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(With 11 Plates)

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ALEŠ HRDLIČKA
Curator, Division of Physical Anthropology
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(Publication 3640)

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During the field seasons of 1931, 1932, and 1934-1937 extensive excavations were carried on by the writer and his various field parties, under the auspices of the Smithsonian Institution, in the pre-Russian sites of Kodiak Island and particularly in a remarkable old site on what became known as "Our Point," Uyak Bay. The chief object of these excavations was to recover the numerous skeletal remains buried in the deposits and thus obtain light on the nature of the old inhabitants of this anthropologically important region. As a result there were gathered several hundred skeletons or parts of skeletons which showed that long before the island was inhabited by the strain of people found there by the Russians and called by them the "Koniags," there was an extensive older and also culturally different, pre-Koniag, population. The skulls and bones of this hitherto unknown population showed a number of special features which deserve to be reported apart from the general study of the specimens.

The Pre-Koniags were an oblong-headed, moderate-sized people of much artistic ability, with some Eskimoid features, but related essentially to the oblong-headed American Indian. They were the first permanent inhabitants of the island, having settled there soon after the passing of glacial conditions, which, however, was fairly late—probably at about the beginning of the Christian era. They left deep, condensed deposits, in part already concreted, and larded with their own remains and those of animals. They apparently developed—or possibly brought in—cannibalism, and during the latter part of their period of occupancy, the evidence showed, did various curious things with their skeletal remains and especially with the skulls. It was very common to find a skeleton without the skull or with whole limbs missing, individual or even small groups of skulls apart, and spare bones disseminated throughout the accumulations. Some of the skulls and bones, moreover, showed conditions or artifacts which will be described in this paper.

DISEASE

If there be excluded one skeleton, in all probability from Russian times, that showed multiple and very marked tuberculous lesions, and cases of arthritis, a rare fracture, or a dental abscess, the numerous skulls and bones from Our Point, as well as those from the pre-White deposits elsewhere on Kodiak Island, are wholly free from disease. This is very remarkable, for the material is both extensive and exhaustive. There is no trace of any of the constitutional diseases or distrophies that leave their marks on the skeleton, and there are no tumors. Even fractures are much less common than with us. These findings apply to both the Pre-Koniag and the Koniag peoples.

The arthritic lesions in the elderly were common. They show the usual variety of alterations in the spine and the joints, but "mushroomhead" femora, relatively frequent in old Peru, do not occur.

The rarity of fractures, even in the ribs, points on one hand to the resistance of the bones, and on the other hand to rarity of such violence as would lead to fractures. There were, however, one or two skeletons in which several of the parts had been badly broken before death—possibly through encounters with bears.

As elsewhere in pre-White Alaska, there were no dental caries; but almost from the beginning of adult life there was progressive wear of the teeth, until eventually in instances the pulp cavity was exposed, infection followed, an apical abscess developed, and the tooth would be lost or rendered useless.

ANOMALIES

Cranial and skeletal anomalies, too, were rare in both the Pre-Koniags and the Koniags. As all through western Alaska, there was in both the Kodiak peoples occasional narrowing of the nasal bones at the root, and in rare instances a metopic suture or some form of an "Inca" bone. There are of course, as in all crania, numerous minor exceptional features, but they are of little importance.

DEFORMATION

A good many of the adult Koniag skulls, particularly males, show a slight asymmetry, probably caused by the subjects in infancy lying habitually on the back more to one side than to the other. Such asymmetries are common in brachycephalic crania everywhere and can hardly be called deformations. They may have had a slight effect on the cranial index in the males, but this could not be material. The Koniags had cradleboards, but used no bandaging of the heads of the infants.

The case was somewhat different among the Pre-Koniags. We do not know whether they had any form of a cradleboard; if they had, it would have been made of perishable material which would long since have disappeared. What is certain is that some deformation begins with this people. It was an occasional characteristic slight to moderate occipital compression that raised the parietal part of the vault, leaving the coronal region flat or even with a slight postcoronal depression. The deformation in only a very few cases was enough to necessitate the elimination of the specimen from the measuring; and fortunately such cases were so infrequent that they did not affect the high value of the collection.

ARTIFACTS

No artifacts were encountered on any of the Koniag skulls or bones, but some were present on those of the Pre-Koniags. They consisted in a few cases of drilled holes, in the skull, lower jaw, a scapula, or a pelvic bone, for the passing of a cord by which the bone or part was suspended; in one case of the insertion of artificial (ivory) eyes into the sockets of a skull; and in one or two cases of trephining. Brief descriptions of the individual cases, supplemented with photographs, follow.

DRILLED SKULLS AND BONES

Drilled skull.—U.S.N.M. No. 377738; from the intermediary pre-Koniag deposits, Our Point, Uyak Bay, Kodiak Island; a broken-out portion of an adult, probably male, skull that may have been trephined in the postcoronal region and was bored through at bregma. (Pl. 1, fig. 1, lower.)

