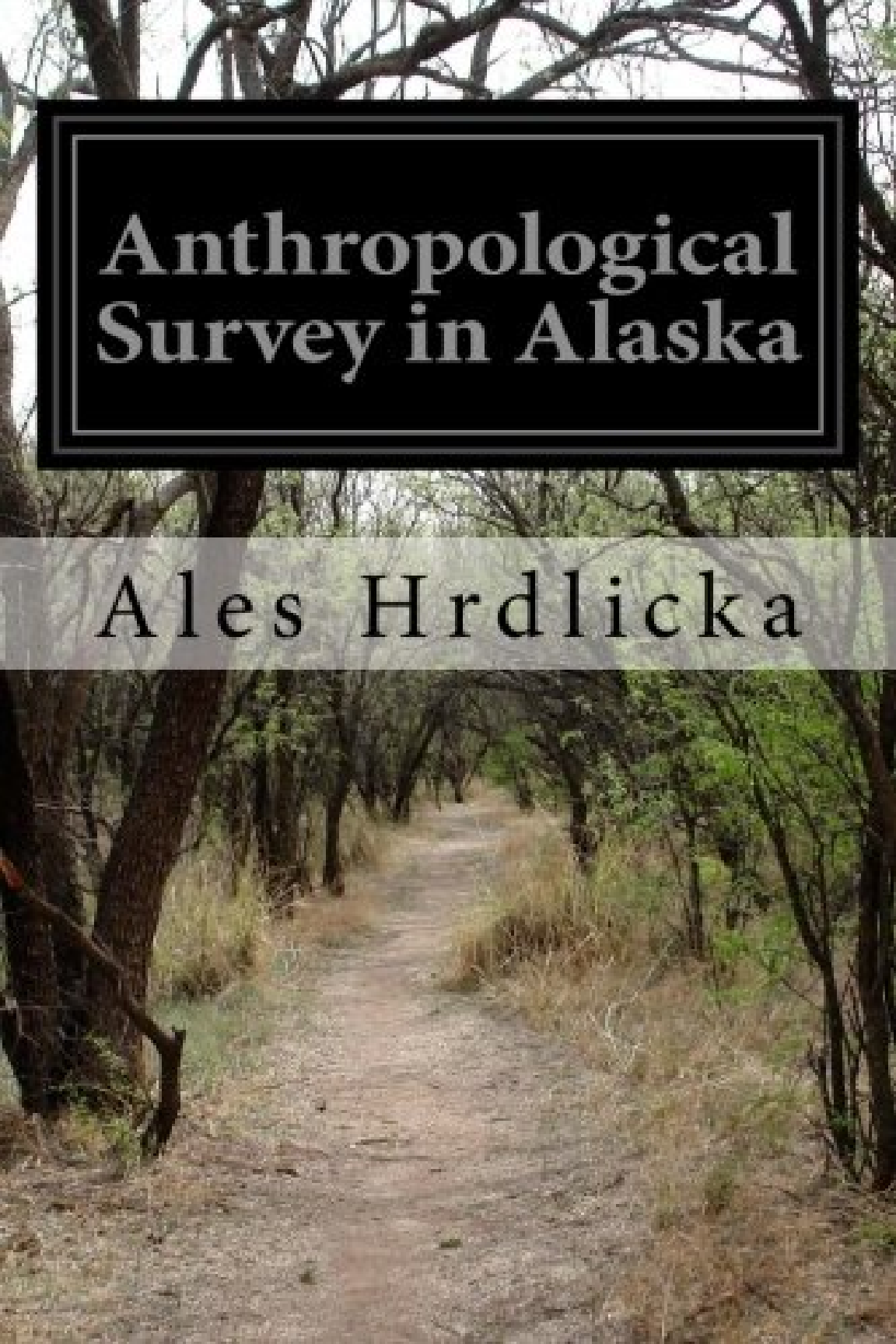

Anthropological Survey in Alaska
Ales Hrdlicka

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*** START OF THE PROJECT GUTENBERG EBOOK ANTHROPOLOGICAL SURVEY IN ALASKA ***

ANTHROPOLOGICAL SURVEY IN ALASKA

By ALEŠ HRDLIČKA

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ANTHROPOLOGICAL SURVEY IN ALASKA

By Aleš Hrdlička

INTRODUCTION

Alaska and the opposite parts of Asia hold, in all probability, the key to the problem of the peopling of America. It is here, and here alone, where a land of another continent approaches so near to America that a passage of man with primitive means of navigation and provisioning was possible. All the affinities of the American native point toward the more eastern parts of Asia. In Siberia, Mongolia, Tibet, Manchuria, Formosa, and in some of the islands off southeastern Asia, living remnants of the same type of man as the American aborigines are to this day encountered, and it is here in the farthest northwest where actual passings of parties of natives between the Asiatic coast and the Bering Sea islands and between the latter and the American coasts have always, since these parts were known, been observed and are still of common occurrence.

With these facts before them, the students of the peopling of this continent were always drawn strongly to Alaska and the opposite parts of Asia; but the distances, the difficulties of communication, and the high costs of exploration in these far-off regions have proven a serious hindrance to actual investigation. As a result, but little direct, systematic, archeological or anthropological (somatological) research has ever been carried out in these regions; though since Bering's, Cook's, and Vancouver's opening voyages to these parts a large amount of

general, cultural, and linguistic observations on the natives has accumulated.

For these observations, which are much in need of a compilation and critical analysis, science is indebted to the above-named captains; to the subsequent Russian explorers, and especially to the Russian clerics who were sent to Alaska as missionaries or priests to the natives; to various captains, traders, agents, miners, soldiers, and men in collateral branches of science, who came in contact with the aborigines; to special United States Government exploratory expeditions, with an occasional participation of the Biological Survey and the Smithsonian Institution, such as resulted in the fine "Corwin" reports and the highly valuable accounts of Leffingwell, Dall, Nelson, and Murdoch; to the separate pieces of scientific work by men such as Gordon and Jennes; and to Jochelson and Bogoras of the Jesup exploring expedition of the American Museum.

As a result of all these contributions, it may be said that there has been established a fair cultural and linguistic knowledge of the Aleut, the Eskimo, and the Chukchee, not to speak of the Tlingit, consideration of which seems more naturally to fall with that of the Indians of the northwest coast.

There are also numerous though often very imperfect and occasionally rather contradictory notes on the physical status of these peoples, and some valuable cultural and even skeletal collections were made. Since 1912 we possess also a good series of measurements on the St. Lawrence Island natives, together with valuable cranial material from that locality, made, under the direction of the writer, by Riley D. Moore, at that time aide in the Division of

Physical Anthropology in the United States National Museum.

The need of a further systematic archeological and somatological research in this important part of the world was long since felt, and several propositions were made in this line to the National Research Council (Hrdlička) and to the Smithsonian Institution (Hough, Hrdlička); but nothing came of these until the early part of 1926, when, a little money becoming available, the writer was intrusted by the Bureau of American Ethnology with the making of an extensive preliminary survey of Alaska. The objects of the trip were, in brief, to ascertain as much as possible about the surviving Indians and Eskimos; to trace all indications of old settlements and migrations; and to collect such skeletal and archeological material as might be of importance.

The trip occupied approximately four months, from the latter part of May to the latter part of September, affording a full season in Alaska. It began with the inside trip from Vancouver to Juneau, where at several of the stopping places groups of the northwest coast Indians were observed. At Juneau examination was made of the valuable archeological collections in the local museum. After this followed a trip with several stops along the gulf, a railroad trip with some stops to Fairbanks, a return trip to Nenana, a boat trip on the Tanana to the Yukon, and then, with little boats of various sorts, a trip with many stops for about 900 miles down the Yukon. This in turn was followed by a side trip in Norton Sound, after which transportation was secured to the island of St. Michael and to Nome. From Nome, after some work in the vicinity, the revenue cutter *Bear* took the writer to the St. Lawrence and Diomede

Islands, to Cape Wales, and thence from place to place of scientific interest up to Barrow. On the return a number of the more important places, besides some new ones, were touched upon, while the visit to others was prevented by the increasing storms, and the trip ended at Unalaska.

Throughout the journey, the writer received help from the Governor, officials, missionaries, traders, and people of Alaska; from the captain, officers, and crew of the *Bear*; and from many individuals; for all of which cordial thanks are hereby once more rendered. Grateful acknowledgments are especially due to the following gentlemen: Governor George A. Parks, of Alaska; Mr. Harry G. Watson, his secretary; Mr. Karl Thiele, Secretary for Alaska; Judge James Wickersham, formerly Delegate from Alaska; Father A. P. Kashevaroff, curator of the Territorial Museum and Library of Juneau; Dr. William Chase, of Cordova; Mr. Noel W. Smith, general manager Government railroad of Alaska; Mr. B. B. Mozee, Indian supervisor, and Dr. J. A. Romig, of Anchorage; Prof. C. E. Bunnell, president Alaska Agriculture College, at Fairbanks; Mr. and Mrs. Fullerton, missionaries, at Tanana; Rev. J. W. Chapman and Mr. Harry Lawrence, at Anvik; Father Jetté and Jim Walker, at Holy Cross; Mr. C. Betsch, at the Russian Mission; Messrs. Frank Tucker and E. C. Gurtler, near the mission; Mr. Frank P. Williams, of St. Michael; Judge G. J. Lomen and his sons and daughter, at Nome; Rev. Dr. Baldwin, Fathers La Fortune and Post, Captain Ross, United States Coast Guard, and Mr. Elmer Rydeem, merchant, at Nome; C. S. Cochran, captain of the *Bear*, and his officers, particularly Mr. H. Berg, the boatswain; Rev. F. W. Goodman and Mr. LaVoy, at Point Hope; the American teachers at Wales, Shishmareff, Kotzebue,

Point Hope, and elsewhere; Messrs. Tom Berryman, Jim Allen; and Charles Brower, traders, respectively, at Kotzebue, Wainright, and Barrow; Mr. Sylvester Chance, superintendent of education, Kotzebue, Alaska; the United States marshals, deputy marshals, and postmasters along the route; and the numerous traders, miners, settlers, and others who were helpful with specimens, advice, guidance, and in other matters.

General Remarks

The account of the survey will be limited in the main to anthropological and archeological observations; but it is thought best to give it largely in the form of the original notes made on the spot or within a few hours after an event. These notes often contain collateral observations or thoughts which could be excluded, but the presence of which adds freshness, reliability, and some local atmosphere to what otherwise would be a rather dry narrative. A preliminary account of the trip and its results was published in the Smithsonian exploration volume for 1926 (Washington, 1927, pp. 137-158).

Not much reference is possible to previous work of the nature here dealt with in the parts visited, except in the Aleutian Islands, where good archeological work was done in the late sixties by William H. Dall, [1] and in 1909-10 by Waldemar Jochelson.[2]

The archeology and anthropology of the Gulf of Alaska, the inland, the Yukon Basin, the Bering Sea coasts and islands, and those of the Arctic coasts up to Point Barrow are but little known. The archeology is in reality known only from the stone and old ivory implements that have been incidentally collected and

have reached various institutions where they have been studied; from the excavations about Barrow, conducted by an expedition of the University Museum, Philadelphia, in charge of W. B. Van Valin, and by the trader, Mr. Charles Brower, the results of which have not yet been published; and from the recent diggings at Wales and on the smaller Diomede Island by Doctor Jenness.[3] Neither Dall, Nelson, Rau, nor Murdoch conducted any excavations outside the already mentioned work in the Aleutians.

FOOTNOTES:

[1] Dall, Wm. H.: Alaska as it Was and Is; 1865-1895. Bull. Phil. Soc. Wash., 1900, vol. XIII, 141. On Prehistoric Remains in the Aleutian Islands. Proc. Cal. Acad. Sci., November, 1872, vol. IV, 283-287. Explorations on the Western Coast of North America. Smiths. Rept. for 1873, Wash., 1874, 417-418. On Further Examinations of the Amaknak Cave. Proc. Cal. Acad. Sci., 1873, vol. V, 196-200. Notes on Some Aleut Mummies. Proc. Cal. Acad. Sci., October, 1874, vol. V. 399-400. Deserted Hearths. The Overland Monthly, 1874, vol. XIII, 25-30. Alaskan Mummies. Am. Naturalist, 1875, vol. IX, 433-440. Tribes of the Extreme Northwest. Contrib. N. Am. Ethnol., vol. I, Wash., 1877. On the Remains of Later Prehistoric Man Obtained from Caves in the Catharina Archipelago, Alaska Territory, etc. Smiths. Contr. to Knowledge, No. 318, Wash., 1878.

[2] Jochelson, W., Archæological Investigations in the Aleutian Islands. Carnegie Inst. of Wash. Publ. No. 367, Wash., D. C., 1925.

[3] Rau, Chas., North American Stone

Implements. Smiths. Rept. for 1872, Wash., 1873. Prehistoric Fishing in Europe and North America. Smiths. Contr. to Knowledge, Wash., 1884, vol. XXV. Thomas, Cyrus, Introduction to the Study of North American Archæology. Cincinnati, 1898. Jennes, D. Archæological Investigations in Bering Strait. Ann. Rep. Nat. Mus. Canada for 1926 (Ottawa 1928), pp. 71-80.

Northwest Coast—Juneau

THE COAST INDIANS

Passage was taken on a small steamer from Vancouver. The boat stopped at a number of settlements on the scenic "inside" route—which impresses one as a much enlarged and varied trip through the Catskills—permitting some observations on the Indians of these parts.

The main opportunity was had at Aleut Bay. Here many British Columbia Indians were seen on the dock, belonging to several tribes. Names of these, as pronounced to me, were unfamiliar. They have a large agency here; engage in salmon industry. A minority, only, full bloods—of the younger a large majority mixed (white blood). The full bloods all show one marked type, of short to moderate stature, rather short legs, huge chest and head, i. e., face. Color near onion-brown, without luster. Indians, but modified locally. Remind one (chest, stature, stockiness, shortness of neck and legs) of Peruvian Indians.

Indians at Prince Rupert same type; color pale brown; eyes and nose rather small for the faces in some, in others good size. Look good deal like some

Chinese or rather some hand-laboring Chinese and Japanese look like them.

Indians at Juneau (the Auk tribe) very similar, but most mixed with whites.

