. The virgin mother and her divine son allow a suggestion of Christian influence. This appears to be less rather than more than we should naturally expect when we consider that the Mescaleros have been longer in semicontact with European civilization than have the natives of any other part of the United States. So little is it in fact that even that is probably apparent rather than real.

Where one finds so much of rich art remaining under such adverse circumstances, he wonders how much of a similar or superior sort has forever perished through the indifference of man to any other art, literature, or religion than his own.

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THE CAYAPA NUMERAL SYSTEM [1]

BY

S. A. BARRETT

THE INDIANS commonly known as the Cayapa,[2] though this is a name foreign to their language, live chiefly along the very tortuous river of the same name, Rio Cayapas, for about fifty or sixty miles, and along its tributaries. These streams are in the extreme northwestern part of Ecuador and empty into the ocean near the villages of Limones and La Tola. Also very small numbers of these people reside on Rio Verde, at Pueblo Viejo de Cayapas, and at one or two other points. The mode of life of the Cayapa has been little altered by civilization, though their territory has been encroached upon and reduced by it.

The houses of the Cayapa are scattered at short intervals all along the streams above mentioned, each house having one or more clearings adjacent in which are grown plantains (the

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1 The notes on and analysis of Cayapa numerals here given are based on the accompanying table of numbers, which runs to 10,000. Only one informant could carry the count above a few thousands, but there seems no doubt that the higher thousands here given are correct.

2 Through the generous provision of Mr George G. Heye of New York City, who for several years past has maintained archæological expeditions in Ecuador, the present ethnological work among this interesting and primitive people was commenced last July with the object of making a study of their life and culture. All these investigations in Ecuador are under the direction of Professor Marshall H. Saville.

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chief food of this people), bananas, sugar-cane, pineapples, cotton, and various other useful plants. These houses are raised from six to ten feet off the ground owing to the extreme dampness due to the excessive precipitation of the region. There are no constantly inhabited villages. The three so-called pueblos of the Cayapa are used only as places of assembly for fiestas.

The women weave textiles, make pottery, and weave baskets, fans and mats, besides doing a large part of the work in the fields. The chief work of the men is the making of dugout canoes, at which labor they are very skilful. The canoe is perhaps the most frequently used and important possession of a family, for on account of the dense, impenetrable forests which cover this particular region water travel only is feasible until the higher mountains are reached, when it becomes no longer possible. This renders canoe-making and canoeing one of the most important features of Cayapa culture, and the use of the paddle is learned by both sexes in earliest childhood.

Their whole life, situated as they are in their tropical jungle and on the banks of a great river upon which they rely in many ways, is of much interest from the standpoint of material culture. Also many other interesting features present themselves, and it is with one of these, their numeral system, that it is intended here to deal.

The Cayapa numeral system is a quinary-decimal-centenary one with certain variations, to be noted later, and the rules upon which it is based are well fixed and regular. In it there are certain points of special interest. One of these is its centenary nature, according to which their is no separate term for thousand;

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but hundred is used as the base of all numbers from 100 up, thus making a number like 4000 forty hundreds, not four thousands.

Also, there appear two terms which show what may be regarded as traces of other systems, though on account of the lack of other terms in support of these systems, they must be treated as only possibilities. Four is formed upon the base two, thus showing what may be a trace of a binary system; but this is the only evidence of such a system found in the whole series of numbers. Especially significant in considering this term is the fact that three exists independently of two, and thus points strongly to a system higher than the binary. The second extraneous term is twenty, which appears entirely unrelated to any of the other numbers, either lower or higher. This might be taken as a trace of a system of vigesimal nature, but it lacks even so much support as four and the binary system for it has not even one other number of a form in any way resembling it. On the other hand, though two other terms of the system are held in common with a neighboring language, the terms for four and twenty do not show this indication of possible borrowing either by one people or the other.

An unusual feature here shown is the use of two distinct terms for the same number in two different parts of the system. This occurs in ten, where *pa'it'a* is used up to nineteen; and *tcū'ñga*, apparently a borrowed term, from thirty up.

The order given to the figures of the various denominations is as follows:

All compound numbers from ten up which contain a figure of the units order have this as the final term. Thus thirteen is

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ten three. The numbers six to nine are compounds of five with the four lower numbers. Here the same rule is followed and the numbers one to four are terminal.

In all tens and in all hundreds, which in this system include the thousands also, the term tens or hundreds is the final one, being preceded by the number of tens or hundreds in the numeral in question. Thus 40 is four tens, 400 is four hundreds, and 4000 is forty hundreds.

In no case is there found anything in the nature of a connective term between the parts of a compound number.

Following the phonetic laws of the language, certain terms, if not used as the ultimate ones, are changed when they occur in a compound numeral. Thus *pē′ma* is the unit three, and *pa′it̆a pēma* is thirteen, but *pē′ñ tcūñga* is thirty. So far as two and three are concerned, the change is regular and universal. One changes in the hundreds place in the numerals one hundred to one hundred ninety-nine, and in six when this occurs as a terminal figure. Five has three forms. According to these phonetic laws also, these numbers, when occurring in units or in the units place, undergo the same changes if followed by other terms possessing the necessary sounds. Thus, in the sentence "he has three new ollas," *ya-tcī kasa pē′n pīa′ma hū*^{n}, literally "his new three ollas has," the change of form of the numeral is necessary. Equally correct, however, is *ya-tcī kasa pīa′ma pēma hū*^{n}, in which the surrounding sounds do not necessitate the change. It appears also that the numbers two and three, and perhaps one and five, may exert an influence upon the term following, as in the cases of *pa′i patsa* and *pē′ñ batsa*, in which the change of the second term would seem to be related to the preceding sounds.

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RULES OF COMPOSITION

The numbers on which the Cayapa numeral system is based are 1, 2, 3, 5, 10, 20, and 100. On these the composition proceeds as follows:

Four is *ta*-2.

Six to nine are 5-*dic* 1, 2, 3, and 4 respectively.

Ten alone and as a component of the numbers 11 to 19 and other higher numbers in which these occur is *pa'it'a*, a term quite different from tens (*tcū'ñga*) used in the composition of the tens from 30 up and in all higher numbers in which these occur.

Beginning with 11 all units proceed regularly by the simple addition of the unit terms 1 to 9 to the particular ten under consideration.

Twenty has a name which, unlike the other tens, is not related in any way to the units.

Beginning with 30 all the tens proceed regularly by the addition of *tcū'ñga* to the unit terms 3 to 9, with certain changes in some of these terms, as elsewhere noted.

Hundred is the last grand division, and all the higher numbers are simply the term hundred preceded by the term indicating the number of hundreds in the particular numeral.

BASAL NUMBERS

One occurs as a basal number in the following: In one where it is rendered *ma'iñ*; in six, where it is rendered *ma'lyō*; and in one hundred, where it is rendered *mam*, and in all higher numbers containing one of these in composition. In the ac-

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companying table of numerals these three forms occur in the following numbers:

ma'iñ occurs in 1, 11, 21, 60, 101, 600, 1100, 1600, 2100, and 6000.[1]

mályō occurs in 6 and 16.

mam occurs in 100, 101, 110, 120, and 10000.

Two occurs as a basal number in the following: in 2, 4, 7, and 9, in all of which it is rendered *pa'lyō*. It is also rendered *pa'lyō*, if in the units place, in all higher numbers in which any of these four occur. If, however, they appear in the tens or a higher column, two becomes *pai*, as is the case in ordinary sentence structure; for instance, *pai kū'tca*, two dogs. An exception appears in 20 and 2000, since 20 is rendered by a term, *ma'ntcalōra*, entirely unrelated to any of the other numbers and also since the system proceeds strictly on a centenary basis from 100 up.

In the accompanying table these two forms occur as follows:

pályo occurs in 2, 4, 7, 9, 12, 14, 17, and 19.

pai occurs in 40, 70, 90, 200, 400, 700, 900, 1200, 1400, 1700, 1900, 2200, 4000, 7000, and 9000.

Three occurs as a basal number in 3 and 8, in both of which it is rendered *pē'ma*, and in all higher numbers which contain either of these. In all cases in which either occurs in the units column it retains its original unit form given above. Wherever it occurs in the tens or in a higher column its form is changed to *pēñ*, here again following the ordinary phonetic rules. These two forms are here found in the following numbers:

pē'ma in 3, 8, 13, and 18.

pēñ in 30, 80, 300, 800, 1300, 1800, 3000, and 8000.

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[1] While 1 in the composite number 6 is rendered *mályō*, this is true only where 6 is the terminal figure in the higher composite numbers. In all other cases it is rendered *máiñ*.

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Five is used as a basal number as follows: in five, where it is rendered *ma'n-da*, and in 6, 7, 8, and 9, in all of which it is rendered *ma'n-dic*, and in all higher numbers in which these occur. In the higher numbers where 5 appears in any of the columns from the tens up, its form is *mañ*. Though five appears in the units as *ma'n-da*, it would seem, when its other forms are considered, that this is really a compound and that its simplest form is *man* or *mañ*. As with the lower numbers, in all cases in which five appears in the units column, it retains its unit form but in all other cases it is changed. Since the system is in part a quinary one, six begins the second set or group, and 6, 7, 8, and 9 are composed of 5, with 1, 2, 3, and 4, respectively, added. In these the term five takes the form *ma'n-dic*, probably *ma'n-da-ic* in full. In this form it occurs in all the higher numbers in which 6, 7, 8, and 9 appear. As above stated, in any of the higher numbers in which five itself appears in any of the columns above the units, it has the form *mañ*, which is the same rendition that it has in a sentence when followed by such a term as *ya* or *kū'tca*, as *ma'ñ ya*, five houses, or *ma'ñ kūtca*, five dogs. In the list of numerals the three forms occur as follows:

mán-da occurs in 5 and 15.

mán-dic occurs in 6, 7, 8, 9, 16, 17, 18, 19, 60, 70, 80, 90, 600, 700, 800, 900, 1600, 1700, 1800, 1900, 6000, 7000, 8000, and 9000.

mañ occurs in 50, 500, 1500, and 5000.

Ten occurs as a basal number as follows: in the numbers ten to nineteen, inclusive, where it is rendered *pa'it'a*, and in the higher numbers in which any one of these appears. This term ten is quite a different one from tens, *tcū'ñga*, which is used in the numbers from thirty up. This unusual use of a term for

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tens which is entirely distinct from the simple ten appears to be explainable through borrowing, since in a neighboring language, the Quichua, both ten and tens are rendered *tcū'ñga*, though the cause of such borrowing, if such it is, remains uncertain. These two terms appear in the accompanying list as follows:

pa'it'a appears in 10 to 19 inclusive, and in 1000 to 1900 inclusive.

tcū'ñga appears in 30 to 90 inclusive, and in 3000 to 9000 inclusive.

Twenty, *ma'ntcalōra*, one of the two exceptions to the regularity of this numeral system, appears as a basal number in 20 and in all higher numbers in which it, as such, occurs. In the accompanying list it appears as follows:

ma'ntcalōra appears in 20, 21, 120, 2000, 2100, and 2200.

Hundred, *pa'tsa* or *ba'tsa*, depending upon its phonetic surroundings, forms the base of all numbers from 100 up. This includes the thousands also, since the system is centenary above 100. Thus, 8000 is not eight thousands but eighty hundreds.

pa'tsa or *ba'tsa* appears here in 100, 101, 110, 120, 200 to 2200 inclusive and 3000 to 10000 inclusive.

	CAYAPA NUMERALS	ANALYSIS
1	*maiñ*	1 [1]
2	*pa'lyō*	2
3	*pē'ma*	3
4	*ta'l-palyō*	*tal*-2
5	*ma'n-da*	5-*da*
6	*man-dic ma'lyō*	5-*dic* 1
7	*man-dic pa'lyō*	5-*dic* 2
8	*man-dic pē'ma*	5-*dic* 3

[1] So far all efforts to reduce these terms to tangible objects such as are often used by primitive peoples in counting have not met with success.

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9	*man-dic ta'l-palyō*	5-*dic tal*-2
10	*pa'it'a*	10
11	*pa'it'a ma'iñ*	10 1
12	*pa'it'a pa'lyō*	10 2
13	*pa'it'a pē'ma*	10 3
14	*pa'it'a ta'l-palyō*	10 *tal*-2
15	*pa'it'a ma'n-da*	10 5-*da*
16	*pa'it'a ma'n-dic malyō*	10 5-*dic* 1
17	*pa'it'a ma'n-dic palyō*	10 5-*dic* 2
18	*pa'it'a ma'n-dic pēma*	10 5-*dic* 3
19	*pa'it'a man-dic ta'l-palyō*	10 5-*dic tal*-2
20	*ma'ntcalōra*	20
21	*ma'ntcalōra ma'iñ*	20 1
	(etc.)	
30	*pē'ñ tcū'ñga*	3 tens [1]
40	*ta'l-pai tcūñga*	*tal*-2 tens
50	*ma'ñ tcūñga*	5 tens
60	*man-dic ma'iñ tcūñga*	5-*dic* 1 ten
70	*man-dic pa'i tcūñga*	5-*dic* 2 tens
80	*man-dic pē'ñ tcūñga*	5-*dic* 3 tens
90	*man-dic ta'l-pai tcūñga*	5-*dic tal*-2 tens
100	*mam ba'tsa*	1 hundred
101	*mam batsa ma'iñ*	1 hundred 1
	(etc.)	
110	*mam batsa pa'it'a*	1 hundred 10
120	*mam batsa ma'ntcalōra*	1 hundred 20
	(etc.)	

[1] There is in Cayapa no nominal plural, hence *tcu'ñga* and *bátsa* are both singular and plural so far as form is concerned. The former, not being the term used for 10, is really used only in a plural sense, but the latter is used as both singular and plural. Further, the term *tcu'ñga* is, according to a short Quichua vocabulary obtained from a couple of informants here, the regular term ten in that language and is used throughout their entire system. The term hundred has also a close parallel, *pátsak, in Quichua*, but, while Cayapa has a strict centenary system above 100, Quichua carries the hundreds only as far as 1,000, which is *waráñga*, a term entirely unrelated to hundred.

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200	*pai pa'tsa*	2 hundreds
300	*pēñ ba'tsa*	3 hundreds
400	*tal-pai pa'tsa*	*tal*-2 hundreds
500	*mañ ba'tsa*	5 hundreds
600	*man-dic ma'iñ batsa*	5-*dic* 1 hundreds
700	*man-dic pa'i patsa*	5-*dic* 2 hundreds
800	*man-dic pē'ñ batsa*	5-*dic* 3 hundreds
900	*man-dic ta'l-pai patsa*	5-*dic* tal-2 hundreds
1000	*pa'it'a patsa*	10 hundreds
1100	*pa'it'a ma'iñ batsa*	10 1 hundreds
1200	*pa'it'a pa'i patsa*	10 2 hundreds
1300	*pa'it'a pē'ñ batsa*	10 3 hundreds
1400	*pa'it'a ta'l-pai patsa*	10 *tal*-2 hundreds
1500	*pa'it'a ma'ñ batsa*	10 5 hundreds
1600	*pa'it'a man-dic ma'iñ batsa*	10 5-*dic* 1 hundreds
1700	*pa'it'a man-dic pa'i patsa*	10 5-*dic* 2 hundreds
1800	*pa'it'a man-dic pē'ñ batsa*	10 5-*dic* 3 hundreds
1900	*pa'it'a man-dic ta'l-pai patsa*	10 5-*dic* *tal*-2 hundreds
2000	*ma'ntcalōra patsa*	20 hundreds
2100	*mantcalōra ma'iñ batsa*	20 1 hundreds
2200	*mantcalōra pa'i patsa*	20 2 hundreds
	(etc.)	
3000	*pē'ñ tcūñga patsa*	3 tens hundreds
4000	*ta'l-pai tcūñga patsa*	*tal*-2 tens hundreds
5000	*ma'ñ tcūñga patsa*	5 tens hundreds
6000	*man-dic ma'iñ tcūñga patsa*	5-*dic* 1 tens hundreds
7000	*man-dic pa'i tcūñga patsa*	5-*dic* 2 tens hundreds
8000	*man-dic pē'ñ tcūñga patsa*	5-*dic* 3 tens hundreds
9000	*man-dic ta'l-pai tcūñga patsa*	5-*dic tal*-2 tens hundreds
10000	*ma'm batsa patsa*	1 hundred hundreds

ESMERALDAS, ECUADOR
DECEMBER 2, 1908

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ON THE STATURE OF THE INDIANS OF THE SOUTHWEST AND OF NORTHERN MEXICO

BY

ALEŠ HRDLIČKA

THE Hyde Expedition for the American Museum of Natural History — a result of the efforts of Professor F. W. Putnam and of the generosity of the Messrs Hyde of New York City — included, from 1898 to 1903, a research by the writer in physical anthropology. These investigations, which are gradually being prepared for detailed publication, extended to practically all the tribes of the Southwest and of northern Mexico, and comprised measurements of stature, preliminary data concerning which are herein presented.

The region covered by the study embraces the territory from southeastern Utah in the north to the state of Morelos, Mexico, in the south; from east to west it stretches in the north from the Rio Grande to the Colorado river, and in Mexico from approximately the line of the Mexican Central Railroad to the Pacific ocean.

The individual tribes studied are the following: A band of Paiute in southeastern Utah; and Southern Ute in Colorado; The Jicarilla Apache, the Navaho (also in Arizona and southern Utah), the Rio Grande Pueblos of Taos, San Juan, Jemez, Santo Domingo, Sia, and Isleta, and the western Pueblos (of

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Laguna, Acoma, Acomita, and Zuñi), in New Mexico; the Mescalero Apache in the same territory; the Hopi, the White Mountain and San Carlos Apache, the Mohave (Eastern or Yavapai, and Western), Havasupai, Walapai, Papago, Pima, Maricopa, and Yuma (mostly in California) in Arizona; the Opata, Yaqui, and Mayo in Sonora; the Tarahumare in Chihuahua; the Tepehuane in Durango; the Cora in Tepic; the Huichol, Tepecano, remnants of the Teul "Mekkos," and the Nahua (Tuxpan) in Jalisco; the Otomi in Hidalgo; the Mazahua and Otomi in the state of Mexico; the Tarasco in Michoacan; and the Tlahuiltec (a branch of the Aztec) in Morelos.

It was the intention of the writer to measure in each tribe at least fifty males and twenty-five females, — adult, normal, full-blood individuals. In a majority of the tribes these numbers were actually reached, or even exceeded; but in a few others, owing to various adverse circumstances, the number of measured individuals fell short of the above figures. In all, measurements of stature, head, etc., were obtained on 2078 full-grown Indians, of whom 1516 were males and 562 were females. There were also numerous measurements on children, which are reported elsewhere.[1] The data, while not in all cases as ample as might be desired, can nevertheless be regarded as sufficient for the most necessary information.

The extensive region covered includes large bodies of historically and ethnically related ancient peoples, as well as cer-

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[1] Physiological and Medical Observations, etc. (*Bulletin 34, Bureau of American Ethnology*, Washington, 1908).

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tain highly interesting newer elements superseding, in the areas they occupy, older populations. The physical characteristics of these many tribes have hitherto, with few exceptions, been unknown. Before the researches of the Hyde Expedition, the only publications of consequence in this line relating to the living were ten Kate's "Somatological Observations on Indians of the Southwest,"[1] giving measurements of the Zuñi, Pima, Papago, and Maricopa, and the report by Boas,[2] giving chiefly the height of the Ute, Paiute, and some of the Pueblos.

The data on stature here reported show great differences according to the tribes and regions, but afford no definite conclusions as to the effect of environment, and particularly of climate, on this important feature of the human body. High and again low statures were found in the mountains as well as in the valleys and low flats, in relatively cold regions, and in those that range among the hottest on this continent. Several large areas show a striking similarity; but on close study we find that this is due more to the fact of blood relation of the tribes in that region than to other influences, and in general the element of heredity must be accorded a greater weight than that of present locality and environment. The most potent factor affecting the stature, next to heredity, appears to be the nature and abundance of the food of the people.

The tallest statures are found in Arizona, among the Navaho, Apache, Pima, Yuma, Maricopa, and Mohave; and in Sonora, among the Yaqui; while relatively low statures prevail

1 *Journal of American Ethnology and Archæology*, pp. 119-144, Boston, 1892.

2 Zur Anthropologie der nordamerikanischen Indianer, *Verhandlungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte*, Berlin, 1895, p. 370.

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among the Ute and some Paiute in the north, among all the Pueblos, and with most of the Mexican Indians.

TRIBAL DATA[1]

THE PAIUTE. — The branch of Paiute studied was that roaming free in southeastern Utah, northwest of Bluff City. The band was estimated in 1900 to number fewer than one hundred. They regard Allen canyon and the neighboring parts of the Blue mountains as their original home. They are partly agricultural, raising some corn and melons, but they depend chiefly on hunting.

On account of the dispersion of the band at the time of the writer's visit, it was possible to measure only thirteen individuals, — six adult men, six adult women, and a girl. Ten others were seen at different times, but showed nothing radically different in their physical characteristics from those who were measured. The people bear, in general, a strong similarity to the Southern Utes. The head-measurements indicate a prevalence of mesocephaly. The measurements of stature were as follows:—

MEN			WOMEN		
SUBJECT	AGE	HEIGHT IN CM.	SUBJECT	AGE	HEIGHT IN CM.
1	23	164.6	1	21	155.7
2	24	166.5	2	22	154.2
3	25	165.7	3	25	157.0
4	25	170.8	4	30	148.7
5	26	172.6	5	40	149.9
6	35	160.4	6	55	147.3

The Paiute of Nevada and adjoining territory, give, according to Boas, for 68 men, the average of 168.3 cm., minimum 151 cm., maximum 186 cm.

[1] For additional notes, see *Bulletin 34, Bureau of American Ethnology*, pp. 132 et seq.

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THE SOUTHERN UTE. — The Southern Ute consist of three branches; namely, the Wiminuche, who at the time of the writer's visit were settled about Navaho Springs near Mesa Verde, southern Colorado, and the Capote and Moache, dwelling on the reservation at Ignatio. The number of individuals in the tribe in June, 1907, was 807. Physically the three divisions of the tribe are homogeneous. Almost all the people are full-bloods.

Up to recent times the Southern Ute lived unrestrained. Their principal means of sustenance was hunting at certain periods of the year, while in winter and in times of necessity they eked out their living by the use of native fruits, seeds, and especially roots.

The head-measurements of these people show a prevalence of mesocephaly with a tendency toward dolichocephaly. In stature they are seldom tall, as will be here seen.

HEIGHT IN CM.	MEN (50) PER CENT	WOMEN (20) PER CENT
140.1 to 145.....	——	4.0
145.1 to 150.....	——	24.0
150.1 to 155.....	4.0	20.0
155.1 to 160.....	6.0	28.0
160.1 to 165.....	28.0	4.0
165.1 to 170.....	38.0	——
170.1 to 175.....	16.0	——
175.1 to 180.....	8.0	——
Average.....	166.8 cm.	153.7 cm.
Minimum.....	153.3 cm.	142.8 cm.
Maximum.....	178.8 cm.	164.5 cm.

Boas[1] gives for 121 Ute, mostly of northern provenience, the average of 166.1 cm., minimum 153 cm., maximum 188 cm.

[1] Loc. cit., p. 370.

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THE NAVAHO. — The Navaho — who, with the exception of the much mixed Cherokee, are the largest tribe in the United States — are an independent, self-supporting people occupying a great semi-arid reservation extending over parts of Colorado, Utah, New Mexico, and Arizona. The Navaho are more or less nomadic; they farm to some extent, and raise sheep and horses, while the women manufacture great numbers of excellent blankets, which form an important source of income.

The Navaho are of mixed Indian (mainly Pueblo) origin; nevertheless, considerable uniformity in physical features is exhibited throughout the Navaho territory. Mixed-bloods are rare.

The predominant type of head among them is moderately brachycephalic. Their statures range as follows: —

HEIGHT IN CM.	MEN (50) PER CENT	WOMEN (30) PER CENT
145.1 to 150.....	——	6.7
150.1 to 155.....	——	16.7
155.1 to 160.....	——	50.0
160.1 to 165.....	10.0	23.4
165.1 to 170.....	26.0	3.3
170.1 to 175.....	42.0	——
175.1 to 180.....	22.0	——
Average.....	171.3 cm.	157.3 cm.
Minimum.....	162.4 cm.	148.4 cm
Maximum.....	180.0 cm.	166.3 cm.

THE PUEBLOS. — The large Pueblo population, including the Zuñi and the Hopi, is divisible, both by language and on the basis of physical characteristics, into more than one group; but their habits and environment are much alike, as is their stature. They are almost exclusively an agricultural people and of domestic habits.

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As to head-form, most of the Pueblo groups are predominantly brachycephalic. There is also, however, in all the villages an admixture of a long-headed element, the main seat of which seems to have been, in olden times, the northeastern region of the Pueblo area; and in a few of the present villages, such as Taos and Isleta, the dolichocephalic type is still in the majority.

The measurements of stature among the Pueblos taken as a whole are shown below. Individually the Isleta are the tallest; the Jemez and Sia people, the shortest.

HEIGHT IN CM.	MEN (383) PER CENT	WOMEN (59) PER CENT
140.1 to 145.....	——	6.8
145.1 to 150.....	0.5	30.4
150.1 to 155.....	3.4	35.6
155.1 to 160.....	20.1	15.3
160.1 to 165.....	29.8	10.2
165.1 to 170.....	32.4	1.7
170.1 to 175.....	12.5	——
175.1 to 180.....	1.3	——
Above 180.1.....	0.2	——
Average	164.5 cm.	152.3 cm.
Minimum.....	148.2 cm.	143.5 cm.
Maximum.....	182.3 cm.	168.4 cm.

Ten Kate[1] gives, as the average of 25 Zuñi men, 162.4 cm., minimum 148 cm., maximum 173.4 cm.; while Boas[2] reports for Zuñi and Moqui (Hopi), as the average of 104 men, 162.9 cm., minimum 153 cm., maximum 176 cm.; and for 27 men of Taos, average 167.6, minimum 157 cm., maximum 182 cm.

THE APACHE. — The Apache, the most recent ethnic group in our Southwest, are divided into several large bodies living

[1] Loc. cit., p. 135.
[2] Loc. cit., pp. 369, 370.

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on separate reservations. They subsist by farming, hunting, and in late years also by working for the whites; formerly they lived largely by hunting. They have been settled, since known, mainly in the elevated narrow valley of the mountainous region in New Mexico and Arizona. Originally, they doubtless came from the Northwest. The Apache present throughout a clear physical type, characterized by decided brachycephaly. Admixture with whites is infrequent.

The Lipan, a remnant of whom live now with the Mescaleros, are Apache in language as well as in features, and are included with that tribe.

In stature the people are quite tall.

HEIGHT IN CM.	MEN (212) PER CENT	WOMEN (70) PER CENT
145.1 to 150.....	——	8.5
150.1 to 155.....	0.5	21.4
155.1 to 160.....	1.4	37.2
160.1 to 165.....	6.2	28.5
165.1 to 170.....	25.0	4.2
170.1 to 175.....	35.8	——
175.1 to 180.....	21.7	——
180.1 to 185.....	9.4	——
Average	169.1 cm.	156.8 cm.
Minimum.....	151.0 cm.	147.2 cm.
Maximum.....	182.5 cm.	169.3 cm.

THE WALAPAI AND THE HAVASUPAI. — The Walapai number 525, and the Havasupai 172 individuals. Both tribes live in northern Arizona. They farm, hunt, and gather native fruits and seeds; some of them, especially the Walapai, work also for the white people. The Walapai in particular are principally hunters.

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These two groups are doubtless a part of what formerly was one body, and, while speaking a Yuman language, they are physically identical with the Apache. Mixed-bloods among them are rare. Their stature ranges as follows:

HEIGHT IN CM.	MEN (47) PER CENT	WOMEN (23) PER CENT
Below 140.....	——	8.7
140.1 to 145.....	——	8.7
145.1 to 150.....	——	8.7
150.1 to 155.....	——	——
155.1 to 160.....	6.4	26.2
160.1 to 165.....	12.9	26.0
165.1 to 170.....	25.4	13.0
170.1 to 175.....	23.4	8.7
175.1 to 180.....	25.6	——
180.1 to 185.....	6.4	——
Average	168.4 cm.	157.7 cm.
Minimum.....	155.1 cm.	134.7 cm.
Maximum.....	180.2 cm.	172.2 cm.

THE MOHAVE. — The Mohave are separated into two bodies, living about seventy miles apart on the Colorado. They number in all a little more than thirteen hundred. Until recent years they lived partly by farming and especially on native fruits and seeds, to a less extent by hunting and fishing. Now many of the men earn their livelihood by working for the whites. They are as yet almost all full-bloods, and live, particularly those of the more southerly division, quite primitively.

The prevailing head-type is moderately brachycephalic, with some admixture of long-headed elements. In this respect they are related to the Pueblos. Their stature is above medium, as may be seen from the following table:

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HEIGHT IN CM.	MEN (45) PER CENT	WOMEN (25) PER CENT
145.1 to 150.....	——	8.0
150.1 to 155.....	——	24.0
155.1 to 160.....	——	28.0
160.1 to 165.....	8.8	20.0
165.1 to 170.....	28.9	20.0
170.1 to 175.....	40.0	——
175.1 to 180.....	17.8	——
180.1 to 185.....	2.2	——
185.1 to 190.....	2.2	——
Average.....	171.6 cm.	158.5 cm.
Minimum.....	161.8 cm.	147.4 cm.
Maximum.....	186.2 cm.	169.3 cm.

THE YUMA. — This tribe, composed almost wholly of full-bloods, numbers 645 individuals. They live on the flats along the Colorado river, in a very hot region. They farm a little, gather native fruits and greens, fish in the Colorado, hunt to some extent, and find employment among the whites. Formerly they were dependent mainly on fish and mollusks from the river, small game of the lowlands, and native fruits and seeds. They are among the tallest Indians in North America. On account of dissatisfaction in the tribe during the writer's visit, it was impracticable to measure a large number of individuals; but those examined represent fairly well the features of the tribe.

HEIGHT IN CM.	MEN (37) PER CENT	WOMEN (5) PER CENT
155.1 to 160.....	2.7	20.0
160.1 to 165.....	5.4	60.0
165.1 to 170.....	24.3	20.0
170.1 to 175.....	35.1	——
175.1 to 180.....	27.0	——
180.1 to 185.....	5.4	——
Average.....	172.2 cm.	161.7 cm.
Minimum.....	159.9 cm.	157.5 cm.
Maximum.....	184.8 cm.	166.8 cm.

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THE MARICOPA. — The Maricopa are to-day a small tribe, numbering only 383 individuals. They are an agricultural people. Formerly they fished in the Colorado and Gila rivers, and gathered native fruits, particularly mesquite and mescrew beans, as well as mescal and greens. Physically they are related to the Yuma. They are brachycephalic and very tall. They have mixed a little with the Pima, but the results of such mixture can be easily eliminated. There is but very little white blood in the tribe. Measurements of stature: —

HEIGHT IN CM.	MEN (40) PER CENT	WOMEN (30) PER CENT
145.1 to 150.....	——	3.3
150.1 to 155.....	——	6.7
155.1 to 160.....	——	33.3
160.1 to 165.....	10.0	43.4
165.1 to 170.....	10.0	10.0
170.1 to 175.....	27.5	3.3
175.1 to 180.....	30.0	——
180.1 to 185.....	20.0	——
185.1 to 190.....	2.5	——
Average	174.9 cm.	160.4 cm.
Minimum.....	162.5 cm.	150.0 cm.
Maximum.....	185.1 cm.	170.8 cm.

Ten Kate [1] gives, for 29 Maricopa men, the average of 172.2 cm., minimum 152.2, maximum 182 cm.; for women, the average of 160.1 cm., minimum 148 cm., maximum 168.9 cm.

THE PIMA. — The Pima, numbering 4037, are an agricultural sedentary people, living since prehistoric times in the Gila valley, in the territory of an older population allied to the southern Pueblos. A part of the tribe, the "Pimas Bajos," live in northern Sonora, principally in the district of Ures. In

[1] Loc. cit., pp. 132, 133.

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former days the Northern Pima derived an important part of their sustenance from the then abundant fish and mollusks of the Gila, and to some extent also from hunting.

The Pima are slightly mixed with the Papago, but mixture with whites is scant. They are a tall people and dolichocephalic. They represent one of the fundamental physical types of the Southwest.

The height of those examined was as follows:—

HEIGHT IN CM.	MEN (53) PER CENT	WOMEN (30) PER CENT
145.1 to 150.....	——	6.7
150.1 to 155.....	——	30.0
155.1 to 160.....	——	26.7
160.1 to 165.....	11.3	33.3
165.1 to 170.....	22.6	3.3
170.1 to 175.....	32.1	——
175.1 to 180.....	26.4	——
180.1 to 185.....	7.5	——
Average	171.8 cm.	157.4 cm.
Minimum.....	161.7 cm.	146.9 cm.
Maximum.....	181.4 cm.	164.8 cm.

Ten Kate [1] gives, for 77 Pima men, the average of 169.6 cm., minimum 155.9 cm., maximum 184.8 cm.; for 51 Pima women, the average of 156.3 cm., minimum 145.8 cm., maximum 167.2 cm.

THE PAPAGO.—The Papago are a tribe of over six thousand individuals, the bulk of whom live in the United States, the remainder being found in northern Sonora. They are to some degree an agricultural people, but depend also, to a large extent, on the natural products of their country and on hunting.

[1] Loc. cit., pp. 126, 127.

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Physically the people show relation with the Pima, and also with the Pueblos. In all probability they contain a large element of the Pueblo people which in ancient times occupied the valleys of the Gila and its affluents. The head-form is prevalently dolichocephalic.

The tribe shows a perceptible intermixture with the Mexicans; these mixed-blood individuals, however, in most instances can be easily separated. The full-bloods measured, principally at San Xavier, gave statures detailed in the table below. Papago from other localities, seen on different occasions, showed no marked differences in this particular.

HEIGHT IN CM.	MEN (50) PER CENT	WOMEN (30) PER CENT
145.1 to 150.....	——	13.3
150.1 to 155.....	——	26.7
155.1 to 160.....	6.0	40.0
160.1 to 165.....	14.0	20.0
165.1 to 170.....	16.0	——
170.1 to 175.....	32.0	——
175.1 to 180.....	30.0	——
180.1 to 185.....	2.0	——
Average	170.9 cm.	155.9 cm.
Minimum.....	155.7 cm.	148.8 cm.
Maximum.....	180.8 cm.	163.3 cm.

Ten Kate[1] gives, for 17 Papago men, the average of 169.5 cm., minimum 163.7 cm., maximum 179.4 cm.

THE OPATA. — The Opata are a remnant of what was formerly a large tribe in northern Sonora. They were doubtless an amalgamation of at least two, if not more, distinct bodies of people. Much of the tribe has disappeared by voluntary mixture with the Mexicans. In their mode of life these people resemble the Papago.

[1] Loc. cit., p. 128.

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The pure-blood remainder shows a prevalence of brachycephaly and a moderate body height; they cannot be classed with the tall statures of the Gila valley tribes.

HEIGHT IN CM.	MEN (30) PER CENT	WOMEN (20) PER CENT
140.1 to 145.....	——	5.0
145.1 to 150.....	——	15.0
150.1 to 155.....	——	20.0
155.1 to 160.....	10.0	55.0
160.1 to 165.....	33.3	5.0
165.1 to 170.....	30.0	——
170.1 to 175.....	16.6	——
175.1 to 180.....	6.7	——
180.1 to 185.....	3.3	——
Average	167.0 cm.	155.0 cm.
Minimum.....	158.8 cm.	144.6 cm.
Maximum.....	180.5 cm.	163.2 cm.

THE YAQUI. — These were, up to within recent years, a very strong tribe, occupying a large region in southern Sonora, particularly along the Yaqui river. They are in part an agricultural people, but live also by hunting and fishing and on the native products of the country. They are mixed somewhat with the more southerly Mayo, and slightly also with the Mexicans.

The Yaqui are, on the whole, a people of strong physical development. The head-form is predominantly dolichocephalic to mesocephalic. In olden times the tribe was doubtless closely related to the Pima. Tall statures are frequent.

HEIGHT IN CM.	MEN (50) PER CENT	WOMEN (33) PER CENT
145.1 to 150.....	——	12.1
150.1 to 155.....	——	45.5
155.1 to 160.....	10.0	33.4
160.1 to 165.....	18.0	9.1

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HEIGHT IN CM.	MEN (50) PER CENT	WOMEN (33) PER CENT
165.1 to 170.....	18.0	——
170.1 to 175.....	32.0	——
175.1 to 180.....	20.0	——
180.1 to 185.....	2.0	——
Average	169.6 cm.	154.2 cm.
Minimum.....	157.0 cm.	146.5 cm.
Maximum.....	180.4 cm.	161.0 cm.

THE MAYO.—The Mayo, numbering more than twenty thousand, occupy an extensive region south of the Yaqui and along the Rio Mayo, extending into Sinaloa. They are in the main an agricultural people, and, while not of as strong physique as the Yaqui, show good body-development. The general head-type is brachycephalic. There is some mixture with the Yaqui and with Mexicans.

In stature the Mayo show as follows:

HEIGHT IN CM.	MEN (53) PER CENT	WOMEN (30) PER CENT
145.1 to 150.....	——	13.3
150.1 to 155.....	3.8	33.3
155.1 to 160.....	9.4	40.0
160.1 to 165.....	15.1	6.7
165.1 to 170.....	33.9	6.7
170.1 to 175.....	28.3	——
175.1 to 180.....	7.5	——
180.1 to 185.....	——	——
185.1 to 190.....	1.9	——
Average	167.3 cm.	155.2 cm.
Minimum.....	154.7 cm.	147.0 cm.
Maximum.....	185.1 cm.	166.5 cm.

THE TARAHUMARE. — This is a very large tribe, occupying an extensive region in Chihuahua and about the northern limits of Durango: their country, a part of the Sierra Madre, is extremely rugged. The people live in deep, narrow valleys or

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barrancas, and over small flats on the elevations. They are in the main agricultural, but carry on, also, considerable hunting and fishing, and utilize for food many of the natural products of the country. They are famous runners. Mixture with other Indian tribes and with whites is limited to those Tarahumare who live on the outskirts of their territory. Those in the deeper parts of the sierra live more primitively than any other tribe in the Southwest or in northern Mexico.

Unfortunately, but little time was spent among these highly interesting people, and the number of subjects measured was not so large as was desirable; but those measured were all full-bloods from the heart of their territory. Their statures were as follows:

HEIGHT IN CM.	MEN (23) PER CENT	WOMEN (10) PER CENT
145.1 to 150.....	——	20.0
150.1 to 155.....	8.7	60.0
155.1 to 160.....	17.4	20.0
160.1 to 165.....	17.4	——
165.1 to 170.....	43.4	——
170.1 to 175.....	13.0	——
Average	164.2 cm.	152.7 cm.
Minimum.....	153.0 cm.	148.6 cm.
Maximum.....	174.5 cm.	159.6 cm.

THE TEPEHUANE.—This tribe is separated into two groups,—one in southwestern Chihuahua and northwestern Durango, the other in southern Durango and extending into Jalisco and Tepic. The people are in the main agricultural, and but little mixed. The measurements of stature given below apply almost exclusively to the southern Tepehuane.

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HEIGHT IN CM.	MEN (40) PER CENT	WOMEN (15) PER CENT
145.1 to 150.....	——	33.4
150.1 to 155.....	——	53.3
155.1 to 160.....	17.5	13.3
160.1 to 165.....	30.0	——
165.1 to 170.....	42.5	——
170.1 to 175.....	5.0	——
175.1 to 180.....	2.5	——
180.1 to 185.....	2.5	——
Average	165.3 cm.	151.6 cm.
Minimum.....	156.6 cm.	145.6 cm.
Maximum.....	180.8 cm.	157.1 cm.

THE TEPECANO. — The Tepecano, in the main, are a small but interesting tribe of isolated agricultural people, probably an ancient branch of the Tepehuane. They live in the valley of the Rio de Bolaños in Jalisco. The individual members of the tribe, besides cultivating the soil, gather quantities of cactus and other native fruits, and do some hunting and fishing. Admixture with the whites is insignificant.

These people, while otherwise well developed, are among the shortest of the tribes examined.

HEIGHT IN CM.	MEN (25)	
150.1 to 155.....	12.0	——
155.1 to 160.....	36.0	——
160.1 to 165.....	40.0	——
165.1 to 170.....	12.0	——
Average	160.2 cm.	——
Minimum.....	153.6 cm.	——
Maximum.....	167.5 cm.	——

THE HUICHOL. — The Huichol occupy the lower elevations and some of the valleys in the rugged sierra of the state of Jalisco. They live by agriculture, by gathering native fruits,

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etc., and by hunting and fishing: they also raise some cattle. Admixture with whites is almost unknown. Next to the Tarahumare, they are the least civilized tribe of northern Mexico.

They are a brachycephalic people of moderate stature.

HEIGHT IN CM.	MEN (30) PER CENT	WOMEN (19) PER CENT
145.1 to 150.....	——	10.6
150.1 to 155.....	3.3	57.9
155.1 to 160.....	16.7	21.1
160.1 to 165.....	40.0	10.5
165.1 to 170.....	33.3	——
170.1 to 175.....	6.7	——
Average	163.4 cm.	154.3 cm.
Minimum.....	155.1 cm.	147.1 cm.
Maximum.....	171.5 cm.	162.2 cm.

THE CORA. — These people, numbering about three thousand, are scattered over a large territory in Tepic. They are agricultural, though they supplement the results of their farming by fishing, hunting, and gathering native fruits. Physically the Cora are allied in head-form with the Huichol; and in stature, it will be seen below, they differ but little from that tribe. Admixture with whites is scant.

HEIGHT IN CM.	MEN (53) PER CENT	WOMEN (10) PER CENT
145.1 to 150.....	——	20.0
150.1 to 155.....	1.9	70.0
155.1 to 160.....	13.2	10.0
160.1 to 165.....	35.9	——
165.1 to 170.....	35.9	——
170.1 to 175.....	11.4	——
175.1 to 180.....	1.9	——
Average	164.1 cm.	152.2 cm.
Minimum.....	150.5 cm.	146.2 cm.
Maximum.....	175.3 cm.	159.7 cm.

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THE NAHUA.—The Nahua occupy extensive regions in southern Jalisco and about Lake Chapala. Their tribal identity is uncertain, the term *Nahua* expressing merely their linguistic affinity. They are quite civilized, according to the Mexican standard, and subsist almost wholly by agriculture. By their head-form they are related to the brachycephalic peoples of northern Jalisco and Tepic. There is among them some mixture with whites, but full-bloods are still numerous.

HEIGHT IN CM.	MEN (50) PER CENT	
155.1 to 160.....	14.0	——
160.1 to 165.....	46.0	——
165.1 to 170.....	32.0	——
170.1 to 175.....	6.0	——
175.1 to 180.....	2.0	——
Average	164.3 cm.	——
Minimum.....	155.5 cm.	——
Maximum.....	177.3 cm.	——

THE TARASCO.—This large agricultural tribe live in the state of Michoacan. They are dolichocephalic and of moderate stature. Mixed-bloods are frequent in settlements nearest those of the Mexicans, but deeper in the territory of the tribe they are scarce. Statures range as follows:—

HEIGHT IN CM.	MEN (50) PER CENT	WOMEN (30) PER CENT
140.1 to 145.....	——	3.3
145.1 to 150.....	——	56.6
150.1 to 155.....	——	20.0
155.1 to 160.....	30.0	13.4
160.1 to 165.....	38.0	3.3
165.1 to 170.....	20.0	3.3
170.1 to 175.....	10.0	——
175.1 to 180.....	2.0	——
Average	163.1 cm.	150.8 cm.
Minimum.....	155.5 cm.	144.7 cm.
Maximum.....	175.5 cm.	165.2 cm.

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THE OTOMI. — This is the largest tribe in northern Mexico, but it no longer forms a unit. Many of the Otomi are full-bloods, but many are mixed with the Mexicans. They occupy a hilly to flat rather than a mountainous country, and subsist by agriculture, by such native industries as pottery, hat-making, etc., and by working for the whites. They are dolichocephalic to mesocephalic in head-form, and rather small in stature.

HEIGHT IN CM.	MEN (62) PER CENT	WOMEN (25) PER CENT
135.1 to 140.....	——	4.0
140.1 to 145.....	——	24.0
145.1 to 150.....	——	56.0
150.1 to 155.....	12.9	16.0
155.1 to 160.....	38.7	——
160.1 to 165.....	29.0	——
165.1 to 170.....	19.4	——
Average	159.3 cm.	147.3 cm.
Minimum.....	148.6 cm.	139.8 cm.
Maximum.....	169.7 cm.	154.2 cm.

THE MAZAHUA. — An agricultural tribe, of moderate size and fairly civilized, living in the state of Mexico. They are somewhat mixed with the Otomi as well as with the Mexicans, but full-blood Mazahua are numerous. Physically they are related to the Tarasco on the one hand and to the Otomi on the other.

HEIGHT IN CM.	MEN (41) PER CENT	
Below 155.....	14.6	——
155.1 to 160.....	17.1	——
160.1 to 165.....	29.3	——
165.1 to 170.....	26.9	——
170.1 to 175.....	9.8	——
175.1 to 180.....	4.9	——
Average	160.9 cm.	——
Minimum.....	148.0 cm.	——
Maximum.....	174.7 cm.	——

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THE TLAHUILTEC. — This is a branch of the Aztec, preserved in almost a pure state in the large village of Cuautepec and the neighboring country on the west, in the state of Morelos. Cuautepec lies in a hot and low plain, two leagues from the capital of the state. The people are agricultural; many of the men work for the neighboring Mexicans. They are generally dolichocephalic and of but moderate stature.

HEIGHT IN CM.	MEN (50) PER CENT	WOMEN (30) PER CENT
Below 140.....	——	3.3
140.1 to 145.....	——	16.7
145.1 to 150.....	——	36.7
150.1 to 155.....	8.0	36.7
155.1 to 160.....	46.0	3.3
160.1 to 165.....	26.0	3.3
165.1 to 170.....	18.0	——
170.1 to 175.....	2.0	
Average	161.0 cm.	148.9 cm.
Minimum.....	153.5 cm.	139.5 cm.
Maximum.....	172.9 cm.	163.3 cm.

RÉSUMÉ OF THE PRINCIPAL RESULTS

The following table, arranged on the basis of the average height in the males and beginning with the shortest tribe, will facilitate a general review of the subject of stature of the Indians in southwestern United States and northern Mexico.