This specimen, as far as the drilling at bregma is concerned, is an exact counterpart of some of those from Michigan reported in 1875-1877 by Gillman.[1] It shows at bregma a clean somewhat funnel-shaped perforation, 7 mm. in diameter dorsally and 4 mm. ventrally. A shelf deep inside the opening indicates that it was made first by a

[1] Gillman, H., Certain characteristics pertaining to ancient man in Michigan. Ann. Rep. Smithsonian Inst. 1875, pp. 234-245, 1876; La perforation crânienne du Michigan. Bull. Soc. Anthrop. Paris, vol. 11, pp. 435-436, 1876; Crânes perforés du Michigan, ibid., vol. 12, p. 82, 1877; Additional facts concerning artificial perforation of the cranium in ancient mounds in Michigan. Proc. Amer. Assoc. Adv. Sci., vol. 26, pp. 335-339, 1877. See also Fletcher, Robert, On prehistoric trephining and cranial amulets. Contr. North Amer. Ethnol., vol. 5, 1882; Cranial amulets and prehistoric trephining. Trans. Anthrop. Soc. Washington, vol. 1, pp. 47-51, 1882.

smaller and then by a larger drill; and 14 mm. posteriorly to it the bone had been cut across and its upper edge beveled, all the other edges being left raw and irregular. The whole piece may have been a crude disk, worn as a breastplate during some observances, or as an amulet on some occasions.

Plate 1, figure 1, shows the specimen, together with a previously unreported fragment from a mound in Michigan with three similar perforations.

A very good late report on artifacts of this nature was published in 1936 by Hinsdale and Greenman.[2] They refer to other post-mortem drilled or cut skulls, summarizing the subject thus (p. 12):

> Crania with a single perforation at the vertex, drilled after death, have been found at four sites in southeastern Michigan and at three sites in western Ontario; crania with more than one perforation, or with an unknown number, have been found at one site in Michigan, at seven in Ontario, and at two in Ohio. Circular disks cut from human crania and perforated with two or more holes, are found in Ohio, Ontario, and New York.

In addition these authors report having found artificial perforations in the femora and tibiae of a skeleton. The case is unique and so curious that the details deserve to be quoted; they read (pp. 4-5):

> There are also perforations in long bones from the Farmington site. Two femurs and two tibiae are perforated near the ends. Although dissociated from any other parts of a skeleton they apparently belonged to the same individual and were lying in normal articulation. A hole 5 mm. in diameter is in the distal end of the shaft of the left femur, anteroposterior. A hole in similar position on the anterior surface of the right femur was carried only to a depth of about 1 cm. The drill was started in the opposite surface of the femur to meet this hole but was only carried to a depth of about 1 mm. Another hole had been started in the anterior surface at the other end of this femur, at the distal end of the neck. It is 8 mm. deep. Both femurs have the heads cut so that each head is a disk about 23 mm. wide. At the other ends both condylar surfaces are missing, apparently they were severed (Pl. IV, Fig. 1).
>
> The perforations in the two tibiae are at the proximal ends. Both articular surfaces have been cut off, and both anterior borders have been shaved down 1 to 2 cm. distal to the tuberosities. The distal ends have also been cut, but the greater part of each articular surface remains. There are two holes through the proximal end of each tibia, one anteroposterior and the other lateral, so that originally they may have intersected in the interior of the shafts, where cancellous tissue has not fallen away. The holes are from 6 to 7 mm. in diameter. The hole in the external surface of the left tibia could not have been more than 7 mm. deep.

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[2] Hinsdale, W. B., and Greenman, Emerson F., Perforated Indian crania in Michigan. Occas. Contr. Mus. Anthrop., Univ. Michigan, No. 5, pp. 1-15, 5 pl., 2 figs., 1936.

The perforations are pictured in plate IV of the above publication. They are small and served, it would seem to the present writer, for fastening together the respective femora and tibiae.

Drilled skull.—U.S.N.M. No. 374674; a normal Pre-Koniag middle-aged male; marks of knife across the forehead suggest that scalp had been removed artificially. (Pl. 1, fig. 2.)

The greater wing of the right sphenoid shows two smaller drill holes (4 mm. wide), that of the left sphenoid, one larger one (6 mm. wide), doubtless for thongs which attached the lower jaw to the skull, or by which the skull was suspended. The skull was one of several isolated crania laid down in such a way that they formed a right angle in the deposits. It is well preserved and has evidently been handled but little. There is no indication as to why it had received the special attention.

Drilled mandible.—U.S.N.M. No. 379244; from Our Point, Uyak Bay; the normal, well-preserved lower jaw of a Pre-Koniag boy of about 14. (Pl. 2, fig. 1.)

In each ascending portion below its middle is a drill hole 6 mm. wide; and a similar although incomplete perforation 5 mm. wide with concave base is seen anteriorly just below the root of the lateral right incisor.

Drilled scapula.—U.S.N.M. No. 379249; from Our Point, Uyak Bay; Pre-Koniag adult, sex uncertain; considerably damaged and acromion process evidently hacked off, but nothing pathological or unusual. (Pl. 2, fig. 2.)

A drill hole 5 mm. wide passes through the body of the spine about 3 cm. from its vertebral end; another similar but incomplete drill hole, with nicely concave base, is seen on the dorsal surface of the bone 3 cm. below the lower border of the glenoid cavity and 9 mm. from the axillary border of the bone.

Drilled sphenoid.—U.S.N.M. No. 379250; a portion of the great wing of a normal sphenoid, with a perforation 5 mm. wide near its pteric end; bone marked "black"[3] (Koniag), but may be displaced "red" (Pre-Koniag). (Pl. 3, fig. 1, right.)

The fragment, though found as such, was plainly broken off secondarily. It was the skull when whole that was drilled for suspension, as in No. 374674, and not the fragment.