Juneau.—A week was spent at Juneau, gathering information, obtaining letters of introduction, and making a few excursions. The city has an excellent museum devoted to Alaskan history and archeology, under the able curatorship of Father Andrew P. Kashevaroff, himself a part of the history of the Territory. The archeological collections of Alaska Indians and Eskimos are in some respects—e. g., pottery—more comprehensive than those of any other of our museums; but they, together with the valuable library, are housed in a frail frame building, under great risks from both fire and thieves. Fortunately the latter are still scarce in Alaska, but the fire risk is great and ever present. The museum is a decided cultural asset to Juneau.

NOTES OF ARCHEOLOGICAL INTEREST

Auk Point.—Thanks to Father Kashevaroff and Mr. Charles H. Flory, the district forester, an excursion was arranged one day to Auk Point, approximately 15 miles distant, a picturesque wooded little promontory near which there used to be a settlement of the Auk Indians. On the point were several burials of shamans and a chief of the tribe (all other dead being cremated), and near the graves stood until a short time ago a moderate-sized totem pole. Of all this we found but bare remnants. The burials of three shamans and one chief had been in huge boxes above ground; but they had all been broken into and most of the contents belonging to the dead were taken

away, including the skulls. The skeletal parts of two of the bodies and a few bones of the chief remained, however, with a few objects the vandals had overlooked. The latter were placed in the Juneau Museum while the bones, showing some features of interest, were collected and sent to Washington. A large painted board near the graves of the shamans remained, though damaged. The totem pole, however, had been cut down the year before by a young man from Juneau, who then severed the head, which he carried home, and left the rest on the beach, from where it was soon washed away. Thus a group of burials, the only ones known of the once good-sized Auk tribe, have been despoiled and their record lost to science. And such a fate is, according to all accounts, rapidly overtaking similar remains everywhere in southeastern Alaska.

Rare stone lamp (?).—At the museum one of the first and most interesting objects shown the writer by Father Kashevaroff was a large, heavy, finely sculptured oblong bowl, made of hard, dark crystalline stone, decorated in relief on the rim and with a squatting stone figure, cut from the same piece, near one of the ends. The bowl looks like a ceremonial lamp, though showing no trace of oil or carbon. Subsequently four other bowls of this same remarkable type and workmanship were learned of, two, the best of the lot, in the University Museum at Philadelphia; one in the Museum of the American Indian, New York; and one, somewhat inferior and of reddish stone, in the possession of Mr. Müller, the trader at Kaltag, on the Yukon (later in that of Mr. Lynn Smith, marshal at Fairbanks). The localities where the five remarkable and high-grade specimens have been found range from the Kenai Peninsula in southwestern Alaska to the lower Yukon. The Juneau

specimen comes from Fish Creek, near Kuik, Cook Inlet (see Descriptive Booklet Alaska Hist. Mus., Juneau, 1922, pp. 26, 27); that in the Heye Museum is from the same locality; the one in Philadelphia was found in the Kenai Peninsula; while that at Kaltag came from an old Indian site on the Kaiuh slough of the Yukon. Locally, there is much inclination to regard these specimens as Asiatic, especially Japanese, and a bronze Japanese Temple medal has been found near that now at Juneau. On the other hand, a strong suggestion of similarity to these dishes is presented by some undecorated large stone lamps from Alaska, and by a class of pottery bowls with a human figure perched on the rim at one end from some of the Arkansas mounds, Mexico, and farther southward. (See Mason, J. A. A remarkable stone lamp from Alaska. The Museum Jour., Phila., 1928, 170-194.)

Copper mask.—Shortly before leaving Juneau I became acquainted with Mr. Robert Simpson, manager of the "Nugget" curio shop, and found in his possession a number of interesting specimens made in the past by the Tlingit Indians. An outstanding piece was an old copper mask, which was purchased for the National Museum. Mr. Simpson obtained it years ago from a native of Yakutat and stored it with native furs and other articles of value. It originally belonged to a shaman of the Yakutat tribe and was said to have been worn by him in sacrificial slave killings, the shaman with the mask representing some mythical being. It is an exceedingly good and rare piece of native workmanship.

Copper "shield."—Another interesting article secured from Mr. Simpson is a large old shieldlike plate of beaten copper, decorated on one side with a

characteristic Tlingit engraved design. Mr. Simpson, in a letter to Doctor Hough, dated June 26, 1926, says: "The shield, or to speak more correctly the copper plate—for it was not used as a shield—was the most valuable possession of the Tlingits. They were usually valued in slaves, this one, at the last known exchange, having been traded for three slaves. The possessor of four or five such plates was a man of the utmost wealth. Some claim that they got these copper plates from the early New England traders and others that they came from the Copper River. Either is possible. Lots of the Copper River nuggets were very large and flat and could have readily been hammered into plate form. I bought this in the village of Klawak on the west coast of Prince of Wales Island. I do not know of another one around here. All of the local elderly natives are familiar with its previous value, and when they have wandered into my shop to sell things they always made deep obeisance to this plate."

Talks.—While in Juneau the writer spoke before the Rotarians, who honored him with a lunch; and later, in the auditorium of the fine new high school, gave a public lecture on "The Peopling of America," etc. The object of these and the many subsequent talks in Alaska was, on the one hand, to reciprocate as far as possible the kindness and help received on all sides, and on the other to leave wholesome information and stimulus in things anthropological. The audience was invariably all that a lecturer could desire, and many were left everywhere eager for help and cooperation. The aid of some of these men, including prospectors, miners, settlers, engineers, foresters, and various officials, may some day prove of much value in the search for Alaskan antiquities.

Juneau—Seward.—June 8, leave Juneau. It has been raining every day, with one exception, and is misting now, depriving us of a view of most of the coast. Wherever there is a glimpse of it, however, it is seen to be mountainous, wooded below, snowy and icy higher up, inhospitable, forbidding.

June 10, arrive at Cordova, a former native and Russian settlement of some importance. Will stay here large part of the day and go to see about Indians, old sites, burials, and specimens, the main hotel keeper, the assistant superintendent of the local railway, the postmaster, the supervisor of the forests, and Dr. William Chase, who has been connected with the work of the Biological Survey in these regions. Mr. W. J. McDonald, the forester, takes me out some miles into the very rugged country, where there are still plenty of bear and mountain goat. After which Doctor Chase takes me to the old Russian and Indian cemetery. There are many graves, mostly Indian, but also a few whites, and even a Chinaman. Russian crosses are still common. The older Indian part could be easily excavated. Learn of skulls and bones on "mummy" island in Prince William Sound.

Indians.—See quite a few. Nearly all appear more or less mixed; color in these more or less pronounced tan with red in cheeks and some tendency to paleness. Heads still all brachycephalic and of only moderate height; faces broad, noses not prominent, in males tend to large.

Two adult men, evidently full-bloods—pure Indian type of the brachycephalic form, head moderate in size, medium short, face not very large, nose slightly or moderately convex, not prominent, but all Indian. Color of skin submedium to near medium brown, no trace of whitish or pink. Stature and build medium;

feet rather small; hair typical Indian, black, straight; beard sparse and short; mustache sparse, no hair on sides of the face.

The boat makes two or three more commercial and passenger stops before reaching Seward, the main one at Valdez, the terminal of the Richardson Trail to the interior. These stops permit us to see some fish canneries, which are of both general and anthropological interest. These establishments employ Japanese, Philippine, and Chinese labor, and it was found to be quite a task to distinguish these, and to tell them from the coast Indians. The Chinamen can be distinguished most often, though not always, the Japanese less so, while the Filipino usually can not be told from the Indian, even by an expert. Here was a striking practical lesson in relationships.

Seward—Anchorage.—Seward found to be a fine little town, full of the same good brand of people that one finds everywhere in Alaska and who go so far to restore one's faith in humanity. It is the terminus of the Government railroad to Fairbanks and a port of some importance.

Indian basketry.—No Indians were seen here, though some come occasionally. But several of the stores, including that of the Seward Drug Co. (Mr. Elwyn Swestmann), have an unexpectedly good supply of decorated Alaska Indian baskets. It was found later, in fact, that the Alaskan Indians, with the Aleutians, compare well in basketry with those of Arizona and California.

Anchorage.—June 12-13. Anchorage, on Cook's Inlet, is a good-sized town for Alaska and the headquarters of the railroad. Here were met some very good friends, particularly Mr. Noel W. Smith, general

manager of the railroad; Dr. J. H. Romig, formerly of the Kuskokwim; and Mr. B. B. Mozee, the Indian supervisor. Here, at Ellis Hall, I lectured on "The Origin and Racial Affiliations of the Indians," and the large audience included seven male (some full blood) and two female (mix blood) Indians—of the latter, one very pretty, approaching a Spanish type of beauty. Near town I also visited with a launch two small Indian fishing camps. From Doctor Romig information was obtained about the Indians and some old sites of the Kuskokwim; and through the kindness of Messrs. Smith and Mozee I was enabled to visit the Indian school at Eklutna. Here at Anchorage I also was given the first and rather rare old Indian stone implement.

The Indians at the camps included 6 full bloods—4 men, 2 women. One of the men tested on chest. Typical full-blood results.

Type of full bloods: Color slightly submedium to medium brown, never darker; heads, subbrachycephalic to full brachycephalic, rather small; forehead in men more or less sloping in two; face, not large, Indian; nose tends to convex but not high. Indian in features and behavior, but features not as pronounced as general in the States tribes.

The full bloods in town: Medium to short stature, not massive frames, moderate-sized faces, Indian type, but not the pronounced form; head brachycephalic; hair all black; mustache and beard scarce, as in Indians in general; color of skin submedium brown. Children in camp (up to about 5 years) were striking by a relatively considerable interorbital breadth, otherwise typical Indian.

Birch-bark dishes.—At Anchorage, in several of the stores, but particularly at one small store, were seen

many nicely decorated birch-bark dishes or receptacles. They are made by inland Indians, are prettily decorated with colored porcupine quills, and evidently take the place of the baskets of other tribes. It was difficult to learn just what Indians made the best or most, though the Tanana people were mentioned. No such fine assortment of these dishes was seen after leaving Anchorage.

Eklutna.—Sixteen miles from Anchorage, along the railroad, is the Indian village and school Eklutna. Mr. Smith made it possible for me to reach this place on a freight and to be picked up later the same day by the passenger train.

At Eklutna was found an isolated but prettily located and well-kept Indian school, with about fifty children from many parts of southwestern Alaska. More than half of these children showed more or less admixture of white blood, but there was a minority of unquestionable full bloods. There were two children from Kodiak Island and two or three southern Eskimo. The main impression after a detailed look at the children was that, while they all showed clear Indian affinities and some were typically Indian, yet on the whole there was a prevalent trace of something Eskimoid in the physiognomies—an observation that was to be repeated more than once in other parts of Indian Alaska.

Burials.—At a few minutes' walk from the school at Eklutna there is in a clearing of the forest a small Indian village, with a late graveyard showing Russian influence. A short distance farther, however, according to the Indians, there is an old burial place of some magnitude, with traces of graves, although quite obliterated.

Eklutna—Fairbanks.—Since reaching Seward the almost incessant drizzles have ceased and the weather has been fine and pleasantly warm. Everything is green, grass is luxuriant, and there are many flowers.

The railroad journey is a regular scenic tour, with its crowning point a glorious view of Mount McKinley. The trains run only in the daytime. For the night a stop is made at a railroad hotel, in a quiet, picturesque location, at the edge of a good-sized river. They have foxes in cages here and a tame reindeer. There are no natives in this vicinity.

There are two interesting passengers on the train, with both of whom I became well acquainted. One is Joe Bernard, an explorer and collector (besides his other occupations) in Alaska and Siberia. He furnishes me with some valuable pictures and much information. The other man is Captain Wilkins, the flier of Point Barrow fame, who strikes me as an able and modest man.

The next day, as the train stops at Nenana, I am met, thanks to a word sent by Mr. Noel W. Smith, by Chief Thomas and a group of his people. These behave kindly and tell me of a potlatch to be held at Tanana "after some days," where they will visit. The chief impresses me with his rather refined though thoroughly Indian countenance.

Fairbanks.—Before reaching Fairbanks, the inland capital of Alaska, I am met by Prof. C. E. Bunnell, head of the Alaska Agricultural College. This college, located on an elevation about 4 miles out of the city, I visit with Professor Bunnell soon after arrival, to find there some interesting paleontological and archeological collections. Here are fair beginnings which well deserve the good will of the Alaskans.

Unfortunately the college has not yet the means for any substantial progress or research in these lines, and the collections are housed in a frame building where they are in serious danger from fire. But their presence will aid, doubtless, in the saving of other material of similar nature from the Tanana region, and specimens of special scientific importance will doubtless be referred to scientific institutions outside.

Fairbanks is a good-sized town, built on the wide flats of the Tanana River. Its population, now reduced, includes some civilized natives, most of whom, however, are mix breeds. A large petrified mammoth tusk on the porch of one of the semi-log houses shows that these are regions of more than ordinary biological interest. And there is soon an occurrence which demonstrates this further. Mr. John Buckley, the deputy marshal, takes me to an old Japanese resident, now a rooming-house keeper, who has had a hobby of collecting fossils, and who in the end is happy to donate to the National Museum a fine skull of a fossil Alaskan horse, together with some other specimens, refusing all payment. Such is the human Alaska, or at least the most of it.

Here, too, to a full hall in the library, a lecture is given on "The Peopling of Alaska and America," after which follows a return to Nenana to catch a steamer to the Yukon.

THE WRITER'S TRIP ON THE YUKON

TANANA—YUKON

June 17. Nenana: This is a small town on the Tanana, mostly railroad buildings, with a hospital; there is one street of stores (three short blocks), most of them now empty. About half a mile off a small Indian settlement about an Episcopalian mission.

Country flat on both sides of the rather large river, except for some hills back of the right shore beyond the railroad bridge, for a short distance. The river flats seem scarcely 3 or 4 feet above water, overgrown with brush and a few scrubby trees, later spruce thickets. Purple flowers (fireweed) strike the eye.

No relics found at Nenana; no information concerning old sites or abandoned villages along the stream.

Physically, the Indians seen at Nenana were submedium brown, good many still full blood, pure Indian type, brachycephalic, faces (nose, etc.), however, of but medium prominence. Moderate to good stature.