	MALES				FEMALES			
	Number of Individuals	Average Stature cm.	Minimum cm.	Maximum cm.	Number of Individuals	Average Stature cm.	Minimum cm.	Maximum cm.
Otomi	62	*159.3*	148.6	169.7	25	*147.3*	139.8	154.2
Tepecano	25	*160.2*	153.6	167.5	.....	.....	.....	.....
Mazahua	41	*160.9*	148.0	174.7	.....	.....	.....	.....

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RÉSUMÉ OF THE PRINCIPAL RESULTS (Continued)

	MALES				FEMALES			
	Number of Individuals	Average Stature cm.	Minimum cm.	Maximum cm.	Number of Individuals	Average Stature cm.	Minimum cm.	Maximum cm.
Tlahuiltec	50	*161.0*	153.5	172.9	30	*148.9*	139.5	163.3
Tarasco	50	*163.1*	155.5	175.5	30	*150.8*	144.7	165.2
Huichol	30	*163.4*	155.1	171.5	19	*154.3*	147.1	162.2
Cora	53	*164.1*	150.5	175.3	10	*152.2*	146.2	159.7
Tarahumare	23	*164.2*	153.0	174.5	10	*152.7*	148.6	159.6
Nahua	50	*164.3*	155.5	177.3	.....	.....	.....	.....
Pueblos	383	*164.5*	148.2	182.3	59	*152.3*	143.5	168.4
Tepehuane	40	*165.3*	156.6	180.8	15	*151.6*	145.6	157.1
Southern Ute	50	*166.8*	153.3	178.8	20	*153.7*	142.8	164.5
Opata	30	*167.0*	158.8	180.5	20	*155.0*	144.6	163.2
Mayo	53	*167.3*	154.7	185.1	30	*155.2*	147.0	166.5
Walapai and Havasupai	47	*168.4*	155.1	180.2	23	*157.7*	134.7	172.2
Apache	212	*169.1*	151.0	182.5	70	*156.8*	147.2	169.3
Yaqui	50	*169.6*	157.0	180.4	33	*154.2*	146.5	161.0
Papago	50	*170.9*	155.7	180.8	30	*155.9*	148.8	163.3
Navaho	50	*171.3*	162.4	180.0	30	*157.3*	148.4	166.3
Mohave	45	*171.6*	161.8	186.2	25	*158.5*	147.4	169.3
Pima	53	*171.8*	161.7	181.4	30	*157.4*	146.9	164.8
Yuma	37	*172.2*	159.9	184.8	5	*161.7*	157.5	166.8
Maricopa	40	*174.9*	162.5	185.1	30	*160.4*	150.0	170.8

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NOTES ON THE IROQUOIS LANGUAGE

BY

FRANZ BOAS

ALTHOUGH a considerable number of grammars and dictionaries of various Iroquois dialects have been published, particularly by Catholic missionaries, it is not quite easy to gain a clear insight into the structure of the language. I will try in the following pages to elucidate a few of its fundamental traits.

PHONETICS. — The method of rendering sounds in the works by J. A. Cuoq,[1] which in other respects are of rare excellence, is very inadequate. A much more exact method has been applied by Mr J. N. B. Hewitt in the texts of Iroquois cosmogonies, published by the Bureau of American Ethnology.[2] His method is purely empirical, and he has refrained from systematizing the sounds heard; and for this reason his texts form an excellent basis for a critical study of the phonetics of the language, the contradictions and variations of the same sounds giving us a means of understanding their characteristics.

The principal traits of the phonetics of Iroquois, as I have heard it pronounced by Mohawk from St Regis, are the following: Vowels occur as pure vowels and in nasalized form. The

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1 *Lexique de la langue iroquoise*, Montréal, 1882. *Études philologiques sur quelques langues sauvages de l'Amérique, Montréal*, 1866.

2 Iroquoian Cosmology (*Twenty-first Annual Report of the Bureau of American Ethnology*, pp. 127-339, Washington, 1903).

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nasalized vowel of the *a* group is pronounced with open lips, and is therefore related to the *n* series; while the nasalized vowel of the *u* group is intonated with closed or nearly closed lips, and is related to the *m* series. This tendency is much stronger in Mohawk than in Oneida and Tuscarora, in which dialects the closure of the lips is quite weak. In Mohawk, on the other hand, nasalized terminal *u* sounds almost like a short *um*.

The vocalic system of Mohawk may be represented in the following manner: —

Pure vowels..... *a* *ê* *i* *o* (*u*)[1] (long and short).
Nasalized vowels..... A^{n} u^{m}.

The vowel *ê* seems to be always open, as in "tell"; but in Oneida I have also heard *e* as in German "Mehl." The nasalized A^{n} has a very weak vocalic timbre, recalling somewhat the obscure *e* in "flower," but inclining more towards *a*, and having strong nasalization. In Oneida the nasalization becomes a distinct *n* before *d* and *t*, and the vowel loses its nasalized character. This tendency seems to be much less marked in Mohawk. In some speakers from St Regis I did not notice it at all, while others had it.

Among the consonants, true labials and labio-dentals are absent, although Mohawk has a bi-labial *f* which appears to be a strengthened, strongly aspirated *'w*. The dental and alveolar series is very well developed, particularly the affricative series. We find

d	*t*				
z	*s*			*j*	*c*
(*ž*?)	*š*			*ǰ*	(*č*?)

[1] *u* does not occur in Mohawk.

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The first column in these series represents the sonants; the second, the surds. As in most American languages, the stress of articulation in these two groups is nearly equal, so that an accurate observation of the glottal character of the sounds is required in order to distinguish them. The surd is always pronounced with a full breath. This is true also of the relations between *g* and *k*. The sounds *j* and *c* represent the French *j* and the English *sh; z*, the sonant of *s; ž* and *š*, the affricatives of *z* and *s*, like *dz* and *ts; ǰ* and *č*, the affricatives of *j* and *c*, like English *j* and *ch*.

Palatals are *g* and *k*. To these must be added a continued sound with moderate stricture in the *k* position. With other consonants this sound approaches the consonant *x̣*, but is generally weaker than the modern English *wh* in words like "whale." Between two vowels the stricture almost disappears, and the sound approaches a pure *h*. In Oneida this stricture is much more marked than in Mohawk, where it becomes a pure aspiration. This sound is always long continued, and appears therefore, when combined with a stop, both before and after it. On the whole, the accent determines whether the breath is heard with greater distinctness before or after the accompanying consonant. The influence of this sound upon the Oneida *l* is remarkable. When accompanied by this breath, the *l* is pronounced with the tip and adjoining back of the tongue laid flat against the palate; the air escaping between the teeth, back of the canines. I render this sound throughout by *ḷ*.

Mohawk has also a continued palatal sound in *i* position, which seems to belong to the consonant groups *gy* and *ky*. I

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have not been able to decide whether these groups must be considered as affricatives of anterior palatals, or whether they are composite sounds.

The *r* of Iroquois is a very weak apical trill, which in Mohawk has such slight amplitude of vibration that it sounds similar to an *l*. In Oneida the trill disappears entirely, and *l* takes the place of *r*.

Finally, the weakened vowels *u* and *i*, which are rendered by *w* and *y*, must be mentioned.

In a number of cases an indistinct parasitic vowel is heard after long vowels ($\bar{a}^a$, $\bar{i}^i$), and a weak hiatus occurs before and after consonants. This seems to be due to a weak glottal stop which is characteristic of many western American languages, where, however, it is much more pronounced.

The system of consonants is, therefore, as follows: —

	DENTALS		ANTERIOR PALATALS		POSTERIOR PALATALS	
Stops	*d t*	— —	—	—	*g*	*k*
Continuants	*z s*	*j c*	—	*x̣*	—	*'(x̣)*
Affricatives	*ž š*	*ǰ č*	(*gy*?)	(*ky*?)		
Trill or lateral....	*r l* (*L*[1])					
Semi-vowels	*w y*	*f*				
Breath	*'*					
Glottal stops.....	*e*					

HEWITT'S SYSTEM OF RENDERING IROQUOIS SOUNDS. — I give here a comparative statement of the sounds as rendered by Hewitt and as heard by me pronounced by St Regis Mohawk.

[1] In Oneida.

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HEWITT *a* = BOAS *a*

HEWITT *ca'ē's'ă'* 271.11 [1] — BOAS *saē'^{e}za^{e}*

niiako'tă's 270.12 — *niagō'da^{e}s*

thatinak'erę' 263.12 — *tādina'gere*

HEWITT *e* = BOAS *e*

HEWITT *ieteroñ'to^{n}'* 261.1 — BOAS *iē^{e}deru^{m}'du^{m}*

ionehră'kwă't 266.4 — *yōne'ra'gwa*

HEWITT *i* = BOAS *i*

HEWITT *ro'ni''hă* 266.5 — BOAS *rō'ni''a*

aotcī'tca' 282.9 — *oǰī'ǰa^{e}*

HEWITT *ii* before vowels not initial = BOAS *i* or *iy*

HEWITT *niiako'tă's* 270.12 — BOAS *niagō'da^{e}s*

niio'to^{n}'hă'tie' 262.12 — *niyōtu^{m}'a'dye^{e}*

(see also p. 435)

HEWITT *o* = BOAS *o*

HEWITT *o'hĕñ'to^{n}'* 260.6 — BOAS *o'A^{n}'du^{m}*

HEWITT *ĕ^{n}*, *ĕñ* = BOAS *A^{n}*

HEWITT *to'kĕ^{n}ske'* 260.1 — BOAS *do'gA^{n}sgê*

iĕ^{n}katiă'tioñ'nite 282.4 — *iA^{n}gā'dyadyu^{m}'nīdê^{e}*

thĕñ'tero^{n}' 256.14 — *tA^{n}'deru^{m}*

Hewitt uses *ĕ^{n}* fairly consistently before *i, w, s, k, ', h, '*; *ĕñ*, before *t, n, r, dj,* and final.

ĕ^{n}. Before *i*: *iĕ^{n}ierat'hĕ^{n}'* 262.10

Exceptionally *ĕñ*: *iĕñ'ioñwe'* 265.13

niiĕ^{n}hĕñ'iĕ^{n}' 265.13

Before *w*: *ĕ^{n}wa'to^{n}* 262.9

Before *s*: *to'kĕ^{n}ske'* 260.1

ĕ^{n}seni'niăke' 263.12

Exceptionally *ĕñ*: *wă'eiakĕñseroñ'* 256.2

Before *k*: *ĕ^{n}kanā'no^{n}'* 264.2

ĕ^{n}ka'tĕñ'ti' 265.10

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[1] Pages and lines of Hewitt's *Iroquoian Cosmology.*

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Before ‘: *nawĕⁿ‘toⁿ‘* 264.1
o’nistĕⁿ‘hā‘ 265.15
ĕⁿ‘saniă’ke’ 263.10
o’nĕⁿ‘ 261.6
Before ’: *nă’karoñto’tĕⁿ’* 268.1
tĕⁿ’s 260.7
Exceptionally *ĕñ*: *nihokstĕñ’’ă* 269.10

ĕñ. Before *t*: *noñwĕñ’toⁿ* 260.5
o‘hĕñ’toⁿ‘ 260.6
Exceptionally *ĕⁿ*: *tĕⁿtkāi’kĕⁿne’* 257.1
ĕⁿtiĕ‘’ke‘ 256.7
Before *n*: *shă’tia’wĕñne’* 260.4
Exceptionally *ĕⁿ*: *iatĕⁿno’sĕⁿ’‘ha‘* 255.7
Before *r*: *wa’tiako’nikoⁿ‘rawĕñrie’* 261.4
ăiĕñ’re’ 257.6
Before *dj*: *niwatoⁿ‘hwĕñdjio’tĕⁿ‘* 267.5
Before *m*: *hĕñm* 268.10 [1]
Final: *nĕñ* 261.4

HEWITT *oⁿ, oñ* = BOAS *uᵐ*

HEWITT	BOAS
ieteroñ’toⁿ 261.1	*iĕᵉderuᵐ’duᵐ*
toñsāioⁿ‘shĕñt’ho’ 262.1	*duᵐsāyuᵐsAⁿ’to*
tciĕñnoⁿ‘toñnioⁿ‘ 261.15.	*ǰiAⁿnuᵐduᵐ’nyuᵐ*
tedjia’roⁿ‘ 268.2	*deɉā’ruᵐ*

Hewitt uses *oⁿ* before ‘ and ’; *oñ* in all other cases.

oⁿ. Before ‘: *oⁿ‘’kă’* 260.6
tewa’toⁿ‘s 261.7
wa’oⁿ‘’kă’we’ 261.12
na‘wĕⁿ‘’toⁿ‘ 264.5
kanoⁿ‘’săkoⁿ‘ 261.1
Exceptionally *oñ*: *o‘sthoñ’‘hă‘* 268.6.
Before ’: *iesnoⁿ’’ke‘* 260.2
ie’teroⁿ’ 261.1

[1] This is an exclamation; *m* does not occur in other words.

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wă'i'ro^{n}' 267.3
wă'kiă'ta'ˊ'to^{n}'ne' 266.13
Exceptionally *oñ*: *tesāiă'tă'ˊtoñ''o^{n}ˊ* 268.4

oñ. Before *t*: *oroñto'tsera'ko^{n}ˊ* 260.10.
ioñthă'ˊhi'ne' 268.14
Before *s*: *niioñsā'ie^{n}'* 265.8
ioñsāierat'hĕ^{n}' 264.9
Before *ts*: *wă'oñts'te'* 260.2
Before *n*: *wă'ˊhatinekotoñ'ni'* 262.7
iă'oñnoñ'wete' 266.7
oteroñtoñni''ă'ˊ 268.1
Before *k*: *noñka'tĭ'ˊ* 260.11
roñ'kwe'ˊ 268.14
Before *r*: *satoñrĭs'hĕ^{n}ˊ* 269.6
wă'ˊhĕ^{n}'nikōñ'riă'ke' 269.9
iă'thatoñrĭ'ˊserătkoñ'tĕ^{n}' 260.1
Before *w*: *noñwĕñ'to^{n}* 260.5
roñwă'ni''ˊhă'ˊ 263.10

HEWITT *t* (without aspiration) = BOAS *d*

HEWITT	BOAS
kiă'tăk'tă' 283.3	*gya^{e}da'kda*
hotĕ^{n}''niote' 281.11	*rodA^{n}nyōdê*

Only before *g* sounds do I hear Hewitt's *t* as the same sound: —

HEWITT	BOAS
āio^{n}tkă'ˊ'tho' 262.13	*ayu^{m}tga'to'*
tkara'ˊkwi'nekĕ^{n}'s 256.4	*tgara'ˊgwī'negA^{n}'s*

HEWITT *th*, *'t*, *'th* = BOAS *t*

HEWITT	BOAS
th: *thatinak'ere'* 263.12	*tādina'gere*
thĕñ'tero^{n} 256.14	*tA^{n}'deru^{m}*
iă'tha'ˊnho''ˊhiiă'ke' 271.5	*iatan'ˊō''ˊiagê*
wā'tio^{n}'ˊshĕñt'ho' 261.2	*wadyu^{m}sA^{n}'to*
'th: *iako'ˊ''thăre'* 263.3	*yagō'tarê'*
āioñtkă'ˊ'tho' 262.13	*ayu^{m}tga'to'*
't: *thoñtāio'ˊto^{n}'ˊhă'tie'* 261.3	*tu^{m}dayo'ˊtu^{m}'ˊa'dyê*

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HEWITT *s* = BOAS *z*

HEWITT		BOAS
că'ē's'ă' 271.11		*saē'^{e}za^{e}*
ioñsashako'n'ho'to$^{n'}$ 274.3		*yu^{m}zasāgōn'ō'du^{m}*
shoñsāiakotidjiskokewa'nio$^{n'}$ 275.1		*su^{m}za'yagōdiǰisgogewa'nyu^{m}*

Hewitt's terminal *s*, and *s* before stops, I hear as the same sound:—

HEWITT		BOAS
tcietăk'he's 260.14		*ǰiêda'kê's*
to'kĕ^{n}ske' 260.1		*do'gA^{n}sgê*
skate'niĕñ'to$^{n'}$ 287.5		*sgade'nyA$^{n'}$du^{m}*

HEWITT *c, sh, 's* = BOAS *s*

HEWITT		BOAS
c: *cā'ē's'ă'* 271.11		*saē'^{e}za^{e}*
că'hadjiĕ$^{n'}$hi''să' 271.4		*sa'aA$^{n'}$i'sa^{e}*
'sh: *thă'tetcio$^{n'}$shĕñt'ho's* 261.14		*tadeǰu^{m}sA$^{n'}$tos*
's: *wă'thathio'sotoñ'nio$^{n'}$* 284.1		*watatyosōdu$^{m'}$nyu^{m}*
niiehāiĕ$^{n'}$'să' 272.11		*nī'ayA$^{n'}$sa*
kano$^{n'}$'sako$^{n'}$ 261.1		*ganu$^{m'}$sagu^{m}*

HEWITT *ts* = BOAS *ǯ*

HEWITT	BOAS
thitcakotkă'ri'tseroñni'hă'tie'se'	*tiǰago'tgarišeru^{m}ni'a'dyesi*

I should expect that *ts* of Hewitt would correspond to *ǯ*, but I have not found any cases of this kind.

HEWITT *tsh* = BOAS *š*

HEWITT	BOAS
ni'ha'qhiots'hes'ă'	*ni'a'x'ō'šis'a*

HEWITT *tci, tc, dji* = BOAS *ǰ*

HEWITT		BOAS
tci: *thă'tetcio$^{n'}$shĕñt'ho's* 261.14		*tadeǰu^{m}sA$^{n'}$tos*
thă'tetcio'kwata'se' 285.2		*tadeǰō'gwadā'sê*
tciako'tĕñ'tio$^{n'}$ 268.5		*ǰago'dA$^{n'}$dyu^{m}*
tc: *aotcītcă'* 282.9		*oǰī'ǰa^{e}*
dji: *tedjiaro$^{n'}$* 268.2		*deǰā'ru^{m}*
nă'kadjiĕ$^{n'}$'hatĭ' 270.9		*nagaǰA$^{n'}$'adi*
că'hadjiĕ$^{n'}$hi''sa' 271.4		*sa'aǰA$^{n'}$i'sa^{e}*

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In a number of cases the *i* of *tci* has a vocalic value. Perhaps this is always the case before *e* and *ĕ*^{n}.

HEWITT *tcietăk'te's* 260.14 — BOAS *ǰîêda'kdê^{e}s*
tciĕñno^{n}toñ'nio$^{n'}$ 261.15 — *ǰiu^{m}nu^{m}du$^{m'}$nyu^{m}*

HEWITT *k* (without aspiration) = BOAS *g*

HEWITT *kano$^{n'}$'săko$^{n'}$* 261.1 — BOAS *ganu$^{m'}$sagu^{m}*
orho^{n}'ke'djĭ' 265.3 — *ōr'u^{m}gê'ǰi*
wă'o$^{n'}$'tkă'we' 261.12 — *wau$^{m'}$tga^{e}wê^{e}*

Before stops I hear the simple *k* as the same sound: —

HEWITT *kiă'tăk'tă'* 283.3 — BOAS *gya^{e}da'kda*

HEWITT *kh*, *'k* = BOAS *k*

HEWITT *tcietăk'he's* 260.14 — BOAS *ǰieda'kê^{e}s*
wă'hatikhwĕñ'ta'ne' 256.1 — *wa'adikwA$^{n'}$da^{e}ne^{e}*

HEWITT *i* after *t, n,* and *k* = BOAS *y*

These sounds, *dy*, *ty*, *ny*, *gy*, *ky*, are presumably affricatives. The sounds *dy*, *gy*, and *ty*, *ky*, are so much alike that it requires the closest attention to distinguish them. In fact, the Mohawk with whom I worked were equally well satisfied with my pronunciation, whether I said *dy* or *gy*. It is easy to show by etymological considerations that some of these sounds must have developed from *d*, others from *g*, but the position of the tongue differs only slightly in these sounds.

HEWITT *iĕ^{n}katiă'tioñ'nite'* 282.4 — BOAS *iA^{n}gā'dyadyu$^{m'}$nīdê^{e}*
wă'thathio'sotoñ'nio$^{n'}$ 284.1 — *watatyosōdu'^{m}nyu^{m}*
kiă'tăk'tă' 283.3 — *gya'da'kda*
aoñsakie'wĕñ'tă'ne' 282.2 — *au^{m}sagyê^{e}wA^{n}da^{e}nê^{e}*

HEWITT intervocalic *i* = BOAS *y*

HEWITT *niiehāiĕ$^{n'}$'să'* 272.11 — BOAS *nī'ayA$^{n'}$sa*
takeniiā'kĕ^{n}ne' 273.1 — *geniyā'gĕ^{n}nê*

HEWITT *qhi* = BOAS *x̣*

HEWITT *nī'ha'qhiots'hes'ă'* 318.9 — BOAS *nī'a'x̣'ōtšis*

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Thus it will be seen that the differences in the rendering of sounds are mainly the following: —

Hewitt hears or writes the surds *t* and *k* where I hear the sonants *d* and *g* with stress similar to that of English *t* and *k*, but with distinct sonant character..

He writes the full accompanying breath of the surd as a separate sound, — sometimes ', sometimes *h*, — so that the combinations *'t, th*, *'th*, and *'k*, *kh*, *'kh*, express these surds.

He writes the breath ', *h*, *'h*; but I have not been able to discover any difference between these sounds, except a variation in the stricture at the *k* point, which seems to be largely individual and accidental.

The affricatives as rendered by him have the same traits as the stops.

The individuals whom I heard do not modify nasalized vowels before consonants, although this change occurs distinctly in some dialects.

The nasalized *u* vowel (Hewitt's o^n) has distinctly a nasalization with closed lips.

I hear the vowel *i* of Hewitt often as an affricative form of the preceding consonant.

INCORPORATION. — Iroquois is characterized by a highly developed tendency to incorporate the pronominal subject and both pronominal and nominal objects. Incorporation of the nominal subject is, however, confined to inanimate objects, — perhaps to words beginning with the prefixes *ga-* and *o-*. In all cases where incorporation occurs, the component elements of the compound term undergo such fundamental modifications that the unity of the term is very firm, and appears as a word-unit.

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In this respect the compound terms of Iroquois resemble those of Algonquin and Eskimo, although the principles of composition are quite distinct.

Since these are perhaps the most fundamental characteristics of Iroquois, they may be described first. Most nouns that are not descriptive sentences are made into independent terms by one of the two prefixes *ga-* and *ō-*; as, *ga-l'An^{n}na'*,[1] song; *ga-nu$^{m'}$sa*, house; *o-'sA^{n}na'*, name; *o-lī'wa*, custom. As soon as one of these nouns is incorporated in a verbal form, it loses its word-forming prefix. On the other hand, in many cases certain elements are suffixed to the nominal stem when it appears in incorporated form, that apparently give to it the character of a verbal noun expressing quality, instrumentality, and similar ideas. In this form the noun is inserted between the prefixed pronouns and the verbal stem. As soon as this composition is made, it appears that each stem, both nominal and verbal, has a certain initial vocalic character which in other forms does not necessarily appear. The simple verb is thus built up according to the plan

Pronoun — vocalic character — stem.

The verb with incorporated noun has the following form: —

Pronoun — vocalic character of noun — nominal stem — nominal suffix — vocalic character of verb — verbal stem.

These forms may be further developed by added prefixes and suffixes.

The vocalic characteristics of verbs and nouns are identical. Five forms must be distinguished, — *a*, *e*, *i*, *ē*, *o*.

PRONOUN. — Before it is possible to discuss these five forms in greater detail, it is necessary to describe the principal charac-

[1] When not otherwise indicated, the following examples and forms belong to the Oneida dialect.

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teristics of the pronoun. Subjective and objective pronominal forms are fundamentally distinct. While the former are used with all verbs expressing activities, all verbs expressing a state or condition are expressed as though they affected an object; as our "methinks." This form of expression is very often used in Iroquois. Not only is every adjective expressed in this manner, but also every completed action is conceived in this way. The Iroquois do not say, "I am ignorant," but "The being ignorant is (on) me." Instead of "I have seen," they say, "The having seen is (on) me." This differentiation of subjective and objective verb is common in American languages, but few only have carried this classification to such extremes as the Iroquois.

Furthermore, there is a fundamental difference in the concepts of personal relations in the subjective and in the objective series. In the subjective series fifteen persons are distinguished, — four in the singular, five each in dual and plural, and an indefinite third person. In the singular we find the first and second persons, and a third person which is divided into a masculine and non-masculine, which latter has sometimes erroneously been called feminine. In dual and plural we find an inclusive, exclusive, second person, and third person masculine and non-masculine.

In the objective series eleven persons are distinguished, — the same four forms of the singular that occur in the subjective series, the indefinite third person, the first person dual (not exclusive and inclusive as in the subjective series), the second person dual and the corresponding plural forms, and finally a third person masculine and non-masculine for more than one, that is, a common form for dual and plural.

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The personal pronouns have very peculiar parallel forms in the possessive pronoun. Nouns which are subject or object of a sentence have possessive pronouns corresponding to the objective forms, and which differ only slightly from the personal pronouns. Nouns with locative postpositions have often, although not always, fifteen persons, which differ slightly, in the indefinite person and in the exclusive dual and plural, from the personal pronoun.

Without reference to their differences in form in connection with one of the five vowels of the stem with which they are combined, the general pronominal scheme may be represented as follows: [1]—

SUBJECTIVE PERSONAL PRONOUN

	Singular	*Dual*	*Plural*	
		dy-, dn-	*dw-, dy-*	Inclusive
1st person	*g-*	*yagy-, yagn-*	*yagw-, yagy-*	Exclusive
2d "	*z-*	*-, zn-*	*zw-, ȝ-*	2d person
3d " masc.	*l-*	*ʻy-, ʻn-*	*lu^{m}-, lad-, l A^{n}-*	3d " masc.
3d " non-masc.	*w-, g-, y-*	*gy-, gn-*	*gu^{m}-, gund-, gun*	3d " non-masc.

Indefinite *iu^{m}-, i-, yag-*

The subjective possessive pronoun shows only a few deviations from this type; in place of

Exclusive dual.....	*yagy-, yagn-*	*u^{m}gy-, umgn-*
Exclusive plural.....	*yagw-, yagy-*	*u^{m}gw-, u^{m}gy-*
Indefinite	*iu^{m}-, i-, yag-*	*u^{m}-, –, ag-*

The first two of these forms are identical with the first person dual and plural of the objective possessive pronoun.

[1] All the following examples, unless otherwise stated, belong to the Oneida dialect.

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OBJECTIVE PERSONAL PRONOUN

		Singular	*Dual*	*Plural*
1st person		*wag-*	*yu^{m}gy-, yu^{m}gn-*	*yu^{m}gw-, yu^{m}gy-*
2d "		*z-*	*ǰ-, zn-*	*zw-*
3d "	masc.	*lo-*	——	*lon-, lod-*
3d "	non-masc.	*yo-*	——	*yon-, yod-*

Indefinite *yago-* (*yagao-*)

The objective possessive pronoun shows more important differences from the corresponding personal pronoun than the subjective possessive pronoun. These differences are in part analogous to those described before. All possessive forms lack the initial *y-* of the verbal forms. Besides, an *a* appears in the third persons masculine and non-masculine, which seems to have been lost in the verbal forms.

OBJECTIVE POSSESSIVE PRONOUN

		Singular	*Dual*	*Plural*
1st person		*ag-*	*u^{m}gy-, u^{m}gn-*	*u^{m}gw-, u^{m}gy-*
2d "		*z-*	*ǰ-, zn-*	*zw-*
3d "	masc.	*lao-*	——	*laon-, laod-*
3d "	non-masc.	*ao-*	——	*aon-, aod-*

Indefinite *ago-* (*agao-*)

On the whole, we receive the impression that *g-*, *z-*, *l-*, are respectively the first, second, and third masculine persons, while the characteristic signs of the remaining persons are obscure. The dual seems to be characterized most commonly by an *n* following the pronoun; while the plural has a *w* in the same position.

On pages 442 and 443 I give a detailed table of the personal and possessive pronominal prefixes for stems with the five vocalic characters.

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Apparently these forms may be arranged in three groups, according to their vocalic characters. The first group consists of the *a* forms alone; the second embraces the *e* and *i* forms; the third, the *ē* and *o* forms. I have indicated in the tables, by underscoring, those forms that are characteristic for each of these groups, and an examination of these forms will prove the justification of our classification. The principal similarities that are characteristic of each group are found in the *e* and *i* forms and in the *ē* and *o* forms in the third persons plural and indefinite. Peculiar is the exceptional position of the *a* forms, which have in the dual throughout *y* where the other forms have *n*; and of the *o* forms, which in the plural have *y* where the other forms have *w*.

Another phenomenon substantiating our classification of these forms appears when the verbal forms take prefixes. In this case the *l* of the third person masculine becomes ' in the first two groups (*a*, *e*, *i*), while it remains unchanged in the last group (*ē*, *o*). In the plural this change takes place in all the groups in the same manner. This change presumably accounts for the initial ' in the third person masculine dual of the subjective prefixes.

The pronominal forms expressing combinations of subject and object are quite remarkable on account of their peculiar grouping. The relations between first and second persons form a group by themselves, in so far as only three forms occur expressing these relations for the three numbers: the first one expressing their relation when both persons are singular; the second, when either the one or the other, or both, are dual; the

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SUBJECTIVE PREFIXES

Vocalic Character	*a*	*e*	*i*	*ē*	*o*
Inclusive dual	*dya-*	*dni-*	*dni-*	*dne-*	*dno-*
" plural	*dwa-*	*dwa-*	*dwA*^{n}-	*dwe-*	*dyo-*
1st person singular	*ga-*	*ge-*	*gi-*	*ge-*	*go-*
Exclusive dual*	*yagya-*	*yagni-*	*yagni-*	*yagne-*	*yagno-*
" plural*	*yagwa-*	*yagwa-*	*yagwA*^{n}-	*yagwe-*	*yagyo-*
2d person singular	*za-*	*ze-*	*zi-*	*ze-*	*zo-*
" " dual	*a-*	*zni-*	*zni-*	*zne-*	*zno-*
" " plural	*zwa-*	*zwa-*	*zwA*^{n}-	*zwe-*	*ǰo-*
3d person masculine singular	*la-*	*la-*	*lA*^{n}-	*le-*	*lo-*
" " " dual	*ʻya-*	*ʻni-*	*ʻni-*	*ʻne-*	*ʻno-*
" " " plural	*lu*^{m}-	*ladi-*	*ladi-*	*lA*^{n}*ne-*	*lA*^{n}*no-*
3d person non-masculine singular	*wa-*	*ga-*	*gA*^{n}-	*we-*	*yo-*
" " " dual	*gya-*	*gni-*	*gni-*	*gne-*	*gno-*
" " " plural	*gu*^{m}-	*gundi-*	*gundi-*	*gune-*	*guno-*
Indefinite	*iu*^{m}-	*ye-*	*ye-*	*yage-*	*yago-*

In the forms marked with an asterisk (*) the possessive subjective pronoun has *u*^{m} for *ya*.

OBJECTIVE PREFIXES

Vocalic Character	*a*		*e i* [1]		*ē*		*o*	
	Personal	Possessive	Personal	Possessive	Personal	Possessive	Personal	Possessive
1st p. s.	*waga-*	*agwa-*	*wage-*	*age-*	*wage-*	*age-*	*wago-*	*ago-*
1st p. d.	*yu*^{m}*gya-*	*u*^{m}*gya-*	*yu*^{m}*gni-*	*u*^{m}*gni-*	*yu*^{m}*gne-*	*u*^{m}*gne-*	*yu*^{m}*gno-*	*u*^{m}*gno-*
1st p. pl.	*yu*^{m}*gwa-*	*u*^{m}*gwa-*	*yu*^{m}*gwa-*	*u*^{m}*gwa-*	*yu*^{m}*gwe-*	*u*^{m}*gwe-*	*yu*^{m}*gyo-*	*u*^{m}*gyo-*
2d p. s.	*za-*	*za-*	*za-*	*za-*	*ze-*	*ze-*	*zo-*	*zo-*
2d p. d.	*ǰa-* [2]	*ǰa-*	*zni-*	*zni-*	*zne-*	*zne-*	*zno-*	*zno-*
2d p. pl.	*zwa-*	*zwa-*	*zwa-*	*zwa-*	*zwe-*	*zwe-*	*ǰo-*	*ǰo-*
3d p. masc. s.	*lo-*	*lao-*	*lo-*	*lao-*	*lawe-*	*lawe-*	*lao-*	*lao-*
3d p. masc. d., pl.	*lona-*	*laona-*	*lodi-*	*laodi-*	*lone-*	*laone-*	*lono-*	*laono-*
3d p. non-masc. s.	*yo-*	*ao-*	*yo-*	*ao-*	*yawe-*	*awe-*	*yao-*	*ao-*
3d p. non-masc. d., pl.	*yona-*	*aona-*	*yodi-*	*aodi-*	*yone-*	*aone-*	*yono-*	*aono-*
Indefinite	*yago-*	*ago-*	*yago-*	*ago-*	*yagawe-*	*agawe-*	*yagao-*	*agao-*

[1] The *i* forms agree with the *e* forms, except that in the 1st p. s. the ending is *i*; in the 1st p. pl., 2d p. s. and pl., the ending is A^{n}.

[2] ǰ originates from *zy*.

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third, when either the one or the other, or both, are plural. It is immaterial which is dual or plural. These forms are as follows: —

			a	*e*	*i*	*ē*	*o*
1st person	subject	Singular	*gu*^{m}*ya-*	*gu*^{m}*-*	*gu*^{m}*-*	*gu*^{m}*ye-*	*gu*^{m}*yo-*
2d "	object	Dual	*gya-*	*gni-*	*gni-*	*gne-*	*gno-*
		Plural	*gwa-*	*gwa-*	*gw A*^{n}*-*	*gwe-*	*gyo-*
2d person	subject	Singular	*sgwa-*	*sge-*	*sgi-*	*sge-*	*sgo-*
1st "	object	Dual	*sgya-*	*sgni-*	*sgni-*	*sgne-*	*sgno-*
		Plural	*sgwa-*	*sgwa-*	*sgw A*^{n}*-*	*sgwe-*	*sgyo-*

The relations of the first and second persons as subject, and of the third person as object, form a second group. In order to present this group clearly, I give only the pronominal part without the stem-vowel, and the characteristic consonants (*y*, *n*, *w*) for the various classes as illustrated in the preceding tables.

I — him	*ʻīy-*	*ʻēš-*	thou — him
I and thou — him	*ʻēty-*, *ʻētn-*	*ʻēč-*, *ʻēšn-*	you two — him he — your two selves
I and ye — him	*ʻētw-*, *ʻēty-*	*ʻēšw-*, *ʻēšy-*	ye — him he — you

Here belongs also

he — thee	*ʻy-*

A third group includes the relations of the indefinite subject to the first and second persons object, and the reversed relations: —

somebody — me	*yu*^{m}*gw-*, *yu*^{m}*g-*		
somebody — us	*yu*^{m}*kī-*	*yetī-*	ye and I — somebody
somebody — thee	*yez-*	*yakī-*	they and I — somebody
somebody — you		*yečī-*	ye — somebody
		kēy-, *ke-*	I — somebody
		sēy-, *se-*	thou — somebody

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The relations of the indefinite third person to the definite third persons are allied to the corresponding third persons of the subjective and objective: —

Subject: somebody	Object: somebody		
him	*lu*^{m}*w-, lu*^{m}*y-*	*sago-*	he
it (non-masc.)	*gu*^{m}*w-, gu*^{m}*y-*	*yago-*	it (non-masc.)
them (masc.)	*lu*^{m}*wan-, lu*^{m}*wadi-*	*sagon-, sagodi-*	they (masc.)
them (non-masc.)	*gu*^{m}*wan-, gu*^{m}*wadi-*	*yagon-, yagodi-*	they (non-masc.)

The relations of the third person masculine subject to the first person are as follows: —

he — me	*lagw-, lag-*		
he — our two selves	*su*^{m}*gy-, su*^{m}*gn-*	*sagy-, sagn-*	I and he — him
he — us	*su*^{m}*gw-, su*^{m}*gy-*	*sagw-, sagy-*	I and they — him

Finally we find —

he — him *lo-*

The forms with non-masculine subject are throughout identical with the objective personal pronominal forms.

The simplest form in which these complicated groupings can be given in tabular form seems to be the following. In these tables, *y*, *n*, indicate the dual forms for the *a* stems and the *e*, *i*, *ē*, *o* stems respectively; *w*, *y*, indicate the plural forms for the *a*, *e*, *i*, *ē* stems and for the *o* stems respectively.

	me	us	thee	you	it
I	—	—	*gu*^{m}*y-, gu*^{m}*-*		*key-*
we exclusive	—	—	*g (y, n; w, y)-*		*yaki-*
we inclusive	—	—	—	—	*yeti-*
thou	*sgw-, sg-*		—	—	*sey-*
ye	*sg (y, n; w, y)-*		—	—	*yeċi-*

Masculine Singular

	him	he	
I	*ʿīy-*	*lagw-, lag-*	me
we exclusive	*sag (y, n; w, y)-*	*su*^{m}*g (y, n; w, y)-*	us
we inclusive	*ʿēt (y, n; w, y)-*		
thou	*ʿēts-*	*ʿy-*	thee
ye	*ʿēš (y, n; w, y)-*		you
he	*lō-*		him

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Indefinite (also Non-Masculine, Dual, Plural Third Person

he	*sago-*	*lu*^{m}*w-*, *lu*^{m}*y-*	him	
it	(non-masc.)	*yago-*	*gu*^{m}*w-*, *gu*^{m}*y-*	it (non-masc. object)
they	(masc.)	*sagon-*, *sagod-*	*lu*^{m}*wan-*, *lu*^{m}*wadi-*	them (masc.)
they	(non-masc.)	*yagon-*, *yagod-*	*gu*^{m}*wan-*, *gu*^{m}*wadi-*	them (non-masc. object)

The various forms with their respective stem-vowels are treated like the subjective and objective forms.

First persons in *gwa-* are treated like the objective *waga*: —

	a	*e*	*i*	*ē*	*o*
thou — me.....	*sgwa-*	*sge-*	*sgi-*	*sgwe-*	*sgo-*
he — me.....	*lagwa-*	*lage-*	*lagi-*	*lagwe-*	*lago-*

All duals in *y*, *n*, and all plurals in *w*, *y*, are treated like the corresponding duals and plurals, and require no further illustration. These forms occur only in combinations of first, second, and third masculine singular persons.

The forms in *ago-* are treated like the personal objective indefinite; those in *on-*, *od-*; *an-*, *ad-*, like the personal objective third person plural.

Those in *i* and *y* require separate treatment. We find —

	a	*e*	*i*	*ē*	*o*
I — thee.....	*gu*^{m}*ya-*	*gu*^{m}*-*	*gu*^{m}*-*	*gu*^{m}*ye-*	*gu*^{m}*yo-*
I — it.....	*kēya-*	*ke-*	*ke-*	*keye-*	*keyo-*
thou — it.....	*sēya-*	*se-*	*se-*	*seye-*	*seyo-*
I — him.....	*ʻya-*	*ʻi-*	*ʻi-*	*ʻīye-*	*ʻiyo-*
we exclusive — it	*yakīa-*	*yaki-*	*yaki-*	*yakiē-*	*yakiō-*
we inclusive — it	*yetīa*	*yeti-*	*yeti-*	*yetiē-*	*yetiō-*
ye — it.....	*yeč̌īa*	*yeč̌i-*	*yeč̌i-*	*yeč̌iē-*	*yeč̌iō-*
he — thee.....	*ʻya-*	*ʻya-*	*ʻyA*^{n}*-*	*ʻye-*	*ʻyo-*

All these, with the exception of "he — thee," are treated in the same manner. In the *a*, *ē*, *o* forms, the *y* or *i* stands before

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the stem-vowel; in the *e* and *i* forms, the vowel disappears, and with it the *y*. The form "he— thee" is treated as though *ʻy* stood for *lz*, a transformation that is not improbable.

The form "thou — him" *ʻēš-* takes the stem-character following the pronominal element.

The remaining forms are —

	a	*e*	*i*	*e*	*o*
somebody — him.	*lu^{m}wa-*	*lu^{m}wa-*	*lu^{m}wA^{n}-*	*lu^{m}we-*	*lu^{m}wayo-*
somebody — it..	*gu^{m}wa-*	*gu^{m}wa-*	*gu^{m}wA^{n}-*	*gu^{m}we-*	*gu^{m}wayo-*

The system of personal pronouns in Mohawk is quite similar to that of Oneida, but there are a number of minor differences. According to the phonetic character of the dialect, *r* takes everywhere the place of *l*. Before the *n* of the dual and the *w* of the plural (except after *g*), a distinct short *e* is inserted, so that we have —

Inclusive plural *dewa-* instead of *dwa* of Oneida.
Exclusive dual *yageni-* instead of *yagni* of Oneida.

The possessive objective of the first person singular in the *a* form is in Mohawk *aga-* instead of *agwa-* of Oneida.

In the pronominal forms with incorporated object, we find in Mohawk — instead of the forms beginning with *s-*, expressing second person subject and first person object — forms beginning with *da-*: —

thou — me *dagwa.*

Only when the verb has a prefix do these forms change to *s* forms identical with those of Oneida.

Important differences are found in the groups of terms

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expressing the relations of the third person masculine singular and the first and second persons.

	Oneida	Mohawk	Oneida	Mohawk	
I — him	*ʻīy-*	*ri-*	*ʻēš-*	*(ē)š-*	thou — him
I and thou — him	*ʻēt (y, n)-*	*(e)čī'd (y, en)-*	*ʻēč-*, *ʻēšn-*	*ʻ(e)čīdj-*	you two — him
				(e)čīzen-	he — your two selves
I and ye — him	*ʻēt (w, y)-*	*(e)čī'd (ew, y)-*	*ʻēš (w, y)-*	*(e)čī'zew-*	ye — him
				(e)čī'j-	he — you

The *e* here is omitted after prefixes. "He — thee" has no aspirate, but is in Mohawk

īa īa iAⁿ ie io.

Only after prefixes does the aspirate here appear.

VERBAL PREFIXES AND THEIR INFLUENCE UPON THE PRONOUN. — A number of temporal and modal ideas are expressed by means of prefixes which have an influence upon the pronominal forms. It has been pointed out before that in the *a*, *e*, *and i* stems in all plural forms, the masculine *l-* (Mohawk *r-*) becomes ʻ; but a number of additional changes are brought about by a few of the prefixes.

1. *wa-* expresses the aorist. After this prefix, the verbal *y-* of the third person indefinite and of the non-masculine of verbs in *o-* disappears, and also the corresponding *ya-* of the exclusive. In all forms in which a plurality or duality of persons including the second occurs, the prefix is *we-* in place of *wa-*. These forms are the inclusive and the second persons dual and plural. The non-masculine singular of the verb in *a-* has the contracted form

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u^m-. Thus the following variants of the normal pronominal forms appear: —

	a	*e*	*i*	*ē*	*o*
Exclusive dual.....	*wagya-*	*wagni-*	*wagni-*	*wagne-*	*wagno-*
" plural	*wagwa-*	*wagwa-*	*wagwA^n-*	*wagwe-*	*wagyo-*
Indefinite	*wau^m-*	*wae-*	*wage-*	*wae-*	*wago-*
Non-masculine	*u^m-*				*wao-*
3d pers. masc. sing....	*wa'a-*	*wa'a-*	*wa'A^n-*	*wale-*	*walo-*
" " " plur. ...	*wa'u^m-*	*wa'adi-*	*wa'adi-*	*wa'A^nne-*	*wa'A^nno-*
Inclusive dual.....	*wedya-*	*wedni-*	*wedni-*	*wedne-*	*wedno-*
" plural	*wedwa-*	*wedwa-*	*wedwA^n-*	*wedwe-*	*wedyo-*
2d person dual.....	*weǰa-*	*wezni-*	*wezni-*	*wezne-*	*wezno-*
" " plural	*wezwa-*	*wezwa-*	*wezwA^n-*	*wezwe-*	*weǰo-*

2. A^n- expresses the future. It transforms the *l* of the masculine into ' in the *a*, *e*, and *i* forms in the singular, and in all forms in the plural. When the future is formed of a verb taking objective pronouns, the *l* changes to ' with all stem-vowels.

3. *a*- expresses the subjunctive. It changes *l* to ' as the other prefixes do, and inserts an *e* after the *a* in all forms in which a duality or plurality of persons including the second is involved. These forms in *ae*- correspond, therefore, to the forms in *we*- of the aoristic prefix *wa*-. In intransitive verbs, all *l* forms change to '.

4. *z*- ("again") shows peculiar forms, which are apparently produced by contractions of this prefix with the initial *y* of the subjective forms, which must also be supposed for the inclusive forms, and insertion of *e* for the second persons dual and plural, as before described. In the aorist the *z* is contracted, with *wa* and *we*, to *za* and *ze*. In the examples that were given to me the

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verbal *y* does not disappear. Thus I have found the following forms: —

	a		*ē*	*o*
	Present	Aorist	Present	Present
Inclusive dual	*ǰidya-*	*zēdya-*	*ǰidne-*	*ǰidno-*
" plural	*ǰidwa-*	*zēdwa-*	*ǰidwe-*	*ǰidyo-* (?)
1st person singular	*zaga-*	*zaga-*	*sge-*	*sgo-*
Exclusive dual	*ǰagya-*	*zayagya-*	*ǰagne-*	*ǰagno-*
" plural	*ǰagwa-*	*zayagwa-*	*ǰagwe-*	*ǰagyo-*
2d person singular	*zesa-*	*zasa-*	*zeze-*	*zezo-*
" " dual	*ǰiǰa-*	*zēǰa-*	*zezne-*	*ǰizno-*
" " plural	*ǰizwa-*	*zēzwa-*	*zezwe-*	*ǰiǰo-*
3d person masc. singular	*s'a-*	*sa'a-*	*sle-*	*slo-*
" " " dual	*ca-*	*za'ya-*	*s'ne-*	*s'no-*
" " " plural	*s'um-*	*za'u*^{m}*-*	*s'A*^{n}*ne-*	*s'A*^{n}*no-*
3d person non-masc. singular	*zwa-*	*zu*^{m}*-*	*zwe-*	*ǰo-*
" " " dual	*sgya-*	*zagya-*	*sgne-*	*sgno-*
" " " plural	*sgu*^{m}*-*	*zagu*^{m}*-*	*sgune-*	*sguno-*
Indefinite	*ǰu*^{m}*-*	*zayu*^{m}*-*	*ǰage-*	*ǰago-*

5. *de-* expresses the idea of duality, a concept that is ever present in the mind of the Iroquois, so that verbs which imply the presence of two acting individuals or parts always have this element. In the present and perfect of *a* stems it stands before the pronouns, and transforms *l* into '. The future prefix *A*^{n} follows the *de-*, which loses its vowel and assumes the form *dA*^{n}-. In the aorist, *wa-* precedes it, while the *e* of the second person dual and plural follows it. The *de-* itself loses its vowel. Before *g* and ', the *d* that remains after the loss of the vowel of *de-* is hardened to *t*.

watgaš ga' l'u^{m}	I chewed
dA^{n}*sa š ga' l'u*^{m}	thou art going to chew
de'a šga' l'u^{m}	he chews
de'a šga' l'u^{m}	he has chewed
wadyu^{m} *š ga' l'u*^{m}	it chewed
deyu^{m} *š ga' l'u*^{m}	it chews

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The importance of this prefix appears clearly from the long list of Mohawk words in Cuoq's Dictionary that begin with *te-*.[1]

6. *d-* ("here, thither"). This prefix changes *l* to ', as usual; it is hardened to *t* before *g and* '. In all present and perfect forms which include the second person, it takes *e* following it, even in the second person singular. In the aorist the forms are identical with those of *z-* ("again"), *d* being substituted throughout for *z*. In the future, the prefix A^n precedes the pronominal forms of the present.