[3] The term "black" was used throughout the excavations for the Koniag deposits, with "red" for the later and "blue" for the older pre-Koniag accumulations; and specimens from the different layers were marked accordingly.

Drilled pelvic bone of a child.—U.S.N.M. No. 379251; right ilium of a small child; bone is marked "black" (Koniag), but is probably a displaced "red" (Pre-Koniag). (Pl. 3, fig. 1, left.)

Near the anterosuperior spine is a perforation 6 mm. wide made from the back forward and very similar to those on the other drilled ilia. There may possibly have been another hole farther on, but the middle portion of the upper part of the ilium has been broken off. The bone is strong and rather flat but shows nothing pathological.

Drilled pelvic bone.—U.S.N.M. No. 379248; from Our Point, Uyak Bay; normal right Pre-Koniag pelvic bone. (Pl. 3, fig. 2, right.)

The ilium near its upper border shows two drilled holes, each 5 mm. in diameter. The bone is that of a young adult, rather small but not weak, sex uncertain. It shows no injury and no marked handling. Posteriorly, a short distance below the anterior perforation is seen the beginning of another, consisting of a sharp rim with a smooth, large dotlike hollow in the middle.

Drilled pelvic bone.—U.S.N.M. No. 377701; from Our Point, Uyak Bay; right pelvic bone of a Pre-Koniag adult male. (Pl. 3, fig. 2, left.)

The ilium shows four borings, three of 8 mm. diameter and one of 6 mm., made without much care from the back forward. Their location and disposal are shown in plate 3, figure 2, left. They were doubtless made for a vertical suspension of the bone, or possibly even of the pelvis as a whole; but the bone was found alone. The pubic part of the specimen had been broken off, but that might have been incidental. The bone itself is normal and indicates a small presenile male individual.

TREPANATION

In the course of the excavations at Our Point, Uyak Bay, Kodiak Island, the "red" or later pre-Koniag deposits yielded a human skull that shows a form of trepanation.

Such operations have not as yet been recorded from anywhere else in Alaska, but there is an example of the practice in the United States National Museum collections from Kagamil Island, and another from Prince William Sound. Several cases also have been found among remains of related type in the oldest deposits at the mouth of the Fraser River[4] and in those of the nearby Boundary Bay. Gill-

[4] Smith, Harlan I. (quoting Hrdlička), Trephined aboriginal skulls from British Columbia and Washington. Amer. Journ. Phys. Anthrop., vol. 7, pp. 447-452. 1924. One or two additional specimens recovered since the publication.

man[5] mentions in addition a skull reported to him from Santa Barbara, Calif., which showed an artificial perforation in the vault that may possibly have been made in life. Several cases of skull trephining are on record or await publication from different parts of the United States and northern as well as southern Mexico (Zapotec tombs, Caso; unpublished), besides the many from Peru and Bolivia.[6]

The description of the Kodiak specimen follows:

Trephined skull.—U.S.N.M. No. 379252; from later pre-Koniag deposits, Our Point, Uyak Bay; skull of an elderly woman, damaged before coming into deposits, breaks in basal parts, lower face missing, otherwise normal. (Pl. 4, fig. 1.)

Along the middle of the upper third of the frontal and adjoining portion of the parietals is a smooth elliptical depression 6 cm. long, at maximum 2.1 cm. wide, and up to 4 mm. deep, the result of an ancient operation—incomplete trepanation. The hollow in all probability was made by scraping, long before the death of the woman. There is no indication as to why it was made, and there was a perfect healing.

Trephined skull.—Reported with the preceding may be the case of skull U.S.N.M. No. 262170, from Knights Island, Prince William Sound; gift of Dr. F. M. Boyle. (Pl. 4, fig. 2.)

The skull is that of a young adult female, probably not very ancient. It shows some disturbance of development—the occiput is bulging and somewhat asymmetrical, with a rather marked supralambdoid "set-back" of the parietals; the left parietal shows over the eminence a fairly large, old, well-healed lesion, which, however, did not affect the inner wall and so may not have been the cause of the operation; yet the thickening of the external plate about the lesion is somewhat pronounced especially anteriorly, where it extends nearly to the rear margin of the lower perforation. Aside from these features the specimen is normal.

The postcoronal upper two-thirds of the left parietal of this skull shows two good-sized openings; one of these is surely due to an

[5] Gillman, H., Certain characteristics pertaining to ancient man in Michigan. Ann. Rep. Smithsonian Inst. 1875, p. 242, 1876.

[6] See Lumholtz, Carl, and Hrdlička, Aleš, Trephining in Mexico. Amer. Anthrop., vol. 10, No. 12, pp. 389-396, 1897; Cosgrove, C. B., A note on a trephined Indian skull from Georgia. Amer. Journ. Phys. Anthrop., vol. 13, No. 2, pp. 353-357, 1929; Shapiro, H. L., Primitive surgery: First evidence of trephining in the Southwest. Nat. Hist., vol. 27, No. 3, pp. 266-269, 1927; Hrdlička, A., Trepanation among prehistoric people, especially in America. Ciba Symposia, vol. 1, No. 6, bibliography, 1939.

operation, and the other probably is. The upper hole is circular, 2 cm. in maximum diameter, 1 cm. in the rear of bregma and involving a portion of the sagittal suture. The edges of the opening are fairly sharp, its external border is beveled, the internal border but little affected. The opening bears all the marks of an old, well-healed trepanation. The bone behind it externally is somewhat thickened but otherwise looks normal.