They are all fairly "civilized," wear white men's clothing, to which on gala occasions are added bands or collars of beadwork, and speak more or less

English. The younger men are evidently good workers.

The distance from Nenana to Tanana is given as about 190 miles by the river.

The government boat *Jacobs*, on which we shall go down the Tanana, is a moderate-sized, shallow-bottomed stern-wheeler, and, like all such boats on these rivers, will push a heavily laden freight barge before it. There are about a dozen passengers, the boat labor, a trader or two. All kindly, open. A few women—most of both sexes of the Scandinavian type. On barge some horses, a cow, pigs, chickens.

Leave after lunch—very good, generous, and pleasant meal in a local restaurant that would do credit to a large city; only the people are better, more human. Meals $1, the almost universal price in Alaska.

Some quaint expressions: When anyone has been away, especially to the States, they say he was "outside." I am an "outsider;" show it "by my collar." Underdone bacon is "easy." To assent they say "you bet." In a restaurant, to a decent, cheerful girl: "May I have a little hot coffee?" "You bet!" Which bright answer is heard so often that one finishes by being shy to ask.

Dogs, of course, do not pull, but "mush." This is from the Canadian French "marche." Dogs do not understand "go" or "go on," only "mush."

Extensive flats. Below Nenana these flats, plainly recent alluvial, are said to extend up to 60 miles to the left (southwestward) and to 20 miles to the right. As one passes nearer they are seen to range from 3 up to about 8 feet above the level of the river at this stage of water.

Cabins and fishing camps along the river, mostly flimsy structures, with a few tents. Indians in some. The Indians are said by the whites to be pretty lazy, living from day to day; yet they seem industrious enough in their own camps and in their own way.

Storage or caches, little houses on stilts. Dog houses in rows. Curious wheel fish traps, revolving like hay or wheat lifting machines, run by the current. They scoop out the fish and let them fall into a box, from which the fisherman collects them twice a day. It is the laziest fishing that could be devised. The contraption is said to come from the northwest coast, but has become one of the characteristic parts of the scenery along the Tanana and the Yukon. An Indian camp—stacks of cordwood—canoes.

The day is sunny, moderately warm and rather dry—about as a warm, dry, fall day with us. The river shows bars, with caught driftwood; also considerable floating wood. There are seagulls, said to destroy young ducks and geese and water birds' eggs. Shores now wooded, mainly poplar, not large. Farther back and farther down, spruce.

The river averages about 200 to 300 yards but differs much in places and there are numerous side channels (sloughs). It is crooked; many bends. The current is quite marked, stated to run 4 to 6 miles an hour. The water is charged with grayish-brown silt, part from glaciers higher above, part from banks that are being "cut." The banks are entirely silt, no trace of gravel or stone. Indian camps getting very scarce. Boat making good time, but now and then requires careful manipulation, with its big, heavy barge in front. Once driven to shore, but no damage, and after some effort gets away again. No trouble yet from mosquitoes, but there are some horseflies.

Pass a large camp—a Finn married to a squaw, and three or four Indian families—all snug in a clearing of the fresh-looking woods on the bank of the river.

Bend after bend in the stream, and boat has to follow them all, and more, for the current and deeper water are now near this bank and again at the opposite bank.

The water in many places is undermining the bank, exposing frozen strata of silt. The top often falls in without breaking, with trees and all, and it then looks like heavy, ragged mats hanging over the bank, with green trees or bushes dipping into the water, and perhaps a clump of wild roses projecting from the sward. There are many low bushes of wild roses in this country, pink and red kinds, now blooming. Also many small bushes of wild berries—cranberries (low and high), raspberries, dewberries or blueberries.

Meat is imported even to here from Seattle, and carried far down the Yukon. When received they place it in a "cellar" or hole dug down to the frozen ground and place the meat there—a natural and thoroughly efficient refrigerator.

Past Old Minto, a little Indian village, a few little log houses in a row facing the river, with a wheel fish trap in front (pl. 1, *a*). Later a few Indian houses and a "road house" with a store at Tolovana. Most Indians there (and elsewhere here) died of the "flu" in 1918, the bodies being left and later buried by the Government. A few isolated little Indian camps.

The boat ties to trees along the banks. No docks or anything of that nature. Not many mosquitoes yet, more horseflies, which, however, do not bother man very much.

After reaching Hot Springs (right bank), there is seen a long range of more or less forested, fairly steep-sloped hills along the right bank, coming right down to the water's edge for miles, with bush and forested flats opposite. At the end of one of the ravines with a little stream, right on the bank, remnants of a little glacier melting very slowly in the sun. Strange contrast, ice and green touching. Boat making good time along the hills.

June 18. Hardly any sleep. Sun set after 10 and rose about 2.30, with no more than dusk between. Then heat in the cabin, and above all the noises. The boat stuck five hours on a bar and there were all sorts of jerks and shudders and calls.

Flats again on both sides, but hills beyond, with just one little spot of snow. Will be warm day again.

ANCIENT MAN

Prospects of old remains of man all along the river are slight if any. Old silt flats have doubtless been mostly washed away (as now) and rebuilt. Only on the older parts, now often far from water, could anything remain and there it is all a jungle of forest with undergrowth, with all surface traces absent (no stone, no shell), and no one here to find things accidentally. As to the hills that approach the river, the slopes (shales, overlain by what looks like stratified mud and silt rock) are mostly of recent exposure, and have doubtless been receding slowly through erosion, so that the bank line along them is not old; and their valleys are few, narrow, and were higher formerly as well as more extended toward where the river flowed then. The only hopeful spot is about Hot Springs, where fossil animal remains are

said to exist, but here nothing as yet has been noted suggesting ancient man.

June 18, 4 p. m. River getting broader. Some low dunes. In distance a range of bluish hills before us—the hills along the Yukon. Boat meandering from side to side. Every now and then a necessary steam blow-out of mud, or a short whistle, hurry of a man over the top of the barge and of two half-breeds along its side to the prow to test, with long pointed and graduated poles, the depth of the water, calling it out to the captain. The calls range from "no bottom" to "4 feet," at the latter of which the boat begins to touch and back water.

5 p. m. Arrived at Tanana, a cheerful looking town, extending over about half a mile along the right bank of the Yukon, here about 20 feet high; but now, with the gold rush over, rather "slack" on both business and population, as are all other Yukon towns. Somewhat disappointed with the Yukon—not as majestic here as expected. See storekeeper—introduced by captain. Hear good news. The Indians have a big potlatch at the mission, 2 miles above. Tanana Indians expected. And there will be many in attendance. Rumors of this potlatch were heard before, but this was the first definite information. Get on a little motor boat with Indians who were making some purchases, and go to the St. Thomas Episcopal Mission, Mr. Fullerton in charge.

THE INDIANS AT TANANA

The mission above Tanana is beautifully located on the elevated right Yukon bank, facing Nuklukhayet island and point, the latter, according to old reports, an old trading and meeting spot of the Kuchin tribes,

and the confluence of the Tanana with the Yukon. The mission house, located on rising ground, the wooden church lower down, the cemetery a bit farther up, and the Indian village a bit farther downstream, with their colors and that of the luxuriant vegetation, form a picturesque cluster.

I am kindly received by Mr. Fullerton and his wife and given accommodation in their house. On the part of the good-sized Indian village everything is life and bustle and we soon are over. Motor launches owned and operated by the Indians in the river; dogs, scores of the big, half-wild, noisy sled dogs tied to stakes along the slope of the bank, fighting stray ones, barking in whole outbursts, feeding on smelly fish, or digging cooling holes into the bank in which they hide most of the body from the warm rays of the sun; and many Indians, about 400 in all, in whole families, in houses, large canvas tents, cooking, eating, visiting—a busy multitude, but with white man's clothes, utensils, etc., not nearly so interesting as a group of more primitive Indians would be.

Walk, visit, talk, and observe. Note many mix-bloods, especially among the younger ones and the children. Among the full bloods, many, about one-half, with features reminding more or less of Eskimoid; but a few typically Indian, i. e., like most of the States Indians.

Medium stature, substantial but not massive build, quite a few of the older women stout. Color of full bloods generally near medium brown, features regular Indian but not exaggerated, noses rather low especially in upper half, eyes and hair Indian. Epicanthus not excessive in children, absent in adults (traces in younger women), eyes not markedly oblique. Behavior, Indian.

The more pronounced Eskimoids have flatter and longer faces, more oblique eyes, and more marked epicanthus. They should come, it would seem, from Eskimo admixture. The Tanana Indians (Nenana) did not, so far as seen, show such physiognomies.

Toward evening, and especially after supper, natives sing and dance. Songs of Indian characteristics, and yet different from those in south; some more expressive. A song "for dead mother," very sad, affects some to crying aloud (a woman, a man). A wash song—a row of women and even some men imitating, standing in a row, the movements in washing, while others sing; humorous. A dance in a line, curving to a circle, of a more typical Indian character. Late at night, a war dance, with much supple contortion. Also other songs and dances up to 2.30 a. m.—heard in bed.

June 19. With dogs barking and whining and Indians singing, got little rest. All Indians sleep until afternoon. No chance of doing anything, so go down to town to get instruments and blanks. Find that storekeeper has an old stone ax—sells it to me for $1. Also tells of a farmer who has one—go there with the boat and obtain it as a gift; told of another one—a Finn—has two, sells them for $1. Come from the gravelly bank of the river or are dug out in gardening. There may well have been old settlements in this favorable location. After return, visit some tents to see sick. Much sickness—eyes, tuberculosis—now and then probably syphilis.

Indians relatively civilized, more than expected, and most speak tolerable English. Have flags, guns, sleep in some cases on iron beds and under mosquito netting, smoke cigarettes and cigars; and even play fiddles. Of course some have also learned the white

man's cupidity and vices.

This day I met with something unexpected, due to perversity of mix-breed nature. Seeing so many Indians present, and after a good reception by them the evening preceding, I thought of utilizing the occasion for taking some measurements. I therefore mentioned the thing to some of the head men shortly after my arrival and receiving what seemed assent, went to-day to Tanana to get my instruments. On coming back and finding a few of the old men, who were quite friendly, I invited them into the "kashim" (community house) and began to question them on old sites, etc., when in came, probably somewhat under the influence of liquor, a mix-breed to whom I had been introduced the night before and who at that time acted quite civilly, but now coming forward began rather loudly and offensively to question about what I wanted here and about authority, giving me to understand at last quite plainly that he wanted to "be paid" if I was to take any measurements. He claimed to be one of the "chiefs," and I would not be allowed to do anything without his help. His harangue quite disturbed the other Indians, who evidently were both ashamed and afraid of the fellow. And as I would not be coerced into employing and paying him, and there being no one, as I learned, of supreme authority, the "chief" of these Indians being little more than a figurehead, it was decided to give up the attempt at measurements. The rest of the visit was therefore given to further observations and to the witnessing of the potlatch. Chief Joseph (pl. 14), nominally the head of these Yukon Indians, expressed his sorrow and tried to make amends by offering himself.

The potlatch was evidently in the main a social

gathering of the Yukon Indians, with the Tanana natives as visitors. It consisted mainly of eating, singing, and dancing, to be terminated by a big "give-away." This latter was witnessed. It proved a disappointing and rather senseless affair. The whole transaction consists in the buying and gathering, and on this occasion giving away, of all sorts of objects, by some one, or several, who have lost a husband, wife, mother, etc., during the preceding year. The possessions of the deceased are included in this and doubtless often transmit disease. All the color of the observance is now gone. The goods—blankets, clothing, fabrics, guns, and many other objects, even pieces of furniture, trunks, or stoves—are gathered in the open and when the time comes are one after another selected by those dispensing and brought to this or that man or woman of those who have gathered around. No song, no ceremony, no talks, no thanking, no "wake" following. Just a poor shadow of something that formerly may have been a tragic, memorable, and meaning occasion.

Returned to Tanana near 10 p. m. and found lodging with a storekeeper who kept a "hotel." Got a big room, big bed, and when store closed was alone in the house, the storekeeper sleeping elsewhere.

June 20. But, Alaska was evidently not made for sleepers. Had not a wink until after 3 a. m.—daylight, people talking loud and walking on the board walk outside, and heard so clearly in my room —loud-laughing girls, the dogs, and at last another boat with its siren; and every now and then a singing mosquito trying to get at me through even the small opening left under the sheet for breathing—there being no netting. Finally doze off, to wake near 9 a. m., but everything closed, deadlike. However, go to a

little frame house for breakfast, and in waiting until it is made find myself with two elderly men who go to-day down the river with their boats. One is a former store clerk, etc., and now an "optician"—peddles eyeglasses down the river; the other was a prospector, miner, and blacksmith, now an itinerant "jeweler" and a reputed "hootch" peddler. As the latter—otherwise a pretty good fellow—has a good-sized though old boat, arrange to go down with him. See the marshal, storekeeper, settle with my hotel man (had to go at 11 to awake him), and ready to start.

The outfit is largely homemade, not imposing, old, unpainted, and unfit for the rough—but it could be worse. It consists of a scow, a low, flat-bottomed boat, partly covered with canvas roof on birch hoops, in which Peake (the owner) carries fresh meat to some one, a stove, dishes, bedding, and many other things; and the motor boat proper, in which there is little room except for the machine and its tender. The latter sits on a soap box; I, on a seat extemporized from a cylindrical piece of firewood with a little board across it, with my two boxes and bedding within easy reach. Sit in front of the scow, except when driven back by spray. But our motor works and so we start quite well at some time after 11. The arrangement is to stop at every white man's camp or settlement down to Ruby. I could have gone on a better boat with its owner, but they charge here $15 a day, with "keep," and twice the amount for the return of the man and the boat, which is beyond my resources.

Tanana—Ruby. The river is clearer than the Tanana, and much broader. It is a great fine stream and its shores, while mostly still low on the left, on the right

rise here and there into moderate loess bluffs, far beyond which are seen higher elevations and bluish forested mountains. All covered with poplar and spruce.

2.15 p. m. Wind has so increased that the scow bumps and squeaks and there is danger of opening its seams. Therefore side to the beach and make lunch—a roast of fat pork, over-salted, canned spinach, dry bread, and black coffee. All on a simple, old, but efficient little stove in the boat. Our companion, the oculist, rides not with us but in a nice little green canoe with a plaything of a gasoline motor fastened to the backboard, but we all eat and sleep together.