When *d-* ("here") and *de-* ("two") appear in combination, the prefix *de-* ("two") precedes the forms for "hither, here," as described before, in the present and perfect. In the future, dA^n- is prefixed to the same forms; in the aorist, du^m- precedes the corresponding aoristic forms.

i-. A number of verbs of the *e* and *ē* forms have a prefix *i-* which has no discernible meaning. Examples are: —

i'glade	I stand	*i'gyA^{n}s*	I put down
i'k'as	I carry	*i'kg A^{n}s*	I have the power of seeing
i'k'awe	I carry along	*i'ksa^{e}s*	I finish
i'k'es	I bring	*i'kwas*	I pick up
i'gyaks	I cut	*i'geks*	I eat

This prefix is not always used in all persons. Its use is always confined to the present tense in which it may persist, while in some cases its use is limited to the first and second persons; or it may not be found with the second person. Examples of these cases will be given later on.

REMARKS ON THE *E* FORMS. — Verbs of the *e* class appear, when the stem begins with a consonant, without vowel. This is always the case when the accent is thrown back so that it stands

[1] See pp. 43-48.

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on a syllable preceding the pronoun; but the same change occurs in other words also. In these verbs, certain contractions occur in the first and second persons singular of the subjective and in the first person of the objective.

Before	'	*g*	*s*	*d*	*n*	*y*
g becomes	*k*	*k*	*k*	*k*	*g*	*gy*
z becomes	*s*	*s*	*š*	*s*	*s*	*ǰ*, *sy*

EXAMPLES.

-*yêsa*^{e} to become useless: —

1st pers. sing. pres.	*gye'sa*^{e}*s*		
2d " " "	*ǰe'sa*^{e}*s*		

-*gw* to pick up: —

1st pers. sing. pres.	*i'kgwas*	1st pers. sing. perf.	*wakgwA*^{n}
2d " " "	*i'sgwas*		

-*sa* to finish: —

1st pers. sing. pres.	*i'ksas*	1st pers. sing. perf.	*wa'ksu*^{m}
2d " " "	*i'šas*		

-*nun'e* to watch: —

1st pers. sing. pres.	*gnu'n'e*	1st pers. sing. perf.	*wagnun'a'u*^{m}
2d " " "	*snu'n'e*	(but aorist *wagenu*^{m}*'ne*^{e})	

-*lade* to stand: —

1st pers. sing. pres.	*i'glade*	1st pers. sing. perf.	*waglada'u*^{m}
2d " " "	*i'slade*	(aorist: *wa'glade*)	

-*'ande* to go ahead: —

1st pers. sing. pres.	*kande'*	1st pers. sing. perf.	*waka'ndu*^{m}
2d " " "	*sande'*		

In the dialects of Iroquois the disappearance of the vowel is not always found in the same verb, and even the same dialect has varieties of forms. Thus we find in Oneida both *igli'us* and *igeli'us* ("I kill").

THE SUFFIXES OF THE INCORPORATED NOUN. — It has been stated before that some nouns in incorporation take suffixes ex-

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pressing abstract ideas or terms of instrumentality. These suffixes are *-sla* (Mohawk - *sera*), *-gwa*, and a few others. The suffix *-sla* is clearly originally an element used to express abstract verbal nouns.

adA^{n}lo'zla	friendship,	from	*-dA^{n}lō'* to be friendly.
nagla'sla	village,	"	*-nagle* to live.
adliyo'sla	war,	"	*-dlī'yus* to fight.

An example of the occurrence of this suffix with an incorporated noun is—

ada'slagā'yu^{m} old stick (*ada'* stick; *-gā'yu*^{m} to be old)

An example of the occurrence of the suffix *-gwa* in the same position is—

ga'dagōda'dye I wear a shoe (*ga-* I, with *a* stem of *-'da* shoe; *gō* for *-gwa*, with *o* stem of *-dadi* to wear).

Another suffix of similar kind seems to be a simple aspiration:—

gali'wīyō' a good custom (*ga-* 3d pers. non-masculine for *e* stem of *o-lī'wa* custom; stem with suffix of incorporation *-li'w-*, *iyō'* good, beautiful).

IRREGULAR VERBS. — A number of verbs belong to different vowel-groups in different tenses and different persons. A few examples of these may be given.

TO SAY.

Present	*du*^{m}*he*	*a*-form	Aorist	^{e}	*i*-form with irregular forms
Future	*lu*^{m}	*i*-form	Perfect	*A*^{n}	*ē*-form, but irregular

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Aorist

wa'anī'^{e}	they (masc.) said	*wagonī'*^{e}	they (non-masc.) said

Perfect

wā'gA^{n}	I have said	*lā'w*A^{n}	he has said
yu$^{m'}$*gn*A^{n}	we (2) have said	*yā'w*A^{n}	it (non-masc.) has said
yu$^{m'}$*gw*A^{n}	we have said	*yagā'w*A^{n}	some one said
ī'zA^{n}	thou hast said	*lō'n*A^{n}	they (masc.) have said
ī'znA^{n}	ye (2) have said	*yō'n*A^{n}	they (non-masc.) have said
ī'zwA^{n}	ye have said		

From this is formed another, second perfect, by the suffix *-lu*^{n}, which, however, in the forms first person singular and the third persons singular, changes to *'u*^{m}. The *i-* of the second person is at the same time dropped. The third person masculine singular has both forms, *-lu*^{m} and *'u*^{m}.

TO EAT. *i-ks* follows the *ē* type, except the indefinite (which has *e*), the third person singular masculine and non-masculine, and the plurals with *w* (which follow the *a* type).

TO DESIRE. *i-l'e* follows the *ē* type, except in the non-masculine singular (which has the form *wa'e'l'e* in the aorist) and in the indefinite (which forms *iy*$A^{n'}$*l'e* present, *way*$A^{n'}$*l'e* aorist).

TO WALK. *i-* (*ē*) has similar forms. Apparently the stem and its vocalic character form a unit here. This verb follows the *ē* type, except in the non-masculine singular, which has *wa'e'* in the aorist; the indefinite, which is *iy*$A^{n'}$*ge* present, *way*$A^{n'}$ aorist.

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ONEIDA TEXT

Ne [1]	*oli'wagā'yu*[m] [2]	*wae'lago''a* [3]	*yag A*[n],[4]	*ne* [1]	*yenā'gele* [5]
The	belief old	somebody took it off	it is said,	that	some one lives

yau[m]*'tsa'de,*[6]	*ne'ok'*[7]	*agoksta*[n]*'',*[8]	*ō'kale* [9]	*yekzā'*[e] ; [10]	*undadadle''a* [11]
some one took himself entirely away,	except	an old woman,	also	a child;	her grandchild

zayonadā'd A[n]*le.* [12]	*O'kale* [9]	*ō'n A*[n] [13]	*ne* [1]	*yekza'*[e] [10]	*waī'*[e], [14]
they were deserted.	And so	after a while	the	child	said,

"Toye'dnu." [15]	*(Šō'ǰi* [16]	*yot'a'i'zu*[m] [17]	*ǰi*	*nyeyagawē'nu*[m] [18]	*yago'lago''u*[m]. [19]*)*
"Thither let us two go!"	(So much the trail was finished	when		thither some one had gone	some one had taken it [non-masc.] off.)

O'n An [13]	*tonya'ā'gne.* [20]	*Yeyadaze''a* [21]	*waē''And*[e]. [22]	*Kale* [9]	*ō'n A*[n] [13]
Then	there thither they two went.	Some one young-bodied being	some one went ahead.	Now	then

wau[m]*'dye*[e]*l A*[n] [23]	*gwa'*	*yel A*[n]*noda'di* [24]	*ne* [1]	*o'sō't'a* [25]	*yundu'*[m]*'e* [26]
some one was made aware	how	some one carried song along	the	her grandmother	says

ya'g A[n]*,* [4]	*"Da'g A*[n] [27]	*d A*[n]*dezatga'to!"* [28]	*U*[m]*dyē'l A*[n] [23]		*nē* [1]	*ni*
it is said,	"Don't	look that way!"	She was made aware		the	how

yeya'daze [21]	*ne* [1]	*agokst A*[n]*'a.* [8]	*Tō*	*ni* [29]	*ǰeyadō'd A*[n] [30]	*ǰi*	*niyo'tu*[m]*'ne* [31]
she was young-bodied	the	old woman.	That	how	again her body was	like	it used to be

ne	*yeyadaze''a.* [21]	*Tō*	*ō'n A*[n]*ya*[e] [32]	*wa-u*[m]*'du*[m]. [33]
that	she a young-bodied one.	Then	stone	she became.

Tō	*nu*[m]*'* [34]	*niga'awī'*[e] [35]	*dundasagotg A*[n]*ze''a* [36]		*sayā'dat,* [37]
That	at	thus it went along	thither looking for them came		one body,

todunda'a'd A[n]*dī*[e] [38]	*ǰi*	*dye'la'gwas.* [39]	*O'n A*[n] [13]	*ōk* [7]	*g A*[n]*su*[m]
thence he came	where	there some one	And	but	near by

was taking off.

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ne'neg$_A$[n] *ī'sle.*[40] *Tō* *gadi* *nē*[41] *sasagoyā'dagō*[42] *ne*
indeed he goes back. That again so he body-takes up the

yekza'[e].[10]
child.

Ne'gadi[41] *wī'ne*[43] *ǰi* *onA^nya'*[e][32] *yagodu*[m'][44] *ne*[1]
Thus therefore thus stone some one became the

agokstA^n'ha;[8] *okō'ni*[e][45] *wi*[e] *ǰi* *ya'de'undA^nlōsliyonē'*[e][46] *ne*
old woman; and also because there not they being friendly the

oli'wagāyu[m][2] *ne'ne* *ǰi* *ne* *dwayadō'dA^n*[47] *lundnagla'sleza'ksgwe*[e];[48]
old custom, that when the we body-being they searched for villages;
thus

tō'gA^ns *ya'gA^n*[4] *wahundu*[m]*go'de*[e][49] *ǰi* *yonA^nyō'de*[50] *ne*
then it is said they passed by where stone stood the

agokstA^ng.A^n,[18] *ne'ne* *a'onanu'n'dA^nne*[e][51] *ǰi* *ni'onadlasō'dA^n*[52]
old woman, that they might know where their fate would
be thus

ne *adliyo'slā'ge.*[53]
the on warfare.

Tō'ne *tu*[m]*wades* [n]*nā'wi*[54] *ǰi* *nau*[m]*gyu*[m]*'wA^nǰō'dA^n*[55] *ne*[1]
Then them they name were given where thus our earth being of the kind the

OnA^nyōdaaga.[56]
Oneida.

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[1] *ne* a nominal particle.

[2] *o-lī'wa* (*e*-stem; incorporated form *-li'wa*) CUSTOM, BELIEF; *gali'wiyō* A GOOD CUSTOM; *oli'wagā'yu*[m] OLD CUSTOM. *-gāyu*[m] OLD; for instance, *ōlundagā'yu*[m] OLD TREE; *ada'slagā'yu*[m] OLD STICK.

[3] *-'lagwas* present, *-'lago''a* aorist, *-'la'gwA^n* perfect (*e*-stem) TO TAKE OFF, particularly TO HUNT PIGEONS. Indefinite person, aorist.

[4] *yagA^n* quotative particle.

[5] *-nagele* present, *na'glat* aorist, *-nagl$A^{n''}u$*[m] perfect, *-na'glagê* future (*e*-stem) TO LIVE. Indefinite person, present; here expressing a noun.

[6] *-saā't'a* present, *-sa'de* aorist, *-saa''du*[m] perfect (*e-stem*) TO TAKE ALL AWAY. One of the numerous class of verbs in *-t'a* present, *-'de* aorist, *-'du*[m], mostly causatives. The

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stem is probably *sa'* or *saa*. This verb takes here the incorporated nominal *-t* (*a*-stem) which makes the passive (so that all passives are *a*-verbs). Thus *u*^{m}*'tsa'de* is the aorist passive singular non-masculine; *ye-* THENCE, a demonstrative verbal prefix.

7 *ne'ok'* particle *ne* (see Note 1) and *ok'* BUT. Compare *wa'ze'du*^{m}, *ok' zahatga'to* IT WAS HIDDEN, BUT HE SAW IT AGAIN.

8 *-kstA*^{n}*'a* (*e-stem*) OLD. Like terms of relationship, the word is used in nominal forms only with possessives, here with the objective possessive. The third persons masculine and non-masculine do not seem to be used as nominal forms. *ago-* possessive indefinite person.

9 *o'-* a connective; *kale* SO.

10 *yekzā'*^{a} (*e*-stem) CHILD.

11 *-adle'('a)* (*a-stem*) TO BE A GRANDCHILD. *adle'zla!* GRANDCHILD! contains the suffix *-zla* expressing verbal nouns, particularly abstract nouns (infinitives). The stem *-dle* is preceded by the incorporated reflexive noun *-dad-* (*a*-stem). *u*^{m} non-masculine singular *a*-form; *-dad-* reflexive; *-a* stem-character of *-dle'a*.

12 *-A*^{n}*las* present, *-A*^{n}*le* aorist, *-A*^{n}*la'u*^{m} perfect (probably *ē*-stem) TO LEAVE; *wagA*^{n}*la's* SHE DESERTS ME; *-dad-* (*a*-stem) reflexive noun; *yon-* perfect, third person non-masculine plural; *za-* AGAIN.

13 *o-* connective (see Note 9); *nA*^{n} AFTER A WHILE.

14 Irregular verb TO SAY. See p. 453. Here indefinite aorist.

15 Irregular verb TO WALK. See p. 454. Here inclusive dual *i'dne*; *to-*, with following glide *y* before *i*, THITHER.

16 *šō ǰi* THUS WHEN, SO MUCH.

17 (*i*)*-za*^{e}*s* present, *-za* aorist, *-zu*^{m} perfect (*e*-stem) TO FINISH; incorporated noun, *o-'a'a* (*a*-stem) TRAIL, stem *-'a'*. This noun is incorporated without suffix; *-d* incorporated passive noun (*a*-stem) with following ', the *d* becomes *t*; *yo-* third person non-masculine singular.

18 Irregular verb TO WALK. See p. 454. Here *yagawē'nu*^{m} indefinite perfect; *nye-* TO A DEFINITE PLACE.

19 See Note 3. Here transitive: somebody — it (non-masculine).

20 Irregular verb TO WALK. See p. 454; *wa'gne* THEY TWO (non-masculine) WENT. The change from *w* to ' here is not explained; *nye-* TO A DEFINITE PLACE; *to-* THITHER.

21 *-ya'daze* (*e*-stem) TO BE PRETTY; from *-ya'da* (*e*-stem) BODY. Here indefinite person.

22 *-'ande'* present, *-'ande'* aorist, *-'andu*$^{m'}$ perfect (*e*-stem) TO GO AHEAD. Aorist indefinite.

23 *-dyēlA*^{n}*s* present, *-dyelA*$^{n'}$ aorist, *-dyelA*$^{n'}$*u*^{m} perfect (*a*-stem) TO BECOME AWARE. Aorist indefinite. Probably a passive form, with incorporated *-d-* (*a*-stem) expressing the passive.

24 *-dadi* present, *-dadye* aorist, *-dadye'u*^{m} perfect (*o*-stem), apparently never without incorporated noun, TO CARRY ALONG; *ga-lA*^{n}*na'* (*e*-stem) SONG, here as incorporated stem *-lA*^{n}*n*. Indefinite present.

25 Stem *-'sot* GRANDPARENT. These terms of relationship have curiously developed possessive forms which are neither quite nominal nor quite verbal. The forms for males are comparatively simple. When the term designates a male relative younger than the speaker, all the forms are expressed by the transitive pronouns I — HIM for MY, THOU — HIM

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for THY, etc. When the term designates a male relative older than the speaker, the forms for the first and second persons singular are HE — ME for MY, HE — THEE for THY. For the terms designating a female relative older than the speaker the possessive forms are used, except that in the third persons for *lao-*, *ao-*, *laona-*, *aona-*, etc. (see p. 443), *lō*, *ō-*, *lōna-*, *ōna-*, appear, and that the first person dual and plural designate the exclusive; the subjective verbal forms being used for the inclusive.

The element -*'a* is a suffix common to all terms of relationship, which, however, disappears in vocatives.

26 See Note 14. Indefinite person, present.

27 A particle.

28 *-tga'tos* present, *-tgato* aorist, *-tgatu*^{m} perfect (*a*-stem) TO SEE; *A*^{n}*zatga'to* THOU WILT SEE; *d-* HITHER (see No. 6, p. 451); *A*^{n}- future; *d-* duality, signifying TO LOOK WITH SOMEBODY.

29 *tō* THAT; *ni* HOW.

30 *-yadō'dA*^{n} present, *-yadō'dA*^{n}*ne* aorist, *-yadōdA*^{n}*'u*^{m} perfect; from *-yada* BODY (see Notes 21, 42) and *-dA*^{n} (*e*-stem) TO BE THAT WAY (see Note 52); TO SEEM, TO APPEAR; probably with *z-* AGAIN (see 4, p. 449). Indefinite.

31 (*n*)—*t'* (*o*-stem) IT IS THIS WAY. I have found the perfect (*n*) —*'ta'u*^{m}, and the future (*n*) — *tu'*^{m}*'age*, but no aorist. The perfect in *-a'u*^{m} seems to be more remote past than the perfect in *-u*^{m}; *-ne* is a usitative ending: *ǰi niyo'ta'u*^{m}*ne* AS IT HAD BEEN, *ǰi niyo'tu'*^{m}*ne* AS IT USED TO BE, *ǰi niyo'tgA*^{n}*s* AS IT USUALLY IS, *ǰi niyo'tgA*^{n}*ne* AS IT USUALLY HAS BEEN.

32 *ō'-nA*^{n}*ya'*^{e} (*e*-stem) STONE; stem in composition *-nA*^{n}*y*.

33 *-du*^{m}*s* present, *-du*^{m} aorist, *-du'*^{m}*'u*^{m} perfect (*a*-stem) TO BECOME. Indefinite, aorist.

34 *tō-* THAT (see Note 29); *nu*^{m} AT, AT THAT TIME, not used for local relations. *gA*^{n}*nu*^{m} AT THIS TIME, AT THIS PLACE; *nē nu*^{m} THAT TIME, PLACE; *ga*^{e} *nu*^{m} AT A CERTAIN PLACE.

35 *-'awī*^{e} present, *-'awī*^{e} future, *-*^{e}*a*, *-'au*^{m} perfect (*e*-stem) TO CARRY ALONG; non-masculine singular; *ni* THAT: the time carried (went) along thus.

36 *-tgA*^{n}*'ze* present, *-tgA*^{n}*se* aorist, *-tgA*^{n}*ze'u*^{m} perfect (*a*-stem) TO COME TO SEE; *sago-* HE — SOMEBODY; *dunda-* (see Nos. 5 and 6, pp. 450-451).

37 Incorporated form of *A*^{n}*skat* ONE, and *oyada* BODY.

38 From *dekdas* (*e*-stem with dual *de-*). (See No. 6, p. 451) *to* THERE.

39 *-'lagwas*, see Note 3; *d-* THERE, see No. 6, p. 451.

40 Irregular verb TO GO, see p. 454; here with *z-* AGAIN.

41 *gadi nē'* AGAIN THUS; *ne'gadi* IN THAT MANNER AGAIN; *gadizA*^{n} THEN ALSO; *gadiwī'*^{e} SO THEN; *gadi ǰi'* ACCORDINGLY.

42 *ī-gwas* present, *-'go* aorist, *-gwA*^{n} perfect (*e*-stem) TO PICK, GATHER; *o-ya'da* BODY; *sago-* HE — SOME ONE; *z-* AGAIN: HE IT BODY GATHERED AGAIN; i. e., he rescued it.

43 *wī'nē* THEREFORE; compare *gadiwī'*^{e} Note 41.

44 See Note 33. Indefinite perfect.

45 *o-* connective; *kōni*^{e} ALSO; *kōni*^{e}*z A*$^{n'}$ AND THAT ALSO (see Note 41).

46 *ya'-* negation, changes *l* of third person masculine to '; *-ne*^{e} PAST (?); *-yo* (*i*-stem) GOOD, BEAUTIFUL; *-sl* verbal noun, added to the incorporated stem *-dA*^{n}*lō* (*a*-stem) FRIEND.

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We find also the independent word *adA*^{n}*lō'zla* FRIENDSHIP; *lu*^{m}- (*'u*^{m} after *d*-) third person masculine plural; *d*- implies duality.

47 See Note 30. Inclusive plural.

48 *-saks* present, *-sā'ge* aorist, *-sāgu*^{m} perfect (*e*-stem) TO SEARCH; *-gwe*^{e} imperfect tense; *-sl* verbal noun, added to the incorporated stem *-nagele* TO LIVE (see Note 5); *nagla''sla* occurs independently as VILLAGE; *-d-* (incorporated *a*-stem) expresses the passive; *lu*^{m}- third person masculine plural.

49 *-du*^{m}*gō'-t'a* present, *-du*^{m}*gō''de* aorist, *-du*^{m}*go''du'*^{m} perfect TO PASS BY (see Note 6); third person masculine plural, aorist.

50 *-na*^{n}*y* (*e*-stem), see Note 32; *-de* (*o*-stem) TO STAND; *yo-* third person non-masculine singular.

51 *-nu*^{m}*de* present, *-nu*^{m}*dA*^{n}*ne* aorist, *-nu*^{m}*da*^{n}*'u*^{m} perfect (*a*-stem, always with objective pronouns) TO KNOW; third person masculine plural; *a-* subjunctive (No. 3, p. 449).

52 (*ni*)*-dA*^{n} present, (*ni*)*-du'*^{m}*'u*^{m} perfect (*o*-stem, always with objective pronouns) TO BE THAT WAY; *adlā'swa* FATE (*a*-stem). This noun is incorporated as in *wagadlaswī'yo* I HAVE GOOD LUCK (*-iyo* GOOD). The *w* of this noun is contracted with the *o*-stem of the verb into *-adlasō'dA*^{n}. Here third person masculine plural. *hona-* instead of *lona-* after *ni.*

53 *-lius* present, *-liu* aorist, perfect (*e*-stem) TO KILL, TO STRIKE; *-d* (*a*-stem) incorporated nominal reciprocal; *-sla* verbal noun; *-ge* postposition, ON.

54 *-wis* present, *-wi*^{e} aorist (irregular, partly *a*-stem) TO GIVE; *o-'sA*^{n}*na'* (*e*-stem) NAME, incorporated form *-sA*^{n}*n-*; *-d* (*a*-stem) passive; *wa-* non-masculine singular; *du*^{m} see No. 6, p. 451.

55 *u*^{m}*'wA*^{n}*'ja* (*o*-stem) EARTH; (*ni*)*-dA*^{n} (*o*-stem) TO BE THAT WAY (see Note 52); first person plural, objective pronoun.

56 Perhaps *onA*^{n}*ya* STONE; *-d* (*o*-stem) TO STAND; *-aga* PART OF, OF THE KIND OF.

TRANSLATION

It is said to be an old belief that people who went pigeon-hunting all went away except an old woman and a child. She and her grandchild were deserted. After a while the child said, "Let us go there!" (The trail was gone where the pigeon-hunters had passed.)

Then the two went. The girl went ahead. Then she noticed a person who sang while he was walking along. It is said, she said to her grandmother, "Don't look that way!" She noticed that the old woman was now good-looking. She appeared again as she used to be when she was young. Then she became a stone.

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As time went along, a man came to look for them from where they had been hunting pigeons. He came near to them and rescued the child.

Thus the old woman became a stone; and it is an old custom, when the people were not at peace, and when they searched for villages, then, it is said, they passed by the place where stands the stone that was an old woman, that they might know what their fate on the war-path would be.

For this reason our tribe was given the name "Oneida" ("those belonging to the stone").

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OUTLINES OF WINTUN GRAMMAR

BY

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THE Wintun Indians, of the grammar of whose language a sketch is given here, are one of the many groups of people speaking distinct languages, living within the area of the present state of California. Their habitat included almost the whole of the western half of the Sacramento valley, and a considerable portion of the region of the upper waters of the Trinity. Their language may be divided into three different dialects, a Northern, Central, and Southern, of which the first is that chosen for presentation here. These three dialects together constitute the Wintun linguistic stock, which is independent from all others, so far as known.

The phonetic system of the Wintun may be represented as follows:

	SURD	SONANT	FORTIS	SPIRANT	NASAL
Velar	*q*	–	–	–	–
Guttural	*k*	*g*	–	*x*	–
Palatal	–	–	–	*x°*	–
Alveolar	*t*	*d*	*t'*	–	*n*
Dental	*ts,tc*	–	–	*s,c*	–
Interdental	*θ*	–	–	–	–
Labial	*p*	*b*	–	–	*m*
Lateral	L	*l,r,ʟ*	–	–	–
		h,y,w			

Among the consonants, surds are more fully developed than sonants, and are more commonly used. The use of the surd

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lateral L is quite common, but the interdental surd *θ* is only occasional. The *r* is usually well trilled, as in several of the neighboring languages, as Shasta, Karok, Yurok, etc. Sometimes *d* and *r* seem almost interchangeable, and *r* in a few cases appears to be aspirated.

The vowels may be indicated thus:

E

i e è a o u

ī ē – ā â ō ū

The sound of *è* is intermediate between *ē* and *ä*. Diphthongs are frequent, those most in use being *oi*, *ai*, *ei*, *ie*, *au*, *eu*.

The great majority of words begin with a consonant. All consonants except *r* and *θ* occur thus initially, but there is a greater fondness for surds than sonants. The most frequently occurring initial sounds are *q*, *k*, *t*, *tc*, *s*, *ṗ*, *ʟ*. Vowels and semivowels are rare in anlaut, *o* and *i* being more used than any others. Diphthongs are very rare initially.

In final sounds, as in those beginning words, consonants are far more common than vowels. Sonants, except *l*, do not occur in auslaut, nor do *x* or *tc*. The most common terminal sounds are *q, t, s, m, l*. Vowels, although final less frequently than consonants, are yet more common than in anlaut, *a* and *i* being those most in use. Diphthongs are frequent as final sounds.

The most common form of stem appears to be that made up of consonant-vowel-consonant, although the combination vowel-consonant, and consonant-vowel-vowel (consonant-diphthong) are also used.

Combinations of two consonants never occur initially, and in but one or two cases finally. The following seem not to occur

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as the first member of consonant combinations, *x*, *x*·, *d*, *tc*, *ts*, *θ*, *c*, *b*, L, ʟ, and *q* is rare. As the second member of consonant pairs the following have not been found, *q*, *ts*, *o*, *n*, ʟ, *r*. No combinations of three consonants occur.

Vocalic harmony shows itself in the choice of connecting vowel between the adjectival stem and the usual adjectival suffix *-s*. After an *o* or *u* stem, this vowel is *o* or *u* respectively; after an *i* or *e* stem, and in a few cases with *u* stems, it is *e*.

Reduplication plays but a small part in word formation in Wintun. A few names of animals, one adjective of color and a few others show its use, but the total number of cases is small. For grammatical or formal purposes, reduplication is also of little importance. Some verbs have the stem duplicated or reduplicated to express iteration and cognate ideas, and adjectives sometimes are reduplicated to indicate the plurality of the accompanying noun.

Formal affixes in Wintun fall almost exclusively into the class of suffixes, the one or two prefixes which have been noted, being rare, and not certainly formal in character. So far as determined, these suffixes may be grouped as follows:

Pronominal suffixes:

-da 1st person.

-ska 2d person.

-m,*-k* 3d person.

Suffixes of pronominal stems:

-s 1st and 2d person singular objective.

-t 3d person singular objective and all persons dual and plural (variable vowel).

-tu 1st and 2d person singular possessive.

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-*n* 3d person singular possessive and all persons dual and plural (variable vowel).

-*l* Dual subjective (with vowel change).

-*te* Plural subjective.

Suffixes of nominal stems:

-*m* objective.

-*n* possessive.

-*in* instrumental.

Suffixes of verbal stems:

Temporal, modal.

-*ibi*, -*be* present.
-*liba*, -*libo* future.
-*wi*, -*wer* future.
-*ise*, -*isu* past.
-*kila* conditional.
-*ska* desiderative.
-*we* exhortative.
-*sin* durative.
-*mina* negative.
-*pura* reciprocal.
-*boha* past particle.
-*wu*, -*u* imperative.
-*na* reflexive.
-*ut* future participle.
-*hi* passive.
-*mala* similative.
-*sum* present participle.
-*heri* past participle.
-*weri* future participle.
-*s* forms nouns from verbal stems.
-*hura*, -*horu* to become.
-*wi* interrogative.

Suffixes of unknown meaning:

-*ma*
-*ta*
-*tca*
-*tcu*

Miscellaneous:

-*t* used with adjectives, where the noun is in the subjective case.
-*s* frequent adjectival suffix, indicating "having quality of."
-*in* adverbial, in adverbs of direction.

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It will be noted that there is a total lack of nominal locative suffixes, and verbal suffixes of motion and instrumentality, all of which are developed in varying degrees among the neighboring Pomo, Shastan, and Maidu stocks.

THE NOUN

The noun itself shows no modifications for number. Where it is accompanied by an adjective, this is sometimes reduplicated, where the noun is plural. Examples of this are given in speaking of the adjective further on.

The Wintun shows a development of syntactical cases comparable to that of the neighboring stocks. The adjoining Maidu to the eastward has a subjective case indicated by a suffixed *-m*. Wintun on the other hand, adopts the other alternative, and marks the objective instead of the subjective, but uses the same suffixed *-m* for the purpose. In some instances, this *-m* becomes *-um* or *-yum*, and in two instances, both inanimate nouns, the usual objective suffix is not used in the examples secured. The possessive is formed by a suffix *-n*, *-en*, sometimes *-men*.

A number of verbal nouns, and one or two others, present a phenomenon not as yet clear. These seem to have a regular subjective suffix, *-t*, which is replaced by *-m* for the objective, and *-n* for the possessive. In the case of the verbal nouns, such as *tul'tcuheris*, he who has been dug up; *kū'rūheris*, one who has been born; *win'is*, the seeing; *haras'*, the going, the subjective is apparently indicated by *-s*, although the forms with *-t* also occur. Further material will be necessary to define the real character of these suffixes. A few examples follow: *tul'-*

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tcuheris, *tul'tcuherit* (subj.), *tul'tcuherēm* (obj), *tul'tcuherēn* (poss.); *win'is*, *win'it*; *tin'is*, *tin'it*; *sed'et* (subj.), *sed'em* (obj.), *sed'en* (poss.), coyote. The use of the suffix *-t* is also seen in adjectives, where the noun they accompany is in the subjective.

A large number of Californian languages show the development of a considerable number of locative affixes. In this particular Wintun is not in agreement with its neighbors, for locatives do not exist, their place being taken by particles used as pre- or post-positions, which stand generally as independent words but may be enclitic. The comitative is expressed by the use of the first person dual, with the noun, as *tutu nēl wiraisida*, I came with my mother (lit. mother we two came). An instrumental suffix is, however, in use rather unexpectedly, for where locatives are not so expressed one does not look for any use of this method. The instrumental suffix is *-in*,[1] and its use may be illustrated thus:

sonin ʟiada, with a stone I hit her.
sukūyum tcipaisida tcūsin, dog I hit with stick.

THE PRONOUN

The personal pronoun has two forms, an independent and an affixed form, the two being entirely unlike. The independent pronoun is treated exactly as a noun, having like the latter a subjective, objective, and possessive form. Whereas, in the noun, there is no indication of number, the pronoun has varied forms

[1] Compare the Maidu instrumental suffix *-ni*. It is curious that there is this similarity here, and in the use of the same suffix *-m*, in Wintun to indicate the objective, in Maidu the subjective.

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for singular, dual, and plural. These various forms of the personal pronoun are as follows:

		Subjective	Objective	Possessive	
Sing.	1	*ni*	*nis*	*neto (min)*	*netis*
"	2	*mi*	*mis*	*matu (min)*	*matis*
"	3	[*pi*]	[*put*]	[*putun (min)*]	[*putis*]
Dual.	1 excl.	*nēl*	*nēlit*	*nēlin (min)*	*nēlinis*
"	1 incl.	*palel*	*pēlit*	*pēlin (min)*	*pēlinis*
"	2	*mēl*	*malit*	*malin (min)*	*malinis*
"	3	[*pēl*]	[*pulit*]	[*pulin (min)*]	[*pulinis*]
Plur.	1 excl.	*nīte*	*nēlēt*	*nēlēn (min)*	*nēlētis*
"	1 incl.	*?*	*pēlēt*	*pēlēn (min)*	*pēlēnis*
"	2	*mīte*	*malēt*	*malēn (min)*	*malēnis*
"	3	[*pīte*]	[*pulēt*]	[*pulēn (min)*]	[*pulēnis*]

Several points may be noted in regard to the forms here given. It is clear that the dual and plural forms are made regularly from the singular stems *n-*, *m-*, and *p-*. This regularity of formation is also found in several other Californian languages, as in Maidu, Washo, Yokuts, etc. In the subjective, the dual is formed by a vowel change, together with the addition of a suffix *l*, the plural by the suffix *-te*. In the objective and possessive, the differentiation by means of a vowel change holds for both dual and plural, which are themselves differentiated by a similar change of *i* to *ē* in the suffix. Further, in the formation of the objective, a different method is followed in the first and second persons singular than elsewhere, a feature found equally in the Maidu. The nominal objective suffix *-m* is not used at all. Similarly in the possessive, the first and second persons singular do not take the nominal possessive *-n*, as do the other forms. The second column under possessive is the predicative form, mine, yours, his, etc. It will be seen that here there is throughout a regular use of the suffix *-is*, which is probably the same as the *-s* of the first and second persons singular objective; sing-

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ular, dual, and plural are however in other respects not formed regularly. Strictly speaking, there is no third person in the personal pronoun, the forms given in brackets being in reality demonstrative. The various forms are however so regular, and the demonstrative is used so consistently as equivalent to the third person, that it has been included here for convenience. This regularity both of form and usage of the demonstrative is very similar to the practice in Maidu.

The personal pronouns have an intensive and reflexive form. The former is made by suffixing *-hiuni*, as: *ni-hiuni*, I myself; *mi-hiuni*, you yourself, you only. The latter by *-'a*, or *-ya*, as: *ni'a*, *ni-ya*, myself; *nēl'a*, ourselves.

The second or affixed form of the personal pronoun differs, as has been said, entirely from the independent. It is invariably suffixed to the verb, following the tense and modal suffixes, and never occurs independently. It is also invariable as regards number and case. These suffixes are as follows: first person *-da*, second person *-sken*, third person *-m*, *-k*. This form of the personal pronoun shows in its use some similarity to the secondary form of the personal pronoun in Maidu. There, as here, this form seems to be unrelated to the independent pronoun, but in Maidu it may stand independently apart from the verbal stem. In Maidu also, it is varied for number, but like this Wintun form, does not take the case endings of the regular independent pronoun.

Only two demonstratives have been found, *eu* this, and *pi* that. The demonstrative is treated as a noun, just as the personal pronoun, and the various forms of *pi* have been given in the previous paradigm. For *eu*, no complete series of forms has been

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found, but the objective occurs as *ēwet* in such a sentence as *ēwet yuptcu*, shoot this one.

The interrogative pronouns are derived from two stems, *he-* and *pe-*, and, in part at least, have regular case forms for subjective, objective, and possessive, and also instrumental.

heket, who.
hekem, whom.
heketun, heketmen, whose.
pe, what.
pehin, with what.
heke, where.
hestaba, henoni, why.
hesen, henoktin, when.
hisam, how far, many.

THE VERB

The Wintun verb is simple compared to that of several California languages, in that it has but two classes of affixes, personal pronominal suffixes, and modal-temporal suffixes. In the conjugation of the verb, both the independent and the suffixed forms of the personal pronoun are as a rule, used together, but the former may in some cases be omitted, where the meaning is perfectly clear without it. The pronominal suffixes have already been given. They are added to the temporal or modal suffixes following the verbal stem, except in the case of the negative, where the pronominal suffixes are added to the negative particle *eleu* instead of to the verb itself.

Temporal suffixes are, so far as known, four in number, *-ibi*, *-be* indicating incompleted action, present; *-liba*, *-libo* indicating indefinite future; *-wira*, *-wir*, *-wi* indicating immediate

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future; and *-ise*, *-isu* indicating completed action, past. These temporal suffixes are added directly to the verbal stem. Modal suffixes include a negative, conditional, desiderative, continuative, imperative, exhortative, and various participial forms. The following paradigm will illustrate the uses of these various suffixes:

	Present	Future	Past	
	SINGULAR			
1.	*ni tcunaibida*	*ni tconlibada*	*ni tcunawira*	*ni tcunaisida*
2.	*mi tcunabesken*	*mi tconlibosken*	*mi tcunawerisken*	*mi tcunaisusken*
3.	*pi tcunabem*	*pi tcunalibom*	*pi tcunawirabem*	*pi tcunaisuk*
	DUAL			
1.	*nēl tcunaibida*	*nēl tconlibada*	*nēl tcunawira*	*nēl tcunaisida*
2.	*mēl tcunabesken*	*mēl tconlibosken*	*mēl tcunawerisken*	*mēl tcunaisusken*
3.	*pēl tcunabem*	*pēl tcunalibom*	*pēl tcunawirabem*	*pēl tcunaisuk*
	PLURAL			
1.	*nīte tcunaibida*	*nīte tconlibada*	*nīte tcunawira*	*nīte tcunaisida*
2.	*mīte tcunabesken*	*mīte tconlibosken*	*mīte tcunawerisken*	*mīte tcunaisusken*
3.	*pīte tcunabem*	*pīte tcunalibom*	*pīte tcunawirabem*	*pīte tcunaisuk*

eleuibida tconmina, I am not dancing.

ni hara-kila, if I go.

ni hara-ska-da, I want to go.

ni tcuna-biya-ibi-da, I continue dancing.

net xīna-sin, while I was asleep.

ponort-u, run! *tca-wu*, sing!

ponort-e, let us run; *tca-we*, let us sing; *ba-we*, let us eat.

ba-buha, after having eaten.

ba-mala-ibi-da, I make believe eat.

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kū'rū-heri-s, one who has been born.
harā'-weri-s, the going away (future).
tīn'is, word, that which is spoken.
kū'te-horu-ma, become small
birā'ibe-wi, is he hungry.

While the above paradigm illustrates what seems to be the usual practice, the following variations may be noted: In the first person, the temporal suffix of the present tense is often omitted, as *ni tcuna-da*. The order here shown, of subject-verb, is sometimes reversed, so that we have: *timada ni*, I am cold; *timabesken mi*, you are cold, etc. Furthermore, in the sub-dialect spoken on the upper Sacramento river, the personal pronouns of the dual and plural are often placed immediately following the verbal stem, the temporal suffix with the affixed form of the pronoun, following, as: *bira-nel-ibi-da*, we two are hungry; *tima-pel-isu-k*, they two were cold; *bira-nite-ibi-da*, we are hungry. Here also there is a different form of the second person dual, which is *lēl* instead of *mēl*, and we thus have: *tima-besken lēl* or *tima-lēl-be-sken*, ye two are cold. This method of treating the pronominal element is technically incorporation, but the essential separateness of the pronoun in spite of its position between the verbal stem and temporal suffix is shown by the tendency in speaking to make practically two words of such a form, as *bira nēl-ibi-da*, *tima lēl-be-sken*.

The transitive verb differs from the intransitive only in the use of the independent objective pronoun, or a noun in the objective case, as: *ni mis wini-da*, I thee see; *malēt wini-da*, ye all I see; *mi nis wina-be-sken*, you me see; *piya mis wina-bem*, he thee sees. The usual order is subject-object-verb, but subject-

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verb-object, and verb-subject-object sometimes occur. In the Sacramento sub-dialect the incorporative tendency is again shown by forms like: *wini-mis-isi-da*, see thee did I. The use of the reflexive reciprocal, and passive is shown in the following examples: *pi-hiuni tcona-bem*, himself he kicks; *raktsu-na-da ni'a*, I hit myself; *nēl tcon-pura-ibi-da*, we two kick each other; *yuptca-da*, I shoot; *yuptcu-hi-da*, I am shot.

THE ADJECTIVE

The adjective usually precedes the noun, although in some cases it certainly follows. The adjective may take the regular temporal suffixes of the verb, as: *kelas tcus*, long stick; *kela-be eu tcus*, this stick is long. Adjectives are varied for number in two ways. Reduplication appears to be the most common, as: *yi*L*mas, yi*L*yi*L*mas*, heavy; *hosopas, hosophosopas*, light. Adjectives are varied further, for case, taking the regular objective *-m* used with nouns, the adjective agreeing thus with its noun, as: *kiē'mila su'kūyum bohē'mum* Lo'*marken*, the old man dog large killed; *olēl' yā'paitu ketēm' yap'aitūm wèqu'na*, above-person one person hated. In a number of cases, adjectives accompanying nouns in the subjective case take a suffixed *-t*, as *kū'tet tè'dit pom'ila wat'sa*, small red ground-baby cried; *tcalit' win'tū pū'iken harā'*, good men towards the east go; *ketet' yā'paitu harā'wiraibe*, one person will go.

LOCATIVE PARTICLES

Locative ideas are expressed in Wintun by a series of particles, which generally precede the noun and which are, as a

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rule, independent. In some cases however they are used as postpositions, and then become enclitic. For the most part they are monosyllabic, and the few polysyllabic forms are evidently compound. The following are the forms already noted:

ol, up
ken, down
el, in, into
pat, out
tup, away
xan, away from
xun, together
yel, backwards
panti, on, upon
kenti, under
qaiwe, across
lamera, around
waiti, through

Sometimes the locative particle is repeated again after the verb, and in some cases two particles may be used together. The following examples will illustrate the use of these forms:

sukū el qēwen biya, the dog in the house is
neto taki basmali panti biya, my hat table on is
ol ponortu, run up
pat ponortu, run out
son mem-ken biya el, stone water-under is in (stone is in river)

THE NUMERAL

The numeral system of the Wintun is quinary up to twenty, above which the method alternates between decimal and vigesimal, 30, 50, 70, and 90 being respectively three-tens, five-tens, etc., whereas 40, 60, and 80 are two-persons, three-persons, four-persons, respectively. The full series of numerals has been given and discussed elsewhere.[1]

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1 *American Anthropologist*, N. S. IX, p. 675.

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The following short example of a text will serve to illustrate a part of the features discussed above:

THE FLOOD

Pom *yel'hura*[1] *tsa'rawa*[2] *bohā'*[3] *wai.* *qè'wel*
world becoming spoiled Coyote lived north. house

win'tūn *qè'wel*[4] *bohā'.* *ketet'*[5] *tsa'rawa* *pi*[6] *ketet'*
Indian house lived. one Coyote that on

èl'eu[7] *he'ken*[8] *win'tū* *suk'mina.*[9] *tsa'rawa* *tawanā'*
not anywhere's people were-not. Coyote lonely

watsā'[10] *pū'rus* *watsā'.* *mut'ut*[11] *tsa'rawa* *ĕl'eu*
cried. heart cried. The hearing Coyote not

heken' *win'tū* *sū'ki.*[12] *pi* *ketet'* *bō'ha.* *mut'ĕ*[13]
anywhere's people were. That one lived. He heard

ki'yem[14] *ki'yem* *tīn.* *sed'et*[15] *el'eu* *kiyem'* *tīn.*
wisely wisely speaking. Coyote not wisely speaking.

eu'win[16] *bi'ya*[17] *yai* *tsa'rawa* *kiyēm'* *tīn.* *tsa'rawa*
Here was spine Coyote wisely speaking. Coyote

tin *"He'nuni*[18] *pom* *hi'ma*[19] *ib'ewi* *ūni."*[20] *"Pom*
said "Why world tomorrow is it thus." "World

mem *tsuhā'wira* *ūni.*[21] *wai'da*[22] *mem* *hinā'* *ūni* *qol'tcin*[23]
water will rise thus. In the north water comes thus sky's

nor'el *pū'ta.* *mem* *wai'ken*[24] *harā'* *kelēl'*[25] *harā'.*
south-in boils up. Water to the north goes far goes.

qol'tci *pom'in*[26] *ʟū'tci* *harā'.* *mem* *pūta'."* *sed'et*
Sky downward ? goes. Water boils up." Coyote

el'eu *tip'na* *eu'win* *tip'na* *yai* *sed'en*[27] *yai'taptsus.*
not knew here, knew spine Coyote's guardian.

yai'taptsus *tīn.* *"El'euwibes'ken*[28] *pĕ*[29] *tip'nomina.*
Guardian spoke "Did you not anything know-not.

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yāp'paitū ēl'in[30] *kū'daibĕ ūni*[31] *qol'tsa*[32] *ol*[33] *kūlūn'*[34]
A person everywhere goes thus sky up edge's

pan'ti[35] *kū'dawira'ibe.*"[36]
upon will go."

NOTES

1 *yel'hura*, apparently from *yel*, a particle meaning backward, in the opposite direction, and a suffix variously appearing as *-hura*, *-horu*, *-huru*, meaning to become, to grow, as *ku'tehoruma*, it became small. Thus here "becoming reversed, turned the wrong way, spoiled."

2 *tsa'rawa*, coyote. The usual term is *sed'et*, which appears below.

3 *bohā'*, apparently a di-syllabic stem, meaning to live in, occupy.

4 *win'tunqè'wel*, Indian-house. The usual method of forming a compound noun, by simple juxtaposition.

5 *ketet'*, one. With adjectives and numeral adjectives, where the noun which it accompanies is in the subjective case, this suffix *-t* is usually employed. Where the noun is in the objective, the adjective agrees, as *olel' ya'paitu ketem' yapai'tum wequn'a*, above-person one people hated.

6 *pi* the regular demonstrative.

7 *el'eu* the negative particle. In the negative conjugation it takes the pronominal suffix instead of the verbal stem.