The lower lesion is not easy to describe. From above downward it consists of a nearly circular portion, 7 mm. in greatest width, and apparently cut out in that form. Below this the outer wall of the skull has been scraped and in it there has been made an oblong, somewhat obliquely quadrilateral opening 22 mm. long by 13 mm. wide. This now has thin and very sharp borders, communicates with the small circular aperture above, and reaches antero-inferiorly, by what looks like a broad crack, a small focus of perforative osteitis. The inner table about this whole second opening is somewhat uneven, but there is no breaking down of the bone, and the whole wound, less the small osteitic lesion, has long since been well healed.

The face and base of the skull are normal.

Trephined skull.—Still another specimen that may well be reported here is U.S.N.M. No. 243974, a normal skull of a Pre-Aleut elderly female from Nazan Bay, Atka Island; collected in the early seventies by William H. Dall. (Pl. 5, fig. 1.)

In the anterior third of the right parietal, 3.5 cm. from the coronal and 1.7 cm. from the sagittal suture, there is an oval opening 12 mm. long by 7 mm. wide, with beveled edge all around and some brown discoloration outside of this. The inner surface of the skull about the opening is entirely normal. The bone about the opening shows healing, but little if any restitution.

It seems impossible to diagnose the lesion as anything else but a trepanation, during life, by cutting. But there is no indication as to why the operation may have been performed; the vault of the skull is wholly normal and shows only one possible injury—a moderate-sized, irregular-edged opening in the unusually thin right postero-inferior portion of the frontal, 3 mm. above the sphenofrontal suture, which appears to be accidental—its edges are rough, there is no beveling, and no trace of cutting (Pl. 5, fig. 2). There are many post-mortem defects in the orbits, the maxillae, and neighboring parts, none of which, however, can have any connection with the trepanation.

Peculiar lesions in skull bones of an infant.—U.S.N.M. No. 372883; from Our Point, Uyak Bay; two portions of the skull of a Pre-Koniag infant. (Pl. 6.)

Present, a large portion of the right and a piece of the left parietal. Each shows curious lesions that, especially on the left fragment, appear to have been artificially produced, although they may possibly have been due to some natural cause.

The right bone shows a streaked outer surface, due to corrosion by roots. In its lower third is a large, nearly circular lesion that looks as though a disk of the bone had been cut out. The edges of the opening are sharp, and its inner border is naturally beveled.

The part of the left bone presents two lesions, one nearly circular, the other nearly right-angular, with the angle itself rounded. The bone is thin, apparently normal, and without any traces of disease or inflammation. The openings look exactly as though someone had cut out two pieces of the bone, but the edges of the openings are almost knife-sharp, and ventrally there is a distinct beveling about each of the defects.

The specimens are the only ones of that nature found in the Far North. They cannot, it would seem, well be trepanations, but what else they could be seems impossible to decide. They might possibly be defects caused by absorption from within, but it is hard to conceive what could cause such odd absorptions.

BREAKING OUT, CUTTING

A broken-out portion of face.—U.S.N.M. No. 379245; from Our Point, Uyak Bay; a normal specimen, Pre-Koniag, strong adolescent male. (Pl. 7.)

The joint maxillary portion of the face has intentionally been broken out at the level of the maxillozygomatic sutures, and the nasal septum, the turbinated bones, and the nasal wall of each antrum were removed; but the good denture, not fully complete, and the whole front of the piece, as well as the palate, were fully preserved. It is difficult to understand the motives behind the making of this piece, or for what purpose it could have served; but it is surely not accidental.

Trepanation on the humerus.—U.S.N.M. No. 332608(6); from Point Hope (old burials), Alaska; normally developed medium-strong right male humerus, 32.3 cm. long; the lower end shows marked arthritic changes, with upper end unaffected. (Pl. 8, fig. 1.)

Eight cm. from the upper end of the bone, externally, at the upper limit of the deltoid ridge, there is a clean-cut somewhat lozenge-shaped opening, 12 mm. long by 8 mm. wide. The operation was done in life, was uneventful, and was followed by perfect healing of the edges. There is not the slightest fracture nor any sign of inflamma-

tion about the locality; yet the shape, size, and perfect edges of the opening can leave no doubt as to its representing a planned and successful operation.

This is the only known example of a trepanation of a long bone from the Far North, or from anywhere else in the Americas.

Cutting away of the head of a femur.—U.S.N.M. No. 372822; from Our Point, Uyak Bay; normal right moderate-sized femur from a Pre-Koniag pre-middle-aged female. (Pl. 8, fig. 2.)

The head of the bone has been cleanly cut away post mortem with a sharp stone knife. The cut is so neat that it must have been made while the bone was still fresh. This is the only specimen of this nature found in the Kodiak excavations, or so far in Alaska, and there is nothing to indicate the object of the cutting. The same deposits, however, yielded several cups each made out of the head of the humerus of a bear, and just as the people made "baby" stone lamps, they may also have made a "baby" bone cup. It may, of course, have been used as a handle to some tool, or for still another purpose.

SKULL WITH IVORY EYES

One of the first outstanding specimens recovered from the deposits at Our Point, Uyak Bay, was the skull, less lower jaw, of a middle-aged Pre-Koniag. The orbits of this skull had originally been filled with some organic mass, possibly gum, which eventually left but a dark, loose residue; and in this mass in each orbit was fixed an ivory eye, with pupil of a black stone. (Pl. 11, fig. 1.)