But a few small Indian camps seen, and no white man's house. Soon after lunch, however, approach "The Old Station," where there are a few Indian houses, and later a white man's place (Burchell's). Stop at the latter. Learn that we are 20 miles from Tanana and on a 5-mile-long channel. There are here 15 to 40 feet high loess-like (silt) bluffs with a flat on the top, which latter was from far back one of the most important sites of the Indians of these regions. Mr. Burchell and his partner kindly take me back, with their better boat, to the main old site. Many old graves there, a few still marked. Traces of dugouts (birch-bark lined), houses, caches, etc., from Burchell's place to old main site. Important place that deserves to be thoroughly excavated, though this will entail no little work. Site was of the choicest, dominant, healthy. Connects by a trail, still traceable, with the Koyukuk region.

There are said to be no traces of pottery in any of these parts. But average to very large stone axes are washed out occasionally from the banks, and other

articles are dug out (long ivory spear, bone scraper, etc.). Promise of bones, etc., by Mr. Burchell.

One hundred miles more to Ruby. Near 8 p. m. start again—sun still high, little wind—endeavor to get to the "bone yard," a great bank bearing fossils. Fine clean scenery, flat on left, flat to elevated with grey-blue mountainous beyond on right. Water now calm and we make good progress. Very few camps—dogs on the beach, fish-drying racks a little farther, then a little log cabin and perhaps a tent, with somewhere near by in the river the inevitable fish wheel, turning slowly with the current.

Had supper at Burchell's; white fish, boiled potato, coffee, some canned greens.

Scenery in spots precious, virginal, flat at the river, elevated behind, foreground covered by the lighter green of poplars and birches, with upright, somber, dark spruce behind. Sun on the right, half moon on the left, and river like a big glassy lake, just rippling a little here and there. Cooler—need a coat. On right, getting gradually nearer the mountains.

Near 10 p. m. Sun still above horizon. On left a long (several miles), mostly wooded, but here and there denuded, palisade-like bank, apparently 200-400 feet high—the "graveyard."

Monday, June 21. Just at sunset last night—after 10 o'clock—came to the "bone yard" bank—a long curving line of loess bluffs 100 to 300 feet high, steep right to water's edge, riven by many ravines. Lowest third (approximately) light compact loess; then a thick layer of river sand (stratified more or less) and small gravel, then from one-third to nearly two-fifths of darker loess. In spots quite dark, frozen, but on surface melting, "running," also tumbling in

smaller or larger masses. Wherever darker there emanates from it and spreads far out over the river a decided mummy-like smell. Too late to photograph from boat, and no other place available. Also impracticable to explore with any detail—would take several days and be a difficult work. The bluffs become gradually lower downstream. No bones seen from boat, but mostly were not near enough to discern. A remarkable formation, in many ways, and in need of masterly study as well as description.

Night on a low gravelly and pebbly beach. Many mosquitoes. Mosquito netting found bad—sides too short (gave directions, but they were disregarded) and mesh not small enough. In a short time impossible to stay under. Supplemented by old netting of Mr. Peake, who will sleep under his canvas in the boat; but the old dirty net has holes in it and the mosquitoes keep on coming through the two. Fighting them until some time after midnight, then under all my things—netting, blanket, clothes—find some rest, sleeping until 4.30 a. m. After that—full day, of course—sleep impossible. The "optician," who slept well under proper Alaska netting, gets up, wakes my man; we both get up, shake, roll up bedding, have a cat-wash, then breakfast, and at 6.30 off once more along the beautiful but not hospitable river.

Inquiry at a local white man's cabin about fossils and Indian things negative—has paid no attention, and fossil bones that he sometimes comes across generally not in good state of preservation.

Right bank now hilly, with greater hills and then mountains behind. Warm, river smooth, just a light breeze. How puny we are in all this greatness.

A lot of trouble develops with the engine to-day—

bad pump. Will not get to Ruby until evening. Meat, on which I must sit occasionally, begins to smell, and there are numerous horseflies, probably attracted by the smell.

Four p. m. Visit Kokrines, on a high bank, native village, cemetery. Photograph some natives, are good natured, talk pidgin English. Clearly considerable old Eskimo admixture, but the substratum and main portion is Indian. All kind and cheerful here, glad to have pictures taken. Only white man is a "road-house" keeper; i. e., storekeeper. Store, however, poorly stocked, probably in all not over $200 worth of goods. "Optician," who is hoggish, has headache, but eats and drinks all he can nevertheless. "Jeweler" repaired his pump, and so we are once more on the way—35 miles more to Ruby. No trace of any relics at Kokrines.

River now a mile wide, with many "slews" (side channels, sloughs), and many low, flat, forested islands. Mountains to right, higher, traces of snow. Smoke wall from forest fire advancing from the west —now also smell. Islands beautiful, fresh colors and clean—light grass on border, then green and grayish poplars, birches, and alder, from among which rise the blackish green spruces. Little native fishing camps a mile or two apart, right bank—on left wilderness of flats, as usual.

A few miles above Ruby conditions change—high bluffs (rocky) now on left, flat on right side. Ruby, from a distance and after the loneliness of the day, looks quite a little town on the left bank, at the base of the higher ground.

Ruby

June 22-23. Our approach to Ruby was very modest. With Mr. Peake paid off, we just sided against and tied to the bank, on which are the lowest houses of the village, and carried out my boxes and bedding on the bank. There two or three men were idly watching our arrival. I asked about the local marshal, to whom I had a note, and had my things carried to the combined post office and hotel. In almost no time I meet Mr. Thomas H. Long, the marshal, become acquainted with the people about, tell my mission, and begin to collect. It does not take long for one properly introduced to be thoroughly and warmly at home in Alaska. The first specimen I get is a fine fossilized mammoth molar. It is brought to me by Albert Verkinik, who was about to depart for some mines, but went back to get the tooth. And he asks no compensation.

The parts of two days spent at Ruby were quite profitable. Visiting, and in the jail, were several Indians who could be noted and photographed. At the old jail there were two skulls of Indians that were donated. The teacher had two of the characteristic Yukon two-grooved axes. The postmaster, Mr. H. E. Clarke, gave a collection of fresh animal skulls. Mr. Louis Pilback donated two mammoth molars, found 2 miles up the Yukon on Little Melozey Creek, about 8 feet deep, in the muck right over the gravel. Mrs. Monica Silas brought me a good old stone knife. Several of the men took me down to the beach to see a damaged fossil elephant skull, also to see some fossiliferous workings above the town. Another party took me a few miles up and across the river to see an Indian camp and near by some old burials. The collections were sent through parcel post; and the evening before departure I gave a lecture to an attentive and respectful audience.

The town itself, however, is now a mere damaged and crumbling shell of what it was in the heyday of its glory, during the gold rush. Many of the frame dwellings and stores are empty; the board sidewalks are rickety and with big holes; and in the air is a general lack of impetus.

June 23. Failing to find another suitable boat, I once more made an arrangement to go farther down the river with Mr. Peake and his friend. Peake's boat and scow were not much to look at, and the troubles with the engine, and with its owner's raw swearing at times, were somewhat trying; but for my purpose the outfit did well enough, and I was treated very well and given all needed opportunity to examine what was of importance on the banks. I was quite sorry when eventually we had to part company, and I know Mr. Peake has not forgotten my quest, for I heard of his talking about it to parties, with whom I was very glad to come in contact, on the Kuskokwim.

June 23. The sunny evening of my second busy day at Ruby, near 10 p. m., Peake unexpectedly comes to the hotel to tell me he will be ready to start to-night, on account of quiet water. His wash "is being ironed" and will be ready soon. The marshal comes in, calls the prisoners to take down my baggage, and at 10.15, after true, hearty good-byes, I am once more in the old scow. Then Peake goes for his wash, with an Indian woman, and does not come until near 11. River peaceful, sun shortly set, sky somewhat cloudy, forest fire on opposite shore below still smoking a great deal. Leaving good people at Ruby, who promise to help in the future. It is getting much cooler after a pretty warm day. Will lie on the hard boxes and try to get a little sleep.

Thursday, June 24. We went long into the night,

then stopped at a lone cabin. Up timely, but slow start—it is 10.10 a. m. before we go. The time gained at night lost now—bad habits. Breeze up the river, occasionally strong, but not severe.

The cabin was the "Dutchman's," or Meyer's. He came out at 1 a. m. to meet us, at the bark of his big dogs, a good-hearted, weather-seared prospector, fisherman, and trapper of about 40, alone with his huskies. Asked me into his little log hut, prepared a place for my bedding on a frame, burned powder against the mosquitoes, brought out from cool "cellar" a bottle of root beer he brews, and then we went to sleep. But dogs kept waking us and Meyer went out several times to quiet them. Fall asleep at 3.20 and oblivious until near 7. Meyer forces on me six bottles of root beer, I leave him some prescriptions, and taking my bed roll we go down to the boat. My men still sleeping, as I expected. And then slow awakening, breakfast, and late starting.

Meyer never saw any Indian bones or stones, but promises cheerfully to watch for them hereafter and to make inquiries. Of course, he also, like so many in these lands, tells of a "prospect" of a gold find, and is quite confident he'll "make good." As usual, also, it is a "lead" that was "lost" and he believes he has found it. And all the time the gold is inside, not outside, of these hunters of the yellow star.

Hills on the right again; flat islands, banks, etc., on the left. Meyer's is 18 miles down from Ruby, right bank. About 5 miles farther down on the slopes of the right bank is a pretty little Indian graveyard (pl. 1, *b*), and a little lower down there are three now empty Indian huts.

Hills and mountains seen also now beyond the wide flats of the left bank. The hills on right, along which

we pass, are more or less forested, but often just bushy and grassy. They rise to about 600 to 700 feet and the slopes are seldom steep. Along their base there are many elevated platforms, low swells, and nooks, that could have served of old—as they serve here and there now—for native habitation, though only few could have accommodated larger villages.

Pass an Indian camp—the inevitable staked dogs; a swimming boy—first being seen bathing in the open.

Whiskey Creek next. Sixty-two dogs, all along the bank, and each one-half or more in his own cooling hole; holes they dig down to near the frozen ground. A settler, and two Indians—a photograph. No relics or bones now, but will watch; promise also to save some animal skulls, etc.

Twelve o'clock. Off again. Day better now, less squally, warm.

Hills above and below lower and earthy—loess, at least much of it. The right shore is all along sunnier, higher, more beautiful, and more open to wind (less mosquitoes). These are the reasons, doubtless, why it was of old and is still the favored side for habitations by natives as well as whites.

Just before reaching "Old Lowden," overtaken by a rather crazily driven small motor boat with four young Indians, who hand us a crude message for the storekeeper at Galena, telling him that a baby in the camp is to die to-night. I offer to see the baby. Find a boy infant about one year or a little over, ill evidently with bronchitis. Father and mother, each about 30, sit over it brooding in dumb grief, each on one side. Respond not to my presence, and barely so to my questions. And when I begin to tell to the fellow who interprets and is some relative that the

baby need not die, and what to do—I note that he is somewhat under the influence of liquor and a little flushed—to my dismay he begins to rant against me as a doctor and against the Government, and wants me perforce, seemingly, to say that the child is going to die and die to-night. There are two guns around and I almost anticipate his catching hold of one. The gist of the piecemeal talk is that they believe I am a Government doctor, who ought to stay four or five days with them and take over the child's treatment, and yet the fellow insists that the child will die before next morning. I do not know what they would say or do to the doctor if he undertook to stay and the child died—or if it recovered. It is dismal. They have the idea that the "Government" is obliged to do all sorts of things for them, without being clear just what, and that it does not do them. They believe, and try to say so, that I am sent and paid by the Government to treat them. Probably they have heard about the Government medical party that is to examine conditions along the river this summer, and think that I do not want to do or give what is necessary. I give all the possible advice, but there is plainly no inclination to follow it. I offer some medicine; they sneer at medicine. Even the father says he does not understand it or want it. They are all surly and in a dangerous, stupid mood. So there is nothing left but to go away as well as one may.

On way down the bank a woman is seen cleaning and cutting fish—knife steel, with wood or ivory handle, of the Chinese and Eskimo type. A porcupine, bloated, and with flies and maggots on it already about the nose, mouth, and eyes, lies next to the woman, and its turn will probably come next after the fish.

Have modest lunch—canned pears, a bit of cold bacon left from morning, a bit of cheese, and coffee; and start once more onward. So much beauty here, and such human discord.

3.30 p. m. Passing on right bank a line of bluffs, wholly of loess, about 200 feet high and approximately 4 miles long, and as if shaven with knife from top to water's edge. After that flats only on both sides, with but one hill far ahead of us.

Motor trouble again—same old pump; but not for long; in half an hour on again. A steamer upward passes us—like a stranger, and power.

Galena

A little town (village), on a flat promontory. An old consumptive storekeeper—no knowledge of any old implements or skeletal remains. Lowden village moved here due to mine opposite and better site. About 10 Indian houses here; inhabitants now mostly in fishing camps.

From Galena down, low shores and islands as on the Tanana, as far as can be seen, with mountains, grayish blue, in far distance (and only occasional glimpses). River never less than three-fourths of a mile and sometimes together with its sloughs and islands several miles broad. Some geese; occasional rabbit seen on land; otherwise but little life. First gulls.

The Indians at Ruby and Galena show here and there an Eskimoid type, with the younger nearly all mix bloods (with whites). Full bloods of same type as all along the river, brachycephalic, low to moderate high vault of head, moderate to medium (rarely

above) stature, medium brown, noses not prominent, concavo-convex, moderately convex or nearly straight, Indian cast of the face, but quite a few more or less Eskimoid. Not very bright.

Sit in the bottom of the scow, in front, before the stove and make notes. When we stop, jump out to tie the boat; when leaving, push it off. Getting sunburnt dark. Forgetting once again that I have a stomach or any other organ. Only sleep, never fully, much less than ought to; but even that is somehow much more bearable here than it would be at home.

6.45 p. m. Suddenly, after a turn, confronted with a steep rocky promontory about 500 feet high—stratified mud rocks. On side, high above, a tall white cross; learn later an Indian murdered a bishop here. A little farther, on a flat below the slope, a small settlement. A remarkable landmark, known as the Bishop's Rock. Afterwards again flats, but some more elevated than before to the left. River like a great looking-glass. Same character of vegetation and colors as farther above, but details varied.