8 *he'ken*, apparently the possessive form from *heke*, where, so that *heken win'tu* might be translated "anywhere's people", those belonging to any place.

9 *suk'mina*, are not. Apparently from a verbal stem *suk-*, to be, exist, with the regular negative suffix *-mina*. It is identical with the suffix of the past tense for the third person, but apparently has no connection directly with it, as we find a future and future conditional form, *suk'libom* it shall be; *suk'ikila*, if there shall be.

10 *watsa'*, cried. Probably separable into a stem *wa-* with the suffix *-tca, -tsa*, widely used in forming verbs, but as yet of uncertain meaning. Other examples of its use are seen in *wuk'tca*, nod; *puL'tca*, blow; *tep'tca*, be born, created.

11 *mut'ut*, the hearing. From the stem *mut-*, *mute-*, to hear. The suffix *-t*, referred to in note 5, seems to be used with verbal stems to form nominal forms, expressing the action of the verb.

12 *su'ki*, was.

13 *mut'e*, he heard. The suffix *-bem* is omitted.

14 *ki'yem*, wisely, cunningly. Probably closely connected with *kies'*, old; *kie'mila*, old man. The duplication seems to be to give the idea of iteration, repeated speaking.

15 *sed'et*, coyote. This is the usual term, although *tsa'rawa* is occasionally employed. The final *-t* here is an instance of the apparent use, with some nouns, of this *-t* as a subjective suffix. See note 5.

16 *eu'win*, here. From *eu*, the demonstrative pronoun, "this," and the adverbial suffix *-in*, other examples of which are seen in *pom'in* downward, from *pom* earth; *xin'in* forward; *tca'nin* sideways.

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17 *bi'ya*, was. A somewhat perplexing form, used apparently as equivalent to *suk-* (see note 9), meaning to be, exist. As the latter seems related to the suffix of the past tense, so this would seem to be connected with that of the present, *ibi, ibe*.

18 *hen'uni*, why. Formed from the same stem *he-* as the other interrogatives.

19 *hima*, tomorrow. Probably for *hi'na* to come, arrive. *Hin'aibewi* is the third person singular interrogative, "comes it, does it arrive."

20 *u'ni*, thus, so. The usage and meaning of this is still uncertain. In some cases it is clear, as *u'ni tīn poqai'la*, thus spoke the old woman; *ket'et yā'paitu u'ni tīn*, one person thus spoke.

21 *tsuha'wira*, will rise. The suffix *-wira* indicates the immediate future.

22 *wai'da*, north or in the north. The suffix *-da* seems to be used here with a general locative meaning. It has not been found with nouns, but occurs in such forms as *len'da*, long ago; *hân'da*, very long ago.

23 *qol'tcin*, sky's. The possessive suffix *-n* makes the literal meaning here "sky's south in" i. e. in the south part of the sky.

24 *wai'ken*, down north. "Down" here in the sense of toward.

25 *kelel'*, far. Apparently from *kel*, the stem seen also in *kel'as*, long, and the particle *el*, in.

26 *pom'in*, downward. See note 16.

27 *sed'en*, coyote's. The possessive form. See note 15.

28 *el'euwibesken*, did you not. The pronominal suffix added to the negative, *el'eu* instead of to the verbal stem, which takes the suffix of negation, *-mina*. The suffix *-wi* is apparently the interrogative.

29 *pe*, what, i. e. in the sense of "anything."

30 *ēl'in*, everywhere, far and wide. Probably from the particle *el*, in, and the adverbial suffix *in*.

31 *ku'daibe*, goes, travels.

32 *qol'tsa*, sky. A variant from the same stem, *qol*, as *qol'tci*.

33 *ol*, up. Compare *olel*, above (*ol-el*, up-in); *olel'as*, high.

34 *kulun'*, edge's. From *kulu'* edge.

35 *pan'ti*, upon. From the particle *pan*, on. Cf. *ken-ti*, under; *wai-ti*, through.

36 *ku'dawira'ibe*, will go.

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A NEW SIOUAN DIALECT

BY

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THE great Siouan linguistic stock has been recognized from the earliest period of ethnological investigation in North America, and indeed its existence was known to French missionaries before the beginning of the eighteenth century, but until comparatively recent times it was supposed to be confined to a section of country lying for the most part westward of the Mississippi and embracing the Dakota (including the Assiniboin), Crow, Hidatsa, Mandan, Omaha, Ponca, Kansa, Osage, Quapaw, Iowa, Oto, and Missouri tribes, and, somewhat more easterly, the Winnebago. In 1881, however, the late Dr Gatschet astonished American ethnologists by demonstrating that the Catawba of South Carolina belonged to this stock also, and in 1883 Horatio Hale showed that the Tutelo, anciently on the headwaters of the Dan, were also Siouan. As a result of their labors and those of Mr Mooney it was subsequently shown that a large number of tribes in the same section were of Siouan connection, though there are some whose position is still in doubt, owing to the early and rapid extinction of the Indians in that area. In 1886 Gatschet, during an examination of the Indian tribes of Louisiana, made a further surprising discovery to the effect that a dialect of the same group was spoken by the Biloxi, the first tribe to greet Iberville on his expedition of 1699, which

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resulted in the founding of Louisiana, and that which gave its name to Louisiana's first capitals, old and new Biloxi. This had been the only Siouan tribe discovered in Louisiana or Mississippi until November of last year, when the writer had the good fortune to find and make partial record of still another, a dialect spoken by a tribe of Indians formerly living on the lower Yazoo, and so small in the very earliest times of which we have any record, that the survival of the language in any form whatever is little short of marvelous.

The first mention of this tribe, so far as the writer is aware, is in Iberville's journal of his first expedition to Louisiana, in 1699. In that year he himself did not go higher up the Mississippi than the mouth of Red river, but he interviewed a Taënsa Indian whom he met in the Houma village, regarding the tribes beyond, and was told that "on the river of the Chicachas" (i. e., the Yazoo) were "seven villages, which are the Tonicas, Ouispe, Opocoulas, Taposa, Chaquesauma, Outapa, Thysia." [1] The first three of these are the only ones located on the lower Yazoo; the others, except the Thysia, the position of which is uncertain, being a considerable distance higher up, in the neighborhood of the Chickasaw. The Tunica language has been known to us since Gatschet recorded it in 1885-86, and we are here concerned only with the "Ouispe" and "Opocoulas." Pénicaut, in chronicling Le Sueur's ascent of the Mississippi in 1700, says, "Ascending this river four leagues one finds on the right the villages where six nations of savages live called the Yasoux, the Offogoulas, the Tonicas, the Coroas, the Ouitoupas and the Oussipés." [2] Later in the same year the Jesuit Gravier visited the lower Yazoo

[1] Margry, *Découvertes*, IV, p. 180.
[2] Ibid., V, p. 401.

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tribes in order to see Davion, who had established himself as missionary among the Tunica, and was reported to be dangerously ill. He says, "There are three different languages in his mission, the Jakou (i. e., Yazoo) of 30 cabins, the Ounspik of 10 or 12 cabins, and the Toumika (Tunica) who are in seven hamlets, and who comprise in all 50 or 60 small cabins." [1] In December, 1721, Father Charlevoix learned of "a village of Yasous mixed with Curoas and Ofogoulas, which may have been at most two hundred men fit to bear arms." [2] La Harpe entered the Yazoo, January 26, 1722, and describes the situation of the nearer tribes thus: "The river of the Yasous runs from its mouth north-northeast to Fort St. Peter, then north-a-quarter-northwest half a league, and turning back by the north until it is east-a-quarter-northeast another half league, as far as the low stone bluffs on which are situated settlements of the Yasons, Courois, Offogoula and Onspée nations; their cabins are dispersed by cantons, the greater part situated on artificial mounds between the valleys, which leads one to suppose that anciently these nations were numerous. Now they are reduced to about two hundred and fifty persons." [3] Father Poisson, ascending to the Quapaw in 1727, mentions "three villages in which three different languages are spoken," [4] but professes no further knowledge regarding them. Du Pratz, in his general survey of Louisiana tribes founded on information obtained between the years 1718 and 1794, assigns about a hundred cabins to the Yazoo, about forty to the Koroa, and about sixty to the "Oufé Ogoulas, or the Nation

[1] Shea, *Early Voyages on the Mississippi*, p. 133. Also *Jesuit Relations*, Thwaites ed., LXV, p. 129.
[2] French, *Hist. Coll. La.*, part 3, pp. 138-139, 1851.
[3] La Harpe, *Établissement des Français à la Louisiane*, pp. 310-311, 1831.
[4] *Jesuit Relations*, Thwaites ed., LXVII, p. 317.

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of the Dog,"[1] which would appear to be a very considerable overestimate.

In 1729, on the outbreak of the Natchez war, the Yazoo and Koroa slew their missionary, and destroyed the French post which had been established among them. "The Offogoulas," says Charlevoix, "were then on a hunt; on their return they were strongly urged to enter the plot; but they steadily refused, and withdrew to the Tonicas, whom they knew to be of all the Indians the most inviolably attached to the French."[2] The earlier association which we know to have existed between these two tribes may also be assigned as a probable cause of their association with them at that period. During the subsequent hostilities this tribe continued as firm friends and efficient allies of the French. De Kerlérec in 1758 reported that "for some years Indian families of the *Offogoula* nation, the remains of a fairly numerous nation which the *Chikachas* have not ceased to persecute, have established themselves [at Natchez]; they are housed under the cannon of the fort, and in war expeditions they join our troops in order to pursue our enemies."[3] The number of their warriors was at that time reduced to fifteen. In 1784 according to Hutchins, they had a small village of about a dozen warriors on the west bank of the Mississippi, eight miles above Point Coupée; but it is evident that Baudry des Lozières is only recalling earlier conditions when at about the same period he places them in their old situation along with the Koroa and Yazoo.[4]

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[1] Du Pratz, *Histoire de la Louisiane*, II, pp. 225-226, 1758.

[2] Shea, *Charlevoix's History of New France*, VI, p. 86, 1872.

[3] *Report of the Fifteenth Session of the International Congress of Americanists*, I, p. 74.

[4] *Voyage à la Louisiane*, p. 251, 1802.

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Hutchins's notice appears to be the last record of this tribe in print, and when one considers that they then numbered only "about a dozen warriors," and that a hundred and twenty-five years have elapsed since the time when he wrote, any likelihood of discovering a survivor would appear to be of the slenderest.

During his visit to the remnant of Tunica Indians living near Marksville, La., in May, 1907, the writer inquired carefully for the tribes known to have been associated with them at various periods of their history, and especially for the Ofogoula, but without success. Finally, rather as a matter of completeness than with the slightest expectation of any practical results, he inquired for the tribe mentioned but four times in early narratives in the places already cited, as Ouispe, Oussipés, Ounspik, and Onspés. To his surprise the Tunica chief answered, "U'shpi, yes. There used to be numbers of them around here about forty years ago, but they are all gone." To the further inquiry whether he could recall any words of the language, he at first replied in the negative, but afterward remembered one, *fesk*ʌ*tca'ki*, which he stated was the word for "opossum."

On the strength of this information the writer at once came to two conclusions, first, that U'shpi was the Tunica term for the Ofogoula, and, second, that the language spoken by them was a dialect of Muskhogean. His first determination was founded on the early disappearance of the term U'shpi from print, the ignorance of his informant regarding any tribe known as Ofogoula, and the closer and later association of the Tunica with that tribe than with any other not otherwise accounted for. His second conclusion was based, first, on Du Pratz's statement that the true name of the tribe was "Oufé Ogoulas" and that it signi-

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fied "Dog people" in Mobilian, as in fact the form that he gives does, from Du Pratz's further statement that the language of these people lacked an *r*, from which Du Pratz himself assumed that it was affiliated with Chickasaw, and from the presence of an initial *f* in the word given him by his Tunica informant, *f* being absent or uncommon in any non-Muskhogean languages of the lower Mississippi hitherto discovered, and unknown as an initial sound in any of them.

In November of the year just past, the writer was again in Marksville for the purpose of correcting and amplifying the Tunica linguistic material collected by Dr Gatschet more than twenty years ago. On his first visit to the village he found the Tunica chief in the company of another old Indian, neither of whom could speak English; and, as the writer is not possessed of a conversational knowledge of French, an Indian woman named Rosa Pierrette was called in from a neighboring house as interpreter. In the course of the conversation which followed, this woman stated that the Tunica are forgetting their language, because the young people all learn French or English, and there are few older ones to converse together. Incidentally she remarked that she and her husband did not use it, because, though both are Indian, their languages differ. On being questioned as to the name of her language, she answered, with a little hesitation, "Ofo." Immediately afterward, however, her husband, who had accompanied her, said, "Osage." Although the writer did not remember to have heard of any Osage so far south as middle Louisiana, he accepted this latter statement as probably correct, but having a few minutes' leisure, obtained several words from her which she gave readily. These showed that the lan-

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guage was indeed Siouan; but the presence of an *f* was puzzling. Nevertheless, this circumstance was accepted as an individual peculiarity in speech, and the writer proceeded to make his arrangements for studying Tunica. A day or two later, however, when going over tribal names with the old chief, "U′shpi" was encountered, and the latter remarked that the woman who had acted as interpreter a day or two before was of that tribe. His suspicions being now reawakened, the writer waited until his Tunica work was completed, and interviewed her once more. He then learned that all of her people had died, or rather had killed each other off, when she was seventeen years old, but that she had tried to remember as much of their language as she could and had often, she said, spent some time studying out how they used to call various objects. She added that her grandmother had always said that the proper name of their tribe was Ofo, which is of course the same as Ofogoula with the omission of the Mobilian ending *-ogoula* (or *-okla*) meaning "people." That these were the Indians called in Tunica *U′shpi* is shown both by the testimony of the living Tunica themselves, and by the fact that the term as it occurs in early records is always applied to a tribe on Yazoo river, and never, so far as appears, to any other. It is true that three of the four references to U′shpi enumerate the Ofogoula also as if the two were distinct tribes; but the three writers who do this are precisely those who had the most superficial knowledge of the Yazoo river tribes, while the fourth had the best facilities for knowing whereof he spoke. Thus the first reference is from Iberville on the authority of a Taensa Indian whose home was some distance from the river in question, and who may have been misunderstood. The second

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is in an enumeration by Pénicaut, himself none too accurate an authority, whose expedition merely stopped at the Yazoo villages in passing. The third is by La Harpe, whose visit extended over nine or ten days. During that time, however, he set out and turned back once, while his entire stay was evidently a busy one. The fourth reference, in which their name appears under the distorted form Onspik, is by Gravier, whose special object, as stated above, was to see the missionary Davion, then reported to be dangerously ill; and it is plain that most of what he learned of the Tunica came through that prelate. Now Davion, as appears from the same report, was devoting all of his time to the study of Tunica, Tunica being the language spoken by the largest number of people there. It is quite natural therefore that he should have learned the Tunica name for this tribe, and have communicated it to Gravier. Finally, we have the evidence of the language which is totally different from Osage, and seems to approach Biloxi and the languages of the eastern Siouan tribes nearer than any others, nearer even than the tongue of the not distant Quapaw.

The use of the term *Ofo* by my informant, and the fact that nearly all early writers except Du Pratz refer to this tribe as the Ofogoula or Offogoula, lead the writer to think that Du Pratz has made a mistake, although a natural and a pardonable one, in calling them Oufé Ogoula and interpreting the name "Nation of the Dog." *Ufe* or *Ofe* is the Choctaw and Mobilian word for "dog," and it would be easy and natural to assume that the *e* of *Ofe* has been absorbed by the initial *o* of *-ogoula* or *-okla.* But if *Ofo* was the name recognized within the tribe, it was almost certainly of native origin, and drawn neither from Choc-

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taw nor Mobilian. Pending further information I shall therefore refer to this tribe as the Ofo and reject *-ogula* as a foreign addition.

Following are the first ten numerals and a few other specimens of the new dialect:

English	Ofo	English	Ofo
1	nû′fha	boy	astî′kî
2	nū′p-ha	baby	añk-hō′shka
3	tā′ni	father	at-hi′
4	tō′pa	mother	oni′
5	kifa^{n}′	sister	it-ho^{n}′fka
6	akApê′	water	ani′
7	fA′kumî	fire	ape′ti
8	pA′tAnî	tree, stick	itco^{n}′ or itca^{n}′
9	kî′shtAshga	earth	ā′ma^{n}
10	îftAptA^{n}′	dog	atc-hû′ñki
I	mi^{n}′ti	deer	ī′ya
you	tci^{n}′ti	bird	deska′ or teska′
we	o^{n}′ti	fish	xo
a person	a′ñkwa	head	ap-ha′
man	ito′	mouth	î′hi
woman	iya^{n}′	to kill	kte

The first person singular is formed by prefixing b-, ba-, or bi-; the second person singular, by prefixing tc-, tca-, or tci-, or sometimes sh- which is regularly used in the imperative; the third person singular seems to take no prefix; the first person dual takes o^{n}- as in Dakota, and, as in Dakota, there are no other persons of the dual represented; the plural persons are formed by prefixing o^{n}- and tc- or tca- in the first two persons and suffixing -tu in all. A curious divergence from all other Siouan dialects is to be found in the presence of an *f* which often seems to replace Biloxi or Tutelo *s*. *Tc* also appears to replace *y*.

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While very little connected material could be obtained, a fairly large vocabulary was recorded, which shows that, excepting the features just noted, the dialect conforms in all essentials to what we are accustomed to find in Siouan dialects elsewhere.

Before the discovery chronicled in this paper, the writer had often asked himself why a Muskhogean tribe, such as the Ofo appeared to be, should have chosen to separate itself from other branches of that family and associate with non-Muskhogean peoples — the Yazoo, Koroa, and Tunica. The mystery has now been cleared up. At the same time this discovery does not cast suspicion on the affiliations of any other bodies of Indians, since it is practically certain that the Yazoo and Koroa were altogether different, and probably connected with Tunica. On the upper Yazoo were two small tribes whose speech is not known with certainty, but they were always closely associated with the Chickasaw and Chakchiuma, from which it may be assumed with greater probability that they were Muskhogean tribes as well.

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PRIMITIVE INDUSTRIES AS A NORMAL COLLEGE COURSE

BY

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IT is only in recent years that any opportunity for a systematic study of anthropology has been provided in America. Thanks to the initiative of Professor Frederic Ward Putnam, Harvard University was one of the first institutions to provide for instruction in this subject. In 1890 there was organized the Department of American Archæology and Ethnology, and the influence of the anthropological work of that department has been far reaching.

Latterly, interest in anthropology has been awakened among teachers in high schools, and recently an experiment was made, by one whose work in this line for many years was inspired and guided by Professor Putnam, in introducing a certain phase of anthropological study in a normal college course.

As the demand for this branch of anthropological science in such an educational institution was new, and as the experience was a rather novel one, an outline of the work and its results may be of interest. In the fall of 1906 I was invited to give a lecture course on the evolution of industries before the normal class in the Department of Domestic Art at Pratt Institute. The course was first given in the school-year of 1906-07, and repeated in 1907-08.

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Some pedagogues have seized upon the idea that the life of the individual is a repetition of the life of the race, and have endeavored to apply this theory in their educational methods. They believe that in its earlier years the child should be not only allowed, but encouraged, to practise the arts of primitive men, in order that it may have that actual development which they hold the race has had, and thus later be prepared to take up training in the arts of modern times on a level with the highest development of the race. For this reason it has been urged that those who are to teach children should have a knowledge of the facts regarding the arts of primitive men.

The desire has been for the presentation of primitive industries in chronological order, and possibly in accordance with the cultural scheme that has been used by a large number of teachers, and which represents man as first living in trees; later in caves, when he practised the arts of fire-making, raft-building, and the like; still later in tents, where he lived as a nomad tending flocks and herds; then as an agriculturist; and finally as a city factory-hand.

To treat the subject of primitive industries chronologically, however, seemed to be impossible at the present stage of knowledge, as the history of but few industries is known for more than a very short period, as the origin of many of the most important is obscure, and as there is no certainty which of the industries have been practised the longest.

To follow the cultural scheme above mentioned seemed undesirable, because, while it appears logical, it is probably false. It is surely untrue that all branches of mankind have passed through all these stages, or in the sequence given. It certainly

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seems highly improbable that all have at one time lived in a forest country where they could be tree-dwellers, or again in a country of caves where they could be cave-dwellers. It seems equally improbable that they all should have passed from the forest country to a country suitable for herding and nomadic life, and again from the prairies and regions suitable for nomadic herders to the sort of agricultural country where tillage could have its beginning; while if they remained in the same area, a knowledge of irrigation would be the prerequisite of profitable agriculture. In fact, the whole scheme seems to be based upon altogether too few anthropological facts, or upon data selected at the expense of other facts, if not distorted to fit the scheme.

Consequently, in our present state of knowledge regarding the chief industries which have been practised by man, it seemed best to group the data for the course by material, economic pursuits, and industrial activities. The subjects were presented in thirty lectures, of which twenty-three were illustrated with museum specimens and occasional demonstrations, while six were reviews with stereopticon pictures. They included the discussion of work in stone, metal, clay (including chiefly the ceramic art), shell, bone, ivory, antler, horn, claws, quills, bristles, beaks, skin, and wood; the securing of food by hunting, fishing, berrying, gathering roots, and similar industries depending upon the utilization of natural products, agriculture and zoöculture; fire-making, house-building, clothing, basketry, spinning, weaving, textiles, transportation, and art.

The adoption of this schedule furnished an arbitrary means of classification for which nothing more was claimed than convenience in giving to the students facts which they could use in

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teaching children, and which in the aggregate, it was hoped, might further their own ideas of the road which each of our industries has traveled. It seemed that, even though it is impossible to discuss the whole history of any single industry, a knowledge of a portion of its development, taken with similar knowledge regarding a number of other industries, would show that the present industrial life is a heritage for which man has struggled since the earliest prehistoric times.

It seemed practicable to discuss the varieties of each class of material which have been used by man, the ways in which they have been manipulated, the tools used in working them, the things made of them, the periods when they were first used by man in various parts of the world, the portions of the world where they have not been used, the materials used as substitutes for others, the position which work in each kind of material holds in our industries to-day, and, so far as possible, the chronological progress of the use of each.

It seemed less practicable to attempt to discuss exhaustively all the industries of any particular period or stage of human development grouped according to materials, such as stone, metal, shell, bone, wood, skin, etc., or to attempt to compare the industries of any one time or stage — like, for instance, the paleolithic period — with the corresponding industries of a later or earlier time or stage.

By following the method of presentation outlined above, many difficulties were avoided. It did not become necessary to establish a sequence of the development of industries, which, as stated before, can hardly be established. In this arrangement of the material, the question was not emphasized whether stone was

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used at an earlier time than shell, or whether wood was used before stone. It was not necessary to state whether fire was first made by friction or by percussion; whether the picking of wild seeds led to agriculture; whether herding and nomadic life preceded agriculture, or vice versa; whether the invention of spinning preceded or followed simple weaving; and whether baskets were made before or after the invention of cloth.

In treating stone-work, the different kinds of stone and the nature of each were first discussed, some attention being paid to indicating which were the more commonly used, and to the source of supply — whether from pebbles or bed-rock. Methods of quarrying and the tools used in quarrying were also described. Following this, the origin of the use of stone was touched upon in a theoretic way. The need of a hard material for tools and objects of defence, as well as the natural inclination to throw missiles in self-defence (which might lead to the picking up of stones, the most likely objects at hand), suggested themselves as among the causes which may have given rise to the use of stone in some places or phases. The readiness of modern man, in the absence of proper tools, to use pebbles for such work as cracking nuts, driving stakes, readjusting wagon-tires, and repairing fences, was mentioned.

Under processes and tools used in fashioning stone, attention was called to the fact that these depend, to a certain extent, upon the material and the resultant forms desired. The processes of fracturing, chipping, flaking, battering, grinding and polishing, rubbing grooves and breaking, incising with picks and knives, scraping and drilling, were illustrated by demonstrations which proved of particular interest to the class, impressing,

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as they did, the ease and rapidity with which the work could be done. The distribution over the world of each kind and method of working stone was mentioned.

Objects made of stone, and the kind of stone chosen for each, as well as the life history from the raw material to the finished product of a number of stone objects, were next taken under consideration. The making of a few stone implements was also demonstrated. The distribution of each object, as well as its use, was discussed. After this, a demonstration of the use of a few stone tools was given. The use of the stone drill and of the celt particularly impressed the class, on account of the unexpected efficiency of the primitive tools, which are capable of rapid and accurate execution.

A brief review of the sequence or chronology of various stone ages was given, and some attention paid to examples of primitive stone-work which exist to-day in remote parts of the world and in the centers of our highest civilization. Attention was called to the fact that stone tools used in ordinary everyday life are readily modified, — new and more efficient materials of manufacture being introduced and more serviceable forms being adopted, either owing to an inner development or to the adoption of foreign types, — while ceremonial stone objects are clung to more tenaciously, and are inclined to survive even a remarkable advance in civilization and culture. The same observation was made in regard to other materials.

The subject of work in metal was treated along somewhat similar lines. The kinds of metal used by primitive men — such as copper, gold, silver, bronze, and iron — were mentioned, together with their accessibility and their properties. The rel-

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ative abundance of different metals, and the qualities which caused primitive men to discover them and which made each available for use by means of processes understood by him, were discussed. The origin of the use of metal, processes used in securing, preparing, and working it into artifacts (such as mining, pounding, smelting, casting, and inlaying), were taken up in order. Brief consideration was given to the tools used in metal-work, the construction of bellows, blowpipes, and the like, as well as to objects made of each kind of metal, the life history of several kinds of metal objects, and the portion of the world where such objects have been made. The distribution over the world of each kind of metal-work was discussed. The chronology of metal-work was given but brief attention; but the lack of sharp limitations between the stone, bronze, and iron ages, was mentioned, as well as the fact that there has been no bronze age in North America, where copper was treated as stone rather than as a metal. Considerable attention was given to Navaho and Haida silver-work.

Work in clay was considered only with reference to pottery and brick making, especially the former. The quarrying and preparation of clay for pottery-making was taken up. Some attention was given to the fact that white, black, red, and other colors were due to the variety of clay mixture used. A discussion of the early discovery of tempering material (such as stone, shell, or broken pottery) followed. Theoretic suggestions as to how pottery may have originated were given, together with certain examples. The various methods of making pottery — with the hands, with paddles, with molds, by coiling, and with the wheel — of various degrees of excellence, were described and

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illustrated, with specimens of the finished product. The life history of a single pottery dish was demonstrated by means of photographs. The decoration of pottery was then discussed, beginning with illustrations of the impressions of the fingers, paddles, and uneffaced coils, — all due to the method of manufacture, — and continuing to the imitation of natural forms, such as gourds, shells, frogs, and the human form or face. The incising, painting, and adding of modeled forms to pottery was also included. Attention was called to the fact that the signs or traces of manufacture mentioned above, such as finger-marks, paddle impressions, and coils, may have been imitated for decorative purposes. Various sorts of things made of pottery were shown, including such objects as whistles and whistling-jars, tools, spindle-whorls, and pipes.

The modern application of primitive methods of manufacture and decoration, as well as the fact that the Chinese, whom many of our people consider primitive, long ago developed an unsurpassed porcelain industry, was emphasized. The influence of one culture upon another, as shown by pottery, was brought out; also the fact that ceramic industry, even in regions where it is developed to a high degree, is sometimes blotted out by the introduction of such objects as the cheap, crude tin can. The general diffusion of pottery and its absence from certain regions, as well as the fact that stone or wooden receptacles, and dishes made of hide or other animal tissues, are in some regions used in place of it, was mentioned, with an attempt to bring out fully the effect of physical environment, tradition, and contact with other cultures.

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In discussing work in shell, the various kinds of shells which primitive people have used for important purposes, or in great numbers, or in many parts of the world, were mentioned. The probability that shells were used at a very early time, and the fact that the lack of evidence of that use is probably accounted for by their perishable nature, came in for a share of the discussion, as well as the recent use of shells over practically the whole world. It was pointed out that in certain parts of the world where no stone occurs — notably on the coral islands — shells were used in place of it. Nor was the fact neglected that the people of such places, never having passed through the stone age or stage of culture, exemplify the complexity and irregularity of human development in opposition to any set schematic theory of evolution.

The structure and character of shells and the fact that certain shell material resembles some kinds of stone, together with the fact that shell has been worked by some of the same methods employed in making stone objects, — namely, by chipping, pecking, grinding, rubbing, grooving and breaking, incising, and drilling, — were discussed.

Utensils and other objects made of shell were illustrated by specimens, including such objects as paint-cups, spoons, wampum, beads, money, fish-hooks, and window-panes; while reference was made to its use for tempering pottery and inlaying. The distribution of the different kinds of shell objects and the methods of working shell throughout the world were briefly mentioned.

Considerable attention was given to the use and importance of shell as money in various parts of the world. Mention was

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made of such matters as the shipment of immense quantities of shell money by civilized nations for trade with African natives, and of its use among primitive people for the redemption of forfeited lives, the ransom of slaves, and the purchase of wives or advancement in social position. The parallelism between some of these customs among primitive peoples, and customs fundamentally and vitally the same, still surviving in our great world-centers of culture, was noted.

While it was not possible to devote more than an hour and part of one review illustrated with lantern-slides, to the discussion of work in bone, antler, horn, teeth, and similar animal materials, it was still possible to suggest the variety of these materials and the extent to which they have been used, as well as to indicate the portions of the world in which objects of each type have been made from them and used by primitive people. The methods of working these materials, and the method of manufacture and manner of use of certain objects made from them, were illustrated by demonstrations and specimens. Here was an opportunity to show that man made objects of bone, ivory, and antler at a very early period, and to call attention to the engraved and sculptured specimens of these materials that were made with crude chipped implements, before man learned to polish stone, and even before he learned to make pottery, as is shown by the finds from western European caves.

The character of bone, ivory, and other animal materials, was commented upon. It was shown that while some of them, like bone and antler, resist decay for a long period under certain conditions, others, like whalebone and horn, are subject to the attacks of insects; so that objects made of them in early times

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have long since disappeared. In this way, evidence as to the chronology of work in these materials has been lost. It was noted that in tropical and temperate regions a comparatively small variety of objects, and not a great number of any one kind, is made of bone and similar material; while in the arctic countries, where wood is scarce, such material is extensively and skilfully used. This was chosen as an example of the effect of environment upon material culture among a primitive people whose commerce and means of transportation do not make them independent of their immediate surroundings. It was possible also to show, when discussing the use of the elk-tooth, which is prized by the savage notwithstanding its lack of usefulness, how people of our own civilization develop and cling to an object, not on account of its practical value, but because of its associations. This instance was given as an example of the power of influences other than reason or physical environment, that determine the development of material culture.

In discussing work in skin, attention was called to the vast number of quadrupeds, birds, and fish, whose skins have been used by primitive peoples; and notice was taken of the fact that the intestines of some animals have been used for certain purposes in the past as well as in the present, while sinew and allied material have served extensively for thread. Some of the animals whose skins have been used were mentioned; among them the musk-ox, buffalo, elk, reindeer, deer, antelope, goat, sheep, dog, fox, elephant, and fishes of various kinds. The fact was emphasized that skins of more than a hundred and forty different kinds of animals were used by American Indian women alone.

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The processes, in various stages of completion, of removing and preparing the skins, were discussed and illustrated, so far as possible, with the actual tools and products. Thus the students acquired some idea of how skins were removed, scraped free from clinging fat and flesh, pared down to an even thickness throughout, and softened as well as cured and cleaned; also how, for some purposes, the hair and fur were scraped off. Reference was made to the oiling of the skin with brains, or other material so that it would not be damaged by water, and to the manner in which it was frequently colored.

Attention was called to the fact that modern tanning is simply a more complicated plan of carrying out primitive processes with better tools and materials. Some of the objects made by primitive peoples from skin were mentioned, such as covers for tents and boat-frames, sacks, sandals, moccasins, leggings, robes, blankets, drumheads, and armor. The modern counterparts of primitive skin objects — such as caps, coats, satchels, and book-covers — were mentioned. What perhaps appealed to the students most of all was that the primitive skin-worker was in a way the forerunner of our butchers, tanners, furriers, dyers, milliners, tailors, bookbinders, and upholsterers.

The tendency of environment to affect material culture was exemplified by the skin-work of the Eskimo and Plains Indians, both of whom live where plants suitable for weaving are scarce, and who have developed skin-work to a high degree at the expense of weaving.

In discussing wood-work, attention was called to the probability that wood was used by mankind at a very early period; although evidence, in the shape of ancient objects made of wood,

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is not extant, because of the perishable character of the material. In some regions, certain kinds of wood are so extensively used that they almost determine the whole technique of that area, and even of some of the surrounding country. For instance, the employment of bamboo by the modern natives of Japan and eastern Asia may be said to characterize their material culture. The same is true of the palm of the Philippine islands and the red cedar on the northwest coast of America.

The different kinds of wood employed by primitive peoples were illustrated by specimens. Processes used in fashioning wood were shown: such as splitting; burning, as in the felling of trees, hollowing out of canoes, and both ancient and modern pyrography; bending, as in the making of primitive snowshoes and modern furniture; beating to separate the wood along the lines of annual growth, as among the Ojibwa basket-makers; sawing, as was sometimes, though seldom, practised by primitive people; lashing pieces of wood together, as we use glue and nails; sewing, as in the fastening of the bottoms of boxes on the northwest coast of America; and also carving for ornamental effects. The use of wooden pegs in advance of nails was mentioned, and the planing or scraping of wood with chipped implements, as it is done to-day with steel tools, was demonstrated. Sandstone and shark-fins used by primitive people, as we use sandpaper, were shown, together with wood worked by means of these tools. Attention was called to the fact that, among certain primitive peoples, holes were made by twisting out the heart of sticks as for pipe-stems, and also by burning, as is done by our carriage-builders to-day. Drilling in wood with a chipped stone drill was illustrated by actual work.

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Attention was called to the fact that wood has been engraved from time immemorial, and that the engraved lines were sometimes filled in with color or with lime, also with an inlay such as bone, shell, wood, and metal. Wedges made of wood and antler, axes, adzes, knives, and drills made of stone, were exhibited. In this manner, the processes and the tools used in working wood were discussed.

Fire-making was illustrated with specimens of apparatus and by actually making fire by two of the principal methods; namely, with the bow-drill and with flint and steel. This presentation brought out the following points: that mankind has known how to make fire from very early times; that the time of its invention and the inventor are unknown; and that it is also unknown which method was first employed. Some of the methods no doubt were developed from others; but the making of fire by percussion, by friction, with the fire-syringe, and by some other methods, must have originated independently. In fact, it is within the realm of probability that some of the same methods of producing fire may have been invented independently in different parts of the world.

Specimens were used to illustrate and demonstrate the old Eskimo method of making fire by striking two pieces of iron pyrites together, as well as its modern equivalent, characterized by the substitution of recently imported steel for one of the stones. The production of fire by striking the outer surface of bamboo with the broken edge of a fragment of pottery was also mentioned. Attention was called to the facts that people in various parts of the world have produced fire by striking together two pieces of flint, or by striking a piece of flint with

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iron or steel; and that quite recently in our own country our forefathers made fire by this method. Indeed, a novelty cigar-lighter based on this principle is sold to-day.

The Samoan plow, the bamboo saw, the method of pulling a bit of rattan back and forth under a piece of bamboo held down by the feet, the palm-drill, bow-drill, and pump-drill, — were all demonstrated.

Fire was actually made by the bow-drill method, and this demonstration proved to be, perhaps, the most impressive in the course. Attention was called to the details of technique which, although unimportant from a theoretical standpoint, must be carefully mastered in order to produce fire by these methods.

Attention was called to the more modern methods of making fire by chemical combinations, with lenses and mirrors, with innumerable kinds of matches, and, most modern of all, by means of electricity.

Three periods were devoted to the subject of food, passing on from the methods employed in securing it to its final consumption. In the first period were taken up what it seemed justifiable to term the most primitive methods of securing food; that is, hunting, fishing, gathering of wild berries, seeds, bark, roots, and other gifts of nature, without any effort towards replenishing the natural supply. In the second period were discussed those methods by which, for the food taken, a new supply is provided, as by agriculture, breeding, establishment of hatcheries, and similar ways of leaving the world-supply of food so as to equal if not exceed the natural production.

From the mountain-tops to the sea-bottom the earth has been searched for food, and the quest to-day is pursued as anxiously

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as ever. Many cases of sickness, and even deaths, must have resulted from the innumerable experiments made by mankind for the purpose of determining what things were serviceable for food.

Attention was called to the great variety of foods that have been used, and to the fact that there is no exclusively meat-eating or plant-eating tribe, for even the Eskimo consumes some berries, although his environment furnishes hardly any vegetable substances. The kinds of food vary with changing seasons because of the control of environment. The distribution of game and edible plants largely influenced the range of man. Our debt to the red race for maple-sugar was mentioned. Besides calling attention to animal and plant foods, mention was made of minerals, such as salt and clay, as well as of narcotics and intoxicants, which seem to have been known to many primitive peoples.

The tools used by primitive men for hunting and fishing — such as bows, arrows, spears, blow-guns, traps, hooks, lines, and nets — were enumerated, and in most cases illustrated by means of specimens. Attention was called to the fact that some people captured animals with the naked hands. In such acts they resemble the apes, and are not far removed from such animals as wolves and foxes, which seize their food with their jaws. Brief mention was made of the employment of various animals — such as dogs, elephants, and falcons — for hunting and fishing, and the use of decoys, as well as methods of stalking.

Attention was called to the fact that, as buffalo-hunting developed extensively along the Missouri, the tribes became less agricultural. This was referred to as an example of the effect of new environment and of the acquisition of a new domestic

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animal, the horse; and used to illustrate the varying course of human culture, which in this case led an agricultural tribe to become a tribe of hunters, thus showing that the course from a hunting stage to an agricultural stage is not by any means applicable everywhere. Another instance of this is the fact that the Koryak, who were originally a sedentary people on the sea-coast, afterwards became reindeer-breeding nomads.

The inadequacy of vegetable foods in certain regions and at certain periods, and its effect on man's choice of food and the selection of a home, as well as the diversity of animal foods, were mentioned. The strong control of environment over the choice of food was contrasted with its less firm control over other phases of life where tradition or custom often exert a stronger determinant force on the lives of people.

In discussing agriculture, it was again pointed out that there is no stage in human history where an exclusively vegetable diet existed. Various methods of practising agriculture, with the tools used in each, from the simple digging-stick to the most intricate combination of harvesting and threshing machines of the present day, were briefly mentioned. Attention was paid to the practice of irrigation by the precolumbian Indians of America, whose skill in this line surpassed that of our own people until very recent times. The work of irrigation in other portions of the world and its benefits and abuses also found brief mention. The intensive farming of the Japanese and some other peoples was contrasted with that of certain portions of the United States. In passing, it was pleasing to note the debt of the white race to the Indians for two agricultural products, corn and tobacco, now so extensively cultivated by our own people.

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In discussing breeding, the whole subject of domestication was taken up. The fact that for many years mankind had not domesticated any new animals of importance, suggests that much of the work of domestication was accomplished in primitive times. A number of domesticated animals were enumerated, and also some which are still in a semi-domesticated state, such as the coyote, which is tolerated in the environs of certain Indian villages, as well as those animals which do not seem to be completely under the domain of man, but return to a wild state very easily, such as the turkey. A distinction was made between those animals which are really domesticated and those which are only kept in confinement.

Attention was directed to the great change in the economic conditions of the Great Plains of North America. In early times the pursuit of the vast herds of buffalo was so regulated, that we may recognize in it the first attempt at controlling the increase and availability of the food-supply. At present we find large herds of domesticated cattle in those districts where the buffalo has become practically extinct. It was also mentioned that here the care of herds of cattle more nearly approaches hunting than in most other parts of the country.

It was suggested that tolerance and friendship for animals may possibly have led to their domestication, as the harvesting of wild products probably led to agriculture.

Milk as an important article of diet, was discussed, and the people using milk were enumerated.

The fact that any domesticated animal or cultivated plant which is found to be useful is rapidly taken up by the people inhabiting contiguous areas, illustrates well the view-point that

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physical environment is not the only cause to be reckoned with in considering the development of culture, but that the effects of contact with neighboring cultures are also of great importance.

Various methods for the preparation and preservation of food — including such processes as beating, crushing, and grinding in making flour and meal from such products as corn, grain, acorns, and sweet-potatoes — were discussed; and specimens of the objects used in these processes, including mortars and pestles, were shown. The drying and smoking of meats, and their protection from the air by sealing with tallow, received some attention; while the Eskimo custom of storing food in a frozen state was mentioned, as were also methods of converting milk products into cheese, butter, and various fermented drinks.

The storage of food by man was likened to the hoarding of nuts by squirrels, the storing-away of honey by bees, and similar animal activities. Different kinds of caches, storehouses, and granaries, were illustrated by means of stereopticon views.

The cooking of food as a labor-saving device for the digestive organs, which results in economy of food, received some attention. It was also noted that tribes that cook their food are perhaps more energetic than those who eat most of their food in a raw state. The various methods of cooking, such as roasting, boiling, and baking, were mentioned. The fact that man cooks his food was specified as one of the great points of difference between him and the other animals.

The various dishes and utensils used in serving food were briefly described, together with methods of preparing food for serving, materials used for seasoning, and the mats, which are

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represented in our own times by tablecloths and napkins, many of the objects being illustrated with museum specimens. It was shown that many foods which are distasteful to one tribe are considered luxuries by another, and that the method of preparation or the condition of food which is considered a luxury by civilized man may be thought filthy or even injurious by primitive man, and vice versa. Primitive people have contributed many kinds of dishes to the bill of fare of civilization; in fact, nearly all of our food-preparations of to-day are the outcome of experiments on the part of primitive man.

In discussing shelter, attention was called to the fact that even some of the lower animals, such as ants, bees, birds, and apes, build homes. From the earliest times, man seems to have tried to build some kind of shelter for himself, although there are tribes now living whose only protection against the wind is a few branches, and others who seek refuge in a hole dug in the ground.

Materials mentioned among those used by primitive peoples for house-building included snow, earth, brick, and stone among the minerals; leaves, bark, and wood from the vegetable world; and skins, bones, and tusks among animal materials. The places where each material is made use of received some attention. It was noted that the physical environment exercises control over architecture; for instance, in arctic regions, where wood is scarce, snow, ice, earth, stone, bones, and skins are used. In northern forest countries, the bark of birch and elm is placed over frames made of poles, or mats woven of rushes are spread over frames made of saplings; while in the buffalo plains, buffalo-skins are used for house-covers. In tropical countries, leaves and wood

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are extensively employed. Where perishable material is used, the houses are usually simpler than in regions where such lasting substances as stone and brick are used. Architectural refinement and ornament seem to develop where the use of durable materials coincides with a climate which does not require a struggle for warmth and food, or against heat.

It was pointed out that houses are dome-shaped, conical, cubical, and of similar form, varying with the available material and the climate. The dome-shape sustains well the weight of heavy snow, and is extensively used in cold countries. The cone-shape is better adapted to regions of rain and light melting snow, both of which must be shed; while the flat roofs are frequent in desert or arid regions.

Social environment was shown to affect the selection of materials and the shape of the house to such an extent that in some places the result is not appropriate, and, indeed, is not at all in accord with the physical environment. Some attention was given to social organization as shown by habitations, which are in many instances simply for a single family, while in others they are constructed for the use of a whole community.

The study of houses illustrated that the final adoption and general use of an invention seem to depend more on the historical relations of a people than upon an independent evolution of the invention. The house of the Navaho is perhaps a good example of this; for these people have preserved, in a country where flat-topped pueblos seem to be the more natural and common form of construction, a type of architecture shared with more northern tribes. Tradition has effected the survival of their archaic style, and they have not evolved any vitally new

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feature since taking up their abode in the arid Southwest. The general type of house used by the Navaho may be found from Siberia to Arizona, throughout a region where houses of various other types might equally well have evolved, — a fact explained by the supposition that many of the peoples throughout this area have derived this type of structure from a common source.

On taking up clothing as a sort of personal shelter, it was suggested that clothing possibly originated in cold countries, because of a need for protection against the climate; while the painting of the body perhaps came to be practised in torrid regions for protection from the effects of sunshine and against insects. Yet in most places the origin of clothing is obscure, and may have developed quite as much from a taste for decoration as from a desire for physical comfort. It has certainly not developed from the feeling of modesty.

It was pointed out that the materials used for clothing are determined somewhat by the climate. Animal materials, such as fur and wool, are used in greater proportion in cold countries; plant products, in temperate regions; and paint and tattooing, in tropical regions, where these applications for decorative purposes can be readily seen, since the body does not require protective garments. A great range of materials was enumerated, including skins of beasts, birds, reptiles, and fish; hair, wool, silk, leaves, bark, and a variety of plant fibers and roots; gold, silver, and asbestos.

In some cases the clothing is made of materials held together by their own natural texture, as in the case of skin and bark. In other instances it is woven, as in the example of strips

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of skin, wool, silk, cotton, and the like. Woven fabrics become more and more common as one passes from an arctic region towards a tropical region.

The tools used in making clothing were illustrated with specimens; and the various parts of the costume — such as headdress, shirts, skirts, trousers, moccasins, and muffs — were also shown.

Different tribes use different kinds of clothing, not only because of their material environment, but because of the traditional customs of their people and of neighboring tribes. It was pointed out that special clothing is used for certain ranks of people as well as for special occasions, such as ceremonials.

In discussing basketry, attention was called to the fact that the textile used was usually a coarse material woven or sewed into the form of the object desired, and that it differs from cloth in that the latter is usually woven from softer and more flexible material into large pieces which are often intended to be cut to form a finished object. Moreover, basketry is usually made by hand, while cloth is mostly made with the aid of a loom, either simple or complex.

Samples of materials used in making basketry, such as cedar-bark, spruce-roots, willow, palm, and bamboo, were shown. Attention was called to the fact that all primitive basket-makers are experts in the knowledge of the vegetable materials which may be used, the season of the year when each should be harvested, and how it should be prepared and preserved.

The technique of basket-making was illustrated by means of models as well as by specimens, both finished and in process of manufacture; and the types of technique were illustrated by

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a few samples of the different kinds of woven baskets, such as the wicker, twill, and twine, and by specimens of sewed or coiled basketry. Reference was made to methods of beautifying these baskets, as by the shaping of the product, by the combination of different weaves or stitches, by the introduction of materials of different colors, by painting, and by the insertion or addition of materials, as in the case of imbrication, the attachment of beads, and the insertion of feathers.

Specimens were shown to illustrate some of the many uses to which basketry is put; as, for instance, mats, caps, coffins, drums, traps, fences, foot-wear, balls, and fans. As in the case of many other industries of primitive people, the uses as well as the materials, the technique, and the decorations of baskets, differ according to physical and social environment.