The specimen was found in the very first week of the work on Kodiak. It lay with its face down in what were designated the "red" or later pre-Koniag layers. It was alone, without the lower jaw or any other part of the skeleton. Without anticipating anything unusual I carefully took it out, saw the orbits filled with what looked like nearly black "dirt" and began to shake this out, when there dropped into my hand an ivory eye; and at the same time Dr. Rich, who was looking on, called my attention to something white that dropped out of the other orbit to the ground, and which proved to be the mate of the first eye.

Plate 11, figure 1, shows the two eyes in their natural size. Nothing of such nature has ever come out of the deposits before or since, and nothing similar has ever been known from any part of Alaska before; recently (1940), however, some related finds of this nature were made by Rainey in an interesting new site at Point Hope.[7]

[7] Rainey, Froelich, A new form of culture on the Arctic coast. Proc. Nat. Acad. Sci., vol. 27, No. 3, pp. 141-144, 1941.

The Uyak skull was a normal specimen. It had evidently been handled, so that some of the teeth were lost. It may have been the head of some outstanding hunter or chief or a distinguished enemy; in the first case it would have been a memorial, in the latter a prized trophy.

SKULL CUPS, BOWLS, AND DIPPERS

The Pre-Koniags of Uyak Bay, Kodiak Island, used a part of the human skull occasionally as a cup, bowl, or dipper. They broke out a suitable piece and trimmed it more or less to suit their purposes.

All these specimens came from the "red" or later pre-Koniag layers of the deposits. At this period the people were certainly not shy of human bones; they practiced cannibalism and must have done all sorts of things with skulls and bones as shown by the skeletal remains in the deposits.

Skull bowls were used, it is known, in Tibet, and may have had a wider distribution in eastern Asia. The practice, in fact, was once widely distributed over the world, even among peoples of the white race, and was very ancient, dating back to at least the Upper Paleolithic (Magdalenian, Solutrean).[8]

In America, in the words of Friederici,[9]

> the skull cup may be followed over the whole continent. It is found in the region of the great Canadian lakes, in Massachusetts and probably in Carolina, in Sinaloa and Michoacan, in Darien and in the Antilles. In South America it is met with in Venezuela, in the realm of the Incas, among the Maynas, Mochos and in the Amazon region. Among the Chaco tribes it was especially reported in the Abipones, Tobas, and Macobies, while the Matacos drank from cups made of the scalps. Especially good information in this respect exists about the Araucano, among whom the cups from the skulls of the Governors Valdivia and Loyala were their most prized trophies.[10]

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[8] See Breuil, H., and Obermaier, H., Cranes paléolithiques façonnés en coupes. L'Anthrop., vol. 20, pp. 523-530, 1909. See also Kuhn, A., Namen von Gefässen, Namentlich von Kochgefässen. Zeitschr. Ethnol., vol. 9, p. 489, 1877.

[9] Friederici, G., Skalpieren und ähnliche Kriegsgebräuche in Amerika. Inaug. Diss., p. 96, Braunschweig, 1906.

[10] Idem, bibliography. There is here, regrettably, some confusion between cups made of human skulls and cups or vessels of clay in the form of skulls. Thus Chase, Henry E., Notes on the Wampanoag Indians, Ann. Rep. Smithsonian Inst. 1883, p. 904, says the Wampanoags "have large drinking-cups made like skulls"; and Holmes, William H., Ancient pottery of the Mississippi Valley, 4th Ann. Rep. Bur. Ethnol., p. 407, referring to the prehistoric industry of Arkansas, speaks of "vessels imitating the human head."

In South America, particularly in Brazil and Chile, cups or bowls made of human skulls were reported, according to Vignati,[11] from the Guaycurie, Abipon, Chiriguano, Toba, and Araucano-Mapuche Indians. The making and the use of such cups was generally associated with war; the skulls used were those of trophy heads, and the drinking from such cups was more or less of a ceremonial nature.

The incidence of cups or bowls made from human skulls in North America is as yet not sufficiently clear. Specimens of this nature could readily be passed over by the finder, or be mentioned where the physical anthropologist would not be likely to see it. An example is the brief report by E. R. Quick on "A Prehistoric Cup Made from a Human Cranium," from Cedar Grove, Ind., published in the January 1881 number of the Journal of the Cincinnati Society of Natural History. The "cup or bowl was made of a child's skull," and accompanied an old man's skeleton. In this case,

> the base of the skull has been roughly cut away and scraped smooth, leaving an irregular margin or rim to the vessel. Both the inner and outer surface has been scraped with some rough-edged tool, leaving numerous scratches. Two holes were drilled through the side, near the upper part of the cup, for the purpose of mending a crack by tying the fractured parts together.

References to similar practices may doubtless be found in the vast ethnographic and archeological literature on the North American aborigines. Dr. J. R. Swanton, of the Bureau of American Ethnology, has given me the following information:

> In my own notes I find but one reference and that merely states that as a war trophy besides the scalp they sometimes took the upper part of the skull. This is in Lawson's History of Carolina, Raleigh edition, page 321. It does not state that the part so taken was used definitely as a cup. And, in Pierre Margry's great work, "Découvertes et établissements des Français dans l'ouest et dans le sud de l'Amérique septentrionale," volume 5, page 96, some of the northern Indians threaten to drink out of the skulls of their captives.