At Ruby had made a genuine, effective, Alaska mosquito netting, and so now feel quite independent of the pest; also have two bottles of mosquito oil, which helps. Fortunately on the water we are not bothered.

Toward night reach Koyukuk River, and later on, Koyukuk village, a pleasant row of houses, white and native, on a high bank. Here, at last, pass one good night, sleeping under good mosquito netting in the house and on the bed of an Italian trader. Also had good supper of salmon, and good breakfast of bacon and eggs, and so feel rested and strong.

Friday, June 25. But in the morning the sky is

overcast and every now and then there is a loose shower. Of course my boon companions are not ready again until long after 9 o'clock, and then the engine will not go again, so a longer delay. They were inclined, in fact, to "lay over," but I urged them on. But they are determined if it rains a bit more to "tie to" somewhere. Fortunately there is no wind. About 3 miles below Koyukuk and its flats, the high bluffs with steep more or less shaved-like barren slopes recommence. A gloomy day.

About 7 miles down, after a large rocky promontory, a small graveyard on the side of a hill, with a little native camp about a third of a mile beyond.

10.45 a. m. Beautiful wooded great hills, 400 to 800 feet high, all along the right bank again, with large **V**-shaped valleys between. A fine, rounded, slightly more than usually elevated island ahead. Left banks flat.

Sun coming out a little; cool, but not unpleasant. No more showers, river smooth, boat making time. Blue hazy mountains far to the left front.

Hills to right rocky, strata horizontal to warped, mud rocks, broad banks of sandy, gravelly or mucky materials, not consolidated, between hard strata.

Now and then a small Indian camp, usually two or three tents, Indians, dogs, boats; some drying fish (not much).

11.00 a. m. Another isolated little graveyard, right slope, near an old camp.

There is no possibility now of excavating any of these graveyards, for the Indians are in unpleasant disposition toward the Government for various reasons. But such a place as that near Burchell's

could be excavated as soon as conditions improve. Also that above Ruby and another opposite and just below Ruby. There are no longer any superstructures left at these (or but traces), and the graves, as seen above Ruby, are near (within 2 feet of) the surface.

No trace or indication of anything older than the double-grooved ax culture has thus far been seen anywhere in the valley; and large stretches of present banks are quite barren.

As we approach Nulato the horizon before us becomes hilly and mountainous. The sun is now fully out and its warmth is very pleasant. Pass an Indian woman paddling a canoe; later an Indian family going upstream in a motor boat. Most of these Indians possess a motor boat of some sort, and know how to run it, though it is not in their nature to be overcareful.

Nulato
(Pl. 1, *b*)

Arrive midday. Quite a village, as usual along the water front on a high bank. Large fancy modern surface burial ground with brightly painted boxes and flying flags on a hill to the right. Met by local marshal and doctor; my things are taken to a little hospital. Natives here have poor reputation, but now said to be better. Boys nearly all mix bloods. Several men and women show Eskimo type, but majority are Indian to somewhat Eskimoid. Soon find they are not very well disposed—want pay for everything, and much pay. Have a few specimens, but to obtain anything from them is difficult. Have been spoiled.

A visit with the marshal to the site of old Nulato on the proximate point; nothing there, just a rabbit's

skull and a lot of mosquitoes. Photograph old graveyard (that of old Nulato), on the distal point beyond the creek.

Mr. Steinhauser, trader, of Czech descent, helpful and kind. But nothing further to do here. Steamer that was to be here to-night or to-morrow will not arrive, just learned, until Tuesday (this is Friday); and so must engage a little gasoline boat to the next station, Kaltag, 40 miles down the river.

Sleep under my new netting in the hospital. In the morning, after parting with doctor and marshal, start 8.30 a. m. Boat little, shaky, run by a half-breed boy of about 18. My old scow with Peake and his companion will stay a day longer. Partly cloudy, warm.

Pass flats, and come again to similar shaved-off bluffs like yesterday. We are now running close to the shore so that I can see everything. Flowers, but not many or many varieties.

9.50 a. m. Pass (about 8 miles from Nulato) a few burials (old boxes) on right slope. (Pl. 1, *c*.) Indian camp about one-half mile farther, and a few old abandoned huts and caches.

Everything on and along the river about the same as yesterday, except in little details. Sky clouded; light clouds, however. The boy with me has had good schooling (for a native) and is a good informer. But there is little of archeological or anthropological interest hereabouts. (Pl. 2, *a*.)

12.10 p. m. Another rounded island ahead of us; far beyond it grayish-blue hills and mountains. Six miles more to Kaltag. But little life here—a few small birds, a lone robin, a lone gull.

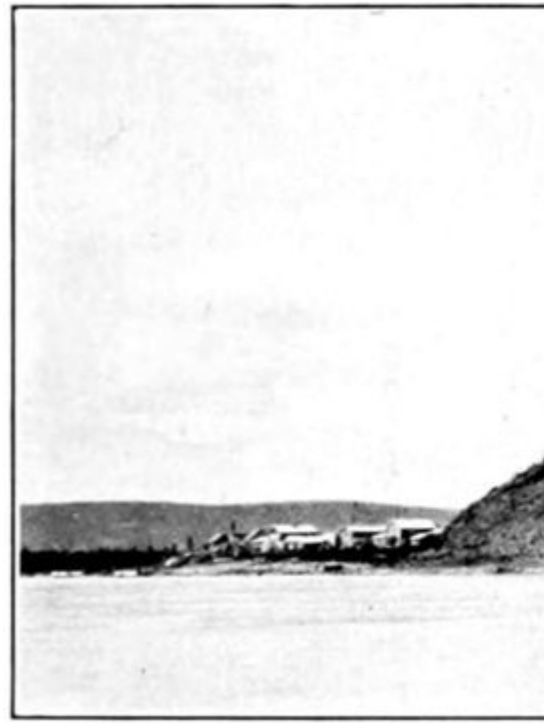
Kaltag

1.00 p. m. Kaltag in view—a small modern village on right bank, less than half the size of Nulato; a nearly compact row of log and plank houses. Nothing of any special interest seen from distance, and but little after landing. The old village used to be somewhat higher up the river.

There is an old abandoned site also just opposite the present Kaltag. Another site, "Klenkakaiuh," is, I am told, in the Kaiuh slough south of Kaltag, in a straight line about 10 miles, but no one there; and several other old villages in that region along that slough—same Indians as those of Kaltag. All of Kaltag go there on occasions, but do not live there permanently any more.



***a*, "Old Minto" on t**

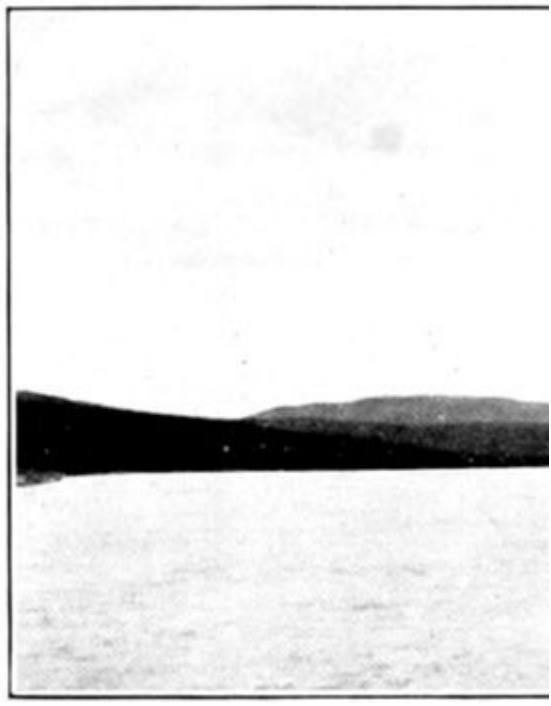


***b*, Present Nulato and its cemetery (on hill t**

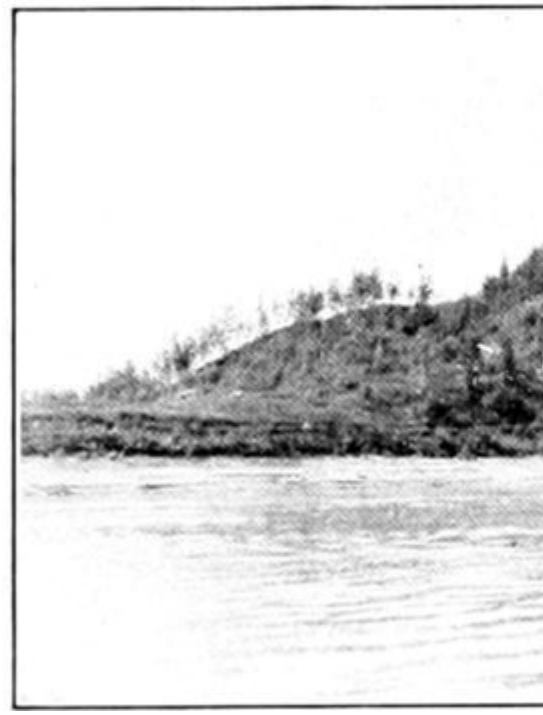


***c*, The Greyling River site, right bank, 22 miles above**

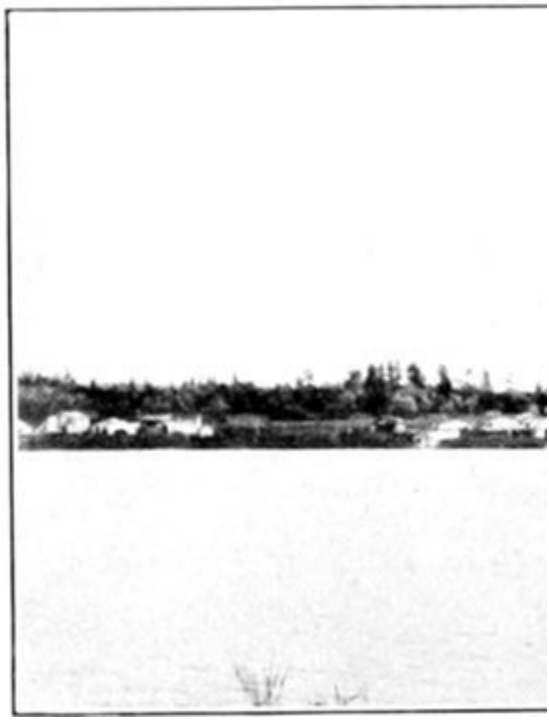
BUREAU OF AMERICAN ETH



***a*, View on the Y**



b, **Indian burial**



***c*, Anvik,**

At Kaltag Eskimoid features already predominate and some of those seen are fully like Eskimo.

There is a tradition of an Asiatic (Chukchee) attempt at Kaltag once.

Later in the afternoon photograph some natives and go with Mr. Müller, the storekeeper, and Mr. McLeod, the intelligent local teacher, on the latter's boat, "hunting" along the banks up the stream. Meet an old Indian (Eskimo type) paddling a birch-bark canoe, said to be the only canoe of that sort now on the Yukon. About three-fourths of a mile above the village see caved bank and find a skull and bones —"split" old burial of a woman.

A canoe coming, so we all go farther up the beach, pretending to examine stones. It is only the boy who brought me, however, going home with some planks, and he grins knowingly.

After that we locate three exposed coffins, two undisturbed and covered with sod. These two, for fear of irritating the natives, are left. But the third is wrapped only in birch bark. It was a powerful woman. With her a bone tool and a white man's spoon. With the burial that had tumbled out of the bank there were large blue and gray beads and three iron bracelets—reserved by the teacher.

I gather all the larger bones and we put them temporarily in a piece of canvas. It is hard to collect all—the men are apprehensive—it might be dangerous for them if detected. Everything smoothed as much as possible, and we go across the river to examine two fish nets belonging to the trader. One of these is found empty; but the other contains five large king salmon, 15 to 20 pounds each, three drowned, two still alive. The latter are hooked, hoisted to the edge of the boat, killed with a club, and, full of blood, thrown into the boat—great, stout, fine fish. To secrete our other findings from the natives the storekeeper gets a large bundle of grass and ties it to my package. We shall be bringing "medicine."

Arrive home, only to learn that against our information the river boat has left Tanana on schedule time, is now above Koyukuk, and is expected to arrive at Kaltag before 8 p. m. Hurriedly pack, a few more photographs, supper, and the smoke of the steamer begins to be visible. In a little while she is at the bank, my boxes are brought down, a greeting with old friends on the boat—the same

boat (*Jacobs*) on which I went from Nenana to Tanana—and we start off for Anvik.

Mr. Müller, the trader at Kaltag, German by birth, has a young, fairly educated Eskimo wife, a good cook, housekeeper, and mother of one child. The child is an interesting white-Eskimo blend.

In his store Mr. Müller showed me a good-sized heavy bowl of red stone with a figure seated in a characteristic way near one end. The specimen was said to have come from an old site on the Kaiuh and is of the same type as that at the museum in Juneau and the two in the east, one at the Museum of the American Indian, New York, and the other at the University Museum, Philadelphia. Regrettably Mr. Müller would not part with the specimen. (See also p. 34.)

The natives of Kaltag, so far as seen, are more Eskimoid than those of any of the other settlements farther up the river.

Fine evening; sit with a passenger going to Nome, until late. Learn that the boat to St. Michael is waiting for this boat and will go right on—not suitable for my work. Also we are to stop but a few minutes at Anvik, where I am to meet Doctor Chapman, the missionary.

Sunday, June 27. About 5 a. m. arrive in the pretty cove of Anvik. Received on the bank by Doctor Chapman, the head of the local Episcopalian mission and school, and also the Anvik postmaster. The doctor for the present is alone, his wife and daughter having gone to Fairbanks, and so he is also the cook and everything. In a few minutes, with the help of some native boys, I am with my boxes in Doctor Chapman's house, and after the boat has left and the

necessities connected with what she left attended to we have breakfast. I am soon made to feel as much as possible "at home," and we have a long conversation. Then see a number of chronic patients and incurables; attend a bit lengthy service in Doctor Chapman's near-by little church; have a lunch with the ladies at the school; visit the hill graveyard. They have reburied all the older remains and there is nothing left. Attend an afternoon service and give a talk to the congregation of about half a dozen whites and two dozen more or less Eskimoid Indians on the Indians and our endeavors; and then do some writing, ending the day by going out for about a mile and a half along the banks of the Anvik River, looking in vain for signs of something older, human or animal. (Pl. 2, *c*.)