The textile arts were discussed under the three headings of spinning, looms, and fabrics. It was pointed out that many of the materials used in weaving are first spun or twisted together. Ropes and cords are also made by twisting, and braiding was considered as akin to spinning. It was pointed out that caterpillars draw out fibers, and spiders make webs.

The various materials used in spinning were illustrated by specimens. The method of preparation, including coloring, of some of the material, together with the utensils used, which naturally vary with the materials, was presented, and the different sorts of spindles used in spinning were illustrated by specimens. There are two methods of spinning, — one hand-twisting with the fingers, and the other twisting by means of a spindle.

It was pointed out that in our own day, thread, cord, rope, and even wire cables and insulation, are twisted by means of

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machinery which is really an exceedingly complicated and highly developed set of spindles. It was shown that the products of spinning are made beautiful, to a certain extent, by dyeing the material and by various degrees of twisting.

Attention was called to the fact that ancient types of cords have been preserved in charred remains of textiles, or in other ways. They may also be studied from their impressions on pottery. We may learn of ancient methods of spinning by studying paintings, sculptures, or other representations of ancient people in the act of spinning.

With reference to weaving, it was pointed out that, while the simplest weaving may be executed with the fingers without the aid of a loom, most types of weaving, even many done by primitive people, are made on a frame which holds the strands in place while the weaving is done with the fingers or with a shuttle, and, in the more highly developed of even primitive looms, with the aid of heddles, battens, and other appliances. Specimens of several different looms and loom-parts were shown. Attention was called to the fact that the simplest weaving is not a difficult art, and must have been done in very early times. Some materials are woven without being spun, but the art of weaving was perhaps invented after that of spinning. Some of the materials which are not spun for weaving produce fabrics which rival in excellence the best work with spun material.

Specimens of all the simple weaves of cloth were exhibited, and seen to parallel most of the more common types of woven basketry. There are also weaves peculiar to textiles. It was shown that textile weaving exhibits a marvelous variety of technique. The methods of beautifying cloth were illustrated by

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specimens which showed how the work was accomplished by such means as varying the spacing and tension of warp and woof, changing the weave, the number of strands crossed, and the distance a strand runs, and by introducing strands of different colors. Specimens were shown which illustrated the great variety of geometric designs, as well as figures of plant and animal forms, that are produced. Some of these, from the tombs of ancient Egypt and Peru and from such primitive peoples as the Indians of the Great Lakes region, rival or surpass in both technique and beauty (whether lent by weave, design, or color combination) the best work of our own mills.

The highest types of our present-day looms were seen, by comparison with the primitive looms, to be exactly like them in plan, only more complex in detail; so that, as far as the fundamentals of this invention are concerned, our civilization has added nothing to the work of ancient and primitive peoples in this respect.

In discussing transportation, attention was called to several aids to both land and water transportation, such as beacons, bridges, roads, and canals. Some of the means of transportation for passengers and freight by water and land were mentioned, and attention was called to the various kinds of motive power employed, — those furnished by man, animals, wind, water, gravity, steam, electricity, and gas. The various means of applying this power from the front and rear, together with vehicles providing their own motive power, then with motive power adjacent to the vehicle, and that in which it was carried along, — were all illustrated by stereopticon views.

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Attention was called to the fact that certain forms of primitive transportation still exist in our higher centers of civilization, as, for instance, the carrying of babies and bundles; while in remote regions they are exemplified by the use of the pack-train, where the amount of transportation and the difficulty of the road would not warrant the effort and expense of installing a more improved system. Considerable discussion was given to the reasons for the persistence of some of these methods and for the introduction of others. Transportation was also referred to as a means of making peoples of various parts of the world acquainted, and thereby developing an interchange of material goods and human sympathies.

In discussing art, mention was first made of the materials and arts in which the esthetic sense is expressed, such as stone, earth, metal, wood, and bark; architecture, basketry, and textiles. The ways of expressing it were mentioned, such as incising, carving, inlaying, modeling, painting, tattooing, and stitching. Consideration was given to some of the forms that may have suggested certain types of artistic production, as, for instance, the forms of man, beasts, shells, and plants; the markings of various natural objects, such as nodes on bamboo, spots on shells, and the mottling on leaves; the traces of manufacture, as the coils on pottery, or the impressions of cord, cord-wrapped paddles, and of the finger-tips. Certain forms of technique, as, for instance, checker and twill weaves, were shown to control certain lines, and in some cases to have given rise to an innumerable number of geometric patterns. It is impossible to weave a finely curved design in coarse checker basketry, while squares are easily made. In such work a curve has to be represented

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by an angular figure. Only in very fine fabrics is the mesh so small that the angular outline is no longer noticeable.

Considerable attention was given to different types of art. In representative art the intent is to represent certain objects. This art may or may not be decorative, and includes realistic, conventional, and pictographic art. Sometimes these forms may be geometric. Decorative art, on the other hand, may be rhythmic, geometric, conventional, realistic, or even pictographic or representative. Realistic art may or may not be geometric, and it may be conventionalized until it is not recognized as anything more than geometric; while geometric designs may suggest certain realistic objects, and come to be modified into more or less realistic forms. Geometric art may or may not be conventional, and sometimes certain patterns have a conventional meaning read into them. One tribe may borrow patterns from another and use them as decorative patterns without symbolic or conventional interpretations; or they may borrow symbolism and meaning with the pattern, or, as before mentioned, read meaning into them of an entirely different character from that applied by the tribe in which they originated.

Specimens were shown to illustrate the fact that a series of objects may be selected and arranged to suggest that realistic art, by means of conventionalism, has given rise to geometric art, or vice versa. When such specimens are selected entirely from one place and period of time, it is difficult, if not impossible, to determine which style of art gave rise to the other. Apparently both processes of art development have taken place; and to determine in any particular selected series which phase of art ex-

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pression led to the other would require a careful determination of the chronology of the specimens in the series.

Realistic and other figures are sometimes distorted to fit the field, somewhat as the map of the world is, when drawn on a flat surface. For similar reasons, realistic forms are dissected and reassembled on a field in another order. One or more of the characteristic features of an animal or other form are often used in a natural or exaggerated way to symbolize the form.

Attention was called to the fact that some tribes decorate nearly all their objects, although they have practically nothing which is not made for use, and also to the fact that sometimes artistic forms are made for the sake of art. Sometimes such objects, after being slightly changed, are made to serve a useful end.

It was shown that an object may be made so that its very form is artistic, or again its art treatment may be an adjunct to a useful form which in itself would not be artistic. Sometimes the shape of a useful object is noticed to resemble the form of something quite different from it. This meaning is then read into it, and by a few slight changes which in no way affect its usefulness, the utensil is made to represent this object, and becomes an art form. It was also pointed out that what is considered artistic or beautiful by one people may not be so considered by another.

On taking up each subject, references were supplied to some of the literature, to museum specimens, to living authorities, and to the places where natives and artisans could be seen engaged in the work. These were referred to from time to time throughout the work on the subject.

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The reviews, illustrated with stereopticon pictures, were held at nearly regular intervals during the course. These were followed by series of questions which covered the same ground, and by the preparation of papers in which either questions had to be answered, or the entire subject covered by the review had to be discussed at length. Pictures were used in the reviews, because this method was thought to be useful in reaching such students as are not impressed by an oral presentation as thoroughly as by visual instruction.

While, as has been pointed out, it was not deemed desirable to illustrate in the course the recapitulation theory, rather interesting results were achieved in other directions. Many of the students stated that the work had increased their respect, not only for artisans in various lines of work, but especially for the skill of primitive peoples. In other words, they came to a realization that our industries depend upon no inconsiderable amount of effort and thought on the part of countless people throughout untold ages.

Individuals of the white race, and perhaps this is especially true of the Americans, seem prone to view the industries and customs of other peoples as curious. They are often inclined to look upon other races, and particularly upon people of a type of culture different from our own, as lazy, filthy, ignorant, and immoral, if not to attribute to them some other low characteristics. It would seem that anything which would tend to correct such impressions, even in the slightest way, would be worth while.

An understanding of the uses of objects employed by primitive people usually removes any idea of those things being cu-

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rious, and may leave the impression that they are the normal outcome of the actual development of human thought and activity.

The proverbially lazy Indian, when viewed without prejudice, is found to be industrious in his own lines of activity. Those of us who have endeavored to make baskets of fine technique, or have engaged in kindred work, must appreciate the industry necessary to the production of some of the Aleutian Indian baskets, as well as those baskets made by Indian women in California, which have sold for hundreds of dollars.

What must the Hawaiian, who bathes almost continually, think of some white men who bathe much less frequently? The "filthy Indian," in many parts of the country purified himself for religious rituals, and even for the sake of health and cleanliness, by means of a vapor bath followed by a cold plunge, whereas a comparatively small proportion of our own people indulge in this especially effective type of bathing.

The so-called ignorant Indian woman, on the average, probably knew more of "botany" than our own women. She not only knew many plants, but understood how to use them; for instance, the basket-maker knew the fibers and stems best suited for her work, at what season of the year they should be gathered, and how they should be treated. The Indian's knowledge of "animal behavior" might be cited in this connection with equal appropriateness. Our general lack of appreciation of art, and the inartistic method in which the average home is arranged, must amaze many of the Japanese; while the lack of art in many of our small and frontier homes and communities must be noticed even in comparison with those of the average Indian

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weaver or carver. Our ignorance of good architecture might have been noticeable to the precolumbian inhabitants of Central America.

The "fanatical Mohammedans" of Arabia, to whom Christian nations send missionaries, must at least wonder whether these missionaries truly represent the morals of those several nations which have each seized a portion of their country. The burning of negroes at the stake during the past decade, and race-riots in the capitals of our states, north as well as south, certainly do not reflect credit upon the ethics of our people of to-day in the eyes of the negro; while the long line of broken treaties made by our Government with the red man has long since led him to view with contempt, not merely the principles of our mobs, but those of our government.

A study of primitive industries alone could not be expected to have much effect on our traditional ideas of the characteristics of other peoples, much less so, when these studies are carried on by so small a portion of our population as students of one department in normal colleges. Nevertheless, however slight might be the result obtained in combating such unfair and mistaken traditional ideas, it would seem worth an effort.

It is a well-proven anthropological truth that tradition and habit are much stronger than reason, so much so, that they completely obscure reason when examining into practices which have become traditional.

Sociology, psychology, economics, politics, and kindred subjects would reach these failings of ours practically and more directly, perhaps, than anthropology, if students and teachers of these subjects were trained in anthropology and anthropo-

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logical methods sufficiently well to be able to use the material which anthropology has to offer for research in these branches.

The work as a whole seemed to be useful chiefly as a culture course, and incidentally to furnish specific examples of value as illustrations in teaching. The greatest response on the part of the students seemed to be to the inspiration which the course gave them in a direction not confined to industries or even anthropology; namely, to depend upon original research by means of actual observations of life or museum specimens and the critical use of sources rather than upon the mere authority of the teacher or the text-book.

There seemed to be a tendency in the minds of the students to classify knowledge of industries in a simple evolutionary scheme, placing it, as it were, in pigeon-holes of equal size and shape, and arranged in a row. The development of civilization seemed to the students to follow one continuous line, beginning with the tree life, developing to cave homes, and so on to factory town life. This idea the course seemed to modify, impressing the fact that not only the development of our modern industries from those of primitive times has been complex, but that other matters are equally complex, that all knowledge must be classified with many cross-references and many relationships, that it may be studied from many view-points, and applied in many ways. Judging from the impression made, it might be hoped that a longer course would completely eliminate the former tendency.

The course seemed to be recognized as having given a certain benefit in that it strengthened the idea that human need is much the same in vital matters throughout all times and among

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all peoples, that fundamental changes come about slowly, and that sudden developments which seem at times to be of great importance, are often essentially superficial.

American Museum of Natural History
New York

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A VISIT TO THE GERMAN SOLOMON ISLANDS

BY

GEORGE A. DORSEY

ON the night of July 3, 1908, I sailed from Brisbane on the new and beautiful ship *Prinz Sigismund* of the North German Lloyd Company. After a five days' sail along the Australian coast, over the lovely blue Coral Sea, passing the eastern extremity of New Guinea, in plain sight of the coral isles of Rosel and Adela, and always under the bluest of skies, we entered, the night of the 9th, Saint George's channel, which separates New Ireland from New Britain, and were in the midst of the German possessions of the South Pacific.

On the following morning we tied up alongside the wharf at Simpson Hafen in Blanch bay, New Ireland. During the day I paid a visit to his Excellency Dr Albert Hahl, Governor of German New Guinea, at Herbertshöhe, the capital. I learned from Dr Hahl that he was about to sail on the little government steamer for a visit to remote parts of New Ireland and adjacent islands; and what pleased me especially was that he was to visit the German Solomons, and that he proposed to cross Bougainville, which up to that time had never before been traversed by whites. I readily gained Dr Hahl's assent to my making the journey with him, and after spending a charming week along the coast of New Ireland we returned to Herbertshöhe for a short visit, and set sail the same night, July 15, for

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the Solomons. The following account of this cruise is from my journal.

This crew is an interesting lot — all naked, except for a *lava-lava* (red loin-cloth). They are big, jolly black fellows — really boys in spirit, if not in age. They have every kind of tattoo mark and scar imaginable. There are many gradations in color; the Solomon-islanders being the darkest (really black), the Papuans a chocolate. Many of them are really fine-looking fellows. Even now they are singing and dancing on the deck below, careless and care-free. The little *Seestern* is great.

During the night the warm tropic rain fell in sheets, and the wind howled, and the little Star of the Sea rocked and tossed — a grand good night for sleep. And so I beat the sun up. Dark clouds of varying density filled the east, and up out of this maze rose the flame which was reflected in the filmy, fleecy clouds overhead, with the moon shining in the west. Slightly to the south was the low, densely wooded shore-line of Buka, and beyond rose the lofty mountains of Bougainville. As we drew closer to Buka, its shore was seen to be an abrupt precipice of coraline rock, rising sheer out of the water, in places three hundred feet high. At places on this table-land could be seen groves of lofty coconut-trees marking the sites of villages. Occasionally there was seen a narrow coral-sand beach, and always could be seen the groves of very tall old coconut-trees and the houses of the natives, and very often, and in constantly increasing numbers as we proceeded south along the eastern shore of Buka, the naked black natives themselves running along the beach.

Buka is the westernmost of the Solomon islands. It is thickly inhabited, but has no white resident. One tried to open

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a little trading-store on the southern end of the island last year, but he was promptly killed and eaten. The governor, however, keeps constantly bringing to Herbertshöhe groups of young fellows, using them for police-duty for a year or more, and then sending them home. He has also made a few punitive expeditions, and so the island is now fairly pacific. As we had a boy on board to return to his home, we put in a bay halfway down the coast. Out came the natives, — five big long canoes; and three curious raft-like affairs, each consisting of five poles lashed together with sharpened ends, and on each one of these things sat astride, or on his heels, a man stark naked. They all came out in remarkably quick time, considering that they came in the face of a strong wind and a heavy sea. Big, brawny, gaunt, black devils they were, with a mop-head of hair (painted red, or streaked with red so as to form a pattern), sticks in their noses, and rings in their ears. It seems that in this village was a man who claimed the power of killing by sorcery: so he was promptly visited by a chief from the eastern end of the island with some of his followers, and was killed. Farther down the coast we dropped another Buka with a message to the offender to be ready to surrender on our return, or he would be hunted out and it would go hard with him. Wonderfully beautiful is this coral island.

At noon we turned into a narrow channel which separates Buka from some tiny islands at the north end of Bougainville. Canoes, both dugout and outrigger, fairly swarmed around the boat, all filled with blacks to see their friends, and trade taro for "tobac."

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At five we were steaming back to the east, then turned south, and now (at nine o'clock) we are off the coast of Bougainville, the largest and least known of the Solomon islands.

The sun rose behind a cloud-troubled east, dark and wild and stormy; but at about seven it lighted up with wonderful brilliancy the lofty range of the Keiser Mountains, with Balbi, the highest peak in the whole archipelago, towering aloft more than ten thousand feet. On down the western coast of Bougainville we proceeded, and just outside the harbor of Kieta we struck a very pretty rain-squall. Kieta harbor, halfway down the coast, is lovely; many small volcanic islands rising up, beautifully wooded. At eight we anchored in front of a new four-year-old "station," with a resident and trader and a few houses perched on the newly-cleared hillside, soon to be covered with a coconut plantation.

While the governor and Sapper conferred with the resident about our land expedition, I took the jolly-boat and four black boys, and pulled down to the Catholic mission, two miles and a half away. The mission is cocked up on the side of a hill, with a beautiful outlook; but the trail was slippery with mud from the rain (and still raining), and this is the *dry* season. I was told that they made a business of selling curios at a fancy price. They had but little, and their prices were high enough. I got only three things. The fathers belong to the unwashed sect (they looked it), with long beards. Then I rowed across the channel, and landed, amidst a coral garden on a white beach, at a large village of about forty houses. Here I remained till noon, returning at two and not getting back to the boat till five.

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I had traded for more than a hundred specimens, and had had a very busy and interesting day. One of my purchases pleased me much. A buxom lass of about sixteen *yams* ("years") had as her only garment a scant bunch of withered flowers, which she released from her narrow girdle and gave to me for a stick of tobacco. She at once walked to a near-by tree and plucked therefrom a long, bright red leaf, the stem of which she tucked under her belt: for another stick of tobacco I secured the leaf. Then she got another leaf — but my collection of costumes was complete. Verily, dress here is ornament.

The houses here are built on piles, with the entrance from a veranda six feet wide, reached by a bamboo ladder; pigs, and fireplaces with plenty of cooking-pots beneath; canoes, mostly outrigger, everywhere, and in course of building; many little structures, with evidence of fire in earthen vessels, presumably shrines; very little carving, but an interesting material life; in many great rough drums.

It is a delight to be amongst these natives. They are such a clean, fine-limbed, healthy lot of animals, men and women, boys and girls. They seem so much cleaner and sweeter than the natives of New Ireland; especially is there a marked absence of skin-diseases, so prevalent among the New-Irelanders. Then as to their disposition, nothing could be finer; nor could anything exceed the beauty of their strong, healthy white teeth, all in perfect alignment. Their faces form an interesting study, those of the men being scarified in minute lines closely placed, the whole forming an intricate pattern as delicate as lace-work. And yet these people are notorious cannibals.

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It has been a busy day. Up early, hot sunshine everywhere. Right after breakfast, while the governor and Sapper were overhauling baggage and packing knapsacks, the chief mate (Pagenstecher) and the chief engineer (Bishoff) and I went in the jolly-boat with four boys to the Mission point where we landed through the surf, and walked along a grassy path by the beach for three miles, a wonderfully beautiful walk close to tropical nature, — lofty trees with stately trunks and hanging rattan straight as an arrow for a hundred and fifty feet, and as thick at the top as at the bottom; great white, crested cockatoos and big eagles and bright-colored birds; on to the native village of Taborai, with big houses very high off the ground, on massive timbers; a big dance-house with enormous drums; and many canoes (outrigger, as in the village of yesterday). Skin disease prevalent, also red loin-cloth, nose-pins, and big ear-lobes. Bought many things, and quenched our thirst from green cocoanuts. Purchases made with stick tobacco. Got two men to take us back to the Mission point in a canoe. Curious sensation — your seat within three inches of the water, which was delightfully blue — coral reefs. Saw a big turtle: they are worth as high as one hundred marks here, — just the carapace. Back to the *Seestern* at one, tired and hungry.

ACROSS BOUGAINVILLE

Called at five o'clock. Clear, starry morning, the morning-star big and glorious. Rosy tints began to play in the east as we were rowed ashore. Two big boat-loads of blacks, and the whites in the long-boat. The rosy east grew rosier behind dark rain-clouds; and, as we neared the shore, the pale bluish-green

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sky between the dark-green mass of an island and the darker cloud-masses above was indescribably beautiful. Ashore smoke was rising from the palm-thatched huts of the natives, curling above tall stately old palm-trees. We land through the surf and our twenty soldiers are augmented by thirty local blacks who are to serve as bearers.

We start off down the beach, led by the guides followed by soldiers, then Professor Sapper and Mr Dœllinger of Kieta, carriers, four more soldiers, the governor and myself, and four more soldiers. We make a long line and an interesting one. Each soldier (from New Ireland, most of them) carries a Mauser rifle, a canteen, and a knapsack. Each bearer has a knapsack on his back and something in his hand, — an axe, a lantern, a folding-cot, a camera, etc. Soldiers and carriers alike are naked, except for a loin-cloth of red calico. The soldiers wear caps. All wear one or more plaited arm-bands, under which are thrust a pipe and a wisp of tobacco. Matches are often carried, thrust in their kinky hair. A mile down the beach, — while the upper eastern sky continues to revel in colors, the black clouds now surmounted by filmy, streaky flames of fire, — we cross a small river in native canoes, and at once plunge into the forest, directing our course toward the center of the island. The trail is narrow, and we at once form in single file, which will henceforth be maintained till we reach the beach on the opposite shore.

After two hours' steady march through a dense second-growth forest, — never seeing the sun, never seeing ahead in the line for more than three or four men, climbing up steadily and gradually, fording two rushing little streams, wading right

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through and paying no attention to shoes, etc., — we pause to blow. Second-forest is a forest which formerly was cultivated for taro, etc., but which has lapsed. It is devoid of great trees, but is often beautiful, and always very thick, even dense. Certain kinds of native forest-trees are never cleared, especially the canaria almond, which bears a nut with a hard shell and a kernel inside like an almond, but larger and of a different shape. Our halting place is a great rocky ledge by the side of a broad river, which we wade through. In good sight now is the towering wall of rock mountains over which we must make our way. The crooning of several kinds of wild pigeons is always heard, and we have seen many and heard many more varieties of parrots, parroquets, and cockatoos.

After fifteen minutes, on we go, the trail darker, steeper, more slippery. At ten we reach the village of Bakawori, a few houses perched on an easily defended plateau, houses on piles, and now abandoned, as these people refused to yield to the magistrate (Dœllinger), and fled to the mountains. We can see the smoke of their fire on a lofty, steep-sided peak off to our right, where they have taken up an abode in defiance. To meet them alone would spell death. Their garden, or plantation, is an interesting example of native agriculture, — taro, banana, cocoanuts, and yams in a little rough clearing; about the clearings are the canaria and bread-fruit trees of the original forest. While we rested for twenty minutes under the pile houses it rained, and rained hard. Below us we had a view over the green tops of the forest, and beyond the sea, — the first far-away view we had had of the sea, for almost always one can see but a few feet away in the forest.

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Leaving the deserted village with its graceful coconut trees and feathery bamboo, we push on again in a gentle rain; but we don't mind, for we are already damp from sweat and wading (we haven't on much to get wet, — a net shirt, khaki trousers, shoes, and leggings), and each of us carries a revolver strapped about his waist, and it and the cartridge-box get heavier every minute. Oh, we are all a strange lot, — men with bushy red-painted hair, tattooed and scarified, with nose-pins and earrings, etc. Some of them have assisted in eating their fellow-men. We soon pass by another plantation, — a little cleared patch with taro, yams, bananas, sweet-potatoes, and a vegetable used as we use spinach, and tapioca and sugarcane, all growing in primitive confusion without white assistance or influence, surrounded by a bamboo fence to keep out the pigs, feral and domestic. On beyond the ravine and garden we begin more real climbing, — hot and steamy, up and up, over slippery rocks, roots of trees, often using both hands to crawl up, or steadying ourselves with a bamboo staff. We cross a dark, gloomy, canyon-like ravine with a wild rushing waterfall pouring forth from among the rocks, with lovely tree-ferns and stately crocuses in flower. Only rarely do we pierce the thick, overhead canopy of dark green, and see the sun shining now fiercely overhead.

At half-past twelve we have done our first day's march, and stop at Kape, — a few houses on an almost inaccessible mountain-spur at an elevation of eighteen hundred feet. In six hours we have walked seven miles. This will give some idea of the difficulty of our march, for we have pushed on as fast as we could. The natives all flee on our arrival. Later the men — wild-looking, naked creatures — venture back with frightened counte-

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nances. But not a woman or a child do we see at Kape. About us are taro, banana, and bread-fruit. Elevation too great for coconut. We select an open, shed-like house for our quarters, throw out the rubbish, spread banana-leaves on the floor, open our cots, lunch on sandwiches, and take a nap. Shirts and trousers are given the boys from the knapsacks; for the air is fresher than below, and they have no blankets. We have already got into fresh clothes, and hung our wet ones up to dry. It began to rain immediately on our arrival, and continued well into the night — and this, again, is the dry season. We dine in primitive fashion at six, on soup, biscuit, and tea. To every three men is given a tin of *bullamacow* (pidgin-English for "bull and cow," i.e., canned meat) and plenty of rice. We turn in early, and sleep like logs, with our revolvers under our heads, and sentries outside, — the boys sleeping on the bare floors of the native houses, twenty or more to a house, — to the music of countless frogs and insects.

Stiff and sore. We breakfast by candle, on coffee and sausage, the chief in the preparation of which is the governor, who is tireless and a regular slasher. Clear, starry sky, and, before the sun has appeared above the forests, we have left the village, I with three stone axes in my knapsack. Saw a curious roaster for canaria-nuts. Off into the gloom, passing the ivory-nut palm, the leaves of which are used for house-thatching, and the wild *Piper methysticum*, used in Polynesia for the manufacture of kava.

We descend from the village by a steep, slippery trail, for about two hundred feet, over a fearful road, to a rocky torrent in a dark glen, then climb steadily till half-past eight, by a very

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steep trail, up and up. See Manila hemp (*Musa textalis*) growing wild, big lovely begonias, and a wealth of mosses, lichens, and ferns. We stop a moment to get breath — now about three thousand feet high. No more cooing pigeons, or cries of cockatoos. The silent bloom of the forest, for we are now in virgin forest never touched by hand of man, is oppressive and impressive. We have reached the limit of the possibility of growing taro. Up and up, crawling and climbing over rocks and roots, and in the mud, but among beautiful tree-ferns, and giant trees with creepers and weird epiphytes which embrace trees, only eventually to strangle them. No sound but the endless chirp of insects, or occasionally the weird cry of a hornbill.

At half-past nine we pause for a few moments to blow, at an elevation of about five thousand feet, with a rare, marvellously beautiful view over rolling billowy forest below us, with the island-studded blue sea beyond. On again, up, up, toward the crest, through forests of great pandanus and feathery bamboo, every inch of ground covered with fern, every tree, limb, and branch coated with damp, thick moss. No tree-ferns now; the odor of damp, decaying vegetation; dark, quiet, cool, fresh, the croaking of frogs; we twist in and out and around the stems of the pandanus, which seem like the ribs of an umbrella or the arms of an octopus. Over a gentle crest; down a little embryo torrent, in which we slake our thirst, and fill our canteens; and again up through a drizzle of a fog; and again down a gentle slope, over another stream and again up; and at an elevation of fifty-two hundred feet we stand on the summit of the watershed of Bougainville, and we cannot penetrate in sight more than twenty feet through the forest. No pause, but on down (at first gradually,

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anl then for a thousand feet rapidly) over rock, trees, stumps, roots, — an awful descent in which hands are as useful as feet. Suddenly a commotion in the line, lusty cheering even, — for the men in front of our long line had, in making a sharp turn, caught a fleeting glimpse of the sea far away below and beyond us, — and the word is passed back, "Sally water, he come up!" Our trail follows now rapidly down, now steeply up, the crest (often very narrow) of a spur; and now we find evidence of the hostility of the interior savages. Our proposed visit has been anticipated, and at intervals our trail is absolutely blocked by trees which have been felled along and across the path. This imposes a very serious burden on us, — the necessity of opening a new trail along the side of the spur, and, as this is narrow and steep, our additional labor is very heavy. Often we have to make a wide down-and-up detour to get around some deep ravine, clinging with feet and hands, slipping, sliding, struggling; but it is cool up here among the cloud-kissed forests.

At twelve we halted on a hog-back, where the trail opened out a little, and in a gentle rain ate some sardines, biscuit, and jam, while the boys were given a feast of *bullamacow*.

After a pause of half an hour we move on and up, and on and down (generally down, apparently always on the same spur of the mountain, often up, but eternally down), our difficulty increases by the way the wretches had blocked the trail. At one place we can see off far below us, on a side-spur, the smoke of a village, the people of which had defied Mr Dœl-linger, and who had blocked the trail. A long, long afternoon. We march on, weary and footsore.

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It is just darkening as we enter the village of Diabora, a small cluster of miserable huts on piles, on a little side-spur, shut in on all sides by dense forest, hidden away from the world like an eagle's nest. We are met by a few scared, stark naked savages, who can do nothing but wonder at the strange and mighty caravan which has come upon them. We are secure in our strength of numbers, although a tired and weary lot we are. While the boys get water for their rice, we roll the great log signal-drums (one of them twelve feet long) out of the council-house, spread our bamboo-leaves, open up cots, prepare our soup and coffee, and get into dry clothes. I buy, for tobacco, pan-pipes, stone adzes, and spears. I see for the first time the curious bamboo-leaf cap in which the native of Bougainville at certain seasons thrusts his frizzly locks, and pins the cone-shaped head-covering on the back of his head with many long spines. The women, clad in a tiny leaf-apron, are even more frightened than the men, and crouch behind the houses or doors. By eight o'clock we are asleep under thick blankets.

Crawl out by candle-light, stiffer and sorer. With two big blisters on my left foot, I take to low shoes, cutting away the offending leather. Oh the poverty of these poor savages whose highest glory is to kill and eat a fellow-man! Up here their gardens are poorer, and they rely on nuts to a greater extent than the men of the lowlands. Their material culture is scant, and their entire decorative impulse seems to be expended on their arrows, which, it should be said, are wonderfully beautiful and effective. We have some difficulty in securing guides, for of our entire party no one has ever gone beyond this village. Beyond this, no white man has ever ventured: into this village

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only one white man has ever before entered, and he is Mr Dœllinger, who came with an armed escort. Five men finally offer to show our way to the sea. So, after leaving a bundle of sticks of negro-head twist and an axe ("tomahawk"), we start off once more. We had already had a glimpse through the forest of the rolling broken country below us and an apparently flat plain beyond that, and we fully expected to reach the shore of Kaiserin Augusta bay that night, and perhaps sleep on the *Seestern*. Little did we know of what lay between us and the seashore. Rising up out of the billowy forest of green was the volcano Pagana, bellowing forth great clouds of smoke from one central and many lesser mouths.

For twenty minutes we climb up by a muddy, slippery trail, past primitive gardens, again to reach the main crest-trail, which we follow for hours, now up, now down (but always with fearful steepness), and almost always through virgin forest, for clearings are few and far between. At half-past eight we hear the booming of the great log signal-drums far away on our right. The nature of the signal we understand not, but of the possibility of the natives to signal from one end of the island to the other there is no doubt. On and on, over ravines bridged by slippery logs (a poor trail), over roots and rocks. The forest resounds with the cries of birds and of locusts and other insects. Suddenly word is passed back, "Sally water, he come up," which means that the sea is in sight. Four hours more and we expect to be on the beach.

At half-past nine we come abruptly upon the little village of Nimara, six houses on piles. The natives are frightened, and we see timid naked men and a few naked women peering around

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the corners. Soon natives are sent up coconut-trees, and we are guzzling the delicious milk. The climber puts his feet in a loose rope noose, and literally walks up the tree by an arm-and-foot motion. The skill of a native in removing the tough outer fiber of the nut on a pointed stick thrust in the ground is remarkable, only surpassed by the way he opens one of its "eyes," cracks it, turns it up, drinks it as he pours it into his mouth in a steady stream, or later breaks it in halves without spilling a drop, and gulps it down.

Off at ten o'clock and plunge downward through the forest, rich in tree-ferns and mosses, and with many beautiful creamy-white bark trees from which canoes are made. A wild descent. At half-past eleven we reach a rushing, roaring river rumbling over a rocky bed. Into it we plunge without hesitation and with shoes (wading in water above our knees, clear and cool), the force of the current making the ford difficult. We now anticipate an early termination of our journey, surely. We are now in the plain. On for two hours along the course of this river, fording it many times, often following in its course in water from knee to waist deep, or along its bank in a flat clayey plain, in the densest of jungles. It is now raining hard and steadily, but we heed it not — couldn't if we would.

The forest, its wonders, its gloomy beauty, the struggle for sunlight, everything in a life-and-death struggle, — bamboo, epiphytes of fantastic shapes, a wonderful canoe-tree, the *airina*, white and soaring aloft, its roots rising up above, thin and narrow, like the buttresses of a cathedral. I think this the most beautiful single tree I have ever seen. It exudes, in a wound, a milk-like rubber, but it is worthless. Much Manila hemp.

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Silence, except for the eternal crickets and the occasional rusty-hinge-like cry of a cockatoo, or the wilder cry of a great hornbill. The day fades; we are tired and hungry; the sea seems no nearer; on we slip and slide, — over and under fallen logs, through streams and over them on logs. We give up seeing the beach this day; and at three we ford another torrent (the twentieth in less than four hours), and by a sharp scramble up a muddy wall (it is too steep to be called a bank) of five hundred feet in height. It is a heart-breaking climb. We want to go on and down, not up.

On for an hour and twenty minutes. Wet to the last stitch, with swollen feet, and weary and hungry, we reach Kuku, situated on a narrow spur at an elevation of seven hundred and fifty feet, and consisting of three long, rough, palm-thatch sheds, the temporary home of nut-pickers. The huts afford shelter from the rain, though they are so low we cannot stand upright in them. And this is our camp for the night. The boys are given their *bullamacow* and rice. The rice I see boiled in green bamboo tubes over a hot fire. Confusion reigns. The men seem famished, and on every hand is heard the sound of the cracking of nuts. Before we have broken our ten-hour fast, it is dark, and the forest resounds with myriads of cicadas. No stars, but no rain. The milk of the coconut I drank on my arrival here seemed the sweetest morsel I ever tasted.

It was interesting to watch the natives greet their hereditary enemies, men who under ordinary circumstances they would kill and eat should occasion offer. In two cases, men met who had been friends: they saluted each other with a grin, and by placing their palm on the other's chest. It is a curious thing

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about these Bougainville cannibals, — they will kill a white, but won't eat him, say his flesh is salty, like "medicine"; but they are very fond of Chinamen. These natives here never saw a white man. Their open-eyed interest in us is curious. As I make my notes by a candle, four of the naked chaps are squatting down outside, watching my every movement; each has a long spear, wears shell arm-bands, and shell ornaments fastened to a cord about his brow. As we approach sleep, we can hear the far-away signal-drums.

The day dawns clear and auspicious. Surely we will reach the sea to-day. Pagana seems near by, and smokes furiously: the blue water of the bay seems just a little way beyond the last hills in sight. We are a dirty lot, no mistake. But the poor natives, they seem a wretched lot indeed. Inside one of the long huts I saw three women and seven children, crouching on the earthen floor. One of the little children smokes furiously on a big native-made block pipe, while one woman carries hers thrust through the lobe of her ear, which has been twisted around once to prevent the pipe from falling out, — a common method of carrying the pipe, and one I saw many times. The men are quite naked, except that one has a string of big blue and red glass beads around his neck. The women wear only a rude girdle with the scantiest of a bit of narrow fringe-apron. These mountaineers seem less robust and smaller than the coast people, and the people of Bougainville seem not quite so black as those of Buka. They sleep on three parallel bamboo poles six feet long, with a piece of bamboo for a pillow: a more uncomfortable bed it would be difficult to imagine.

Yes, these people are cannibals, and rated as savages, and so

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they are — rather wretched savages as compared with those of the coast. But, after all, their savagery is simply a part of their conception of their unconsciously developed scheme of life to survive in the struggle for existence, and their cannibalism is an outgrowth of a religious system rather than a sign of degraded mentality. The law of the jungle, here as elsewhere, is that one knows only friends and foes; and one kills, if possible, his foe, lest he be killed; and one eats his enemy's flesh, that one may partake of and so absorb something of his ferocity, which, added to one's own strength, makes one better able to preserve one's life. The minds of these people differ from ours only in their contents, and that differs because their social environment has been different from ours.

Down the awful ladder-like trail (this one even more abrupt than the one we climbed to this camp), a beautiful rushing river, great trees arching it overhead, and trailing in the water graceful delicate lines of rattan. We see splendid cedar trees (*Cedralis Australia*), not at all like our cedars, yet a valuable tree. Then out of the river-bed into a plain, and over a gentle watershed, fording many small streams.

At half-past nine we reach the broad, clean, lovely, swiftly flowing Curaro river, on a broad gravel-bank of which we bask in the sun, opening our sacks, and spreading our dirty, grimy, wet clothes to the bright sun, while we bathe in the clear water. Even many of the natives take a wash-up. The bright sun is most welcome.

We follow this river for a considerable distance, fording it many times, and always enjoying its sunny openings and a view which is more than the ten to twenty foot view we had in the

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forest. We leave the river reluctantly. Turning up from the valley to the right, we pass laboriously through a somewhat broken, swampy plain, fording innumerable small streams. The forest here is very dense, with many noble trees. Birds seem more numerous. We are hungry, but press on; and shortly after noon we begin to climb, scrambling up for fifteen minutes; then turn abruptly into a stream and wade it for ten minutes, its bed being solid rock; then up over a very steep declivity, using our hands, elbows, and knees as much as our feet. On top we find the solitary house of some nut-gatherers, two men, two women, and a baby. One of the women was a particularly repulsive creature, with flat nose, five big tubes in her ears, and a leaf hanging to a bark string for the remainder of her costume. The boy's sole "garment" was a stick in the septum of his nose. In the house was a plentiful supply of yams and much pottery. We pause for only a moment, and then continue to climb for two solid hours, — a heart-breaking, body-racking climb; then, when it is too steep to climb, we worm along the side of a precipice which towers straight up above us. This does not look much like seacoast country. Just here we come to one of the most interesting trees I have ever seen. An epiphyte, growing from the edge of the cliff above, had spread its roots of massive size down the face of the cliff (and still others out into space, until they reached the earth-slope beneath, — a distance of eighty feet), entwining in their course other large trees like the coils of a mighty serpent. We pass a yam-patch literally hidden away on the steep slope beneath our trail. On we go, clinging to the side of the steep slippery face of the wall by our nails. At one place the trail passes a rock precipice beneath us, giving us a

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marvellous view over hills and valleys beneath us, every foot clothed in green.

On, on, tired and faint; the cry of a dog, the sight of a coconut-tree, — signs of man, — most welcome, however savage. At three forty we are at Mabulibuli; and all this awful day's work on two crackers, some sardines, and coffee! For a stick of tobacco I buy coconuts. Never did anything taste so sweet. I even eat the insipid meat of the nut. The boys cry, "*Seestern*, he come up!" And sure enough, far below us, over miles of wooded plain, we can see the smoke of our ship, but not to be gained to-day. Everybody is at once drinking coco-milk, and cracking nuts. The men seem famished, and well they may, for it has been a long day. Confusion reigns. Everybody busy. Out of disorder the tireless governor, and his valuable ally Mr Dœllinger, bring cots, rice, soup, coffee, order, sentinels, peace, content. Not that anybody has complained. On the whole march I have heard not one word of complaint.

The usual poverty-stricken village, scared men adorned solely with a nose-plug, and more timid women clad in a string and a red leaf. By the time we have partaken of our "air-tights" and the men have cooked their rice in the bamboo tubes, it is dark. Wonderful night, with thick stars so bright! And oh the sounds of the night! — the laughter of the blacks, the weird music of pan-pipes, the unmelodious croaking of unfamiliar frogs, the stridulations of countless even more unfamiliar insects. And, while we recline on our cots, the governor relates of his endless store of experiences. What a book he could write! For he has not only witnessed the absolute break-down of cannibalism and savagery on some of these islands and is

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seeing it disappear on others, but has the intelligence to describe accurately what he has seen. And then, again, Dr Hahl's experience here as a colonizer should prove extremely valuable to the world at large; for I regard him as one of the most diligent and intelligent students of the duties, as well as the privileges, of the white man in the tropics that I have ever known. None the less profound is his knowledge of European politics. As he and I have trudged along through the forest, and over the mountains, and through the slimy mire, we have discoursed endlessly of the South Seas, of their fate, especially the sad fate which awaits surely and irrevocably the natives; the shaping of events in Europe, which is destined probably to witness the diminishing of England's greatness and the growing power of Germany until she shall have absorbed Holland, Denmark, and the Scandinavian peninsula. My respect for Dr Hahl increases from day to day. He represents the highest and best type of modern German.

How we did sleep under our thick blankets! At five o'clock the day is ushered in by the fading of the stars and the song of many birds, welcome after the metallic cry of paroquets, parrots, and cockatoos. Tobacco and axes are given to five men of the interior villages, who now return, not daring to trust themselves among their coast enemies, who would never suffer them to return to their own country alive if they went farther. Only one of them has ever ventured beyond this point. New guides are secured. Shall we reach the sea to-day? It seems near, though it is evident that we are to strike the bay far to the north of the *Seestern*. While we are packing up, I make a few pur-

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chases. The houses are on piles, with a log lower front, bamboo sides, and a gable-end with palm plaiting, the neatest I have seen.

At half-past six we are off, down an awful trail, scrambling, creeping, leaping; then ford the rock-bed of a little stream; then through a muddy sweet-potato field; and on down into the plain by an extraordinarily steep descent. Yes, we are low enough now. Through a swamp two feet deep, with a rock wall on our left, out of which in one place rushes a cascade, — a dark and damp retreat. The line halts from time to time: that means we have come to a particularly bad spot. The swamp is too deep to flounder through; it must be crossed on some slippery log, often hidden by a foot of thin black mud. Ever mindful of where we put our hands (for thorny rattans and saw-tooth creepers abound); and ever mindful of our feet, lest we sprawl in the mud, tripped by one of the countless roots or creepers, each laughing at his neighbor's flounderings, — on we go over a little rise of land, and down at once into a more fearful swamp, up to our waists, our staffs going down eight feet, and our feet held up only by the network of roots beneath. Close and hot and damp. And this is the "dry" trail in the "dry" season!

Again a river, but this one broad, silent, deep. We cross it on a great tree felled across it, and follow its left bank for a long distance, in soft sandy soil. Crows caw and the rain falls. Off from the river, and at half-past eleven we strike another broad, silent, deep river on our left, with a gloriously beautiful banyan on its bank. We ford the river on a great log-jam, and on we go into the forest again. Hotter and steamier, darker and gloomier, no sound but the cooing of the pigeons. We cross ten

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or more small streams, wading or on logs, ever mindful of holes by the trail made to catch wild pigs. Then a mile of awful floundering in a swamp from two to three feet deep, which terminates in a salt-water swamp even fouler than the ones before, then a jungle-swamp of the poisonous *ipoh* palm. But what care we: we have reached tidewater, foul though it may be. On we go for half an hour, floundering, splashing, sloshing.

At half-past two we enter a plantation of taro and bananas, and yam and *ipica*, bordered by luxuriant wild hibiscus, used as fiber for lines, nets, etc. And, ah, welcome sound! we now hear the roar of the surf. Through another plantation, with a splendid view of Pagana, still smoking furiously; then into a beautiful virgin forest, the booming of the surf louder and louder; then native houses, the village of Tagas; and then the sea, rolling in as unconcernedly as though an expedition across Bougainville were a matter of daily occurrence.

Off to the north is the ship's boat under sail. Impossible to land: so we must walk four miles down the beach to a landing-place at the mouth of a river. As we pause for a moment to get our bearings, our native guides have brought out from unknown sources rice, taro, and other edibles. We are still hungry. Our boots and leggings and trousers are black with slime and mud: so off come foot and leg gear, and barefoot we struggle down the beach, — a long, irregular line of sixty-five. A lovely walk between the sea and feathery casuarinas. At the river's mouth I trade my remaining tobacco, lava-lava, etc, for specimens. Then Sapper and I board the cutter at five, and devour food, the first since daylight this morning. Thirteen of us are rowed down to the *Seestern*, which we reach at nine

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o'clock, tired, dirty, hungry. Two boats are sent back for the governor, Dœllinger, and the remaining men. They get aboard at four A.M.

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THE PILLARS OF HERCULES AND CHAUCER'S "TROPHEE"

BY

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IN a famous passage of *The Monk's Tale,* Chaucer cites "Trophee" as an authority on Hercules:

> At bothe the worldes endes, seith Trophee,
> In stede of boundes he a piler sette (B. 3307-8).

In the Ellesmere and in the Hengwrt MS., *Trophee* is glossed "Ille vates Chaldeorum Tropheus". Ignoring the gloss for the present, we may ask ourselves where Chaucer got his information about the pillars of Hercules. Professor Skeat replies, "From Guido",[1] and quotes the first book of the *Historia Trojana* to support his answer. The pertinent passage in Guido delle Colonne runs as follows:

> Sed quod suorum [sc. Herculis] actuum longa narratio poetarum longa expectatione animos auditorum abstraxit, ista de eo sufficiant tetigisse, cum et rei veritas in tantum de sua victoria acta per mundum miraculose diuulget quod vsque in hodiernum diem vsquequo victor apparuit columne herculis testentur ad gades. Ad has columnas magnus Macedonius Alexander, regis Philippi filius, qui et ipse de stirpe regum thesalie, que macedonia similiter dicitur, fuit productus, subiugando sibi mundum in manu forti legitur peruenisse. Ultra quas non est locus habitabilis, cum ibi sit mare magnum, oceanus videlicet, quod angustum locum ibidem per medium gremium habitabilis terre nostre seipsum infundens mediterraneum nobis ipsum mare constituit per intrinsecas mundi partes

[1] *Oxford Chaucer,* II, lv.

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a nobis nauigabile, vt videmus. Quod, licet ab ipso loco infusionem recipiat, effusum litoribus siriis clauditur, in quibus ciuitas acon nostros potissime recipit nauigantes. Hunc locum angustum, a quo primum hoc mediterraneum mare dilabitur, nostri hodie nauigantes strictum sibile nominant. Et locus ille in quo predicte columne Herculis sunt affixe dicitur saracenica lingua saphis, a quo non sufficit vltra ire. [1]

Now the trouble with this passage is that it by no means explains Chaucer's words. In the first place, Guido does not speak of "bothe the worldes endes", but only of the western end.[2]

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[1] Ed. 1489, sig. a 3, r°. I have regulated the punctuation. The passage is pretty fully translated, though with amusing errors, by Lydgate, *Troy Book*, i, 595-616 (ed. Bergen, E. E. T. S., I, 29). See pp. 565-66, below.