The specimens in the United States National Museum are as follows:

Skull bowl.—U.S.N.M. No. 379243; from Our Point, Uyak Bay; the rear half of a normal skull of a "blue" (deep) Pre-Koniag adult female, shaped artificially though crudely into what evidently served as a cup or a bowl. (Pl. 9, lower.)

The specimen now has a hole near the center caused possibly by one of my boys' picks, though it may have been made by the people

[11] Vignati, M. A., Los cráneos trofeo. Arch. Mus. Etnográfico, No. 1, pp. 93, 118-120, 153, 1930.

"killing" the cup after the decease of the owner, as they habitually did with the stone lamps and other articles. The blow was delivered from the outside, causing about the wound characteristic peelings of the inner table.

Skull bowl.—U.S.N.M. No. 377738; from Our Point, Uyak Bay; skull of a Pre-Koniag female. (Pl. 10, lower.)

The rear third of the parietals and the occipital squama were cut off and rounded to a moderate-sized bowl 10 cm. wide by 12 cm. long. The ventral ridges of the occipital were leveled to make the interior of the bowl somewhat more even and, incidentally, to give a better thumb-spot for handling the vessel. It would have been very useful to drink from, or to contain more or less liquid food.

Skull dipper.—U.S.N.M. No. 379247; from Our Point, Uyak Bay; occipital bone of a Pre-Koniag, probably an old male. (Pl. 9, upper.)

The borders of the bone were trimmed all around, and the right lower end was left protruding somewhat to form a convenient handle. The specimen could have been used as a shallow cup from which to drink water or as a ladle for dipping out more or less liquid food. It shows no special marks, but considerable handling.

Skull dipper.—U.S.N.M. No. 379246; from Our Point, Uyak Bay; left parietal of a Pre-Koniag adult. (Pl. 10, upper.)

The specimen had been trimmed all around to form a dipper, the lower left corner being left somewhat protruding for a handle. There is nothing extraordinary about the bone itself, and it bears no marks; but it had been broken ("killed" ?) and some pieces were lost before it came into the deposits.

Skull dipper from Aleutian Islands.—U.S.N.M. No. 379253; rear portion of the skull of a sub-middle-aged male, probably Pre-Aleut, from one of the mummy caves on Kagamil Island, cut into the form of a large dipper or a bowl. (Pl. 11, fig. 2.)

The piece consists of the occipital, a small part of the right and large part of the left parietal, and the left temporal, with a portion of the base which served for a handle. The parietals and temporal were cleanly cut by a very sharp knife. The whole formed a spacious bowl, and the cut edges are worn, showing considerable use. The dish had evidently been used only for liquids, for its surfaces show no abrasion. The rostrum of the stella turcica had been removed, probably to facilitate holding, and a part of the squama of the cut left temporal has been broken off, either during or after the deposition of the specimen in the cave.

SUMMARY AND CONCLUSIONS

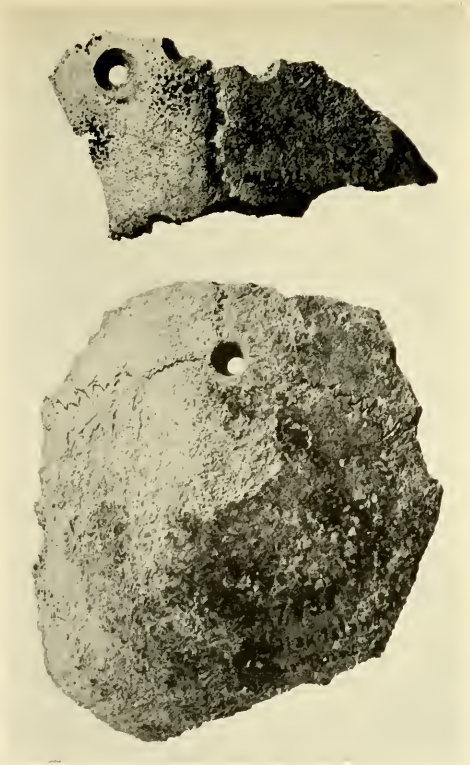
This paper calls attention to the limited pathology and grosser anomalies, as well as the various artifacts, shown by the skeletal remains of the pre-Russian and particularly the Pre-Koniag people of Kodiak Island, and reports a few related specimens from southwest Alaska.

The Kodiak remains show absence of all constitutional diseases that leave their marks on the skeleton, with the exception of senile arthritis.

The artifacts, limited largely to the later period of the Pre-Koniag people, include some slight grades of head deformation; drilling of skulls or bones for suspension as charms or trophies; trepanation; the cutting of bones or breaking out of parts for some utilitarian or other purpose; and the making of cups or bowls from human skulls.

An apparently significant fact is that most if not all the drilled bones are male, and the three trephined crania all female.