There are many and bad gnats here just now—how bad I only learned later, when I found my whole body covered with patches of their bites; and also many mosquitoes, which proved particularly obnoxious during the lunch. As the doctor is alone, the three excellent white ladies of the school, matron and teachers, invited us, as already mentioned, to lunch with them. We had vegetable soup, a bit of cheese, two crackers each, a piece of cake, and tea. But I chose an outlandish chair the seat of which was made of strips of hide with spaces between; and from the beginning of the lunch to its end there was a struggle between the proprieties of the occasion and the mosquitoes that kept on biting me through the spaces in the seat. Chairs of this type, and I finally told that to the ladies to explain my seeming restlessness during the meal, should be outlawed in Alaska.

The Anvik People

The Anvik people, it will be recalled, were the first Yukon natives seen by a white man. They were discovered in 1834 by Glazunof, and since then have occupied the same site, located favorably on a point between the Anvik and the Yukon Rivers. They belonged to the Inkalik tribe, a name given to them, according to Zagoskin, by the coast people and signifying "lousy," from the fact that they never cut their hair, which in consequence, presumably, harbored some parasites. Their village was the lowest larger settlement of the Indians on the Yukon, the Eskimo commencing soon after.

The Anviks to-day are clearly seen to be a hybrid lot. There are unmistakable signs of a prevalent old Eskimo mixture. The men are nearly all more or less Eskimoid, and even the head is not infrequently narrower, fairly long, jaws much developed. The women, however, show the Eskimo type less, and the children in a still smaller measure—they are much more Indian. Yet even some women and an occasional child are Eskimoid—face flat, long, lower jaw high, cheek bones prominent forward (like welts on each side of the nose), whole physiognomy recalling the Eskimo. The more Indianlike types resemble closely those of the upper Yukon. There is perceptible, too, some mixture with whites, particularly in the young.

To bed about 11. Attic warm and window can not be opened because of the insects. Sleep not very good; some mosquitoes in room anyway. Wake up after 3 and just begin to doze off again when the doctor gets up. About 4 he puts his shoes on—one can hear every sound throughout the frame house, even every

yawn—and then goes to the kitchen where there soon comes the rattling of pots. At 4.30 comes up to bid me good morning and ask me if I am ready to get up and have breakfast. A man with a boat is to be ready at 6 to take me to some old site. So a little after 5 I get up, shave, dress and go down. Another night to make up for sometime, somewhere.

We finish breakfast and the doctor goes to look for the man, but everything deadlike, no one stirring anywhere. So I pack my stone specimens from the river above and the bones from Kaltag, etc. It is 8 a. m. and then at last Harry Lawrence, our man, appears—having understood to come about that time —and before long we start, in a good-sized boat, up the Yukon.

Day mostly cloudy but fairly good; no wind. Must use mosquito mixture all the time, even after I get on boat, but they quit later. Am standing on the back of the boat against and over the "house" over it—inside things shake too much and I can not see enough.

Passing by fish wheels—heaps of fish in their boxes —some just being caught and dumped in. Picturesque bluffs passed yesterday seen to be of volcanic stone, near basalt, not granite, with indication of minerals. Passing close to vertical cliffs of fissured and fragmented rocks 200 to 500 feet high—dangerous. Consolidated volcanic ashes with inclosure of many bowlders—fine lessons in geology. Slides of soil and vegetation here and there. Large spruces and altogether a richer vegetation since this particular rock region was reached. There was in fact a plain line of demarcation in the vegetation where the rocks changed.

Sleepy. Afraid to doze and fall off, so go inside. But there the motor thumps and shakes too much for a

nap to be possible.

About 12 miles upstream from Anvik, on the north bank, the mineralized rocks and tufa suddenly cease, to be superseded by a line, several miles long, of sheared-off loess bluffs about 200 feet high. Here the vegetation changes very perceptibly. Two mammoth jaws obtained from these deposits have a few years ago been given to Mr. Gilmore, of the United States National Museum.

22 to 23 miles up the river, north bank, a fine large platform and an old native site. Many signs still of pit and tunnel houses. A little farther upstream a hill with abandoned burials. Excavate a grave on a promontory over the river—not very old—wet and not much left of soft parts, but succeed in getting the skeleton. Fine middle-aged adult, somewhat Eskimoid, about typical for this region. Carry down in a bag, dry on the beach gravel. Lunch on beach; cheese, bread, coffee. The site is known as that of the Greyling River. (Pl. 2, *b*.)

Start back a little after 3. Very warm day. River smooth. Sky looks like there might be a storm later.

Hear of pottery—40 years ago it was still made at Anvik. Was black, of poor quality. The women used to put feathers in the clay "to make the pots stronger." When buried it soon rotted and fell to pieces. In shapes and otherwise it was much like the Eskimo pottery. Its decorations consisted of nail or other impressions, in simple geometrical designs, particularly about the rim. It was rather gross, but better pieces did occur, though rarely.

It is becoming plain that there are no known traces of any really old settlements along the present banks of the Yukon; nothing beyond a few hundred years at

most. If there was anything older no external signs of it have been noted, and no objects of it have ever been found. It seems certain that the stone implements thus far seen were used and made by the pre-Russian and probably even later Indians. They all belong to the polished-stone variety. No "paleolithic" type of instrument has yet been seen.

It is also evident that the Eskimo admixture and doubtless also cultural influence extended far up the river. The farther down the river, particularly from Ruby, the more the Eskimoid physical characteristics become marked and the Indian diluted, until at Anvik most, or at least much, physical and cultural, is clearly Eskimo.

Have further learned quite definitely that native villages on the Yukon were seldom if ever stable. Have been known (as at Kaltag and elsewhere) to have changed location as much as three times within the last few scores of years, though in general they keep to the same locality in a larger sense of the word. Anvik alone seems to have remained on the old site since the advent of the whites.

Anvik, Tuesday, June 29. Last night gave talk on evolution to white teachers, etc. Quite appreciated, regardless of previous state of mentality.

Caught up with some sleep, even though my attic room was so hot that the gum from the spruce boards was dropping down on me. Good breakfast with the doctor—canned grapefruit, corn flakes with canned milk, bread toasted in the oven, and coffee.

Pack up my Greyling skeleton—much drier to-day—and dispatch by parcel post, through the doctor as postmaster.

Photograph school children and village. Gnats bad

and have to wear substantial underclothing (limbs are already full of dark red itching blotches where bitten by them) though it is a hot day again.

The full-blood and especially the slightly mixed children would be fine, not seldom lovely, were they fully healthy; but their lungs are often weak or there is some other tubercular trouble.

The color of the full-bloods, juvenile and others, on the body, is invariably submedium to near medium brown, the exposed parts darker; and the chest test (mine) for full-bloodedness holds true. The young are often good looking; the old rather ugly.

All adults fishing now, the fish running much since a day or two; all busy at the fish camps, not many, in the daytime especially, about the mission.

At noon air fills with haze—soon recognized as smoke from a fire which is located at only about a mile, and that with the wind, from the mission. We all hasten to some of the houses in the brush—find enough clearing about them for safety. The school here burned two years ago and so all are apprehensive. Natives from across the river hasten to their caches. Luckily not much wind.

After lunch children come running in saying they hear thunder; one girl saying in their usual choppy, picturesque way, "Outside is thunder"; another smaller one says, "It hollers above." Before long a sprinkle and then gradually more and more rain until there is a downpour followed by several thunderclaps (as with us) and then some more rain. That, of course, stops the fire from approaching closer and all is safe. Such storms are rare occurrences hereabouts.

My limbs are a sight from the gnats. Must apply Aseptinol. Worse than any mosquitoes; like the worst chiggers. Poisonous—some hemolytic substance, which causes also much itching, especially at night.

Arrange to leave to-morrow. Good people these, unpretentious, but white through and through.

Mr. Lawrence, the local trader, who with his boy was with me yesterday, is going to take me to an old site down the river and then to Holy Cross. Donates a fine old ivory arrow point from the site mentioned. Doctor Chapman gives three old dishes and two stone axes—haft on one of recent manufacture. The natives seem to have nothing of this nature, and no old site is near. The nearest is Bonasila, where we go to-morrow.

This is truly a fish country. Along the placid Anvik River fish smell everywhere—dead fish on shore here and there, or fish eggs, or offal.

Wednesday, June 30. Hazy and cool, 52° F. Take leave with friend, Doctor Chapman, then at school, and leave 8 a. m. for Bonasila.

The gnat pest was bad this morning—could hardly load my baggage; had to apply the smear again, but this helps only where put and for a time only.

Bonasila

Close to 10 a. m. arrive at the Bonasila site. Not much—just a low bank of the big river, not over 4 feet high in front, and a higher rank grass-covered flat with a little stream on the left and a hill on the right. But the flat is full of fossae of old barabras (pit and tunnel dwellings), all wood on surface gone; and there is a cemetery to the right and behind, on a

slope.

Examine beach and banks minutely until 12. Modest lunch—two sandwiches, a bit of cake and tea—and then begin to examine the shore again. Soon after arrival finding bones of animals, some partly fossilized; beaver, deer, caribou, bear, fox, dog, etc., all species still living in Alaska, as found later, though no more in the immediate neighborhood.

Mosquitoes and gnats bad—use lot of oil. Begin soon to find remarkably primitive looking stone tools, knockers, scrapers, etc. Crawl through washed-down trees and brush. Many stones on the beach show signs of chipping or use. Very crude—a protolithic industry; but a few pieces better and showing polished edge. Also plenty of fragments of pottery, not seldom decorated (indented). Make quite a collection. And then, to cap it, find parts of human skeleton, doubtless washed out from the bank. Much missing, but a good bit recovered, and that bit is very striking. (See p. 156.) Also a cut bone (clean cut, as if by a sharp knife) in situ in the mud of the bank, and a little birch-bark basket still filled with mud from the bank, with later a larger basket of same nature in situ; could save but a piece. Conditions puzzling. Was there an older site under one more recent?

2 p. m. About 2 p. m. go to the cemetery. About a dozen burials recognizable. A pest of mosquitoes and gnats—Lawrence soon bleeds over face and neck, while I keep them off only by frequent smearing. He soon has to smear, too. Open five graves—placed above ground, wooden (split and no nails) boxes covered with earth and sod. Skeletons all in contracted position, head to the east and lying on right side. Some in poor condition. Three women, one man, one child. Gnats swarm in the moss and the

graves, and with the smears, here and there a trickle of blood, the killed pests and the dust, we soon look lovely. But there is enough of interest. With each burial appears something—with the man two large blue Russian beads; first woman—a pottery lamp (or dish), iron knife; with the second two fire sticks, stone objects (sharpeners), partly decayed clay dish; with the third, a Russian bead and a birch-bark snuffbox; with the child a "killed" (?) glass bottle of old form and an iron flask; in the grave of an infant (bones gone) a Russian bead. A grave of a child—bones burned.

6.15 p. m. Rest must be left. Lawrence may be enabled to do some work in the fall. Leave 6.15; carry quite a lot—in sacks, gasoline cans, lard cans. Wonder how I shall be able to send things from Holy Cross, and what next. Cool, sky overcast whole day.

Holy Cross

Thursday, July 1. Slept on the floor of a little store last night at Ghost Creek. The Catholic mission at Holy Cross, with all sorts of room, about 1½ miles down, and where, though late and tired, I visited Father Jules Jetté, a renowned student of the dialects of the Yukon Indians, did not offer to accommodate me, and the trader in their village could only offer me a "bunk" in one little room with three other people. So after 10 p. m. we went down to the "Ghost Creek," where I was gladly given a little corner in the store of Alec Richardson. Of course there were whining dogs outside, right next to the store on both sides, and they sang at times (or howled) like wolves, whose blood they seem to carry. And a cat got closed in with me and was pulling dried fish about, which she chewed, most of the night it seemed. So there

was not much sleep until from about 5 a. m. to 8.30, after the cat was chased out and the dogs got weary. Then no breakfast till near 9.30.

Went to mission again to see Father Jetté—he is not of the mission—a fine old Frenchman and scholar. He was not responsible for last night and anyway I was spoiled farther up the river. His meritorious work deserves to be known and published.

After a very simple lunch packed yesterday's collections from the Bonasila site—five boxes. The parcel post here alone will cost $20.40. How odd that the transportation of the collections of a Government institution must be paid for from the little appropriation received for scientific work to another department of the same Government.

It is cloudy, drizzly, cold. Am endeavoring to leave to-morrow, but they want $35 to the next station, and the boat does not leave for St. Michael until the 11th. Fortunately I am able to send away the collections, and there will surely be some way down the river.

Ghost Creek

July 1-2, 10.30 p. m. A night on the Yukon. (Pl. 3, *a*,) They have lit a powder against the mosquitoes. Smear the many gnat bites with Mentholatum—helps but for a while—and having now my fine meshed netting, my own bedding, and a clean pillow, I feel fine, safe from all the pests, and ready for a quiet night, all alone.

Commenced dozing off when a he-cat, who hid in the store at closing, begins to make all kinds of unnamable noises. Stand it for a while, but he does

not stop and one could never sleep—so crawl out from the bed, catch the beast, and throw him out.

In again and settling down, when another cat—did not know there were two here—begins to mew and tries to force its way out under the door, which is about 2½ inches above the floor. Persists until I have to get up the second time. Throw that cat out and in bed once more.

In a minute, however, the dogs outside espied the cats and began a pandemonium of howls and yelps and barks. Try hard, but can not stand it. Moreover, the last cat got on the roof, where I hear him walking, and he seems in no hurry to get off. So finally have to get out, catch the cat on the edge of the roof, throw him back into the store, and to bed for another trial. But soon have to smear the body; the bites itch too much. The sleepiness is now quite gone. A mild amusement as to what next. It must be midnight or later now, and it has grown cold. One blanket is not sufficient. Doze off a little, wake up with cold, readjust blanket and flaps of bag, doze off a little again—the dogs commence to howl, just for a song this time, in two, three, then a unison. The bites itch bitterly, now here, now there. The sun has risen; it is real cold, probably no more than about 40° to 45° F. And so on until 5.30, when at last fall into a deep, dreamless sleep, regardless of light, cats, dogs, and everything and sleep until 8.30.