[2] Guido was led to mention the Pillars of Hercules here by a passage in the *Roman de Troie*, vv. 805-810 (ed. Constans; vv. 791-6, ed. Joly), where, however, Benoit refers not to the pillars at Gades but to those which Hercules set up in the Orient. Perhaps Guido was ignorant of the tradition about the Oriental pillars and therefore understood Benoit to mean those at the Straits of Gibraltar. Cf. Hamilton, *The Indebtedness of Chaucer's Troilus and Criseyde to Guido delle Colonne's Historia Trojana*, pp. 55-57. Perhaps Guido had a confused recollection of the passage in which Quintus Curtius declares that Alexander intended, after subduing the East, to make the circuit of the Mediterranean and to carry his conquests as far as the Pillars of Hercules in Spain: "Ipse animo infinita complexus, statuerat, omni ad Orientem maritima regione perdomita, ex Syria petere Africam, Carthagini infensus; inde, Numidiae solitudinibus peragratis, *cursum Gades dirigere* (*ibi namque columnam Herculis esse fama vulgaverat*); Hispanias deinde . . . adire; et praetervehi Alpes, Italiaeque oram, unde in Epirum brevis cursus est" (x, 1, 17-18). Arrian makes Alexander tell his soldiers the same thing in an oration:

Καὶ ἐγὼ ἐπιδείξω Μακεδόσι τε καὶ τοῖς ξυμμάχοις τὸν μὲν Ἰνδικὸν κόλπον ξύῤῥουν ὄντα τῷ Περσικῷ, τὴν δὲ Ὑρκανίαν τῷ Ἰνδικῷ, ἀπὸ δὲ τοῦ Περσικοῦ εἰς Λιβύην περιπλευσθήσεται στόλῳ ἡμετέρῳ τὰ μέχρι Ἡρακλέους Στηλῶν

(v, 26, 2). See also Arrian, vii, 1. Cf. Anspach, *De Alexandri Magni Expeditione Indica*, 1903, pp. 79, 85, and note 271. According to an apocryphal story in the Pseudo-Callisthenes, Alexander, at the outset of his career, actually invaded Italy (i, 29, ed. Müller, p. 30; see especially Version A, in the note, p. 31). This story is due, at least in part, as Müller recognized, to confusion with the campaign of Alexander's maternal uncle, Alexander Molossus, the king of Epirus, against the Lucanians (B. C. 332). Julius Valerius (i, 22; Kuebler, p. 31) follows Pseudo-Callisthenes A, and the *Epitome* (ed. Zacher, p. 28) preserves all that is essential in the passage of Valerius. Vincent of Beauvais quotes the passage from the *Epitome*, — "ex historia alexandri magni" (*Speculum Historiale*, iv, 24, Venice ed. of 1494, fol. 40 v°). See also the *Historia de Preliis*, caps. 22 and 30 (ed. Landgraf, pp. 50-51, with the note), and the later revision edited by Zingerle, cap. 22, p. 147; also the Middle English *Wars of Alexander*, vv. 1024-46 (ed. Skeat, pp. 51-52; Lamprecht's *Alexander*, ed. Kinzel, pp. 80-81. Cf. Nöldeke, *Beiträge zur*

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Professor Skeat tries to remove this difficulty by remarking that "the expression 'both ends of the world' refers to the extreme points of the continents of Europe and Africa, *world* standing here for *continent*". "The story is", he adds, "that Hercules erected two pillars, Calpe and Abyla, on the two sides of the Strait of Gibraltar".[1] This interpretation is forced, and, as we shall soon see, cannot be entertained. What Chaucer means is "at the Eastern and the Western end of the world"— the Oriental and Occidental limit. In the second place, the passage from Guido contains nothing whatever that accounts for Chaucer's "Trophee".

The western pillars of Hercules were, of course, well known to Chaucer and everybody else.[2] He did not need to get information about them from Guido. The question that confronts us is rather that of the Pillars of Hercules in the Orient, which Guido says nothing about, and which were not, like those at the

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Geschichte des Alexanderromans, p. 4 (Vienna Academy *Denkschriften, Philos.-hist. Classe*, XXXVIII, No. V, 1890); Miller, Zacher's *Zeitschrift*, X, 10-12; Ausfeld, *Der griechische Alexanderroman*, 1907, pp. 44-45, 134-6, 221.

Justin (xii, 13, 1) informs us that when Alexander was returning to Babylon, after his Indian expedition, he got word, "legationes Carthaginiensium ceterarumque Africae civitatium, sed et Hispaniarum, Siciliae, Galliae, Sardiniae, nonnullas quoque ex Italia eius adventum Babyloniae opperiri." This passage is quoted by Vincent of Beauvais (*Speculum Historiale*, iv, 63, Venice ed. of 1494, fol. 44) and by Orosius, iii, 20, 2 (ed. Zangemeister, p. 182).

[1] Notes on *Canterbury Tales*, B. 3307 (*Oxford Chaucer*, V, 233).

[2] On the Western Pillars of Hercules see Pomponius Mela, *De Situ Orbis*, i, 5, 3 (cf. ii, 6, 8), with the authors cited by Tzschuck in his edition, III, i, 132-6. Pomponius is quoted in full by Boccaccio, *De Genealogia Decorum*, xiii, 1 (ed. 1511, fol. 95 v°). A typical passage with regard to the Western Pillars may be seen in Orosius, i, 2, 7 (ed. Zangemeister, p. 10): "Europae in Hispania occidentalis oceanus termino est, maxime ubi apud Gades insulas Herculis columnae visuntur et Tyrrheni maris faucibus oceani aestus immittitur" ("Þær scyt se Wendel-sæ up of Þæm garsecge Þær Ercoles syla standaÞ" King Alfred. Cf. Alfred's translation of i, 2, 94, ed. Zangemeister, p. 35). "The Isles of Gades ('Insi Gaíd') and the Pillars of Hercules ('Colomna Ercoil') are mentioned in the Irish saga of *Bricrius's Feast* (*Fled Bricrend*, 93, ed. Henderson, p. 118; Windisch, *Irische Texte*, I, 302).

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entrance to the Mediterranean, familiar to every merchant and traveller of the fourteenth century. Yet evidence about these Eastern Pillars is not hard to find. Gower mentions them twice in plain terms:

> El grant desert d' Ynde superiour
> Cil qui d' arein les deux pilers fichoit,
> Danz Hercules. — *Traitié*, vii, 1.[1]
> This kniht the tuo pilers of bras,
> The whiche yit a man mai finde,
> Sette up in the desert of Ynde;
> That was the worthi Hercules. — *Confessio Amantis*, iv, 2054 ff.[2]

And there is an illuminating record in the *Roman de Troie* of Benoit de Sainte More, an author with whom both Chaucer and Gower were very well acquainted:

> Hercules,
> Cil qui sostint maint pesant fais
> E maint grant merveille fist
> E maint felon jaiant ocist
> E les bones [bornes] iluec ficha
> Ou Alixandre les trova (iv, 805-10).[3]

It seems quite clear that Benoit got his information about the Oriental Pillars from some form of the Alexander legend.

In the *Res Gestae Alexandri* of Julius Valerius, written probably in the third or fourth century of our era, there is a long extract from what purports to be a letter from Alexander to his mother, Olympias, in which the conqueror gives an account of

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1 Macaulay, I, 383.

2 Pauli, II, 70; Macaulay, II, 356.

3 Ed. Constans (vv. 791-6, ed. Joly). See p. 546, note 2, above, with the reference to Hamilton there cited. On the Eastern Pillars, cf. also Eugène Talbot, *Essai sur la Légende d'Alexandre-le-Grand*, 1850, pp. 167-8; Berger de Xivrey, *Traditions Tératologiques*, 1836, pp. 53-54, 401, 428.

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his visit to the "Herculis stelae", about ninety-five days' march beyond Babylon:

Profectus ergo a Babylone una cum his, quos magis strenuos in exercitu habebam, . . . in ulteriora regionum animum intendi pervenique usque ad Herculis stelas non minus itinere dierum ferme nonaginta quinque, fama de Hercule sic loquente, quod hasce metas peregrinationis suae fixerit deus ille, qui et duas stelas, id est titulos sui quosdam, ibidem dereliquit, quorum unus ex auro, alter vero argenteus habebatur. Sed enim altitudo eorum est titulorum cubitis ferme quindecim, crassitudo vero in cubitis duobus.

Alexander could hardly believe that such masses of precious metal were solid. He stayed there some days to refresh his soldiers, and amused himself by boring a hole in the golden *stela*:

Sacrificatusque deo Herculi titulum illum aureum, qua potui, rimatus sum foramine per omnem crassitudinem elaborato, neque claudicare fidem crassitudinis eius inveni. Sed cum cavernam illam replere religiosum mihi videretur, ad supplementum eius quingentis auri talentis opus fuit. [1]

This information was of course derived by Julius Valerius from the so-called Pseudo-Callisthenes, though the anecdote is found in but one version of the Greek text of that writer:

Ἦλθον ἐπὶ τὰς Ἡρακλέους στήλας ἐν ἡμέραις κέ. ἔφασαν γὰρ τὸν Ἡρακλέα ὅρους ποιῆσαι ἐν τῇ χώρᾳ, ἐν ᾗ ἐπορεύετο, στῆλας β΄, τὴν μὲν χρυσῆν τὴν δὲ ἀργυρᾶν, τὸ μὲν ὕψος πηχῶν ιγ΄, τὸ δὲ πλάτος πηχῶν β΄. Ἐμοῦ δὲ μὴ πιστεύσαντος εἴ εἰσι σφυρήλατοι, ἔδοξέ μοι θῦσαι τῷ Ἡρακλεῖ καὶ ἐκτρυπῆσαι μίαν τῶν στηλῶν· ἐράνη δέ μοι ὁλόχρυσος. Ἐγένετο δέ μοι πάλιν ἀναπληρῶσαι τὸ τρύπημα, καὶ εὑρέθησαν χρυσοῖ ⸗αφ΄ ἀναλωθῆναι.[2]

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[1] Julius Valerius, iii, 49, ed. Kuebler (iii, 81, ed. Mai).

[2] Pseudo-Callisthenes, iii, 27, Version A. (ed. Müller, p. 139, note). The passage is not found in Versions B and C (Müller, *ibid.*); cf. Zacher, *Pseudo-Callisthenes*, 1867, p. 168; Meusel, *Jahrbücher f. Class. Philol.*, Supplementband V, 784; Ausfeld, *Der greichische Alexanderroman*, 1907, pp. 105, 195-6. It occurs, however, in the Armenian translation (Raabe, Ἱστορία Ἀλεξάνδρου. *Die armenische Übersetzung . . . auf ihre mutmassliche Grundlage zurückeführt*, 1896, p. 95), and, with various corruptions, more or less amusing, in the Syriac (Budge, p. 131) and the Ethiopic (Budge, pp. 332-3). Cf. H. Becker, *Zur Alexandersage*, 1906, p. 21; F. Kampers, *Alexander der Grosse und die Idee des Weltimperiums in Prophetie und Sage*, 1901, pp. 126 ff.

Version C of *Pseudo-Callisthenes*, in another place (ii, 34, Müller, p. 87), mentions

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The work of Julius Valerius was, as is well known, superseded in general circulation, from the ninth century on, by an *Epitome*, of which there are a great many manuscripts extant, both in England and on the Continent. In the ordinary text of the *Epitome* the anecdote just referred to does not appear.[1] It is found, however, in part, in the *Oxford Epitome*.[2]

The *Itinerarium Alexandri* draws directly from *Julius Valerius* in its account of this incident:

> Electo denique sibi ad ejusmodi patientiam comitatu, ad Herculis stelas famae jactantia persecutus est diebus nonaginta continuis emensa via. Dignam quidem illam rem pretio tanti laboris, si quis aurem ad fidem dicentis inclinet. Ii quippe tituli alter auro pingui, alter argento proceritudinis erant XII cubitorum, crassi vero per quadrum cubitis binis; adeo inmenso pondere, ut ejus periculum ipse rex fecerit terebrata crassitudine auri ejus, cujus dampnum mille quingentis mox aureis inferciverit.[3]

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two golden στῆλαι, one of a man and the other of a woman, which Alexander found in the Orient, and which he said were the στῆλαι of Hercules and Semiramis: Εἰς ἑτέραν κατέλαβε γῆν, ἔνθα στῆλαι εἱστήκεισαν δύω χρυσαῖ, μία μὲν ἀνδρὸς, ἡ δὲ ἑτέρα γυναικός· αἷς περιτυχὼν Ἀλέξανδρος ἔφη· Ἡρακλέως στῆλαι αὗται καὶ Σεμιράμεως (cf. Zacher, *Pseudo-Callisthenes*, p. 138; Berger de Xivrey, *Traditions Tératologiques*, pp. 338-40). This is in neither version A nor version B (see Müller, *l. c.*; Meusel, p. 761). C then makes Alexander find the royal city of Semiramis, as to which see Versions A, B, C, iii, 17, 57; 18, 1 (Müller, p. 125; Meusel, p. 776; Ausfeld, *Der griechische Alexanderroman*, p. 96); Julius Valerius, iii, 18, 28; Zacher, *Pseudo-Callisthenes*, pp. 161-2. For altars of Semiramis, see the passage from Pliny quoted on p. 554, below.

[1] See Zacher, *Julii Valerii Epitome*, 1867, pp. xii-xiii, 61. For the probable reason why it was omitted see p. 558, note 1, below.

[2] Corpus Christi College Ms. 82. See G. G. Cillié, *De Iulii Valerii Epitoma Oxoniensi*, 1905, p. 50. The *Oxford Epitome* follows Valerius pretty closely to the end of the description of the *stelae*, but omits the account of Alexander's experiment. On the relation of the *Oxford Epitome* to the full text of Valerius and to the ordinary Epitome, Cillié, pp. ix ff., does not agree with Paul Meyer, *Alexandre le Grand dans la Littérature française du Moyen Age*, II, 24-26.

[3] Cap. 119 f., ed. Mai, 1817 (pp. 77-78), ed. Müller (in his *Pseudo-Callisthenes*, p. 167); cap. 54, p. 29, ed. Volkmann (1871). Cf. Karl Kluge, *De Itinerario Alexandri*, p. 28; Zacher, *Pseudo-Callisthenes*, pp. 80-82.

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In the *Historia de Preliis* of the Archipresbyter Leo of Naples, a tenth-century excerpt of the Greek romance, the incident appears in the following shape:

> Venimus ad columnas Eraclii. Invenimus columnas duas, unam auream et aliam argenteam, habentem in longitudine cubita duodecim et in latitudine cubita duo. Perforantes eas invenimus eas ex auro. Paenituit me, quod perforavi eas et clausi foramen illarum et posui ibi aurum pensante solidos mille quingenti. [1]

Here the form of a letter to Olympias is preserved. In the enlarged and improved *rifacimento* of the *Historia de Preliis*, which probably dates from the eleventh century, and which was immensely popular, the material of the letter is worked into the narrative at an appropriate place,[2] and the "columns" become "statues":

> Alio namque die amoto exercitu pervenit ad locum ubi erant statue due, quas ibi posuerat Hercules, una aurea et alia argentea, habentes in longitudine cubitos duodecim et in latitudine cubitos duos, vidensque eas Alexander precepit perforare illas, ut videret si essent fusiles, cumque eas perforassent et invenissent

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[1] Ed. Landgraf, 1885, p. 130. This is the oldest version of the *Historia* (preserved in a Bamberg MS.). For the different forms of the work, see Landgraf, pp. 7 ff.; Kinzel, *Zwei Recensionen der Vita Alexandri Magni interprete Leone Archipresbytero Neapolitano*, 1884; Kinzel's edition of Lamprecht's *Alexander*, 1884, pp. xvii ff.; P. Meyer, *Alexandre le Grand dans la Littérature Française du Moyen Age*, II (1866), pp. 34 ff., 390 f.; O. Zingerle, *Die Quellen zum Alexander des Rudolf von Ems*, 1885; Kuebler, *Romanische Studien*, VI, 203 ff. The most recent (and apparently the best) classification is that of Ausfeld (see p. 552, note 1, below); but the last word has not yet been said.

[2] Cf. Kinzel, *Zwei Recensionen der Vita Alexandri Magni interprete Leone Archipresbytero Neapolitano*, 1884, pp. 24-30; Kinzel's edition of Lamprecht's *Alexander*, pp. XXV-VI, 291; Skeat, *Wars of Alexander*, E. E. T. S., p. 310, note on v. 4068. The difference between the versions in the point that here concerns us may be seen by comparing Landgraf's edition, pp. 129-30, with Zingerle's, pp. 216, 256. In the excerpt in Ekkehard's *Chronicon Universale* we have: "Coadunato autem populo suo, exiit et venit ad columnas Heraclii, unam auream, alteram argenteam, habentes in longitudine cubitos duodecim, in latitudine duos" (ed. Waitz, *Mon. Germ. Hist., Scriptores*, VI, 70, 41-42); cf. the Bamberg Version of the *Historia*, and see Ausfeld, Zacher's *Zeitschrift*, XVIII, 402.

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eas fusiles, precepit claudere foramen illarum mittensque ibi aureos mille quingentos. [1]

The rather close translation in the Middle English *Wars of Alexander* runs thus:

> Þe secund day with vp son, he with his sowme nezes,
> Quare þire Immages ere þat Arculious, had in an Ile rerid.
> Þe tane was all athill gold. of siluir þe tothire,
> Twelfe cubettis fra þe topp doun. & twa was þe brede.
> He made his pepill þaim to perse. to proue þam with-in,
> Quethire þai ware hologhe or hale. & hale he þam fyndis,
> Saze þaim thike þurze-out. & aithire thrill stoppis,
> And fillis þam [with] florentis. a fyftene hundreth. [2]

The fiction or tradition which represents Alexander as discovering Pillars of Hercules in the East is certainly no invention of the authors whom we have been considering. It undoubtedly goes back, in some form, to the time of Alexander himself. The conqueror and his warriors took considerable satisfaction in following, as they supposed, in the footsteps of Hercules and Dionysus, with whom they of course identified various Oriental gods and heroes with whose relics or ceremonies they came in

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[1] Cap. 91, ed. Zingerle (*Die Quellen zum Alexander des Rudolf von Ems*, 1885, p. 216). This is the version called "J1" by Ausfeld (*Der griechische Alexanderroman*, p. 22). Another version "J2," made from "J1" under the special influence of Orosius, has "due statue auree," and omits "quas . . . argentea," thus dissociating Hercules from the statues (see Zingerle's note). Ausfeld is inclined to think that this dissociation was due to Orosius, i, 2, 7 (see p. 547, note 2, above), the reviser thinking it an error to locate the Pillars of Hercules in the East (*Die Orosius-Recension der Historia Alexandri Magni de Preliis*, in *Festschrift der badischen Gymnasien*, 1886, p. 105).

[2] Vv. 4067 ff. (ed. Skeat, E. E. T. S., p. 225). Cf. Ulrich von Eschenbach's *Alexander*, vv. 21733 ff. (ed. Toischer, pp. 578-9; see also Toischer, *Ueber die Alexandreis Ulrichs von Eschenbach*, Vienna Academy, *Sitzungsberichte, Philos.-hist. Classe*, 1880, XCVII, 324, 372). See also the Italian version of the *Historia de Preliis* published by Grion, *I Nobili Fatti di Alessandro Magno*, 1872, p. 125 (cf. P. Meyer, *Alexandre le Grand*, I, xiii).

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contact.[1] On this point the evidence is conclusive and undisputed. Arrian tells us that Alexander felt that he was a rival of Hercules,[2] and he expressly mentions the story that Hercules had vainly attempted to storm the Indian rock Aornus as one of the reasons that led the Macedonian king to attack it.[3] The same authority informs us that Alexander gladly credited the legend that the Indian city of Nysa was founded by Dionysus, feeling pleased to think that he had come as far as Dionysus had and was about to go still farther.[4] Quintus Curtius makes Alexander promise his soldiers that they shall "pass the bounds of Hercules and Father Liber" and subdue the whole world;[5] and again he represents him as beseeching them not to break in his hands the palm of victory "qua", says Alexander, "Herculem Liberumque, si invidia abfuerit, aequabo."[6] Once more, when his soldiers are murmuring he tells them that the ocean is near at hand,—"iam perflare ad ipsos auram maris: ne invideren sibi laudem quam peteret. Herculis et Liberi patris terminos transituros illos, regi suo parvo impendio immortalitatem

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1 On the supposed Indian campaign of Dionysus and its relations to Alexander's conquests, see the references given by Voigt in Roscher, *Ausführl. Lexicon der griech. u. röm. Mythologie*, I, i, 1087-9, and by Kaerst in Pauly-Wissowa, I, 1429. As to Hercules in India, see, for example, Diodorus Siculus, ii, 39. Cf. also Sainte-Croix, *Examen Critique des anciens Historiens d'Alexandre-le-Grand*, 1804, 2d ed., pp. 389 ff.

2 iii, 3, 2.

3 iv, 28, 1-4. With his usual sobriety, Arrian refuses to express a positive opinion whether Hercules (ὁ Θηβαῖος ἢ ὁ Τύριος ἢ ὁ Αἰγύπτιος) ever went to India; but he asserts positively that Alexander heard the story and was influenced by it. Cf. Anspach, *De Alexandri Magni Expeditione Indica*, 1903, pp. 27 ff. (especially notes 80 and 84). As to Aornus see also Arrian, iv, 30, 4; v, 26, 5; *Indica*, 5; Quintus Curtius, viii, 11, 2.

4 iv, 30; v, 1; cf. v, 2, 5; v, 26, 5; *Indica*, 1, 4-5; 5, 9; Quintus Curtius, viii, 10, 11. See Anspach, pp. 20-21.

5 "Illos terrarum orbis liberatores, emensosque olim Herculis et Liberi patris terminos, non Persis modo, sed etiam omnibus gentibus imposituros iugum" (iii, 10, 5).

6 ix, 2, 29.

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famae daturos."[1] There are many other pertinent passages,[2] but the point is too thoroughly established to require discussion.

Actual boundary-stones of Bacchus are mentioned by Quintus Curtius (vii, 9, 15):

> Transierant [*sc.* Macedones] iam Liberi patris terminos, quorum monumenta lapides erant crebris intervallis dispositi arboresque procerae, quarum stipites hedera contexerat. Sed Macedonas ira longius provexit.

The place referred to is identified by Franz v. Schwarz with a pass on the Mogul-tau, the natural boundary between Sogdiana and the Scythian desert.[3] For stones, the author of the *Metz Epitome* substitutes a column: "Eos Macedones per noctem sequentes usque ad Liberi Patris columnam peruenisse dicuntur".[4] Pliny, speaking of the same place, says that altars erected by Hercules and Liber are to be found there:

> Ultra [*i. e.* beyond the River Ochus] Sogdiani, oppidum Panda, et in ultimis eorum finibus Alexandria, ab Alexandro Magno conditum. Arae ibi sunt ab Hercule ac Libero patre constitutae, item Cyro et Samiramide atque Alexandro.[5]

Dionysius Periegetes, whose geographical poem, written in the time of Hadrian, became extremely popular and was translated by Rufus Avienus and by Priscian, mentions Pillars of Hercules at the entrance to the Mediterranean[6] and pillars of

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[1] ix, 4, 21.

[2] See, for instance, Arrian, v, 3, 4; vi, 3, 4-5; vi, 14, 2; Quintus Curtius, viii, 5, 8 and 11; viii, 10, 1; ix, 8, 5; ix, 10, 24.

[3] *Alexander des Grossen Feldzüge in Turkestan*, 1893, pp. 60-61. Cf. H. Becker, *Zur Alexandersage*, 1894, p. 15, note 1.

[4] § 12, ed. Wagner (*Jahrbücher für classische Philologie, Supplementband* XXVI, 99).

[5] *Nat. Hist.*, vi, 16 (18), 49. On these altars Harduin notes that they marked the limits of the world in that direction, "ut cum columnis, quae sunt apud Gades, simile quiddam habere videantur." See F. v. Schwartz, *Alexander des Grossen Feldzüge in Turkestan*, p. 60; Anspach, *De Alexandri Magni Expeditione Indica*, p. 81, note 263.

[6] Vv. 64-68 (Bernhardy, p. 12); cf. the commentary of Eustathius (*id.*, pp. 96-97) and the Scholia (p. 328). See also Avienus, *Descriptio Orbis Terrae*, vv. 98-100 (p. 431); Priscian, *Periegesis*, *vv.* 72-78 (p. 463).

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Dionysus by the ocean in the remotest mountains of India.[1] Priscian, it should be noted, translates Dionysius's στῆλαι by *statuae*. The commentary of Eustathius on Dionysius is important for our present investigation. The geographer having referred to the Indian Nyssa (Nysa) in connection with the Pillars of Dionysus, Eustathius [2] quotes Arrian's account of Alexander's visit to the precinct of Dionysus on Mount Merus hard-by.[3] He also has much to say of the supposed expedition of Hercules to India, utilizing Arrian[4] in his discussion of this subject also, and remarking that according to one story Hercules must have gone to both boundaries of the earth.[5]

Pillars of Dionysus in India are also mentioned by Apollodorus, but in a passage which is regarded as an interpolation.[6] Servius, in a note on "Protei columnas" (*Aeneid*, xi, 262), remarks: "Columnas Herculis legimus et in Ponto et in Hispania". In a letter to the Rhodians, given in the *Metz Epitome*, Alexander is made to mention an Eastern Column of Hercules: "Nos ultra columnam Herculis patrii nostri...." [7]

The belief that Hercules and Dionysus set up pillars or other monuments in the East was adverted to by Strabo, about the beginning of the Christian era, in his genuinely scientific discussion of the Pillars of Hercules at the entrance to the Mediterranean. Some think, he says, that the points of the strait are the

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1 Vv. 623-5, 1161-5 (Bernhardy, pp. 37, 62); Eustathius, pp. 224, 313-314; Scholia, p. 358; Avienus, vv. 824-6, 1377-84 (pp. 448, 460); Priscian, vv. 616-18, 1057-8 (pp. 475, 485).

2 Bernhardy, pp. 313-15.

3 Arrian, v, 2.

4 v, 3.

5 Ὥστε τούτῳ τῷ λόγῳ ἐφ' ἑκατέρους τέρμονας γῆς ἐλθεῖν τὸν Ἡρακλέα (Bernhardy, p. 314).

6 Διελθὼν δὲ Θρᾴκην, [καὶ τὴν Ἰνδικὴν ἅπασαν, στήλας ἐκεῖ στήσας,] ἦκεν ἐς Θήβας (*Bibliotheca*, iii, 2, 1). See Hercher's edition, 1874.

7 § 107, ed. Wagner, p. 114.

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Pillars (τὰ ἄκρα τοῦ πορθμοῦ τὰς Στήλας εἶναι); others identify the Pillars with τὰ Γάδειρα (i. e. Gades, Cadiz); others suppose that they lie outside of τὰ Γάδειρα; others identify them with Mt. Calpe in Spain and Mt. Abilyca in Africa; others with certain small islands near these mountains; others with two bronze columns preserved in a temple of Hercules at Gadeira,— and so on. The inquiry, he continues, is not unreasonable.[1] It is likely enough that Hercules set up something of the sort as the limits of the inhabited world or of his expedition. For it seems to have been a custom in old times to erect memorials of this kind. And he proceeds to give examples. "Alexander", for instance "erected altars as the limits of his Indian campaign at the easternmost place which he reached in India, imitating Hercules and Dionysus."[2] Strabo argues, therefore, that there may once have been real Pillars of Hercules at the entrance to the Mediterranean, and that, these having perished, the name may have been applied to the places where they stood. The Macedonians, he says, apparently did not see any actual pillars (στῆλαι) of Hercules or of Dionysus in India. Yet, since certain places were shown to them which bore that name, they identified with the pillars those places in which they found evidence to substantiate what was told of Dionysus or of Hercules.[3]

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1 Ἀλλὰ ζητεῖν ἐπὶ τῶν κουρίως λεγομένων στηλῶν τοὺς τῆς οἰκουμένης ὅρους ἢ τῆς στρατείας τῆς Ἡρακλέους ἔχει μέν τινα νοῦν (iii, 5, 5).

2 Ἀλέξανδρος δὲ τῆς Ἰνδικῆς στρατείας ὅρια βωμοὺς ἔθετο ἐν τοῖς τόποις εἰς οὓς ὑστάτους ἀφίκετο τῶν πρὸς ταῖς ἀνατολαῖς Ἰνδῶν, μιμούμενος τὸν Ἡρακλέα καὶ τὸν Διόνυσον· ἦν μὲν δὴ τὸ ἔθος τοῦτο (iii, 5, 5). On the altars erected by Alexander see Pliny, *Nat. Hist.*, vi, 17 (21), 62; Arrian, v, 29, 1; Q. Curtius, ix, 3, 19; Diodorus Siculus, xvii, 95, 1; Plutarch, *Alexander*, 62; Philostratus, *Vita Apollonii*, ii, 43; *Metz Epitome*, 69 (ed. Wagner, p. 107). Cf. Anspach, pp. 81-82, notes 266, 267.

3 Οὐδὲ ἐν τῇ Ἰνδικῇ στήλας φασὶν ὁραθῆναι κειμένας οὔθ' Ἡρακλέους οὔτε Διονύσου, καὶ λεγομένων μέντοι καὶ δεικνυμένων (τῶν) τόπων τινῶν οἱ Μακεδόνες ἐπίστευον τούτους εἶναι στήλας, ἐν οἷς τι σημεῖον εὕρισκον ἢ τῶν περὶ τὸν Διόνυσον ἱστορουμένων ἢ τῶν περὶ τὸν Ἡρακλέα (iii, 5, 6).

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Lucian, in the third century of our era, ridicules these stories about the Oriental Pillars in his *True Story*. His adventurer sailed out into the Western Ocean, leaving the Pillars of Hercules at the entrance to the Mediterranean, and after a voyage of nearly three months, landed on an island. Three stadia from the shore, in the midst of a wood, he found a pillar of bronze, bearing a Greek inscription: "So far came Hercules and Dionysus".[1] Hard by were two footprints in a rock, — one a plethron in length, the other not so long. "And it was my opinion", adds the narrator, "that the shorter of the two was the footprint of Dionysus, the other that of Hercules".[2]

Enough has probably been said to make it clear that Chaucer was following a tradition of very long standing when he asserted that Hercules set up pillars at both ends of the world, —that is, at the Eastern end as well as the Western.

Nothing that we have so far considered, however, throws any light upon Chaucer's "Trophee", for there is not a word in any of the passages that we have examined — either in those that (like the quotation from the *Historia de Preliis*) were accessible to Chaucer, or in those that were not — which affords us even a suggestion of this term. Still, it seems probable that we are on the right track. As a mere *word*, "Trophee" is clear enough. It is of course the French *trophée*, Latin *tropaeum* (*tropheum*). It is Chaucer's use of "Trophee" as the name of a *person* that causes all the difficulty. And that use, as all are agreed, is the result of a misunderstanding, whether on the poet's own part or on the part of some authority whom he is following. What we need, then, is a passage — accessible to Chaucer or his prede-

1 Ἄχρι τούτων Ἡρακλῆς καὶ Διόνυσος ἀφίκοντο.

2 *Vera Historia*, i, 6-7.

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cessors — in which the term *tropaea* is applied to either the Occidental or the Oriental Pillars of Hercules or to both.

Such a passage is not hard to find. It occurs in a text that was very familiar to mediæval writers, — the apocryphal *Epistola Alexandri Macedonis ad Aristotelem Magistrum suum de Itinere suo et de Situ Indiae.*[1] In this letter, Alexander, after an account of his vanquishing Porus and receiving him into favor, tells how Porus guided him to the farthest shores of the East:

> Ast et ad Herculis Liberique trophaea me deduxit in orientis ultimis oris; aurea utraque deorum constituerat simulacra. Quae an solida essent, ego scire cupiens omnia iussi perforari, et id ipsum cum vidissem solida esse, simili metallo complevi et Herculem Liberumque deiectis simulacris victimis complacavi.[2]

The passage is quoted by Vincent of Beauvais in his *Speculum Historiale,* as follows:

> Ex epistola alexandri. Peruenit autem ad herculis liberique trophea in

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[1] The best edition is that of Kuebler and Schlee, appended to Kuebler's *Julius Valerius* (Leipzig, 1888, pp. 190-221). There is a later version in the Bamberg MS. E. III, 14, probably made independently from the Greek in the tenth century (edited by Kuebler, *Romanische Forschungen*, VI, 224-37). The *Epistola* is not to be confused with the letter to Aristotle in Julius Valerius, iii, 17, 14-27 (ed. Kuebler, pp. 123-35; ed. Mai, 1817, iii, 23-43, pp. 157-77), which is from *Pseudo-Callisthenes* (version A, iii, 17, ed. Müller, pp. 120-5). The *Epitome* of Valerius's work omits the letter just referred to (see Zacher's edition, iii, 17, p. 55), but, in compensation, the separate *Epistola Alexandri de Situ Indiae* is very often annexed to the *Epitome* in manuscripts (see, for example, Ward, *Catalogue of Romances*, I, 109-19). Indeed, it seems to have been the intention of the epitomator that it should be thus annexed, for he expressly refers his readers to the "epistola quam [Alexander] Aristoteli praeceptori suo misit," meaning, we may be sure, not the letter which he omits but the separate *Epistola* (cf. Zacher, *Pseudo-Callisthenes*, p. 106). On the relation of the *Epistola* to the Alexander material, see especially H. Becker, *Zur Alexandersage*, 1894 (*Alexanders Brief über die Wunder Indiens*); Ausfeld, *Zur Kritik des griechischen Alexanderromans*, 1894, pp. 8 ff.; H. Becker, *Zur Alexandersage*, 1906 (*Der Brief über die Wunder Indiens in der Historia de Preliis*); Ausfeld, *Der griechische Alexanderroman*, 1907, pp. 27-28, 177 ff. An Anglo-Saxon translation of the *Epistola* has been edited by Cockayne (*Narratiunculae Anglice Conscriptae*, 1861, pp. 1 ff.) and by Baskervill (*Anglia*, IV, 139 ff., and separately, 1881).

[2] Kuebler and Schlee's text, at the end of Kuebler's edition of *Julius Valerius* (1888), p. 204.

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vltimis finibus orientis posita: vbi vterque deus auri solidum habebat simulachrum: quod alexander explorare cupiens fecit ea perforari: et item simili metallo repleri. [1]

Here we have the same story that we have already seen in *Julius Valerius* and in the *Historia de Preliis*,[2] but the monuments are called *trophaea*, not *stelae* (as in Valerius) or *columnae* or *statuae* (as in the *Historia*).

The *Epistola Alexandri* is evidently one of the sources of the following observations on Hercules, in which the unknown compiler of a sixth-century Wonder-Book associates the Western Pillars and the Eastern *trophaea*:

Quis Herculis fortitudinem et arma non miraretur, qui in occiduis Thyrreni maris faucibis columnas mire magnitudinis ad humani generis spectaculum erexit, quique bellorum suorum tropea in Oriente juxta Oceanum indicum ad posteritatis memoriam construxit? [3]

I venture to suggest that this same passage of the *Epistola Alexandri* is, in some way, the starting-point for Chaucer's "Trophee". No doubt if Chaucer had had an accurate text of the

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1 iv, 55 (Venice, 1494, fol. 43 v°). It is interesting to observe the way in which the Old French romance of *Alexandre* by Lambert li Tort and Alexandre de Paris has treated this incident (see Michelant's edition, p. 316, ll. 24-27; p. 317, ll. 4-8; p. 318, l. 37-p. 319, l. 3). The romance speaks of the "bornes Arcu" or "Ercu" (Hercules), and *Liber* has become *Libis*. Cf. P. Meyer, *Alexandre le Grand*, II, 170 ff. For the "bones Arcu," see also Michelant, p. 3, ll. 29-31; p. 300, ll. 15-17.

2 See pp. 549, 551, above.

3 *De Monstris*, etc., i 14 (*Ulysse Robert, Les Fables de Phèdre, édition paléographique publiée d'après le Manuscrit Rosanbo*, 1893, p. 154; Berger de Xivrey, *Traditions Tératologiques*, 1836, p. 53). The treatise is assigned to the sixth century by Berger de Xivrey (p. xxxiv), and Robert (p. xli) assents. The manuscript which contains it is the celebrated Pithou (later the Rosanbo) MS. of Phaedrus. The Fables are in an early ninth-century hand (Robert, p. xiii), the Wonder-Book is in a hand that is only a trifle later (pp. xii, xli ff.). The same treatise is contained in the Codex Wisseburgensis of Phædrus (Wolfenbüttel, "Gud. 148"): see Haupt, in his *Zeitschrift*, V, 10; Müllenhoff, Haupt's *Zeitschrift*, XII, 287; Hervieux, *Les Fabulistes Latins*, I (1884), 245 ff.; Robert, p. xliv.

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Epistola[1] before him when he wrote *The Monk's Tale*, or even an accurate copy of the extracts that are made by Vincent of Beauvais, he would not have transmogrified *trophea* into a person. But, although he may have read the *Epistola* once upon a time, and although we are certain that he knew Vincent (or at least that he refers to him),[2] we are not to suppose that he had either of these authorities at hand for steady and repeated consultation. No one who is acquainted with the possibilities of confusion which beset mediæval scribes and readers, or who has even a faint conception of the blunders of which he himself (*pace tanti viri dixerim!*) might be capable if he were dependent on his memory alone for quotations and references, will be surprised that out of the passage concerning the "Herculis Liberique trophea" there should have grown up — by a series of corruptions, mistranslations, and mnemonic lapses — the no-

[1] The *Epistola* goes on to tell how Alexander proceeded to the ocean. "Quem quoniam tenebrosum vadosumque mihi locorum incolae affirmabant et quod Herculi et Libero ultra visum non esset accedere, praestantissimis diis, tanto maiorem me ipsis videri dicebant, quanto patientiam immortalium et sacra praeterirem vestigia" (Kuebler, pp. 204-5). In the course of his further adventures, Alexander speaks of the fear felt by his men that he had incurred the wrath of the gods "quod homo Herculis Liberique vestigia transgredi conatus essem" (p. 208). He also saw the "antrum Liberi" (Anglo-Saxon "þæt scræf Libri þæs godes," Baskervill, p. 24, l. 562), and lost several men who entered it (p. 209). "Supplex orabam numina, ut me regem totius orbis terrarum cum sublimibus trophaeis triumphantem in Macedoniam Olympiadi matri meae remitterent" (p. 209). Finally he returned to Phasiace. "Ibique legato meo praecepi, quem praesidio praeposueram nomine Alticonem, ut poneret Persarumque et Babyloniorum pilas solidas aureas duas pedum vicenum quinum et in his omnia facta scriberet faceretque eadem in ultima India ultra Liberi et Herculis trophaea, quorum centum erant; quae et ego quinque mea aeque aurea eis altiora denis pedibus statui et in eis victorias atque itinera nostra describere imperavi" (p. 220). The passage about the wrath of the gods (p. 208) is quoted by Vincent as follows: "Dicebant milites iram esse deorum eo quod alexander ausus esset transgredi herculis et liberi metas" (*Spec. Hist.*, iv, 55, Venice, 1494, fol. 43 v°). Vincent also quotes a part of the passage in which Alexander gives Altico his instructions, including the words "vltra trophea liberi et herculis quorum centum erant" (iv. 60, fol. 44 r°).

[2] "Vincent, in his Storial Mirour" (*Legend of Good Women*, Prologue A, 307). Cf. Miss Hammond's *Chaucer. A Bibliographical Manual*, p. 105.

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tion that there was an author called "Tropheus" or "Trophee," and that to this author Chaucer should have credited the statement that Hercules set up a pillar as a boundary "at bothe the worldes endes".

That the word *tropaea* gave trouble is shown in striking fashion by several of the translations made of the *Epistola Alexandri ad Aristotelem*. The Anglo-Saxon version omits the word and otherwise changes the passage.[1] The Icelandic version also dodges *trophaea*.[2] The old Italian version absurdly renders *trophaea* by *trionfo*.[3]

The gloss "Ille vates Chaldeorum Tropheus", in the margin of the Ellesmere and the Hengwrt MS. of the *Canterbury Tales* may or may not be Chaucer's own. It seems most likely, on the whole, that it is a reference jotted down by the poet himself.

1 "And Herculis gelicnisse and Libri Þæra twegea goda he [*sc.* Porus] buta of golde gegeat and geworhte and hie butu asette in þæm eastdæle middangeardes (ed. Baskervill, p. 20; Cockayne, *Narratiunculae Anglice Conscriptae*, p. 19). This is a kind of amalgamation of the two sentences of the original: "Ast ad Herculis Liberique trophaea me deduxit in orientis ultimi oris aurea utraque deorum constituerat simulacra." Kuebler (in his edition of Julius Valerius, 1888, p. 204) puts a semicolon after *oris*, but the Anglo-Saxon translator construed "in orientis ultimi oris" with "constituerat." The Anglo-Saxon translator also dodges the word "trophies" later in the *Epistola*. Where the Latin has "Orabam numina, ut me regem totius orbis terrarum cum sublimibus trophaeis triumphantem in Macedoniam Olympiadi matri meae remitterent" (Kuebler, p. 209), he renders: "Ond ic . . . bæd þa godmægen þæt hie mec ealles middangeardes kyning and hlaford mid hean sigum geweorþeden, ond in Macedoniam ic eft gelæded wære to Olimphiade minre meder" (ed. Baskervill, p. 24, ll. 569 ff.) The passage near the end (p. 220), which mentions the "Liberi et Herculis tropaea" again, does not appear in the Anglo-Saxon.

2 This version is considerably abbreviated and shows a very imperfect comprehension of the original: "Ok sealfr hann for med mer i austanvert riki sitt. Þagat sem fremzt hafdi komiz Hercules. ok Liber. Þar liet ek [*sic*] gora likneski eptir þeim or brendu gulli sem adr hofdu verit skurdgod" (ed. Unger, in the *Anhang* to *Alexanders Saga*, Christiania, 1848, p. 170). Note that the Icelandic translator says nothing about Alexander's boring into one of the images.

3 "Venendo al trionfo d'Hercole e di Bacco, a' quali Dei egli [*sc.* Poro] haveva posto nell' ultima contrade di Levante alcune statue d'oro" (*I Nobili Fatti di Alessandro Magno*, ed. Grion, Bologna, 1872, p. 251).

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But, however that may be, we can hardly doubt that it represents substantially the shape in which information about "Trophee" lay in Chaucer's mind. He had seen somewhere, in all probability, a statement ascribed to "ille vates Chaldeorum Tropheus" to the effect that Hercules set up pillars in the Orient, and this ascription, we may conjecture, was the last result of a series of blunders of which the mention of "Herculis Liberique trophea" in the *Epistola* had been the point of departure.[1] Perhaps a confusion between *Liber*, "Bacchus", and *liber*, "book", was operative at some stage of this process. That "Tropheus" is called a "vates Chaldeorum" is a welcome indication that we are on the right track. For seers, Chaldean and other, play a considerable part in the history and the legend of Alexander.[2]

It is not impossible that an excessively curious place in *Julius Valerius* has got mixed up in some fashion in the imbroglio which we are considering. In the letter to Olympias — the same in which we have already found an account of the "Herculis stelae" which Alexander examined [3] — Alexander describes

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[1] Manifestly the original misunderstander of the passage in the *Epistola* did not owe his knowledge of the Eastern Pillars of Hercules to that work, for it does not use the word *columnas*. He was doubtless already familiar with the passage in the *Historia de Preliis* (derived from Julius Velerius) in which the *columnae* are mentioned (see p. 551, above), and, coming upon the same anecdote in a corrupt text of the *Epistola* (or in a corrupt quotation from it), recognized the identity of the incident, but supposed *trophea* (or whatever he read instead of it) to be the name of an author. This error he may have made at the time, or, very possibly, years afterward, when he was writing from memory. Or, still more probably, we are concerned with a case of progressive misunderstanding, in which several persons were implicated. *Crescit eundo!*

[2] See, for example, Arrian, iii, 16; 5; iv, 13, 5; vii, 11, 8; vii, 16, 5; vii, 17; vii, 22, 1; Quintus Curtius, iii, 3; iv, 10, 4; v, 1, 22; vii, 7, 8; ix, 4, 27; Diodorus Siculus, xvii, 112 (cf. 116); Pseudo-Callisthenes, iii, 30 (ed. Müller, p. 144); Julius Valerius, i, 50 (63) (ed. Kuebler, p. 60); iii, 57 (92) (p. 165). Cf. R. Geier, *Alexander und Aristoteles in ihren gegenseitigen Beziehungen*, 1856, pp. 205 ff.

[3] See page 549 above.

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a temple in which Xerxes used to give oracular replies to inquirers:

Nam et aedem quandam ad speciem Graeci operis illic magnificentissimam viseres inque ea aede etiam responsa dare memoratum regem sciscitantibus celebrant. Et situm ibidem in templo viseres varium opus, *tropheum aureum* dependens aedificii de culmine, adhaerebatque *illi tropheo* orbis quidam ad modum vertiginis caelitis, superque orbem simulacrum columbae sessitabat, quod ubi responsa rex diceret, humanis vocibus sciscitanti loqui ferretur. *Id tropheum* cum auferre indidem mihi cupiditas foret, ut ad vos et ad nostram Graeciam mitteretur, idem qui aderant, contenderunt rem sacram esse neque contemnendo periculo invadari a quopiam posse. [1]

Tropheum here means a "bird cage",[2] but the word is excessively rare, and certainly was not always understood by the scribes. The *tropheum* was not, to be sure, a *vates*, but it was closely associated with the vaticination, and it may well have given rise to various errors in the mediæval mind. The point need not be pressed, but is worth a moment's notice.

We cannot expect to retrace the devious paths of miscopying, mistranslation, and misapprehension which led from the "Herculis Liberique trophea" to Chaucer's "seith Trophee." But the history of literature is crowded with examples of similar errors. Two or three may be selected from the Alexander tradition itself.

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1 Julius Valerius, iii, 52 (85), ed. Kuebler, p. 160 (cf. Mai, ed. 1817, iii, 85, p. 218). See Pseudo-Callisthenes, iii, 28 (ed. Müller, pp. 141-2; Meusel, p. 786); Armenian, Raabe, p. 96; Syriac, Budge, p. 133; Ethiopic, Budge, p. 337; *Historia de Preliis* (Landgraf, p. 125; Zingerle, § 122, p. 256); *Wars of Alexander*, vv. 5599-5610 (ed. Skeat, p. 274); Italian, ed. Grion, p. 164. Cf. Zacher, *Pseudo-Callisthenes*, pp. 169-172; Ausfeld, *Der griechische Alexanderroman*, pp. 107, 198; Cillié, *De Iulii Valerii Epitoma Oxoniensi*, p. 52. The passage is not found in the *Epitome* of Julius Valerius. The cage is mentioned in Valerius (*tropheum*) and Pseudo-Callisthenes (ὀρτυγοτροφεῖον) only.

2 τροφεῖον (*Pseudo-Callisthenes*, iii, 28, ὀρτυγοτροφεῖον).