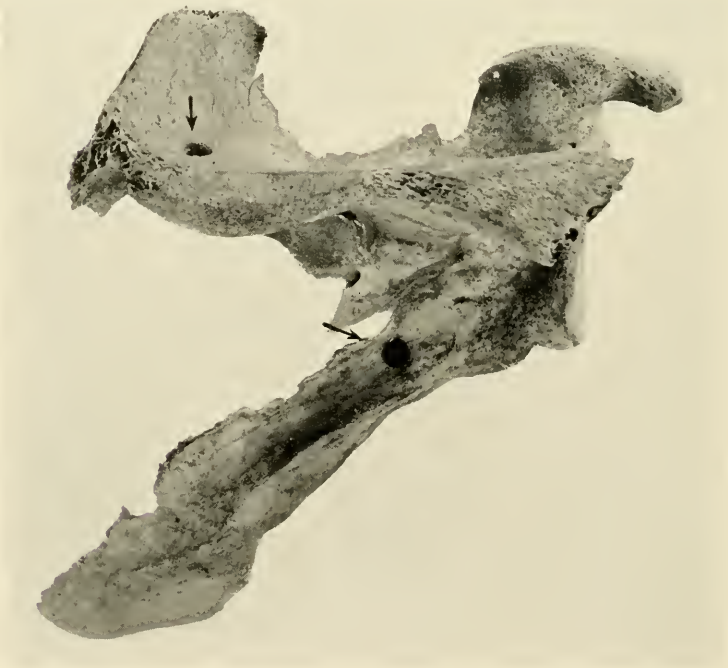
There are here presented thus, from the Far Northwest, a whole series of observances with the human skull and bones previously unknown from that area. As excavations in those regions proceed, this field will doubtless be further enriched. It shows the existence among the peoples of pre-White western Alaska of considerable ceremonialism which, together with mummification, sacrifice of slaves, and other practices, establishes on the one hand further cultural links with the rest of the American continent, and on the other hand suggests strongly an ancient pre-American origin of all these usages. It increases greatly the need of the extension of explorations beyond the Bering Strait and Sea into the vast and archeologically still largely unknown territories of eastern Siberia.



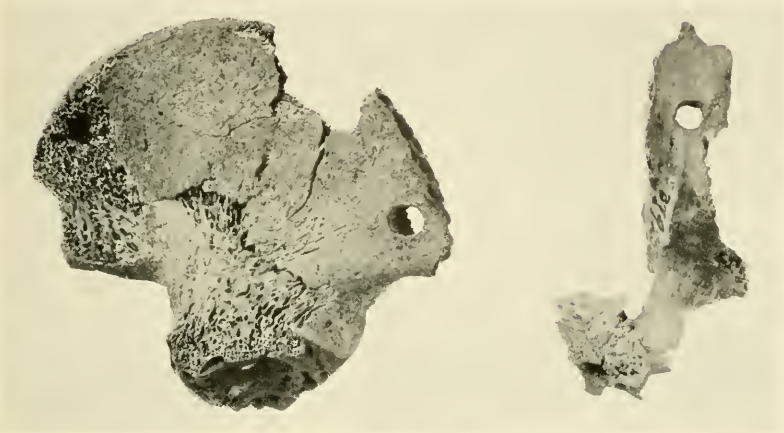
1. Upper, fragment of an Indian skull from Michigan, showing drillings in the top of the skull. U.S.N.M. No. 147272. Lower, a portion of a Pre-Koniag skull from Our Point, Uyak Bay, Kodiak Island, showing a drilled hole at bregma. U.S.N.M. No. 377738.

2. A Pre-Koniag male skull from Our Point, Uyak Bay, Kodiak Island, with two drilled holes in the right temple region and one in the left (not shown), for suspension. U.S.N.M. No. 374674.

1. Lower jaw of a Pre-Koniag boy of about 14, from Our Point, Uyak Bay, Kodiak Island, drilled for suspension through each ascending portion above the angle, and also incompletely below right lateral incisor. U.S.N.M. No. 379244.



2. Pre-Koniag right scapula, from Our Point, Uyak Bay, Kodiak Island, showing one complete and one incomplete drill hole, for suspension. U.S.N.M. No. 379249.



1. Pre-Koniag specimens from Our Point, Uyak Bay, Kodiak Island. Left, child's pelvic bone, drilled for suspension. U.S.N.M. No. 379251. Right, a portion of a sphenoid of an adult skull, drilled for suspension. U.S.N.M. No. 379250.