Wake up, can not believe my watch; but it goes, and so probably is right. But no one anywhere yet stirring.

Dress, wash a bit in the muddy river; head feels as if it had been knocked by something heavy. Make my "roll" of bedding and then work on notes, putting down faithfully what has transpired. About 9.30, at

last, the storekeeper comes to say they overslept and that a cup of coffee will be ready before long.

Friday, July 2. "Ghost Creek" was named so because of many burials about the creek. The flat between the hills here is about three-fourths of a mile long by the water front, with rising slopes, and used to extend considerably farther out, but was "cut" or washed away by the river. It has been used for a village site and burial ground by the old Indians of the vicinity. As the banks tumble away, bone arrow points, barbed and not, stone scrapers, and other objects wash out. Graves are found in the ground as well as above it. Russian influence prevalent in the objects buried with the bodies, but site extends to pre-Russian time. Same type graves as at Bonasila, with slight local modifications.

At Bonasila the burials above ground were in boxes of hewn wood, joined somewhat as the logs in a log house, and without any base. The body inside was covered with birch bark (three or four pieces), then covered with the top planks, unfastened, and these in turn covered with about a foot of earth and sod. At Ghost Creek the same, but there is an undressed-stake base or platform on which the sides of the "coffin" rest and with somewhat less earth and sod on the top of the box. But graves differ here from underground and birch bark alone (no trace of wood, if any was ever there; but probably none used) to such aboveground as have iron nails and sawed planks. Here, as at Bonasila, a few simple articles are generally found buried at the head, and for these many of the graves were already despoiled and the skeletal remains scattered or reburied.

There appears to be no line of demarcation between the underground and aboveground graves; possibly

the latter were winter burials, but this must be looked into further.

The bodies here, except the latest, are buried flexed. Exceptionally, both at Bonasila and here, the planks surrounding the grave were painted with some mineral pigments which resist decomposition better than the wood, and decorated in a very good native way with series of animals and men, caribou, bear, etc. Too faint to photograph, and too bulky and decayed to take away; but decoration much superior to ordinary Indian pictographs, and apparently connecting with the type of art of the northwest coast. It is of interest that practically the same decorated burials were seen by Dall among the Eskimo of Norton Sound (Unalaklik).[4] In this case it was probably the Indian habit that was adopted by the near-by Eskimo, for none of the more northern Eskimo practiced such burials. The habit was also known in southeastern Alaska. (Pl. 3, *b*.)

Jim Walker, the helpful local mix-breed trader, has dug out many of these graves (alone or with Harry Lawrence), and a good many of the objects are said to have been taken away by Father O'Hara, formerly of the Holy Cross Mission.

According to all indications the stone culture of Bonasila and of Ghost Creek (1½ miles upstream from Holy Cross) were related, both passing apparently into the Russian period, and that at Ghost Creek continuing down to our times, for there is still living here an old man who belongs to this place which once had a large village. Much could be done yet and saved in both places.

Saturday, July 3. At last slept, notwithstanding everything, and succeeded even in being warm.

Breakfast 8.30, for a wonder. Two soft-boiled Seattle eggs, two bits of toast with canned butter (not bad at all), some over-preserved raspberries, and a faded-looking nearly cold "flapjack" with sirup, also mediocre tea. But all goes here, and the stomach calls for no other attention than to fill it.

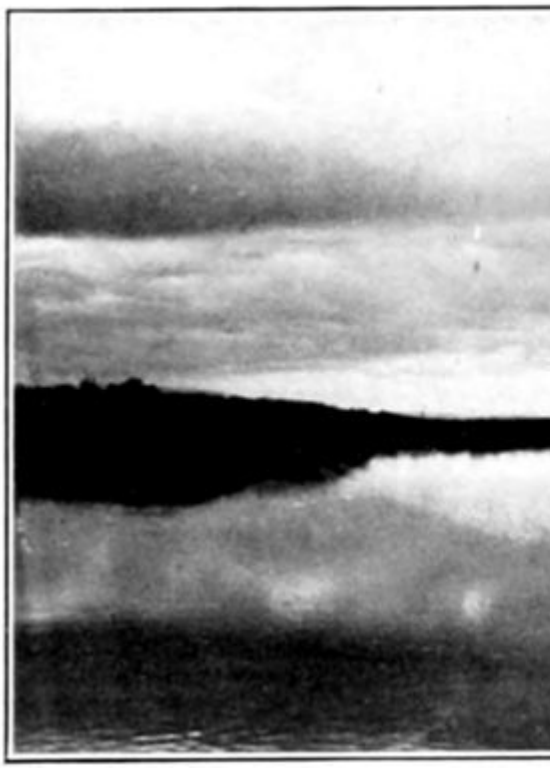
Finishing work, getting further information from the old Indian, writing, and waiting to go away with a trader to Paimute, the first all-Eskimo village, 25 miles farther down the river. Rains occasionally, but not very cold. Many gnats when wind moderates.

Lunch—canned sardines (in this land of fresh salmon!), a bit of toast, some canned fruit, and that unsavory tea.

Have utilized this day in a profitable manner. Have learned that there was another burial ground about half a mile farther upstream, behind an elevation. So got a rowboat and with Jim Walker's young boy rowed over. Had to wade through high grass over a wet flat, and then up the rank grass and bush-covered slope, and there found a number of old burials. All rifled, but most of the bones still there. So send boy back, on the quiet—there is above the store the camp of the old man with an old Indian woman and sick girl—for some boxes, and meanwhile collect. It is an unceasing struggle with the mosquitoes and gnats in the tall grass and weeds; but one after another I find what remains of the usual old box burials. The bones are mostly in good condition. The boy arrives with several empty gasoline boxes, we gather drier grass and moss, and pack right on the spot, eventually get to the boat, strike off as far as possible from the shore so none could see what is carried, and proceed to Walker's storehouse. Old Indian and his old crony nevertheless

stand on bank and look long at us. In storehouse boxes closed, later delivered by the boy to the mail boat, and so that much is saved; for were it not collected, in a few years the weather, vegetation, and animals, human and other, would destroy everything.

BUREAU OF AMERICAN ETH



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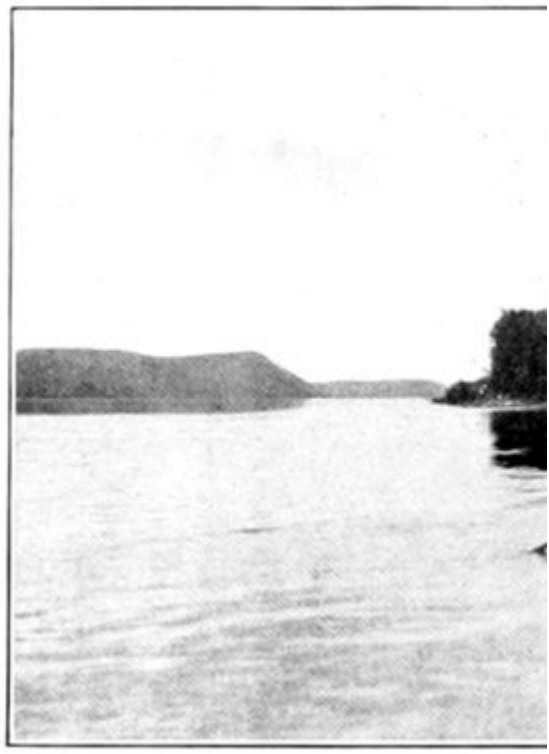


***b*, Lower middle Yukon: Painted burial box of a Yukon**
which us

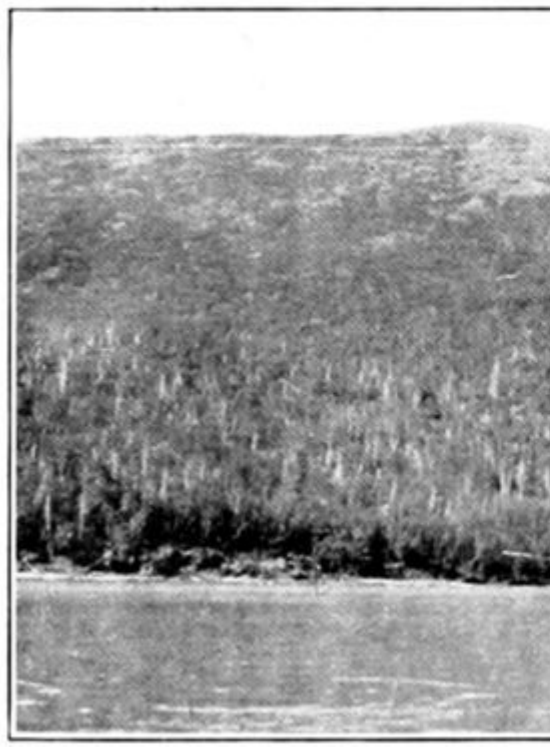
BUREAU OF AMERICAN ETH



***a*, Eskimo ca**



***b*, Old "protolithic" site 12 miles down from Pa**



***c*, "Old" site in bank seen in middle of picture, 12 miles**

Moreover, the utmost care is taken always to leave everything in as good shape as found; and the remains taken will be treated so well and may give us so much that we need that there is no more hesitation in securing them than there would be on the part of a paleontologist in securing old bones for his purposes.

For supper, though it is still early, am invited by Simel, an elderly Jew mail carrier. Have fine meat-and-potato soup, lettuce-and-cucumber salad (even if the cucumbers from the Holy Cross hothouse are overripe and bitter), fresh (storage) meat, cooked

dried apples, and poor but hot coffee—all seasoned with the best will and genuine, simple friendliness.

Max Simel, whose home is at Ophir, has been in this country 29 years, and "never needed to buy a quarter's worth of medicine." Has a wife in Seattle, also a daughter and a son; has not seen them for four years. Wants me to call on them and tell them I met him. With his companion, Paul Keating, of Holikachakat, gives me some interesting information. They tell me independently and then together of an occurrence that shows what may happen along this great river. A well-known white man and woman, prospectors on their mail route, have last year thawed and dug out a shaft, nearly 40 feet deep, through muck and silt, to the gravel, in which they hoped to get gold; and just before they reached the gravel they found a piece of calico, old and in bad condition, but still showing some of its design and color.

7 p. m. It rains, but wind has moderated, and so near 7 p. m. we start on our way farther down the river, stopping just long enough at Holy Cross to attend to my reservation for St. Michael. The agent has no idea when the boat will go—maybe the 11th, maybe not until the 14th or later.

Going on an old leaky scow with an elderly, faded, chewing, not very talkative but for all that very kindly and accommodating man, who with one hand holds the steering wheel and with the other most of the time keeps on bailing. He carries supplies for his store and I my outfit, camera, and umbrella. Sky has here and there cleared, even patches of sun appear on far-away clean-cut hills. Water not very rough; make fair time downstream. Banks flat now, river broad, some hills in distance.

8.00 p. m. Hills nearer ahead of us. Some of the flats look from distance like fine tree nurseries. Getting cool. Cloudy ahead. The banks flat and low, no good site for habitation. Not even fishing camps here—just long "cut-banks" (banks being cut by the river) and low beaches. Here and there new bars and islands that are being built by the river. No birds, no boats, just an occasional floating snag or a rare solitary gull.

FOOTNOTES:

[4] Alaska and Its Resources, p. 19: "Our attention was attracted by the numerous graves. These are well worth the careful attention of the ethnologist; many of them are very old. The usual fashion is to place the body, doubled up, on its side, in a box of plank hewed out of spruce logs and about 4 feet long; this is elevated several feet above the ground on four posts, which project above the coffin or box. The sides are often painted with red chalk, in figures of fur animals, birds, and fishes."

Paimute

Paimute down river, I am told, has nothing but Eskimo; Holy Cross, but a few natives now, mainly Indian; above Holy Cross, Indian, Eskimo only as adapted or in admixture.

July 3, 8.30 p. m. Hills on right now right before us. Behind first a fish camp of the Holy Cross Mission natives. River narrows and bends. Two other fish camps become visible. Stop; damp, cold, smoke, fish smell, a few natives, Eskimo. River now like molten glass, but air damp and cold, and I must sit behind

the engine and keep my hands over the hot exhaust pipe to keep somewhat comfortable.

Pass bulging bluffs on right—old stratified shales.

11.00 p. m. Arrive at our destination about 11 p. m. But a few log huts on the right side of the river, with few others and a primitive frame church in the back. A little store and a big storehouse (with skins, etc.), trader's house (log cabin) a few rods away. Open store, only to find that a pup had been forgotten there, made a lot of mess and dirt and ate most of one side of bacon.

12.00 p. m. Got to bed in the cabin at 12. Spread bed roll on two reindeer skins which, with fire in the stove, keep me fairly warm. Rain in night and several earth tremors—common in these parts; feel several light ones every night and a stronger one occasionally even in daytime (a big "fault" in the Alaskan range and a proximity to the Aleutian volcanic zone).

Awake before 8, but as it still rains nothing can be done, while my man within a few feet of me still snores; stay in blanket till 9. Modest breakfast at 10 a. m.

10.00 a. m. A little house cleaning—watch kitten clean windows of the many flies, which it eats; and then my man, a Swede by birth, sailor, self-taught painter (of ships and sea scenes), and musician (accordion), goes to bail out the boat. Still full of bites that itch and need a lot of Aseptinol, which in turn makes underwear look dreadful. And no bath possible.

Last night met some of the local Eskimo, full bloods, mostly from the Kuskokwim River. Strong, kinder

than the Yukon Indians. But they differ but little in some cases from the latter. They are medium brown in color, hair exactly like the Indian, beard also—only the rather flat (not prominent) mid parts of the face, with rather long and narrow (upper two-thirds) nose, and the cheek bones protruding more or less forward, with face long (often), due to the vertical development of the jaws, helps to distinguish them as Eskimo. There is no clear line of demarcation between the Indian farther up the river and the Eskimo down here, yet in some here the Eskimo type is unmistakable. They have more epicanthus, flatter, longer, and stronger (more massive) face, stronger frame, rather submedium length of legs, and less brachycephalic (or more oblong) head, but not the characteristic, narrow and high, keel-shaped dome that one is used to associate with the Eskimo.

1 p. m. A little lunch—just a cup of coffee and a few crackers. Photograph two natives.