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The superscription of the letter of Darius to his satraps beyond the Taurus is as follows in *Pseudo-Callisthenes*: Βασιλεὺς Δαρεῖος τοῖς ἐπέκεινα τοῦ Ταύρου στρατηγοῖς χαίρειν.[1] Out of this, by some process, the Ethiopic translator has made: "From Darius, the king of kings, to the subjects of Tiberius Cæsar the Greek."[2] It is submitted that an epistle from Darius to the subjects of a Greek Tiberius Cæsar, bidding them arrest Alexander of Macedon, is quite as great a curiosity as a *testimonium* as to the Pillars of Hercules derived from an author named Tropheus.

Julius Valerius informs us that Alexander, shortly before his death, received a letter from his mother concerning the quarrels of Antipater and Divinopater ("super Antipatri et Divinopatris simultatibus"), and urging him to return to Epirus.[3] Of course there never was any such person as Divinopater, and it is highly probable[4] that this strange name arose from a misreading of the Greek participle δεινοπαθούσης ("feeling indignation"), which occurs at this point in Version A of the *Pseudo-Callisthenes*.[5] Yet Divinopater passed into the *Epitome* of Valerius,[6] and thence (as *Divinuspater*, governor of Tyre) into the French romance of Lambert li Tort the Alixandre de Paris. The romance even professes to give the actual conversation between him and Antipater as they discuss their affairs and plot the

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1 i, 39 (Müller, p. 44).

2 Budge, p. 59.

3 iii, 31, 56 (89), p. 163.

4 According to the admirable suggestion of Zacher, *Pseudo-Callisthenes*, p. 12.

5 See Müller's ed., note on iii, 31, p. 144: Τῆς δὲ μητρὸς αὐτοῦ Ὀλυμπιάδος πλεονάκις γραφούσης περὶ τοῦ Ἀντιπάτρου καὶ δεινοπαθούσης [insert ὡς] σκυβαλίζεται μήτηρ οὖσα ἀνθρώπου [read Ἀλεξάνδρου, with the Armenian]. Cf. Ausfeld, *Der griechische Alexanderroman*, 1907, p. 109 (with n. 1). It is to be observed that the *Historia de Preliis* avoids the error which has made its way into the text of Julius Valerius. It reads (ed. Landgraf, 31a, 125, p. 126): "Mater vero illius multis vicibus scripserat Alexandro de Antipatro et angustiabatur," this last word being a sufficiently close translation of δεινοπαθούσης.

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death of Alexander. Indeed, it is Divinuspater who suggests the use of poison:

Dist Divinuspater: "De tel marcié tel vente;
Fortune lieve l'oume et puis le recravente,
Car mauvaistiés est d'ome qui tous jors se demente.
Bon consel ai trové, se il vos atalente:
Nous li donrons venin, et nus ne s'en repente,
Que l'arme aut en infer, en painne et en tormente."
Et dist Antipater: "Ceste raisons est gente;
La gent en vengerons que il a fait dolente." [1]

The mistakes which Lydgate makes in translating Guido's account of the Western Pillars of Hercules show how little fitted the worthy Monk of Bury is to act as guide to modern scholars. Guido writes that the straits at the entrance to the Mediterranean are known to sailors as "Strictus Sibile", and that the place where the Pillars of Hercules stand is called "Saphis" in the Saracen tongue: "Hunc locum angustum, a quo primum hoc mediterraneum mare dilabitur, nostri hodie nauigantes Strictum Sibile nominant. Et locus ille in quo predicte columne Herculis sunt affixe dicitur Saracenica lingua Saphis a quo non sufficit vltra ire".[2] Lydgate takes *Saracenica* as the name of the place, and, reading *longa* for *lingua*, works out the meaning as follows:

Sibellys streytes maryners it calle,
And þe boundes, þei named ben of alle,
Of Hercules, for he hym silf hem sette,
As for markys alle other for to lette

[1] I give the passage as printed by Paul Meyer, *Romania*, XI, 224. See Michelant's edition, p. 504, ll. 19-27; cf. P. Meyer, *Alexandre le Grand*, II, 188, 202-3.

[2] Ed. 1489, sig. a 3, r°.

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Ferther to passe, as Guydo maketh mynde;
And þe place is callyd, as I fynde,
Syracenyca, as fyn of his labour,
Or Longa Saphi, recorde of myn auctour. [1]

It may also be worth noting that Lydgate refers to Ovid as an authority on the pillars at Gades,[2] though Ovid does not mention them. To Ovid also he refers for the Labors of Hercules, but the list which he gives is not taken from that poet.[3] In this list, by the way, we find the fire-breathing monster Cacus transmogrified into a *cat*,—"The fyry cat he slouz without[e] more"![4] Obviously Lydgate read *catus*.

This observation with regard to the methods of the amiable Don John will probably be held to excuse one from appending any new theory as to what he says of Chaucer's *Troilus* and the "book which called is *Trophe* in Lumbard tong."[5]

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[1] *Troy Book*, i, 609-16 (ed. Bergen, E. E. T. S., I, 29).
[2] i, 597-600.
[3] The list (i, 573-594) is, as Bergen (p. xvii) notes, not in Guido.
[4] i, 591.
[5] See Skeat's *Oxford Chaucer*, II, liv.

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NOTES ON THE IRISH PRACTICE OF FASTING AS A MEANS OF DISTRAINT

BY

F. N. ROBINSON

THE purpose of the following notes is to illustrate more fully than has hitherto been done the ancient Irish procedure of fasting as a means of distraint. The existence of the custom, particularly in the form in which it appears in the Brehon law, has long been recognized, and comparisons have been made with similar institutions in other parts of the world. Attention has also been called by editors and commentators to scattered instances of it in Irish literary and historical documents; but no attempt has been made to bring together any considerable amount of material from different sources and to exhibit side by side the various features of the practice. The examples here collected, though not numerous, represent nearly every department of Irish literature, and show that the conception was widely diffused and long retained; and they are not offered as constituting a complete survey of the early Irish material. Their number could doubtless be much increased by a systematic canvass of printed Irish writings, and no one knows how much evidence concerning this, as concerning all other phases of Celtic life and thought, lies concealed in the great mass of unpublished Irish manuscripts.

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In the Brehon law fasting is simply a special form of notice which must be served upon a debtor of high rank before seizure of his goods. The principal passages bearing upon the matter are the following:[1]

"Notice precedes every distress in the case of the inferior grades,[2] except it be by persons of distinction or upon persons of distinction; fasting precedes distress in their case. He who does not give a pledge to fasting is an evader of all; he who disregards all things shall not be paid by God or man." — In the commentary which follows this statement it is explained that if the plaintiff fasts without receiving a pledge, he is entitled to double the debt and double food; and the seventh of death-fine, and honor-price, provided food has not been offered him. If food has been offered him, and no pledge has been given him, he is entitled to double the debt and five horned cattle. But if a pledge has been offered him, and he continues to fast, though food be not offered, he forfeits the debt and five horned cattle. Further provisions follow with regard to the periods of notice required in different cases.

"He who refuses to cede what should be accorded to fasting, the judgment on him according to the Feini is that he pay double the thing for which he is fasted upon." — Then the commentary repeats explanations similar to those given above.

"He who fasts notwithstanding the offer of what should be accorded to him, forfeits his legal right according to the decision of the Feini. The just mode of stopping each fasting with the Feini is to give the security of a good surety who would not

[1] *Ancient Laws of Ireland*, I, 112 ff.

[2] Perhaps to be translated rather "among the Feini" (i. e., the Irish). The quotation follows the English translation of the *Ancient Laws*.

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evade, or a pledge of the pledges in the house of the person who is fasted upon."—This is followed by a note prescribing a fine, according to the rank of the plaintiff, in addition to the forfeiture of his claim, if he persists in fasting after the pledge is offered. [1]

This whole procedure was long ago compared by Dr Whitley Stokes [2] with the Indian custom known as "sitting dharna," and various opinions have been held as to the relation of the two institutions and as to the sanctions which underlie them. Neither of these subjects can be adequately discussed here, and in any case the problem on the Indian side would lie beyond the competence of the present writer. [3] But the instances of Irish fast-

1 Other references to the custom in the "Senchus Mor" are collected by Atkinson in the Glossary, s. v. *troscad.* (An instance in Vol. I, p. 128, appears to have been overlooked). Some are cases of bare mention and others are obscure. On the whole they add little to the information in the passages quoted above.

2 Sir Henry Maine, in his *Lectures on the Early History of Institutions* (1875), p. 297, credited Dr Stokes with having first made the comparison. It is also true that Dr Stokes's editions of Irish texts have brought to notice many of the Irish instances of the practice.

3 "Sitting Dharna" and related Eastern customs are described in Maine's *Lectures on the Early History of Institutions*, pp. 39 ff, 297 ff, and more fully by H. R. Fink, *Calcutta Review*, 1876, pp. 37 ff. See also Leist, *Jus Gentium*, p. 475. Opinions have differed as to the age of the custom, and Fink (following Monier Williams, *Indian Wisdom*, 270, n.) denies that it is recognized in the laws of Manu. But Jolly, *Ueber das Indische Schuldrecht* (Sitzb. d. bairischen Akad. d. Wiss. 1877), p. 316, holds the modern practice to be identical with *acarita* in Manu, and its antiquity is further supported by a recent article of Professor Washburn Hopkins (*Journ. of the Am. Oriental Soc.*, XXI, 146 ff) in which instances are cited from Sanskrit literature of suicide by starvation undertaken for the purpose of injuring or constraining another person. On a loose form of *Dharna*, known in South India as *takāzā*, see the same article, pp. 157 ff, and compare Dr Stokes, *Revue Celtique*, VII, 249.

Usages similar to the Irish and Indian exist in other parts of the world, but no attempt will be made to deal with them here. A few references are added merely for purposes of illustration. On suicide as a mode of revenge see p. 583, below. On fasting in particular see the account of customs in Bosnia and Slavonia given by F. S. Krauss, *Smailagic Meho*, Ragun, 1885, pp. 120 ff (cited in *Mélusine*, IV, 406). A literary parallel in Old French, perhaps derived from Celtic, is found in the *Lai d'Ignaure* (see *Mélusine*, VII, 56). It is noteworthy that other tales of the same type lack the element of fasting. Compare Child, *English and Scottish Ballads*, Part IX, pp. 29 ff. Luzel (*Mélusine*, IV, 41) men-

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ing which are to be cited will throw some light, it is hoped, on the character and history of the Celtic custom. They will at least show that the principle was of much more general application than appears in the laws.

With regard to chronology, it should be explained at the outset that all the Irish materials are derived, of necessity, from documents written since the conversion. The Brehon law code, although traditionally supposed to have been drawn up in the fifth century by a commission of which St Patrick was a member, is preserved only in late manuscripts and cannot be dated with certainty.[1] The articles dealing with delayed seizure, including those on fasting, are held by M. d'Arbois de Jubainville not to belong to the older portion of the compilation.[2] On any assumption there was plenty of opportunity for Christian influence to operate upon the laws, and the evidences concerning fasting to be cited from general literature are mostly of a still later period. Indications of pagan origin, therefore, must be found, if found at all, in the character of the practices themselves, and not in the time of their record or occurrence. So little, in fact, does chronology enter into the discussion that no especial account will be taken of it in the arrangement of the material; but approximate dates will ordinarily be given for the documents cited.

The conceptions of simple religious fasting and of fasting with hostile purpose against a debtor or an enemy seem reasonably distinct, whatever their original relation. Perhaps the no-

tioned the Breton phrase *me iuno warnhan*, "I will fast on him," as a possible survival of the conception, and Professor J. D. M. Ford has suggested that there may be something similar behind Sancho Panza's use of *ayuno* (*Don Quijote*, part I, chap. xxv, near the end). The fabliau of *Guillaume au Faucon*, cited by Gaidoz in *Mélusine*, VII, 57, does not seem to be really parallel.

[1] Certain considerations in favor of the substantial truth of the tradition are urged by Professor Bury, *Life of St. Patrick*, pp. 355 ff.

[2] *Cours de Littérature Celtique*, VII, p. 220.

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tion of compulsion exercised upon the divinity has been a fundamental element in fasting and other phases of religious asceticism; and what appears to the modern Christian as a form of sacrifice and humiliation may once have been, in some of its aspects, a way of taking the kingdom of heaven as it were by violence. But with this question we are not here primarily concerned. For the ancient Irish, as for us, the two ideas seem to have been separate, although it was inevitable that, possessing both conceptions, they should sometimes have confused them. On the one hand, ordinary cases of religious fasting, conceived and described as they might be anywhere else in the literature of Christian Europe, are of the commonest occurrence in Celtic; and Irish treatises on the subject, like the so-called "Second Vision of Adamnan"[1] are unaffected by what I will call, without meaning to beg any questions, the non-Christian conception. On the other side there are cases of fasting in which heaven does not seem to be addressed or its intervention directly contemplated, but in which the proceeding, just as in the laws, is purely between man and man. With examples of this character it may be best to begin.[2]

1 *Revue celtique*, XII, 420 ff.

2 Instances which show a mixture of the two conceptions will be treated later. Some of them are decidedly ambiguous and the terms employed in the original Irish give little help toward determining their meaning. Of the four words for fasting which occur in the passages under consideration, *aine* usually means the common Christian fast, though it appears to apply to the other kind in the story of Vortigern (see p. 576, below); *treidhenus* (see the *Senadh Saighri*, p. 579, below) regularly means a three days' religious fast; *troscad* is common in both senses; and *toichned*, which is rare, also has both uses. On *toichned* see Meyer, *Voyage of Bran*, II, 294, n., and *Cain Adamnain* (*Anecdota Oxoniensia*, 1905), p. 50, and Stokes, *Revue celtique*, XXII, 42 and 434. Various prepositions are used before the name of the person fasted against. *Ar* and *for* appear in the laws, and in the non-legal texts, *ac, ar, for, fri, la* all occur without distinction of meaning. The passage *Bai Patraic ina troscadh frí Día for Loeguirí*, "Patrick was fasting toward (?) God upon Laegaire," suggests a distinction which is not elsewhere carried out. Thus in the Book of Leinster *troscud frisseomh* and *troscud foir* stand side by side and refer to the same occurrence. See Stokes, *Lives of Saints from the Book of Lismore*,

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Several instances occur in the well-known collection of topographical legends entitled the "Dindsenchas," a compilation of the Middle Irish period embodying material of various dates.[1] In the prose introduction the preservation of the stories themselves is explained by the statement that Amorgein, the poet, fasted for three days and three nights on Finntan mac Lamech (*rotroisc . . . for Finntan*) in the presence of the men of Erin and the boys and girls of Tara. Finntan, here called the son of Lamech, was believed to have survived the deluge and lived till the seventh century. He had therefore been a contemporary observer of most of Irish history and was well able to give Amorgein the information desired.[2]

Again, in the Dindsenchas of Carn Conaill, there is an instance of fasting, combined this time with the wager of battle.[3] The sons of Umor settled in Ireland and gave King Cairpre, as sureties for the performance of their services, Cet mac Magach, Ross mac Deda, Conall Cernach, and Cuchulainn. When Cairpre imposed on them an unendurable rent, they decamped to the territory of Ailill and Medb. Then Cairpre summoned the

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p. IX. The Irish phrases, except in a few cases where the original text is for the moment inaccessible to the writer, will be quoted here. But it has been necessary, for the sake of brevity, to give condensed summaries rather than full translations of the stories cited.

1 The prose portions of the "Dindsenchas" from a Rennes MS. have been published by Stokes in the *Revue celtique*, vols. XV and XVI. For the episode here cited see vol. XV, p. 27. An edition of the metrical "Dindsenchas" has been begun by Professor Edward Gwynn in the Todd Lectures Series of the Royal Irish Academy.

2 A similar procedure is mentioned in one account of the way Senchan Torpeist learned the story of the great *Tain Bó Cuailnge*. "Some say that it was made known to Senchan after he had fasted against the saints (*iar troscud fri noebu*) of the seed of Fergus, and it would not be strange if this were so." (See Windisch's edition of the *Tain*, p. LIII). Indeed the story in the "Dindsenchas" may well have been taken over from the earlier saga cycle, as is held to have been the case with many features of the Ossianic sagas.

3 *Revue celtique*, XV, 478 ff.

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hostages and demanded "their honor or their life." They repaired to Cruachan (the stronghold of Ailill and Medb) and fasted on the green (*fochraid a troscud for faichte in dunaid*). Cet's wife asked a night's respite that the sons of Umor might take counsel, and the next day Oengus came out and said his son and three of his brothers would fight on his behalf with the hostages. They fought, and the sons of Umor were killed, and the hostages took their heads to Cairpre.

In the Dindsenchas of Druim Criaich[1] there is bare mention of what appears to be a similar fast. When the three sons of Eochaid Feidlech gave battle to their father, he ordered a fast against them (*timnais . . . troscad ara macaib*) to overthrow (?) them, or to make them grant him a month's truce. But they fought him on the morrow and were completely routed.

Another case where fasting is mixed up with warfare is furnished by a modern entry in the "Annals of Ulster" (*sub anno* 1536).[2] Magrath of the Termon is there said to have fasted on the sons of Aedh Blind-Eye O'Neill (*do throsgadh air chlainn Aedha*). Those sons, and every muster they found, made a raid in consequence on Magrath, and his son was slain "in revenge for that fasting" (*a n-dighailt in troisgi sin*).

In the "Acallamh na Senorach,"[3] a Middle Irish compilation of miscellaneous tales and traditions, there is a curious story of the three sons of Lughaidh Menn. They asked their father for land, but he replied that no father had made him

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1 *Revue celtique*, XVI, 148 ff.

2 The *Annals of Ulster* have been edited by B. Macarthy in the Rolls Series. This episode was cited by Stokes in the *Academy*, Sept. 12, 1896.

3 Edited and translated by S. H. O'Grady in his *Silva Gadelica* (London, 1892) and by Stokes, *Irische Texte*, Part IV. For this passage see Stokes's edition, pp. 11 ff.

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such a gift and that they must win it for themselves. After taking counsel, they made their way to the green of the Brugh and sat down to fast upon the Tuatha Dé Danann (*troscad do dhénam re Tuatha De Danann*). Bodhbh Derg, the Dagda's son, soon came out to them and said their purpose had been revealed to the Tuatha Dé Danann. He invited them into the Brugh and offered them food; but they refused to break their fast, declaring that they had come to ask for a land and a domain. Then the Tuatha Dé Danann went into council and decided to give the sons of Lughaidh Menn wives and a domain and great gifts (mostly of a magic character). The Tuatha Dé Danann, it will be remembered, are held to have been originally mythological persons, who were explained by the Irish chroniclers as a race of early invaders and who came to be regarded as fairies in the later belief of the people. In the present story fasting seems to serve the purpose of more violent modes of attack which are found in other tales of the sacking of a *sidh* or other-world abode.

In the traditions about the Irish saints there are a number of cases in which one man fasts against another, but in some of them the ordinary Christian conception of fasting seems to have modified or even replaced the other. The following story of St Columba,[1] however, seems quite parallel to the cases that have been considered. King Aed asked Columba to obtain for him from the Lord that the Leinstermen should not triumph over him in battle. The saint replied, "That is hard for me, for my mother was one of them (i. e., of the Leinster folk); and the Leinstermen came to me to Daurmag, and instituted a fast upon me

[1] It is related in the Middle Irish *Boroma* in the *Book of Leinster*. See Stokes's edition, *Revue celtique*, XIII, 89.

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(*rofuaipretar troscud form*) . . . [They asked] that a foreign king should not take the victory from them, and I gave them that pledge."

Of the same character seems to have been the fasting mentioned in a story of St Finnen of the sixth century. It is told in the Middle Irish accounts of the transformations of Tuan mac Cairill.[1] One day Finnen and his followers came to the stronghold of a pagan warrior in Ulster, who denied them admittance. They fasted upon him (literally "at him" or "by him," *rothroiscset aci* in one manuscript, *docinet lais* in another) of a Sunday, and one version of the story says that hospitality was granted them, and Finnen and the warriors became good friends.

According to one of the glosses in the "Martyrology of Oengus,"[2] a dumb poet fasted upon the nun Moninne (*ro troisc aici*) in order to obtain speech. "And this was the first thing he said, *nin nin*. Hence the nun was called *Mo-ninne* and the poet *Ninine Eces*." Here we have to do obviously with a Christian miracle, but the fasting is conceived, not as a form of divine worship, but as a means of constraining the nun to perform the miracle.

In the "Tripartite Life of St. Patrick"[3] there is also a story of fasting which it is most natural to interpret in the same way. On the road to Midluachair, Patrick saw slaves felling a tree, and their hands were bleeding. They told him that they were not permitted by Trian, their master, to sharpen their irons and thus to lighten their labor. Patrick first blessed the irons,

[1] See H. d'Arbois de Jubainville, *Cycle mythologique*, pp. 47 ff, and Meyer, *Voyage of Bran*, II, 76 ff, 285 ff.

[2] Edited by Stokes for the Henry Bradshaw Society. See p. 167. The text of the Martyrology is Old Irish, probably of about the year 800, but the glosses are of later date.

[3] Edited by Stokes for the Rolls Series (see p. 218).

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and then went and fasted upon Trian (*troisciss fair*). The next day he departed, first casting spittle on a rock, which broke into three parts.[1] A third part of the spittle was flung a thousand paces. Patrick said: "Two-thirds of the fasting [be] upon the rock, and a third upon the king and the stronghold and the people. There shall not be a king or a prince of the race of Trian. He himself shall die and go down to bitter hell." Trian went to beat his slaves for having given a bad account of him, but his horses dragged him into the lake which bears his name (*Loch Trena*). "He will not come out till the vespers of doomsday, and it will not be for happiness even then." The purpose of the fasting is not explicitly indicated, and it might perhaps be regarded as a Christian observance of Patrick's by way of preparation for his miracle; but it can quite as easily be taken as part of the saint's direct attack upon Trian, and the language ("he fasted against him") points to this interpretation.

A similar question as to the meaning of the fasting arises in a story of Germanus and Vortigern, told in the Irish version of Nennius.[2] Germanus tried to get Vortigern to give up an incestuous relation with his own daughter. But the king fled to the mountain Vortigerman, and when the clerics surrounded him there, he took flight again to Caer Vorthigernd, his stronghold in Gunnis. Germanus and the clergy still followed him, and they fasted there three days and three nights (*robatar in aine andsin*). At the expiration of this time Vortigern was struck dead by a thunderbolt. The term used in the Irish text (*aine*)

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[1] This strange feature of the "thirds" is doubtless due to the resemblance between the common noun *trian*, "third," and the king's name.

[2] *Lebor na h-Uidre*, 4[a], printed by Hogan, Todd Lecture Series of the Royal Irish Academy, VI, p. 14.

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is applied more commonly to a regular religious fast, and the phrase "upon him," or an equivalent expression, is not used. But the situation so closely resembles that in the cases of hostile fasting, that the instance deserves consideration if only to show how easily one conception could pass into the other.

A number of other cases might be cited, especially from the stories of the saints, in which the two sorts of fasting are in some fashion confused or combined. Either an instance of fasting for distraint has been brought into close association with devotional fasting, or an incident originally of the latter type has been interpreted by the Irish in terms of fasting for distraint. The first situation is illustrated by the story[1] of Germanus and Patrick, who tried without success to put down the Pelagian heresy in Britain. Then Patrick said: "Let us fast for three days and nights upon them in the gate of the city, and if they do not yield (?), *iudicet Deus super se*." At the end of the third night the earth swallowed the city with all its inhabitants. Similarly, when St Caimmine fasted three days against Guaire (*boi oc troscud fair*) to obtain reparation for an injury, Guaire was obdurate and an angel told him that the battle of Inisceltra should go against him. Then Guaire went and knelt to St Caimmine, who promised him a later victory over his foes. Guaire said to Caimmine, "Fast with me then unto God (*fri Dia*), that he may grant my prayer."[2] A case mentioned in the

[1] See the commentary on Fiacc's Hymn in the Franciscan MS., published by Stokes and Strachan, *Thesaurus Palaeohibernicus*, II, p. 311; also earlier editions of the "Liber Hymnorum," and Stokes's *Tripartite Life*, II, 419.

[2] See the "Battle of Carn Conaill," from the *Lebor na h-Uidre*, published by Stokes in the *Zt. für celt. phil.*, III, 208 ff. For other accounts see O'Grady, *Silva Gadelica*, I, 396, and Keating's History, Irish Texts Society edition, III, 60.

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"Martyrology of Oengus," [1] on the other hand, may well be only a religious fast related in Irish terms. "A great tree there was in Rome; and the heathen worshipped it, till the Christians fasted on the saints of Europe (*ro troiscset na cristaide for naemaib na h-Eorpa*) that the tree might fall, *et statim cecidit*." With this may be compared the statement in Keating's History [2] that the Irish clergy fasted upon Targesius the Lochlannach (*do troisceadh fós leo air*), and God put him in their hands. Divine interference is still more explicitly said to have been the object of fasting in the story of King Raghallach of Connacht, whom St Fechin of Fobar rebuked for unfaithfulness to his wife. The king would not desist from his sins, and the clergy fasted upon him and prayed that he might die a vile death. The prayer was answered.[3]

In a number of instances fasting is said to have been done upon or against God himself. According to the Old Irish "Saltair na Rann," [4] when Adam, after the expulsion from Eden, was doing penance in the Jordan, he prayed the river with its many creatures to fast with him upon God (*co troisced lais for Dia*). The stream ceased flowing and gathered together all its beasts to pray for Adam's forgiveness, which God granted, though not to Adam's offspring. In the Latin "Vita Adae et Evae," from some form of which the Irish account is apparently

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[1] See Stokes's edition for the Henry Bradshaw Society, p. 108. Cf. also the case (on p. 204) where the saints fasted for Ciaran's death and obtained it. Here no one is mentioned as fasted against.

[2] Irish Texts Society edition, III, p. 176.

[3] Quoted from Keating by Dr Hyde, *Literary History of Ireland*, p. 233. See the Irish Texts Society edition, III, p. 134, where Father Dinneen translates *do throiscsiod air*, "fasted on his account."

[4] See Stoke's edition, *Anecdota Oxoniensia*, 1892, ll, 1629 ff.

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derived,[1] the river and its creatures simply condole with Adam. The fasting, which is there attributed to Adam and Eve only, may have been understood by the Irish as purely penitential, though they described it in terms of the fast for distraint. The same may be true of a case in the "Senadh Saighri" where the clergy fasted three days against or toward God (*co n-dernsat na cleirigh treidhenus fri Dia*) to obtain the dispersion of demons from the grave of Donnchadh,[2] and of a case in the legend of St Michael where the inhabitants of Sepontium fasted against God and Michael (*rothroiscset fria Dia acus Michel*) to procure aid in war against the pagan Neapolitans.[3] But the persistence of the idea of hostility or compulsion, even in cases of fasting upon God, is well shown by a tale of three clerks, which is preserved in the "Book of Leinster" and the "Book of Lismore."[4] They agreed that they would recite every day a number of psalms, prayers, or hymns, and that when any one of them should die the others would share his portion. When the first clerk died, his psalms were divided according to the agreement. But the second died soon after, and the survivor was saddled with the obligations of all three. In protest against the injustice he fasted against God,[5] and an angel came to tell him that God was angry

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1 See Wilhelm Meyer's texts and discussion in *Abhandlungen der Königl. Bayerischen Akad. der Wiss.*, XIV (1878), pp. 187 ff.

2 See the *Gaelic Journal*, IV, 108.

3 In the *Leabhar Brecc*, 222, ll. 40.

4 The Leinster version was published by Gaidoz in *Mélusine*, IV, 6, ff, and the Lismore version in Stokes's *Lives of the Saints from the Book of Lismore*, p. IX.

5 The phrase *troscud frissiomh* occurs in both MSS., and *troscud fair* in the Book of Leinster. It is interesting to note, though the fact may be of no significance, that when the angel blames the clerk for unlawful fasting, he uses a term (*troscud indligthech*) almost identical with that employed in the "Senchus Mór" when fasting is declared unlawful after a pledge of payment has been offered to the creditor. See *Ancient Laws*, I, p. 114.

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with him because of his unlawful fasting, for he should yet receive mercy.

Beside these cases of fasting upon God may be put one which makes opposite application of the same principle. In the "Voyage of the Sons of O'Corra" [1] Conall Derg says to his wife that it is a pity they have no son, and proposes that they make communion with the Devil, if perchance he will give them an heir. "Thereupon they made a fast against the Devil (*doronsad trosgadh fria demhan*), and the woman became straightway pregnant."

In some accounts of the oriental *dharna* and related customs mention is made of the obligation of counter-fasting on the part of the besieged debtor.[2] No provision of this sort appears in the Brehon laws, and there has been no suggestion of the practice in the cases thus far discussed. But a few instances which remain to be cited furnish clear evidence that it was familiar to the Irish mind, whether or not the underlying reason was the same as among the Eastern peoples.

The first of these stories seems to be somewhat confused in the form in which it has come down to us.[3] When St Patrick was fasting against King Loegaire (*ina troscad fri Dia for Loegaire*), Angus the queen held by Patrick and fasted. Loegaire

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[1] Stokes's edition, *Revue celtique*, XIV, 26.

[2] See particularly Maine, *Early Institutions*, p. 299, and Stokes's comments in the *Tripartite Life*, p. 560, n. Hopkins, op. cit. p. 157, cites a remarkable instance of counter-suicide which occurred in India in 1894. In Elphinstone's *History of India*, ed. 1843, I, 372, the counter-fasting is explained by the fact that the besieging debtor not only appeals to the creditor's honor, but also stops his supplies. Among the Irish the special development of counter-fasting may be connected with the deep-seated feeling of the people concerning the obligations of hospitality and the injury offered by refusing food at a man's house. Compare the remarks of Professor Kittredge in the *Harvard Studies and Notes in Philology and Literature*, VIII, pp. 210 ff.

[3] It is printed from MS., Rawl. B. 512 in Stokes's *Tripartite Life*, pp. 556 ff.

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went to the banquet-house to carouse, but she kept Enna, her son, with her and refused to eat while Patrick fasted. When the boy asked for food, she said, "It is not fitting for you to eat food, and Patrick a-fasting upon you." The boy answered: "It is not upon me he is fasting, but upon Loegaire." A boiled wether was brought to the boy, and the first morsel he ate stuck in his breast, and he died. At the queen's request Patrick prayed to Paul and Peter, and to Mary and the virgins, to restore the boy, but to no avail. Then the angel Victor told Patrick to pray to Michael, whose feast-day it was, and promise him the first portion of his food, and furthermore that his monks should always make the same offering on that day; and thus was established the custom of killing the Michaelmas sheep. The boy was restored to life, "and from him are all the O'Learys." [1]

Another case of counter-fasting is found in the story of King Diarmait,[2] who held Aed Guaire a prisoner at Tara. Ruadan, and Brendan of Birr, and the twelve apostles of Ireland came and fasted upon him, and he upon them. They stayed for a year before Tara, fasting every other night, while the king fasted within the city. Then Brendan the navigator induced Diarmait to release Aed in return for fifty horses, but cheated him by giving him transformed seals, which resumed their own shape in a year and a season. In anger at the deception Diarmait shut the gates of Tara on the clergy, and they resumed fasting against each other. At last Brendan told the clergy to receive meat and ale

[1] Keating (Ir. Texts Soc'y edition, III, p. 41) has the story of the miracle, with no mention of the fasting. The *Leabhar na g-Ceart*, on the other hand, refers to the fasting of Patrick on Lœghaire, and couples it with the fasting of the saints against Diarmuid as constituting the cause of the destruction of royal power at Tara. See O'Donovan's edition, p. 53.

[2] Cited from the Book of Lismore by Dr. Hyde, *Literary History of Ireland*, p. 229. For the text see O'Grady, *Silva Gadelica*, I, pp. 66 ff.

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and pass them into the bosoms of their robes. Diarmait was deceived by the trick, and supposing his foes to have eaten, he himself partook of food. Thus the fasting of the clergy prevailed, with just what effect is not made clear. But Mughain the queen had thereafter a dream of evil import, and the story ends with the cursing of Tara.

In an Irish life of Adamnan [1] there is a similar account of rival fasting, combined with other asperities, between Adamnan and Irghalach. Adamnan took to fasting all night, plunged in the cold water of the Boyne, and Irghalach endured the same hardships. But at last Adamnan got a cleric of his monastery to dress up like him and tell Irghalach that it was his intention to eat and sleep. Irghalach was deceived by the trick, and Adamnan's fasting prevailed. The unborn child of Irghalach was cursed, so that when born he lacked one eye.

Doubtless other modifications of the custom of fasting would be found by systematic investigation. But the cases which have been given exhibit the common ideas on the subject among the mediæval Irish, and the historic and legendary instances have some bearing on the interpretation of the legal procedure mentioned in the beginning. They make it hard, for example, to accept the opinion recently expressed [2] by Monsieur d'Arbois de Jubainville, that the fast was simply "une forme polie du commandement," and again, "un produit spontané du christianisme et de la feodalité." It is doubtless true, as M. d'Arbois de Jubainville maintains, that the practice described in the "Senchus Mor" did not expose the life of the creditor. But

[1] See Reeve's edition of Adanman's *Vita Columbae*, p. LIV, n; also the text published by O'Grady, *Silva Gadelica*, I, pp. 406 ff.

[2] In his commentary on the *Senchus Mor* (*Cours de Littérature celtique*, VIII, 220).

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the provision that the debtor should be liable for a fraction of the plaintiff's death-fine may fairly be held to point back to a stage where the fasting was less of a formality. Moreover, in the examples from general literature that have been discussed the fasting was certainly conceived, not as an exhibition of special courtesy, but as a procedure in some way dangerous to resist. This conception is not likely to have been of Christian origin, and those scholars appear to be right who would connect the whole custom with the practice of suicide as a means of revenge, and who assume it to have derived its sanction, in the first instance, from the fear of some supernatural punishment for murder.[1] There is no reason for assuming any direct connection between Irish and Hindu fasting, or any contact between the Druids and the Brahmins; and M. d'Arbois de Jubainville is doubtless right in denying that the customs go back to a common Indo-European legal institution.[2] But it remains probable, after all, that they are both very ancient and had their origin in the same general conceptions. These may well have been Indo-European, though they were not confined to any single branch of the human family.

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1 For this view see particularly Maine, in the places already cited; also Gaidoz, in *Mélusine*, IV, 10, and P. W. Joyce, *Social History*, I, pp. 206-7. Hopkins's article gives considerable illustration from oriental sources. A possible Irish instance of this kind of suicide, not involving fasting, is discussed by Stokes, *Lives of the Saints from the Book of Lismore*, p. 295. For the discussion of an interesting parallel in Greek see F. Lot, *Annales de Bretagne*, XI, 361.

2 Op. cit., VIII, 222.

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DUSARES

BY

C. H. TOY

MANY Arabian deities are known to us by name, but of most of them little is known besides the name; in only a few cases are there descriptions of qualities and functions. The majority of these gods appear to be local divine patrons, like the Canaanite Baals, each supreme and all-sufficient in his own domain; some, however, have had a larger rôle, their fame passed beyond Arabia [1] into the Græco-Roman world, and their characters are more fully developed.

Certain deities of Mecca, the chief cultic center of northern Arabia in pre-Mohammedan times, are mentioned in the Koran. The most important of these are the three goddesses Allāt or Al-Lāt ("the goddess"), Al-Uzza ("the mighty one"), and Manāt (apparently "the disposer, dispenser").[2] There were other centers of worship besides Mecca, some of them of great influence. The shrine of the god Dhu'l Halasa, in the borderland between Hijaj and Mecca, was sometimes called the Yemenite Kaaba, was a sort of rival, that is, of the Meccan shrine. Of the deities of the southern shrine the most interesting, because of

[1] The name "Arabia" includes not only the peninsula proper, but also the desert running up to the Euphrates.

[2] *Koran*, li. 19. They are called "daughters of Allah," a term that Mohammed takes in a literal sense; but probably the original meaning was that they belonged to the divine circle, as the Hebrew expressions "sons of God" and "sons of the prophets" describe persons who were members respectively of the divine court and the prophetic guilds.

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the large area over which his worship extended, is Dhu ash-Sharā, the "Dusares" of the Greeks. His supposed connection with a certain goddess has raised a question of general interest for the history of Semitic religious cults, and it is this question that I propose to examine here, prefixing a brief statement of the history of the god, and of his cult so far as it is known.

I. THE CULT AND THE NAME

The ancient notices of Dusares have been collected and discussed by a succession of writers, particularly by Zoega ("De orig. et usu obeliscorum", p. 205), who is followed by Movers ("Phœnizien", i. 337 ff.); Osiander (in "Zeitschr. d. deutsch. morgenl. Gesellschaft," vii. 477); Levy (in "ZDMG," xiv. 464 ff.); Mordtmann (in "ZDMG," xxix. 99 ff.); Wellhausen (in "Reste arab. Heidentumes", on which see Nöldeke's review in "ZDMG," xii. 707 ff.); Ed. Meyer (art. "Dusares," in Roscher's "Lex. d. Griech. u. Röm. Myth."); Nöldeke (in art. "Arabs (Ancient)" in Hastings's "Encyclopædia of Religion and Ethics").

These notices show that the worship of the god prevailed in a large part of western Asia. The details may be summarized as follows:[1] Dusares is said to be the special deity of Arabia by Tertullian (circa A.D. 200) in his "Apologeticus," 24, and his "Ad Nationes," ii. 8; and this statement is repeated by Eusebius in his Oration in praise of Constantine (A.D. 335). For central and northern Arabia we have the statements of a couple of Arabic writers: Ibn Hisham (d. 834), reporting the words of an earlier writer, Ibn Isḥak (d. 768),

[1] The supposed allusion to Dusares in Herodotus is referred to below, p. 598.

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mentions the Daus tribe, whose abode was a few days' journey south of Mecca, and Ibn al-Kalbi (d. 819) the Harith tribe, as addicted to this worship. For the Sinaitic peninsula there is the testimony of an inscription published by Levy in "ZDMG," xiv. 464 ff. Here and in the home of the Daus tribe occurs the proper name Abd. dhu ash-sharā ("servant of D."), which is an evidence of the popular worship of the god. The Nabatean region is rich in records of Dusares, mostly in the form of inscriptions.[1] These are given in Euting's "Nabat. Inschr. aus Arabien," Nos. 2-4, 9, 11b, 20, 27; De Vogüé's "Syrie Centr," Nos. 7a, 9; Waddington's "Inscr. gr. et lat. de la Syrie," Nos. 2023, 2312. Waddington refers also to Saulcy, "Musée Parent," 1867, p. 11. Among the places in connection with which the Dusares cult is mentioned in these inscriptions are Petra, Batanea, Bostra, Adraa, Umm al-Jamal, and Saida; and Epiphanius adds the name of Elusa, a place not far from Petra. Notices of Dusares are found also in the dictionaries of Hesychius, Stephen of Byzantium, and Suidas, which add some details of interest.

The Dusares cult seems, thus, to have been practised over the Arabian region extending from the northern border of Yemen to the extremity of the desert on the north and east. What gave it its vogue is not perfectly clear; but as the name is Arabic, and as the cult prevailed chiefly among the Nabateans, we may conclude that these people carried it with them in their wanderings. It is probable that they were familiar with it in

[1] The Nabateans were an Arabian people who moved northward and got possession of a great part of the territory between the Red Sea, Syria, and the Euphrates. The remains of their capital, Petra, exhibit signs of a relatively advanced civilization. When they settled in an Aramaic-speaking region, they wrote inscriptions in that language. Many of their inscriptions, however, are in Greek, and there is one in Latin.

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their southern home, that Dusares was, in fact, their special god, the god of their region. There were other Arabian deities whose worship was widely extended, particularly Al-Uzza and Al-Lāt. Lively intercourse existed between the various Arabian tribes; and a partial unity of religious belief had arisen in the early centuries of our era, as appears, among other things, from the fact that in Mohammed's time the name Allah (which is simply al-ilahu, "the god," that is, the local god of any region) was readily accepted generally as the name of the supreme deity. The Greeks and Romans of the early centuries were especially acquainted with the region occupied by the Nabateans, and it was therefore natural for Tertullian and others to speak of the Nabatean deity as the god of Arabia.

The general signification of the name "Dusares" may be fixed with substantial certainty, but the precise meaning is doubtful. The older etymologies, many of which are mentioned by Zoega, may be passed over as untenable. The prefix *dhu* (which is the demonstrative pronoun "that," and so "he") always points to a person who is connected in some way with the thing represented by the following word, which is always a concrete substantive.[1] The *dhu* thus often has the meaning "possessor, lord," and is employed in divine titles in the same way as the Canaanite *baal*. Such titles, frequent in Semitic theology, indicate the local character of the divinities to which they belong. The fact that, according to Arabic usage, the second element in a name compounded with *dhu* must be concrete, excludes the sense "brightness" in this connection. If *sharā* could be shown

[1] See the examples given in Lane's *Arab.-Eng. Lexicon.* In the Koran occur *dhu an-nun*, "he of the fish" (Jonah), *dhu al-Karnain*, "he of the two horns" (Alexander the Great), and other such titles.

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to mean "lightning" or "sun," then "Dusares" might be "the master of lightning," or "the lord of the sun," like the Phœnician *Baal-hamman*, the sun-god ("lord of the sun");[1] but neither of these senses has been proved for *sharā*.[2] Arabic usage favors the view that it is the name of a place or of a tribe, and, as no such name of a tribe is known,[3] the probability is that it is the name of a place. It occurs in fact in the sense of a "tract of land," and in connection with several localities: a place on the road from Mecca to Syria infested by lions, mentioned by Ad-Damiri in his work on animals;[4] a mountain near Mecca; and a swampy region in the neighborhood of the Euphrates. It is probable that other places were so called, and in the absence of distinct statements by early writers it is hardly possible to fix with certainty the region from which the god received his name. Wellhausen decides for the Euphrates tract on the ground that such wild and fruitful spots, held to be inhabited by Jinn, were regarded as sacred by the old Arabs, and were natural sites for shrines;[5] but there were shrines in many other places.[6] The site of a shrine was determined by various sorts of theophanies and by other conditions and events of which notices have not come down to us. All that can be said is that the cult of Dusares

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1 Cf. the Sabean *dhu samawi*, "the lord of heaven," the sky-god.

2 W. R. Smith's argument for "god of lightning" as the meaning of "Dusares" (in his *Kinship*, note 8) is not convincing. On the later interpretation of Dusares as sun-god see below, p. 590.

3 Ed. Meyer, in Roscher's *Lexikon*, s.v. "Dusares," mentions a suggestion made to him that *sharā* (in Arabic, *sharay*) is formally identical with the biblical *Sarai;* but this fact does not throw any light on the signification of the Arabic title, since the origin of the name *Sarai* is obscure.

4 *Hayat al-hayawan*, s.v. *Asad* ("the lion").

5 *Reste arabischen heidentumes*, p. 47. See the references in this work and in Lane's *Arabic Lexicon.*

6 The shrine of Dusares in the tribe of Daus was at the foot of a mountain.

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prevailed over the region extending from the northern border of Yemen through the desert up into Syria. Its diffusion in the north appears to have been due to the Nabateans; but the early history of this tribe is obscure. We do not know its original seat,[1] or how it came to adopt the worship of this deity. It may be regarded as certain that Dusares was originally a local god, invested with all the powers usually ascribed to Semitic local gods by their worshippers — not limited in functions, not attached particularly to any power or object of nature, but capable of doing everything that a divine patron might be expected to do. He is named from the region that he controlled, he was simply the lord of the Shara. It is not known whether he had any other name — a name derived, for example (as is the case with some Greek deities), from his connection with earth or sky, or with some occupation of his people. Many Semitic gods were known only by their titles as lords of certain places; such are the numerous Phœnician and Canaanite Baals and Meleks. The chief god of Tyre was called simply Melkart, "the king of the city."

Only meager notices of the cult of Dusares have come down to us. According to Suidas, he was represented at Petra by a four-square block of stone, on which the sacrificial blood was poured. This is probable, but the fact is not distinctive — many gods were thus represented and worshipped.[2] In the territory of the Daus tribe there was a *hima* (a temenos) dedicated to him, and in it a pool of water, in which probably worshippers

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1 Strabo (xvi, 4, 26) speaks of them as dwelling in Arabia-Felix, and everything points to this general region as their home; but what precise point they occupied is not clear.

2 W. R. Smith, *Religion of the Semites*, p. 201 ff., 301.

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performed a ceremonial bathing.[1] The details of the ceremony are not recorded, but doubtless some notion of purification was involved in it.

In the course of time Dusares suffered a certain transformation. In the Arabian peninsula he was the god of nomadic tribes, and his functions corresponded to their needs. When the Nabateans, taking him with them, occupied the wine-growing region of the Hauran, he, as tribal god, became a patron of the vine. The architectural ornaments of the district show that the culture of the vine was a prominent feature in the life of the people.[2] Coins of the region indicate the existence of some sort of festival connected with the worship of the god.[3] It was natural, therefore, that the Greeks should identify him with their god of the vine, Dionysos,[4] and the Nabateans themselves, living in a Greek atmosphere, may possibly have so called him. But there is no proof that he had any other point of contact with Dionysos than patronage of the vine and the festivals therewith connected. Strabo (xvi., 4, 26), writing near the beginning of our era, observes that the Nabateans worshipped the sun with libations and the use of frankincense, whence it has been inferred by some modern writers that Dusares was a sun-god. This, however, by no means follows. The worship of the sun may have been a distinct and independent cult. Such a distinct cult there was in Arabia, and there is nothing to connect Dusares with it particularly.[5] Still less can it be maintained that he represents

1 Ibn Hisham, 253.

2 Waddington, *Inscriptions*, No. 2023.

3 Eckhel, *Doct. numm.* 3, 178, 499.

4 Hesychius cites a certain Isidore as saying that the Nabateans call Dionysos Dusares.

5 See further below, p. 594.

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"the life of nature which in winter is born anew and manifests itself especially in the sun."[1] Such a conception is not Arabian, and there is no proof that Græco-Roman influence had expanded the figure of Dusares into these proportions.

The evidence at our command leads us to conclude that Dusares was and remained, up to the time when he was effaced by Islam, a tribal god, originally a local divine chief, who, after the manner of all ancient deities, the Semitic particularly, accommodated himself to the changing fortunes of his worshippers, sometimes assuming a new function, but never rising to the height of the great universal Assyrian, Babylonian, Hebrew, and Græco-Roman gods. His career is instructive as showing how a local Semitic deity could maintain substantially his early character in the midst of foreign influences.

II. DUSARES AT PETRA

A notice of Dusares by Epiphanius, Bishop of Constantia in Cyprus (fourth century), in his *Panarion* ("Refutation of Heresies"),[2] has given rise to a question of interest for the history of Semitic religion in Arabia and Syria. Epiphanius is defending the church doctrine of the virgin birth of Jesus, and remarks that many leaders in idolatrous cults, compelled to confess a part of the truth, have tried to deceive their followers by instituting festivals on the night of the Epiphany. He mentions the festival held in Alexandria in the Korion (that is, the temenos of the Kore, the Divine Maid), in which, he says, an image marked with the sign of the cross was carried in solemn proces-

[1] So Ed. Meyer, in Roscher's *Lexikon*, art. "Dusares."