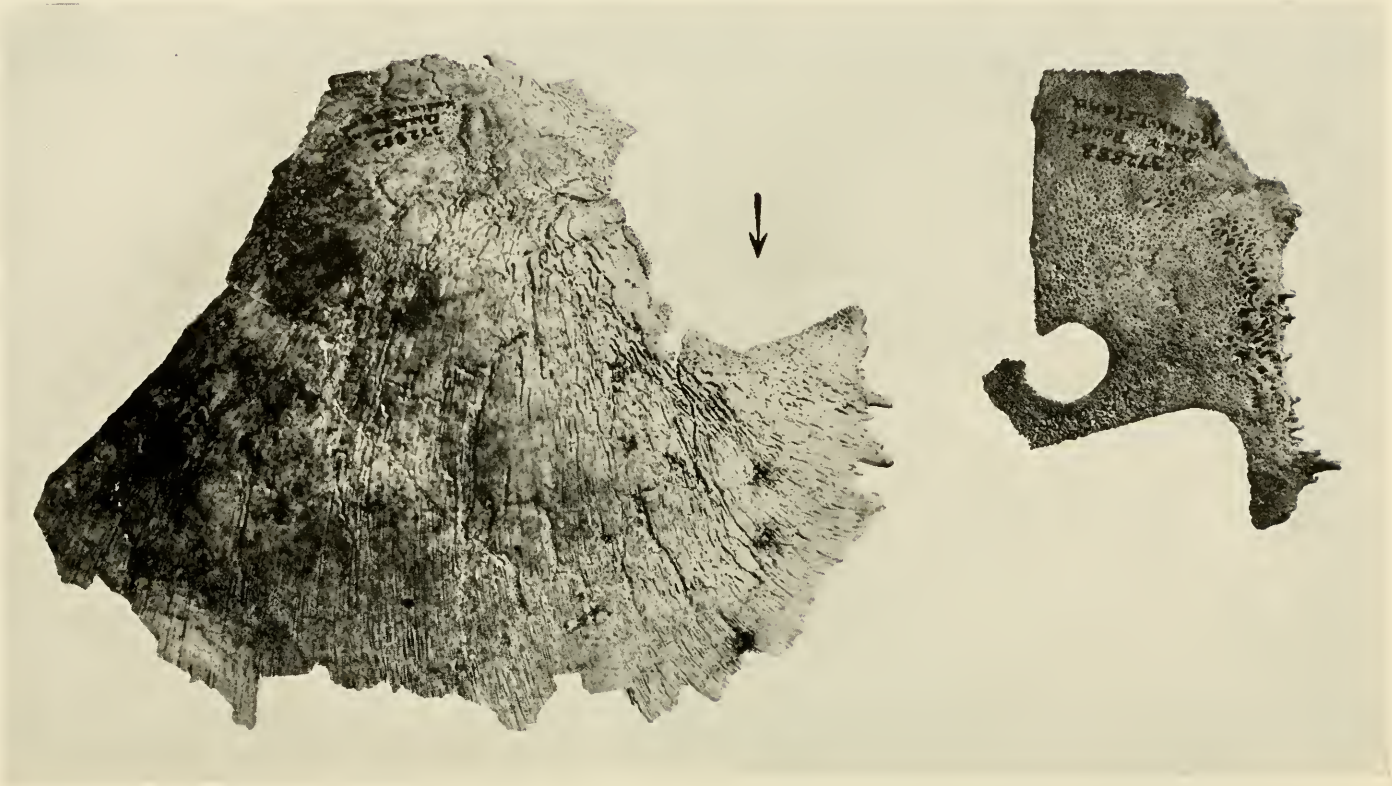
2. Pre-Koniag pelvic bones from two separate subjects, drilled for suspension; from Our Point, Uyak Bay, Kodiak Island. Left, U.S.N.M. No. 377701; right, U.S.N.M. No. 379248.

1. Skull of an elderly Pre-Koniag woman, showing incomplete trepanation; from Our Point, Uyak Bay, Kodiak Island. U.S.N.M. No. 379252.

2. Female skull from Knights Island, Prince William Sound, showing trephining. U.S.N.M. No. 262170.

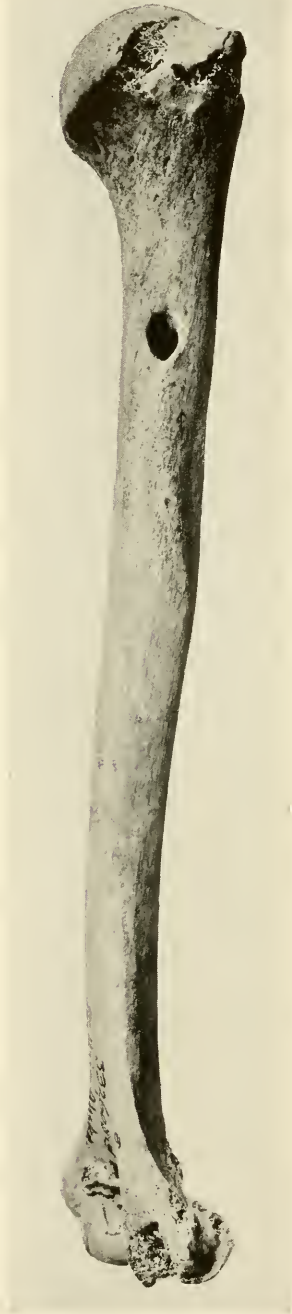
1. Skull of an elderly pre-Aleut woman, from Atka Island, Aleutian Chain, showing trepanation. U.S.N.M. No. 243974.

2. Enlarged view of trepanation illustrated in figure 1, showing beveling of the border. The discoloration about the opening may possibly be due to some inorganic material applied originally to the wound.



Parts of a Pre-Koniag infant skull, from Our Point, Uyak Bay, Kodiak Island, showing lesions resembling trephinings.
U.S.N.M. No. 372883.

Front and rear view of a purposely broken out Pre-Koniag maxilla, from Our Point, Uyak Bay, Kodiak Island. U.S.N.M. No. 379245.



1. Right male humerus, from Point Hope, Alaska, showing trepanation. U.S.N.M. No. 332608 (6).

2. A Pre-Koniag female femur, from Our Point, Uyak Bay, Kodiak Island, the head of which has been neatly cut off. U.S.N.M. No. 372822.

Pre-Koniag dipper and bowl made from human skulls; from Our Point, Uyak Bay, Kodiak Island. Upper, U.S.N.M. No. 379247; lower, U.S.N.M. No. 379243.

Pre-Koniag dipper and bowl made from human skulls; from Our Point, Uyak Bay, Kodiak Island. Upper, U.S.N.M. No. 379246; lower, U.S.N.M. No. 377738.

1. Ivory eyes, from a Pre-Koniag male skull, Our Point, Uyak Bay, Kodiak Island. Natural size.

2. A dipper made from a human skull, from Kagamil Island, Aleutian Chain. U.S.N.M. No. 379253.