[2] Published by Œhler as addendum in his *Corpus Hereticorum*, II, i. 632, and reproduced by Mordtmann in *ZDMG*, xxix, 99 ff.

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sion on that night, and the ministrants, being asked the meaning of this, replied that on this night the Kore (that is, the Parthenos) bore the Aion. He goes on to say, "The same thing occurs in the idol temple of the city Petra (the metropolis of Arabia, called Edom in the Scriptures). They sing hymns in the Arabic language to the virgin, calling her in Arabic *Chaabou*, that is, Kore or Parthenos, and to her son, Dusares, that is, the only-begotten of the Lord. The same custom exists in Elusa on the same night as in Petra and Alexandria."

Epiphanius lived for some time in Egypt, and, though his desire to find confirmations of his dogma may detract from the value of his reports in certain respects, there is no good reason to doubt that his account of what happened in Alexandria is correct so far as regards the fact of the ceremony. It was a procession in honor, probably, of Isis and Horus — divine mother and divine child.[1] What he calls the sign of the cross was doubtless the Egyptian *ankh* (a tau-cross surmounted by a handle in the form of a stirrup, the *crux ansata*), the symbol of life and divinity. The title *Kore* (which he interprets as identical in meaning with *parthenos*) is in Greek the name of the goddess Persephone (originally the maid-spirit of the corn), but seems not to have been used, in Egypt, of Isis or any similar deity. It was, apparently, under the influence of Greek conceptions that Epiphanius employed it of the goddess of the Alexandrian ceremony. The term *aion* appears in Valentinian Gnosticism as the

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[1] The public cult of Isis continued in Egypt after the establishment of Christianity as the official religion of the Empire — it was not suppressed till the end of the fourth century. See Roscher's *Lexikon*, art. "Isis," cols. 371, 425. This article gives also the literature on the relation between the Egyptian cult and that of the Madonna. Erman, in his *Egyptian Religion*, does not mention a midwinter festival of Isis. It was, perhaps, a lesser ceremony that Epiphanius witnessed.

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designation of a quasi-divine figure; whether Epiphanius had in mind an etymology of the name Horus or some other name is uncertain. His account, though in the main trustworthy, is colored by irrelevant preconceptions. The same remark applies to his description of the ceremony at Petra. As a native of the Palestinian city Eleutheropolis, which is not far from Petra, he had opportunity to observe or to learn of the religious rites of the latter place; and his statement may be accepted in general, though the precise meaning of his words is not clear. His *Chaabou* is generally taken to be the Arabic *Ka'aba*[1] (with nominative ending, *Ka'abu*), a term (literally "cube") that is used both of a stone block and of a temple; but a slightly different word (from the same stem), *Ka'āba*, is an epithet of a girl just maturing (with fully-formed breasts), though not necessarily a virgin, and it was apparently this word that Epiphanius had in mind. But the term used in Petra must have referred to a stone block, the representation of some deity: he appears to have adopted the meaning that suited his argument. As Dusares, according to Suidas, was worshipped at Petra under the form of a cube of stone, the probability is, that it was he who was connected with the term *Ka'aba*. What then of the goddess mentioned by Epiphanius as the mother of Dusares? One suggestion is that he gives the name of the god to his mother;[2] but this cannot be said to be probable. Or is Dusares, like Mithra, held to be born from a rock?[3] An influence of Mithraism here is by no means impossible;[4] for though, according to Cumont (art.

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1 So Rösch, W. R. Smith, Wellhausen, Ed. Meyer, and others.

2 So Rösch, in *ZDMG*, xxxviii, 643 ff.

3 The Mithra stone is often found with the inscription *petræ genetrici*.

4 Cf. Wellhausen, *Reste Arab. Heidentumes*, p. 46.

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Mithra in Roscher's "Lexikon"), no Mithra inscriptions have been found in Syria, the cult of Mithra was established in the Mediterranean islands and in Sidon and Alexandria, and Epiphanius, living in Cyprus, may have been familiar with the myth, and may have applied it here. The divine stone would then be regarded as the mother of the god. A simpler and perhaps more natural explanation is that Epiphanius, hearing of two deities, a male and a female (the latter possibly bearing the title "mother"), and having in mind the cult of Isis and similar cults, naturally assumed that the one deity was the son of the other. Of his statement that Dusares was "the only-begotten of the Lord," it is difficult to find a satisfactory explanation. It may be the arbitrary transference to the Petra god of a title of the Christ, of whom he held Dusares to be a Pagan imitation. It is not likely that it was an epithet of Dusares current in Petra. There is no evidence of the existence of such an epithet, and a title of this character would be unexampled elsewhere in Arabia. Nor is it probable that it is the product of a fanciful etymology of the name Dusares invented by Epiphanius himself. He is said, indeed, to have been linguistically learned. Jerome calls him "pentaglot," says that he was acquainted with Hebrew, Syriac, Egyptian, Greek, and Latin; but none of these languages supplies the desired explanation; and the expression *monogenes*, familiar to a Greek, seems not to be used of a divine person except in Christian literature.

The fact that the festival at Petra was held at the winter solstice is supposed by some to point to the worship of Dusares as sun-god.[1] This is not necessarily the case. Midwinter festi-

[1] Cf. the statement of Strabo quoted above, p. 590.

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vals arose in many parts of the world in connection with the death of vegetation, independently of the cult of a sun-god; they were naturally associated with the worship of the local deity. Dusares, as (apparently) the chief god of the Nabateans, would occupy a place of honor in all festivals, while maintaining his character as tribal god. The universality of his functions as tribal patron accounts satisfactorily for all that is attributed to him. Greek writers like Strabo and Hesychius naturally identified him with Greek deities; but this sort of procedure has no historical validity, and often serves only to obscure the real character of non-Hellenic divinities.

A more important question connected with the Petra ceremony is whether it indicates the existence among the Nabateans of a cult of mother and son, and, if so, whether the cult is originally Semitic. The conception of a great mother-goddess is a widespread one; it goes back to the recognition of the earth as the divine source of life.[1] Several Semitic deities have the title "mother of the gods," or "great mother," the Babylonian Ishtar, the Carthaginian Tanit, and the Arabian Al-Lāt;[2] but this rôle never assumed in Semitic cults the importance attached to it in the figures of the Phrygian Kybele and the Greek Demeter. Ishtar is the kindly mother of men, but becomes a great protecting deity, and particularly a patron of war; and of a general maternal rôle of Tanit and Al-Lāt we have no details. The conception seems not to have commended itself greatly to the Semitic peoples.

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[1] Examples from various peoples are given in Tylor's *Primitive Culture*, i. 326 ff.

[2] Jastrow, *Religion of Babylonia and Assyria*, p. 83; *Corp. Inscript. Semit*, No. 195; De Vogüé, *Nab.* 8.

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As, however, some Semitic goddesses have the title "mother," it is conceivable that a son should stand by the side of the mother, and that the two should be united in one cult. Such a collocation is found outside of the Semitic field, the best example of combination being in Egypt, where Isis and Horus frequently appear together, the latter generally as an infant in arms.[1] The Phrygian Attis, though sometimes represented as son of Kybele, is specifically her lover. Dionysos is the son of Semele, but Semele plays no part in the worship of her son. In Semitic cults combinations of deities are generally loose and ineffective. Married pairs hardly occur outside of Babylonia and Assyria, and are there rather formal academic associations than family unions. Ishtar is in the old epic poetry an unmarried goddess who takes her partners at will; Tammuz is her lover or husband, not her son; and so, in the Syrian form of this cult, Adonis is the beloved of Aphrodite (that is, Astarte), not her son. In the whole Semitic area outside of Arabia, we do not find an instance of the worship of a mother-goddess and her son. It is held, however, by some scholars, that the ceremony at Petra involves the existence of such worship. Such is the view of W. Robertson Smith,[2] whose argument in outline is as follows:

The goddess of Petra must have been Al-Lat, who is styled among the Nabateans "the mother of the gods"; and as she is represented by Epiphanius as *parthenos*, that is, unmarried, a male deity associated with her could only be her son. Jerome's description of the cult at Elusa[3] (said by Epiphanius to be identical with that at Petra) is not opposed to this conclusion. He says that Venus was there worshipped *ob Luciferum*: the Arabian goddess usually identi-

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1 The figures of Mut, the "mother," and her son Khons, seem to have no cultic significance.

2 Given in his *Kinship and Marriage in Early Arabia*, chap. vi, note 8.

3 In his *Vita Sancti Hilarionis*, cap. 25.

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fied with Venus is Al-Uzza (the "Venus" of Elusa was in fact the goddess Al-Khalasa,[1] but the difference of name is of no importance). "Al-Uzza," the "mighty goddess," must be the highest title of a female deity, and the goddess so named cannot be different from the mother of the gods. Now, it appears from Ephrem's description of her that her worship was licentious,[2] and therefore a single male god associated with her must be her son. As to Jerome's "Lucifer," he should be Dusares, since, according to Epiphanius, the Elusa cult was identical with that of Petra. The term appears as a title of Azizus,[3] that is, Aziz (the male counterpart of Al-Uzza), who was worshipped at Edessa in the time of Julian, and in various Dacian inscriptions has the titles *bonus puer posphorus* (sic) *Apollo Pythius*: as Phosphorus he is Lucifer; as Puer he is the Dusares of Epiphanius; as Apollo he is the Arabian archer-god Kozah, an Idumean deity.[4] Dhu ash- Shara is most easily taken as meaning the "lightning god," and thus seems to be only an epithet of Kozah.

In all these details, apart from the statement of Epiphanius, there is nothing to show the existence of an Arabian cult of mother and son. So far as Jerome's notice of the worship at Elusa is concerned, the enigmatical expression *ob Luciferum* at any rate does not convey the impression that the god was subordinate to the goddess; if there had been a relation of son to mother, Jerome would probably have mentioned it.[5] Smith refers to certain cases of collocation of two deities in various

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1 Tuch, in *ZDMG*, iii, 193 ff. [It is not probable that Al-Khalasa is the name of a goddess. The god worshipped at Tabala was styled Dhu al- khalasa, a name that Smith improperly renders "son of al-Khalasa." It means "lord of al-Kh"; but the signification of the latter term is doubtful.]

2 Ephrem Syrus, *Op. Syr.*, ii, 457; cf. Isaac Antioch., i, 246.

3 In *ZDMG*, xxxii, 565.

4 Josephus, *Antiquities*, xv, 7, 9.

5 As Al-Uzza was commonly identified with Venus, who represented the morning-star, and as Lucifer also was a name of this star (cf. Isa. xiv, 12), a simple construction of Jerome's words would be that the goddess was worshipped because of her identification with the god of the morning-star, Lucifer. The difference of gender is not important. Jerome's purpose apparently was simply to point out the relation between two deities, and in Latin "Lucifer" is a name for the planet Venus as morning-star.

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places. Thus Herodotus (iii. 8), speaking of the Arabians, says, "They acknowledge as gods only Dionysos and Urania . . . . they call Dionysos Orotal and Urania Alilat." Alilat is doubtless Al-Lāt, "the divine being," naturally rendered by Herodotus "the heavenly one." The name "Orotal" has hitherto defied all attempts at explanation. It may represent Hobal, or Dusares, or some other great god;[1] but Herodotus does not say that the relation between the two deities was that of son and mother, or that their cults were connected with each other. So as to Hobal and Al-Uzza, the chief god of the Koreish in the Meccan temple — they are never spoken of by native or other ancient authorities as forming a cultic pair. The notices of Al-Wathanain, "the two idols," as the rendering of Alush (Num. xxxiii. 13) in the Arabic version published by Lagarde, and of Al-Sanamain, "the two images," Tuche and Zeus (in ZDMG xxxix. 44), are so vague that no conclusion as to the cults they represent can be drawn from them. In a polytheistic system the worship of two divinities in the same place and in the same temple cannot be surprising; but such collocation in itself proves nothing as to the relation between the two.

As is remarked above (p. 588), there is no ground for regarding Dusares as specifically a lightning-god, and more generally, if he held arrows in his hand and gave lots by them, this is not a distinctive function. Hobal at Mecca and Dhu'l-Halasa at Tabāla gave oracular responses in this way, and probably the method was general; the use of arrows for drawing lots was

[1] Hobal and Al-Lāt may have been prominent at Mecca in the fifth century B.C. Later, as we have seen (p. 590, above), Dusares was identified by the Greeks with Dionysos, but there is no sign that in the time of Herodotus an intimate cultic relation existed between Dionysos and Harmonia — she was then associated with Kadmos as his wife (Euripides, *Bacchæ*, 1356).

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common among the Arabs, for example, in determining the share of a slain camel that each man was to have.[1]

From this review of the evidence we are justified in concluding that, outside of the statement of Epiphanius, there is no known record of any Semitic cult of mother and son. The licentious feasts of the Edomites referred to by Bar-Hebræus (in his commentary on Ps. xii. 9), if they have any connection with Petra, could only be like the similar ceremonies in Syria and elsewhere, a feature in a cult of a goddess and her lover. The Petra festival might be regarded as an importation from a non-Semitic community, and Egypt would then be naturally thought of. The Egyptian cult related to a goddess and her infant son, but Epiphanius does not say that Dusares was an infant, though perhaps he leaves this to be inferred from his statement that the Petra ceremony was identical with that of Alexandria.[2] A Mithraic or Greek influence is conceivable, and such a one (though there is no direct evidence of its existence) may be supposed to have affected the cult at Petra.

Perhaps, however, there was no such influence, and in that case it is supposable that Epiphanius's evident disposition to find parallels to the Christian cult of mother and son, as it existed in his time and place, may have led him to read into an Arabian ceremony what it did not properly contain. Knowing of the worship of two deities, a male and a female, at Petra and Elusa, he might naturally take it to be identical with that at Alexandria;

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1 One such procedure is described in the Commentary on v. 22 of the Moallakat of Imru'l-Kais.

2 Wellhausen (*Reste Arab. Heidentumes*, pp. 46 ff.) properly remarks that no Semite ever thought of his god as a child. Semitic deities are masterful patrons and rulers; the epithets applied to them usually signify lordship.

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and, understanding the term *Ka'aba* to mean "virgin," his theological view would force him to regard Dusares as the son of the virgin goddess. In fact, Al-Lāt and Al-Uzza are unmarried, but neither of them appears in Arabic authors as having a son.

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FRANCES H. MEAD [1]

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[2] In 1856 Professor Putnam was appointed Curator of Ornithology in the Essex Institute. His annual reports are incorporated in the Proceedings of the Institute, 1856-1864. In 1864 he became Curator of Vertebrata, and in 1866 was appointed Superintendent of the Museum (see No. 40).

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29. Remarks before the Essex Institute, 1864-65. (*Ibid.*, ix-xi, xix, lii, lv, lx, lxxiv-lxxv, lxxix, cxxxvi, cliv, clix, clxii-clxiii, clxxx.)
30. On the death of Dr. R. H. Wheatland, 1864. (*Proceedings Boston Society of Natural History*, X, 1-2.)
31. On assumption of male plumage by a Pea-hen, 1864. (*Ibid.*, 25.)
32. On the fish fauna of the Great Lakes, 1864-65. (*Ibid.*, 64, 65, 240.)

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33. Remarks on ichthyology, 1864-65. (*Ibid.*, 68, 181, 211.)
34. Annual Report of Curator of Ichthyology, 1865. (*Ibid.*, 132-134.)
35. On Indian grave on Winter island, Salem, 1865. (*Ibid.*, 246-247.)
36. On reproduction of lost parts in reptiles. (*Ibid.*, 278.)
37. Annual Report of the Curator of Ichthyology. (*Ibid.*, 372-373.)

1867

38. Appendix to D. H. Storer's *A History of Fishes of Massachusetts.* (*Memoirs American Academy of Arts and Sciences*, Cambridge and Boston, IX, 278-280.)

1868

39. Remarks before the Essex Institute, 1866-67. (*Proceedings Essex Institute*, Salem, V, 1, 4, 15-17, 59, 63, 67, 82, 107, 109, 119, 120, 134, 154, 163, 172.)
40. Report of Superintendent of Museum of Essex Institute, 1866. (*Ibid.*, 28-33.)
41. Resolution passed by the Essex Institute on gift of $140,000 from George Peabody for the promotion of science and useful knowledge in the County of Essex, 1867. (*Ibid.*, 116.)
42. Report of Superintendent of Museum of Essex Institute, 1867. (*Ibid.*, 138-139.)
43. Resolution passed by the Essex Institute extending thanks to Louis Agassiz for successful efforts in the passage of law enabling scientific societies to obtain alcohol free of excise tax, 1867. (*Ibid.*, 140.)
44. On Indian remains in Essex county, 1867. (*Ibid.*, 186, 197-199.)
45. New England Reptiles in April, 1867. (*American Naturalist*, Salem, I, 107-108.)
46. Annual Report of Curator of Ichthyology, 1867. (*Proceedings Boston Society of Natural History*, XI, 172-173.)

1869

47. Remarks before the Essex Institute, 1868. (*Proceedings Essex Institute,* Salem, VI, 6, 25, 26, 39, 45, 50.)
48. Report of Superintendent of Museum of Essex Institute, 1868. (*Ibid.*, 20-21.)
49. On shellheaps, and on certain archæological specimens, 1868. (*Ibid.*, 31.)
50. Resolution passed by Essex Institute on the death of Horace Mann, 1868. (*Ibid.*, 54-55.)
51. On the McNeil collection from Central America, 1868. (*Ibid.*, 56.)
52. Annual Report of the Curator of Ichthyology, 1868. (*Proceedings Boston Society of Natural History*, XII, 17.)
53. On aboriginal utensils from Nicaragua, 1868. (*Ibid.*, 218.)
54. The McNeil expedition to Central America, 1868. (*American Naturalist*, Salem, II, 484-486, 612-613.)

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55. Do snakes swallow their young? 1868. (*Ibid.*, 133-143.)
56. Resolution offered at a meeting of the Essex Institute on the donation of $140,000 to found the Peabody Academy of Science, 1868. (*Ibid.*, 680.)
57. Report of Director of the Museum of the Peabody Academy of Science. (*First Annual Report Peabody Academy of Science*, Salem, 40-52. 3 diagrams).

1870

58. Notice of the Eighteenth Meeting of the American Association Advancement of Science held in Salem, 1869. (*American Naturalist*, Salem, III, 223.)
59. Skates' eggs and young, 1869. (*Ibid.*, 617-630, 12 ill.)
60. Two rare specimens of Indian carving wrought from steatite, 1869. (*Bulletin Essex Institute*, Salem, I, 21, 1 ill.)
61. On monstrosities in Trout, 1869. (*Ibid.*, 31-32.)
62. Remarks before Essex Institute, 1869. (*Ibid.*, 50, 52, 99, 102-103, 139.)
63. Annual Report Superintendent of Museum, Essex Institute, 1869. (*Ibid.*, 83-84.)
64. Remarks on stone and copper implements from Wakefield, 1869. (*Ibid.*, 90.)
65. On shellheaps in Essex county, Massachusetts, 1869. (*Ibid.*, 123.)
66. On skulls of several species of Bears, and a molar tooth of a Bear found in a shellheap on Goose island, Massachusetts, 1869. (*Ibid.*, 138.)

1871

67. Acceptance of appointment as Director of Museum, Peabody Academy of Science, at time of dedication of the Academy, August 18, 1869. (*Second Annual Report Peabody Academy of Science*, Salem, 5-6.)
68. Report of Director of Museum Peabody Academy of Science, 1869. (*Ibid.*, 53-60.)
69. Report of Director of Museum Peabody Academy of Science, 1870. (*Third Annual Report of Peabody Academy of Science*, Salem, 71-76.)
70. On the great mound in St. Louis, 1870. (*American Naturalist*, Salem, IV, 62-63.)
71. On the young of *Orthagoriscus mola*, 1870. (*Ibid.*, 629-633. 4 ill.)
72. Note on American Panther, 1870. (*Ibid.*, 692.)
73. Note on Deer's horns, 1870. (*Ibid.*, 762-763.)
74. Note on E. D. Cope's Classification of Fishes, 1870. (*Ibid.*, V, 593.)
75. Formation of the Mammoth Cave. (*Ibid.*, 739-744. Reprinted in *The Mammoth Cave and Its Inhabitants*, by A. S. Packard and F. W. Putnam, Salem, 1879.)
76. Remarks before the Essex Institute, 1870. (*Bulletin Essex Institute*, Salem, II, 48, 164.)

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77. Annual Report of Superintendent Museum of Essex Institute, 1870. (*Ibid.*, 73-74.)

78. Report on various zoological specimens collected from Chadwick's pond, 1870. (*Ibid.*, 90-93.)

79. On the structure of Fishes, 1870. (*Ibid.*, 110-111.)

80. On Indian stone implements, 1870. (*Ibid.*, 161.)

81. On the Mt. Washington Meteorological Station, 1870. (*Ibid.*, 164.)

82. Note on *Hemiramphus* from Danvers mill-pond, 1870. (*Ibid.*, 171.)

83. Note on abnormal growth of incisor teeth of the Woodchuck, 1870. (*Ibid.*, 172.)

84. On the occurrence of *Euleptorhamphus longirostris* on the coast of Massachusetts, 1870. (*Proceedings Boston Society of Natural History*, XIII, 236-240.)

85. Note on the *Pimelodus cyclopum* of Humboldt. (*American Naturalist*, Boston, V, 694-697.)

1872

86. Remarks on Turtles, 1870. (*Proceedings Boston Society of Natural History*, XIV, 17-18.)

87. Resolutions of sympathy and aid offered to Chicago Academy of Sciences at time of Chicago fire, 1871. (*Ibid.*, 386-387.)

88. Remarks before the Essex Institute, 1871. (*Bulletin Essex Institute*, Salem, III, 29, 75, 88.)

89. The new Australian fish, 1871. (*Ibid.*, 40-41.)

90. Annual Report of Superintendent of Museum, Essex Institute, 1871. (*Ibid.*, 65-66.)

91. Fishes in Wenham lake, 1871. (*Ibid.*, 88-90.)

92. Indian relics from Beverly, 1871. (*Ibid.*, 123-125. Two plates afterward published, *ibid.*, XXVII, opposite p. 89, Salem, 1897.)

93. Resolutions of sympathy and aid offered the Chicago Academy of Science at time of Chicago fire, 1871. (*Ibid.*, III, 136-138.)

94. Ancient fortification on the Wabash river, 1871. (*Ibid.*, 148-155. 3 ill.)

95. Blind Fishes of Mammoth Cave and their allies, 1871. (*Ibid.*, 165-178. Reprinted in *The Mammoth Cave and its Inhabitants*, by A. S. Packard and F. W. Putnam, Salem, 1879.)

96. Report of Director of Museum, Peabody Academy of Science, 1871. (*Fourth Annual Report Peabody Academy of Science*, Salem, 7-13.)

97. Synopsis of the family *Heteropygii*, 1871. (*Ibid.*, 15-23.)

98. Blind Fishes of Mammoth Cave and their allies. (*American Naturalist*, Salem, VI, 6-30, 2 pl., 2 fig. Reprinted in *The Mammoth Cave and its Inhabitants*, by A. S. Packard and F. W. Putnam, Salem, 1879.)

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99. The Etheostomoids. (*American Naturalist*, Salem, VI, 109-115. 5 ill.)

100. Young of the Blind Fish. (*Ibid.*, 116-117. Reprinted in *Mammoth Cave and its Inhabitants*, by A. S. Packard and F. W. Putnam, Salem, 1879.)

101. Note on Eels. (*American Naturalist*, Salem, VI, 449.)

102. Note on the inhabitants of Mammoth Cave. (*Ibid.*, 554. Reprinted in *Mammoth Cave and its Inhabitants*, by A. S. Packard and F. W. Putnam, Salem, 1879.)

103. Rattle of the Rattlesnake. (*American Naturalist*, Salem, VI, 693-694.)

104. The Blind Fishes of the Mammoth Cave and their allies. (*Nature*, VI, 415-417. Reprinted from *American Naturalist*, VI, 1872.)

1873

105. On the Caterpillars and Pupæ of the Cabbage Butterfly, 1872. (*Bulletin Essex Institute*, Salem, IV, 9.)

106. The Rattle of the Rattlesnake, 1872. (*Ibid.*, 65.)

107. Account of archæological researches at Jeffries' Neck, Ipswich, 1872. (*Ibid.*, 79-80.)

108. Resolutions on death of Dr. Wm. Stimpson, 1872. (*Ibid.*, IV, 88.)

109. On Indian shellheaps in Massachusetts, 1872. (*Ibid.*, 122-123.)

110. On egg case of the Skate, 1872. (*Ibid.*, 123-124.)

111. Description of an ancient Indian carving found in Ipswich, 1872. (*Ibid.*, 156-158. 1 ill.)

112. On the great antiquity of Man, 1872. (*Ibid.*, 168.)

113. Description of an ancient fortification on the Wabash river, 1872. (*Proceedings Boston Society of Natural History*, XV, 28-35, 2 ill.)

114. Note on ancient races of America, their crania, migrations, and greatest development in Mexico and Peru, 1872. *Ibid.*, 228-229.)

115. Report of Director of Museum, Peabody Academy of Science, 1872. (*Fifth Annual Report Peabody Academy of Science*, Salem, 7-14.)

116. Tadpoles in winter. (*American Naturalist*, Salem, VII, 497-498.)

1874

117. Notes on *Liparis* and *Cyclopterus*, 1873. Abstract. (*Proceedings American Association Advancement of Science*, Salem, XXII, 335-340.)

118. Description of a few stone knives found in Essex county, Massachusetts, 1873. (*Bulletin Essex Institute*, Salem, V, 80-86. 3 ill.)

119. On stone implements and a carved stone, representing a cetacean, found at Seabrook, N. H., 1873. (*Ibid.*, 111-114. 1 ill.)

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120. Remarks on toads and fishes, 1873. (*Ibid.*, 124-125.)
121. Note on Col. John Wells Foster, 1873. (*Ibid.*, 124.)
122. Remarks before the Essex Institute, 1873. (*Ibid.*, 124, 151-152.)
123. Description of a stone knife found at Kingston, N. H., 1873. (*Ibid.*, 125, 1 ill.)
124. Fishes of Chebacco pond, 1873. (*Ibid.*, 141-142.)
125. Obituary remarks on Louis Agassiz, 1873. (*Ibid.*, v, 205-207.)
126. Remarks on the *Liparidae*, 1873. (*Proceedings Boston Society of Natural History*, XVI, 114.)
127. Notes on the *Myxinidae*, 1873. (*Ibid.*, 127-135, 1 table.)
127a. Report of Director of Museum, Peabody Academy of Science, 1873. (*Sixth Annual Report, Peabody Academy of Science*, Salem, 7-12.)
128. Notes on the genus *Bdellostoma*. (*Proceedings Boston Society of Natural History*, XVI, 156-160.)
129. Notes on the *Ophidiidae* and *Fierasferidae*. (Ibid., 339-348, 3 ill.)
130. Remarks on the family *Nemophidae*. (*Ibid.*, 366-373, 1 ill.)
131. *Gobiosoma molestum* from the Ohio river. (*American Naturalist*, Salem, VIII, 233-234.)
132. The Mammoth Cave in Kentucky. (*Salem Register*, LXXV, no. 97.)

1875

133. Note on teaching natural history in the schools, 1874. (*Bulletin Essex Institute*, Salem, VI, 8-10.)
134. On rare fishes from the harbors of Marblehead, Salem and Beverly, 1874. (*Ibid.*, 11, 13.)
135. Indian remains from Essex county, Massachusetts, 1874. (*Ibid.*, 17-19.)
136. Description of the Blackfish in Salem harbor, 1874. (*Ibid.*, 22-24.)
137. Note on the development of the arts of engraving and printing, 1874. (*Ibid.*, 70.)
138. Notice of Indian skull from shellbed on Rock island, Illinois, 1874. (*Ibid.*, 70-72.)
139. Note on tooth of a Shark, 1874. (*Ibid.*, 72.)
140. Remarks on the death of Alpheus Crosby, 1874. (*Ibid.*, 74.)
141. Note on shellheaps at Ipswich, 1874. (*Ibid.*, 111.)
142. Note on *Chauliodus Sloani* caught on George's Banks, 1874. (*Ibid.*, 111.)
143. Notes on fishes and insects from Ipswich river, 1874. (*Ibid.*, 121.)
144. Note on Indian implements, 1874. (*Ibid.*, 121.)
145. The Anderson School of Natural History on Penikese island, 1874. (*Ibid.*, 143-144.)
146. Account of the scientific work of Professor Jeffries Wyman. Resolutions on his death, 1874. (*Ibid.*, 152-153.)
147. Opening address at field meeting, Manchester, 1874. (*Ibid.*, 156-157.)

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148. Remarks on Mammoth Cave and some of its inhabitants, 1874. (*Ibid.*, 191-200. Reprinted in *Mammoth Cave and its Inhabitants.* By A. S. Packard and F. W. Putnam, Salem, 1879.)

149. Notice of important archæological discoveries of the Hayden Expedition, 1874. (*Ibid.*, 204-205.)

150. Resolutions on the death of Jeffries Wyman, 1874. (*Proceedings Boston Society of Natural History*, XVII, 125.)

151. On the Fishes and Crayfishes of Mammoth Cave, 1874. (*Ibid.*, 221-225. Reprinted in *Mammoth Cave and its Inhabitants*, by A. S. Packard and F. W. Putnam, Salem, 1879.)

152. On the male and female organs of Sharks and Skates, with special reference to the use of "claspers," 1874. Abstract. By F. W. Putnam and S. W. Garman. (*Proceedings American Association Advancement of Science*, Salem, XXIII, B. 143-144.)

153. On the Anderson School of Natural History at Penikese, 1874. Abstract. (*Ibid.*, 144-146.)

154. History of the Hartford Meeting, American Association Advancement of Science, 1874. (*Ibid.*, 150-155.)

155. Report of Permanent Secretary, Hartford Meeting, American Association Advancement of Science, 1874. (*Ibid.*, 171-173.)

156. Obituary notice of Jeffries Wyman, 1874. (*Proceedings American Academy of Arts and Sciences*, Boston, n. s., II, 496-505.)

157. Archæological researches in Kentucky and Indiana, with description of Salt Cave. (*Proceedings Boston Society of Natural History*, XVII, 314-332.)

158. The pottery of the Mound Builders. (*American Naturalist*, Salem, IX, 321-338, 393-409. 68 ill., 3 pl. Reprinted from *Eighth Report Peabody Museum of American Archaeology and Ethnology, Harvard University.*)

159. Archæological exploration in Indiana and Kentucky. (*American Naturalist*, Salem, IX, 410-415. Reprinted from *Eighth Report Peabody Museum of American Archaeology and Ethnology, Harvard University.*)

160. Memorial to Legislature of Massachusetts for a scientific survey of the Commonwealth. [As representative of the Essex Institute]. (*House Document*, no. 184, p. 5-8, Boston.)

1876

161. Archæological researches in Kentucky, 1875. (*Bulletin Essex Institute*, Salem, VII, 2-9.)

162. Fortifications, and other enclosures, made by the Indians and the older races in North America, 1875. (*Ibid.*, 56.)

163. Notice of shellheaps and Indian rel-

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ics at Newbury, 1875. (*Ibid.*, 106-107.)

164. Remarks on Indian shellheaps and the Thoreau collection, 1875. (*Ibid.*, 138.)

165. Report of Permanent Secretary, Detroit Meeting, American Association Advancement of Science, 1875. (*Proceedings American Association Advancement of Science*, XXIV, 335-338, 354-357.)

166. The Swallow Archæological collection from New Madrid, Mo., 1875. (*Reports Peabody Museum of American Archaeology and Ethnology*, Cambridge, I, 16-46, 69 ill.)

167. Archæological explorations in Kentucky and Tennessee, 1875. (*Ibid.*, 47-52.)

168. Ninth Annual Report Curator Peabody Museum American Archæology and Ethnology, 1876.[1] (*Ibid.*, 7-23.)

1877

169. On some of the habits of the Blind Crayfish, and the reproduction of lost parts, 1875. (*Proceedings Boston Society of Natural History*, XVIII, 16-19.)

170. On the Ancient Peruvians, 1876. (*Bulletin Essex Institute*, Salem, VIII, 34-36.)

171. On ancient gold images from graves near Bogota, 1876. (*Ibid.*, 53.)

172. On Indian and Esquimaux skulls, 1876. (*Ibid.*, 66-67.)

173. Report of Permanent Secretary, Buffalo Meeting, American Association Advancement of Science, 1876. (*Proceedings American Association Advancement of Science*, Salem, XXV, 361-363.)

174. History of The Buffalo Meeting, American Association Advancement of Science, 1876. (*Ibid.*, 341-344.)

1878

175. On a piece of Mexican sculpture found near Acapulco, 1877. (*Bulletin Essex Institute*, Salem, IX, 69-71.)

176. Remarks on development in ceramic art and ornamentation among American nations, 1877. (*Ibid.*, 77-78.)

177. Report of Permanent Secretary, Nashville Meeting, American Association Advancement of Science, 1877. (*Proceedings American Association Advancement of Science*, Salem, XXVI, 367-372, 393-396.)

178. Remarks on the Common Eel. (*Proceedings Boston Society of Natural History*, XIX, 279-280.)

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[1] These Annual Reports as Curator of the Peabody Museum of Harvard University, from 1876 to date, contain many important details of Professor Putnam's archæological explorations in the United States.

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179. Ancient American pottery. A Criticism on Prime's *Pottery and Porcelain*. (*Nation*, New York, XXVI, 8.)

1879

180. Report of Permanent Secretary, St. Louis Meeting, American Association Advancement of Science, 1878. (*Proceedings American Association Advancement of Science*, Salem, XXVII, 341-346.)

181. Archæological explorations in Tennessee, 1878. (*Bulletin Essex Institute*, Salem, X, 72-85, 10 ill.)

182. The Mammoth Cave and its inhabitants. By A. S. Packard and F. W. Putnam. Salem. (8vo, 62 pp., 2 pl., 15 figs.)

183. Circular letter proposing to establish a Society for the purpose of furthering and directing archæological investigation and research. By Charles W. Eliot, Alexander Agassiz, W. Endicott, Jr., W. W. Goodwin, Augustus Lowell, F. W. Putnam, Martin Brimmer, T. G. Appleton, E. W. Gurney, Henry P. Kidder, C. C. Perkins, C. E. Norton. Cambridge.

This is the Archæological Institute of America. See *First Annual Report* of that organization, Cambridge, 1880.

Since the organization of the Committee on American Archæology, Professor Putnam has been an active member of that Committee. The annual reports of the committee are published in the Supplements to the annual volumes of the *American Journal of Archæology*, beginning vol. IX, n. s., 1905.

184. The Southern Californians. (*Report upon U. S. Geographical Surveys West of the One Hundredth Meridian*, VII — Archæology — Part I, Archæology and Ethnology of Southern California, 1-31.) Washington, Government Printing Office.

185. Perforated stones (from California, Africa, India, Swiss Lakes, Denmark, South and Central America). (*Ibid.*, 135-189, 1 pl., 18 fig.)

186. Sculptures. (*Ibid.*, 218-221, 3 ill.)

187. Implements and weapons made of bone and wood. By C. C. Abbott and F. W. Putnam. (*Ibid.*, 222-233, 1 pl., 12 fig.)

188. Textile fabrics and basket-work. (*Ibid.*, 239-250, 1 pl., 3 fig.)

189. Ornaments. (*Ibid.*, 251-262, 1 pl., 9 fig.)

190. Iron implements and other articles obtained by contact with Europeans. (*Ibid.*, 272-276, 1 pl., 2 fig.)

191. Ruins in the Cañon de Chelle. (*Ibid.*, Part II, The Pueblo Ruins and the Interior Tribes, 372-373, 1 pl.)

192. Implements of stone, pottery, and other objects found in New Mexico and Arizona. (*Ibid.*, 374-390, 4 pl.)

193. [Editorial notes and insertions in papers written by others.] (*Ibid.*, xvii-xx, 46-47, 50-52, 68, 83, 103-105, 109-111, 112-113, 116, 118, 121, 132, 134, 192, 193-

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194, 195-196, 200-201, 202-203, 205-207, 211-213, 214-217, 237-238, 266, 267, 319, 322, 326, 340, 341, 348, 355, 361, 363, 366.)

1880

194. Tenth Annual Report Curator Peabody Museum American Archæology and Ethnology, 1877. (*Reports Peabody Museum American Archaeology and Ethnology*, Cambridge, II, 7-26.)

195. Eleventh Annual Report Curator Peabody Museum American Archæology and Ethnology, 1878. (*Ibid.*, 191-220.)

196. Archæological exploration in Tennessee, 1878. (*Ibid.*, 305-360, 55 ill., 1 plan.)

197. Manufacture of soapstone pots by the Indians of New England, 1878. (*Ibid.*, 273-276, 1 ill.)

198. Twelfth Annual Report Curator Peabody Museum American Archæology and Ethnology, including a notice of Cahokia Mound, 1879. (*Ibid.*, 466-496, 3 plans.)

199. Report of Permanent Secretary, Saratoga Meeting, American Association Advancement of Science, 1879. (*Proceedings American Association Advancement of Science*, Salem, XXVIII, 563-567.)

200. Thirteenth Annual Report Curator Peabody Museum American Archæology and Ethnology, 1880. (*Reports Peabody Museum American Archaeology and Ethnology*, Cambridge, II, 715-751.)

201. Egyptian antiquities found in America. (*American Art Review*, Boston, I, part 1, 254-255, 1 ill.)

1881

202. Remarks on chambered mounds of Missouri, 1879. (*Proceedings Boston Society of Natural History*, XX, 304-305.)

203. Remarks on some bones of New England Indians and on archæological explorations in Tennessee, 1879. (*Ibid.*, 331-333.)

204. Remarks on the ornamentation of some aboriginal American pottery, 1879. (*Ibid.*, 333.)

205. Report of Permanent Secretary, Boston Meeting, American Association Advancement of Science, 1880. (*Proceedings American Association Advancement of Science*, Salem, XXIX, 756-763.)

206. The former Indians of Southern California, as bearing on the origin of the Red Man in America, 1880. Abstract. (*Bulletin Essex Institute*, Salem, XII, 4-6.)

207. On Pueblo Indians of New Mexico and Arizona, 1880. (*Ibid.*, 178-183, 2 ill.)

208. Were ancient copper implements hammered or moulded into shape? (*Kansas City Review*, V, 490.)

209. A review of Evans's *Bronze Age in Great Britain and Ireland*. (*The Independent*, New York, XXXIII, 9-10.)

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210. Ancient American pottery, a review of Potter and Evers's *Contributions to the Archaeology of Missouri.* (*Scientific American,* New York, XI, suppl. 261, 4161-4163, 28 ill.)

211. Pueblo pottery. (*American Art Review*, Boston, II, part 1, 151-154, 1 pl., 2 fig.)

212. Palæolithic Implements of the Delaware valley. A discussion before the Boston Society of Natural History. (*Proceedings Boston Society of Natural History,* XXI, 147-149.)

213. Archæological Explorations at Madisonville, Ohio. (*Harvard University* [Library] *Bulletin,* Cambridge, II, no. 6, 216-218.) [Reprinted in *Cincinnati Enquirer*, July 15, 1881.]

1882

214. On the methods of manufacture of early American pottery, 1881. (*Bulletin Essex Institute*, Salem, XIII, 167-168.)

215. Report Permanent Secretary, Cincinnati Meeting, American Association Advancement of Science, 1881. (*Proceedings American Association Advancement of Science*, Salem, XXX, 392-393.)

216. Sketch of Lewis H. Morgan. (*Proceedings American Academy of Arts and Sciences*, Boston, n. s., IX, 429-436.)

217. Stone implements found at Marshfield. (*Boston Evening Transcript*, Feb. 4, 1882.)

218. The use of copper, bronze and silver in North and South America. (*Ibid.*)

219. The Maine shellheaps. (*Portland Advertiser*, Portland, Me., Dec. 23, 1882.)

1883

220. Note on pottery vessel from St. Francis river, Arkansas, 1880. (*Proceedings Boston Society of Natural History*, XXI, 90-91.)

221. Remarks on a carved bone found at Scarborough, Maine, 1880. (*Ibid.*, 107-108.)

222. Remarks on the Palmer Archæological collection from Coahuila, Mexico, 1880. (*Ibid.*, 118-120.)

223. Palæolithic implements from Wakefield, 1881. (*Ibid.*, 122-123.)

224. Archæological exploration at Madisonville, Ohio, 1881. (*Ibid.*, 216, 222.)

225. Remarks on oölite-like conglomerate from Mammoth Cave, 1881. (*Ibid.*, 233.)

226. Remarks on stone implements from Marshfield, Mass., and Sag Harbor, New York, 1882. (*Ibid.*, 405-406.)

227. Remarks on the Robinson collection from shellheap at Ipswich, 1882. (*Bulletin Essex Institute*, Salem, XIV, 161-163.)

228. Report of Permanent Secretary, Montreal Meeting, 1882. (*Proceedings American Association Advancement of Science*, Salem, XXXI, 640-643.)

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229. Annual Report of Commissioners on Inland Fisheries for the year 1882. By E. A. Brackett, Asa French and F. W. Putnam. *Public Documents, No. 25.* Boston: State Printers, 1883. 8° 58 p.

230. Iron from the Ohio mounds: a review of the statements and misconceptions of two writers of over sixty years ago. (*Proceedings American Antiquarian Society*, Worcester, n. s., II, 349-363. 18 ill.)

231. An account of recent archæological explorations in Wisconsin and Ohio. Abstract. (*Ibid.*, III, 4-20.)

232. Archæological frauds. (*Science*, Cambridge, I, 99.)

233. An Indian burial mound. (*Ibid.*, 168.)

234. Stone graves of the Cumberland valley. (*Ibid.*, 292.)

235. Damariscotta shellheaps. (*Portland Advertiser*, Portland, Me., Feb. 7, 1883.)

236. Notes on copper implements from Mexico. (*Proceedings American Antiquarian Society*, Worcester, n. s., II, 235-246. 8 ill.)

236a. Shellheaps on the coast of Maine. (*Science*, Cambridge, I, 319.)

236b. Altar-mounds in Anderson township, Ohio (Turner group). (*Ibid.*, 348-349.)

236c. Ancient cemetery at Madisonville, Ohio. (*Ibid.*, 373-374.)

236d. Mound exploration, Little Miami valley (Turner group). (*Ibid.*, 496-497.)

1884

237. Abnormal human skull from stone-graves in Tennessee. Abstract. 1883. (*Proceedings American Association Advancement of Science*, Salem, XXXII, 390-392.)

238. A new stand for skulls. Abstract. 1883. (*Ibid.*, 392-393.)

239. Report of Permanent Secretary, Minneapolis Meeting, American Association Advancement of Science, 1883. (*Ibid.*, 493-497.)

240. First notice of Pine Grove or Forest River Shellheap, 1883. (*Bulletin Essex Institute*, Salem, XV, 86-92.)

241. Chipped stone implements, 1883. (*Ibid.*, 137-142, 19 ill.)

242. Note on earthworks of Little Miami valley, 1883. (*Proceedings Boston Society of Natural History*, XXII, 358.)

243. Note on emblematic mounds in Wisconsin and Ohio. (*Ibid.*, 432.)

244. Remarks on curiosity as an incentive to research, 1884. (*Bulletin Essex Institute*, Salem, XVI, 154-156.)

245. Annual Report of the Commissioners on Inland Fisheries for the year 1883. By E. A. Brackett, Asa French and F. W. Putnam. *Public Documents, No. 25.* Boston: State Printers, 1884. 8°, 117 p.

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246. Human foot-prints found in tufa near the shore of Lake Managua, Nicaragua. Abstract. (*Proceedings American Antiquarian Society*, Worcester, n. s., III, 92-93.)

247. Human under-jaw found in gravel at Trenton, New Jersey. Abstract. (*Ibid.*, 93.)

1885

248. Report of Permanent Secretary, Philadelphia Meeting, American Association Advancement of Science, 1884. (*Proceedings American Association Advancement of Science*, Salem, XXXIII, 715-719.)

249. Annual Report of Commissioners on Inland Fisheries for the year 1884. By E. A. Brackett, F. W. Putnam, and E. H. Lathrop. *Public Documents, No. 25.* Boston: State Printers, 1885. 8°, 107 p.

250. Report of Director of Museum, Peabody Academy of Science, 1874. Abstract. (*Annual Reports Peabody Academy of Science, 1874 to 1884*, Salem, 21-22.)

1886

251. Report of Permanent Secretary, Ann Arbor Meeting, American Association Advancement of Science, 1885. (*Proceedings American Association Advancement of Science*, Salem, XXXIV, 552-555.)

252. On methods of archæological research in America, 1885. (*Johns Hopkins University Circulars*, Baltimore, v, no. 49, 89.)

253. Explorations in the Little Miami valley. [Letter from Peabody Museum Camp in Ohio, Sept. 20.] (*Boston Sunday Herald*, Oct. 24. Reprinted in *Peabody Museum Reports*, III, 549-554.)

254. The Altar mounds of the Turner group in Ohio. [Letter from Peabody Museum Camp in Ohio, Oct. 2.] (*Boston Sunday Herald*, Nov. 8. Reprinted in *Peabody Museum Reports*, III, 554-562.)

255. The Serpent Mound. [Letter from Peabody Museum Camp in Ohio, Oct. 5.] (*Boston Sunday Herald*, Nov. 21.)

256. Account of continued explorations of mounds in Ohio by C. L. Metz and F. W. Putnam, 1885. Abstract. (*Proceedings American Antiquarian Society*, Worcester, n. s., IV, 9-10.)

257. Central American jades. (*Ibid.*, 62-64.)

258. Note on Alaskan jade. (*Ibid.*, 64.)

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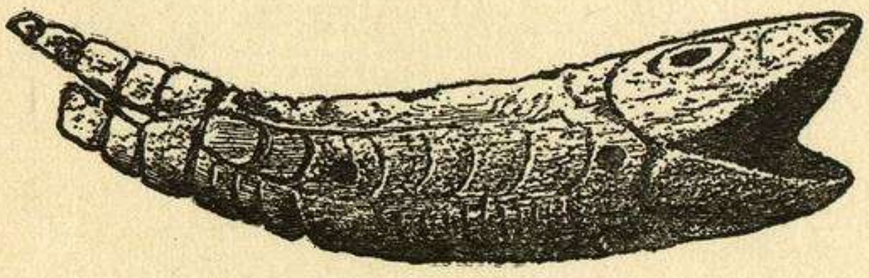

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PUTNAM ANNIVERSARY VOLUME

1909

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