1.30 p. m. Start toward Russian Mission. Trader carries sugar in bags and tea for camps.

Near 2. Stop at an Eskimo camp, see sick baby, photograph a few individuals. Get an ax for a pocketbook—old man happy as a child at the exchange. Made another one happy this morning in payment for information with one of my steamer caps. (Pl. 4, *a*.)

Pass along the still continuing bulging hills on the right. They are forested over lower parts, barren, though mostly greenish, above. As usual flats on left, devoid of man. Occasionally a fish camp on right, or a small village, somewhat different, though in essentials like the Indian (more gregariousness noticeable—up river mostly individual or at most two or three families). Every favorable higher flat or

low saddle among the hills on the right and facing the river (or a slough) is utilized by the natives, but such places are scarce.

The ax obtained looks as if it had been broken after found, to make of it a single-edge tool. Tumbled out of a bank. Old Eskimo knew not who made it. Found some miles below Paimute by the old man. Others found, but lost. Ivory arrow and spear points also known to natives, but no one now has any.

A mountain ahead of us. Sky clouded mostly, high diffuse vapors and low, heavy but separated cumuli in the east; one would expect soon a heavy rain. Visibility exceptionally good, horizons far away, uncommonly clear. Mountains sharply outlined against the sky.

About 12 miles below Paimute, on left, some higher banks (old silts and dunes). The ax from the old man had been found here. Stop. Find pottery 12 feet, charcoal 15 feet from surface. Also polished and worked stones. But most of bank has already been cut off and what remains shows no signs of man on the top. (Pl. 4, *b*.)

Cross river obliquely to right bank, just beyond last ("12-mile") hill. Find at once numerous evidences of stone work along the stony beach. In an hour have a fair collection, mainly rejects, but interesting. On top of bank find several mounds and ridges, doubtless dunes, though the one farthest up the river looks very much like a large oval man-made mound. Parts of two much-weathered skulls and one bone lay on the top of this. No definite marks of graves excepting perhaps in one instance. A sign of old clearing farther down, but no "barabras." A spot well worthy of exploration. It was, I learned a little later from Nick Williams, a native who used to act as a pilot on

the river, the old mountain village or "Ingrega-miut," and the site is 12 miles downstream from Paimute. (Pl. 4, *c*.)

Beyond are flats and cut banks, both sides, but with hills (old water front) behind on the right and mountains in front. River here very wide.

Many of the worked stones, and occasionally, according to native information, skulls and bones, are washed out from the banks and deposited (rolling, etc.) lower on the beach in something like strata, and in that way evidence is being perverted. Some day a new bank or even a dune may be formed over these secondary deposits and a great source of possible future error be completed.

All the natives along the river (to here) like to bury on the lower slopes of near-by hills.

To bed on floor of kitchen tent at the fine, clean little place of Tucker's, at 10.30. At 1.30 the 20 dogs start a fine, sustained, unison howl song, and I seem to hear an approaching boat. As the Governor of Alaska is expected, slip on shoes and necktie, brush hair, and run out. There is a little boat at the little "dock" (the only one seen so far on the Yukon). Tucker and his son are already there, and I soon hear that the governor is on the boat, which is that of Mr. Townsend, of the Fish Commission. In a few minutes we meet, both in shirt sleeves. And I learn the *Matanuska*, the boat that was to take me from the Russian Mission to St. Michael, has broken down and is not coming. In her place, but no telling as to time, will be sent the *Agnes*, a smaller and slower boat, on which three people have already this season been "gassed" (overcome by the exhaust gases), one of them jumping into the river. She has accommodation for four persons at most, and that of the most

primitive, they say. The governor fortunately gives me some hope that I may be picked up and taken down by the same boat which is taking him to Holy Cross. He also tells me of a skull for me at one of the stopping places, Old Hamilton. A frank, good, strong man.

Boat leaves in a few minutes. Back to bed, but now almost full daylight—also cold, and so no more than a doze until 6.15, at which time the boy comes to the kitchen where I was kindly accommodated to start fire and breakfast. So up with a drowsy head. At 7 breakfast—coffee, oatmeal, flapjacks, and good company. Everything about this place is neat, fresh, pleasing—the best individual place on the river. Cloudy, blustery, cool; can not start, so go 1½ miles down to Dogfish village, or I-ka-thloy-gia-miut—probably the same as Zagoskin's I-ka-lig-vig-miut. Only three or four families there now; nearly all the inhabitants died of influenza in 1900. But already before reaching the village, in examining the stones along the beach, I find some chipped ones, and they represent the same industry evidently as those at the two sites yesterday. Later find numerous chipped scrapers, pointed hammers, crude cutters and chisels, and a few axes. Make quite a collection, including a few objects found in possession of natives.

This is a good site, above high water. Must be old. Pottery also encountered occasionally by present occupants, but not one bead; little if any river cutting here for a long period. Worth exploration. Photograph another Indianlike Eskimo. Want to buy an old dish from an Eskimo, border inlaid with six white stones, shaped like an oblong lozenge with rounded corners, but he wants $20. Lunch all together, some Eskimo included, at Tucker's, and

then as the wind moderates and the sun comes out, start for the Russian Mission. Mostly still clouds and cool, with some rain in the mountains to the right.

Finds and inquiries made at Dogfish village make it positive that the stone culture there is Eskimo, i. e., of the Eskimo of this region who are probably not a little mixed with Indians. Their head is but moderately oblong, not keel shaped. The majority, however, have Eskimo features.

But the cupid-bow (double-grooved) axes are not known to have been made by these people, and when used after being found or brought down from farther up the river they apparently were broken. One such example was seen already at Ruby—another one at Anvik—secured; and one found yesterday at Mountain village. The axes here are most often oblong, quadrilateral, without groove, or approaching the single-grooved axes of the Indians in the States.

July 6. Proceed down the river toward Russian Mission, examining the banks as closely as possible. Toward evening stop at "Gurtler's," a short distance above the mission.

Mr. Gurtler is a German by birth; his wife is half Indian, of Ruby. She, as well as her 14-year-old daughter, are neat, apt, and very industrious, quiet and nice mannered. With an Eskimo woman, she cleans and cuts up—a whole art of its own—on the average over 200 good-sized salmon a day. Clean place, very good smoking house—much superior to those up the river, except Tucker's.

Sleep in a clean bed of theirs; would much prefer my own and the hard floor, but fear to offend.

Russian Mission

Pack my stones and bones collected between here and Holy Cross, and after lunch go to Russian Mission. Meet Mr. Cris Betsch, the trader, and find him both friendly and anxious to help. Teacher and her mother invite me to supper. Before that Mr. Betsch calls in a number of the older men, and we have a talk about ancient things, but they know nothing worth while beyond a few score of years at most; they give me, however, some data and names of old villages.

A few years ago some human bones and skulls were dug up here and reburied. Eskimo readily agree to help us find them and to let me take them. Moreover, they are quite eager to dig up an old medicine man supposed to be buried under a good-sized (for this country) blue spruce. They get shovels, soon find some of the old bones and a damaged skull, and later on, with the help of information given by an elderly woman, uncover also a female skull. Uncover further the end of two birch-bark-covered coffins, from Russian time, and would readily dig them out did I not restrain them; as also with the medicine man. We shall probably get some such specimens from this locality later, so there is no need of disturbing the burials.

Mrs. Barrick, the teacher, gives us a "civilized" supper, at which I am introduced for the first time to a great and fine Yukon specialty, namely, smoked raw strips of king salmon, and find them excellent. Then a good talk with all, after which pack specimens—still somewhat damp, but it would be difficult to wait—deliver to the post, and am sent to my place around the hill at a little past 10 p. m. with

an invitation by Mr. Betsch to go to-morrow to "the slough of the 32 kashims (council or communal house)," about 10 miles down the river. But I have already been promised by Gurtler to take me down to this place, and so I can not accept. Just now I need sleep.

July 7. After breakfast examine banks and beach along Gurtler's place and find two stone implements, two pieces of decorated pottery, and a bone of some animal. Wash, dry, and pack, then a cup of coffee—the Gurtler's have a habit of drinking a second cup at about 10 a. m. each day—and then, after some of the seemingly inevitable trouble with motor, start down the river. It rained yesterday; the clouds show low pressure; it is not warm and the water is somewhat rough.

Stop a bit at the mission to give Mrs. Barrick a fish and get a bag or two from Mr. Betsch, and then proceed. From the river the Russian Mission settlement is seen to be very favorably situated at the foot of the southern slope of a big hill. But the recency of the flat below and in front of the church and schoolhouse is clearly seen again. The site about where the church and school are may—in fact must, it is so favored—be a very old one, and doubtless a thorough excavation of the slope from the back of the houses upward would be both easy and very instructive. The place should by all means receive attention.

Reach and examine the "32 kashim slough," a beautiful side channel about 7 miles long; reach about 1½ miles from its entrance, examine banks and pass through jungle, find tracks of foxes and of a bear, also see one big beautiful red fox trotting ahead of us on the other beach—but not a trace of man.

Examine also the "mounds" on Grand Island, but find them to be only dunes.

Lunch on the beach; remarkably few mosquitoes and no gnats; smoked raw salmon strips again, and coffee; and at 5 leave for home, it being impossible so late to go down to the end of the channel.

On return all going nicely until 5. Then, in a slough 3½ miles from the Russian Mission, after an examination of another likely site, breakdown of the motor. Do everything possible to make it go until about 8, but in vain. Then I take the crazy little rowboat that luckily we took with us, bail out the water with our shovel, and row to the mission for help. Get there about 9, send back a launch with some natives, have a little supper with the teacher, and row home around the hill, reaching Gurtler's near 11. In a few minutes the launch is towed in and all is well once more. Mr. Betsch got for us two good native "kantágs" or wooden dishes. Also we fix to go down to the "32 kashims" to-morrow once more with Mr. Betsch and the teacher.

July 8. Up a little after 6; breakfast; and then comes in a native from the mission with two letters and information that the *Agnes*, the little mail-carrier boat, has arrived during the night and is waiting for me to take me to Marshall and to Old Hamilton, whence another boat will take me in a day or two to St. Michael. So get ready in a minute, put my baggage on a native's boat, pay my bill, leave another lot of good friends, and row to the mission. There is the little dinghy *Agnes* with its "accommodation" for three passengers already two-thirds filled up, and towing two big logs as a freight. Put my things partly in a "bunk," partly on the roof, give good-byes to Betsch and the teacher, help to

push off the boat which is stuck in the mud, and we are off for another Yukon chapter.

We pass by the lower end of the "32 kashim" slough —no sign of any site—all recently made flats. If there is anything left of the old sites it must be at the foot of the hills, or has been covered with silt. The site is so favorable that in all probability there was once there a good-sized settlement, but due to river action and the jungle it could not be located. Mr. Betsch visited the place that day, and again with some old natives on another occasion, without being more fortunate.

Cloudy, slightly drizzly day, no trace of sun, mists over the tops of the hills. Could not stand it in the boat, so sitting on my box on the roof of the boat, wrapped, due to the cold, in a blanket.

A little below the "32 kashim" slough a small stream enters from inland—a place to be examined; but this boat can not stop for such a purpose.

A half mile or so farther down a few graves and crosses, with remnants of a native habitation.

Over 3 miles down, just beyond first bluff, fine site, with low hills stretching far beyond it—now but a few empty, half-ruined native houses. Should be explored.

South of second rocky bluff a live camp, and farther down another.

The left side of the river is still all flats as far as one can see, but about 17 miles below Russian Mission human bones came out of a bank there (on a slough).

Marshall

At 3 p. m. reach Marshall, a little cheerful-looking mining town, high on a bank. See the place, identify the skeleton from the above-mentioned bank as that of a missing white man, see telegraph operator, postmaster, teacher, commissioner. Sun comes out, is warm. Almost no mosquitoes here and no gnats. Hills above and beyond town belong already to the coast range and are barren of trees, even largely bare of shrubs and bushes. Leave 4.30.

Soon after Marshall—after passing by an Eskimo village (white man's style of buildings)—leave the hills and enter flats on both sides. This is the beginning of the delta region. River like glass, and it is warm in the sun but very perceptibly cooler when sun is hidden.

The boat has only three bunks, and there are five of us with the two pilots. But on the last trip up, there were, fortunately only for about eight hours, seven, including two women and a child, and that without any privacy or conveniences whatsoever. It is almost criminal, and they charge a very steep fare. However, for me it will soon be over—only about 36 hours. Still it is hard to believe this is yet in the United States and presumably under some sort of supervision.

Which brings me to a realization that the first half of my journey—the preliminary survey of the Yukon—is slowly closing; a little, and it will be the sea and other conditions, which also brings the realization that I have seen much but learned not greatly. What should be done would be to own a suitable fast boat; to locate on each of the more important old sites a party for careful, prolonged excavation; and to try to locate, in the rear of or on the higher places on the present river flats, more ancient sites than are known

to date. These steps, together with the enlisting of the interest in these matters of every prospector, miner, and trader, would before many years lead to much substantial knowledge.

Friday, July 9. Must keep up these notes, for they alone keep me posted on the day and date; even then I am not always sure. There are no Sundays in nature.

Slept in my bag on the roof of the *Agnes*. Her namesake must have been one of these goodly but insufficient and but indifferently clean native women, plodding, doing not a little work, but wanting in many a thing. It was cold and dreary, but I found an additional blanket, and so, with mosquito netting about my head—one or two got in anyway—would have slept quite well had it not been for a dog. At about 1 a. m. we stopped in front of a little place called also "Mountain Village." And almost at once we began to hear a most piteous and insistent wail of a dog who either had colic or thirst or hunger, and he kept it up with but little stops for what seemed like two hours, making my sleep, at least, impossible.

Saturday, July 9. Morning. Cold, cloudy, rough—head almost beginning to feel uncomfortable, the boat is tossing so much. A teacher comes aboard with an inflamed hand which I fix; a few questions, the mail bag, and we are off again. Enter a slough where it is less rough and warmer. Later the sun will probably come out again. This evening we shall be at Old Hamilton and then a new anxiety—how to get to St. Michael.

Just had a little walk over the roof—my roof, for the other two passengers prefer to sleep in the gassy, dingy room below, though how they can stand it is

beyond my medical ken. It is four short steps long, or five half steps in an oblique direction.

Every object in distance appears magnified all along the river for many days now. An old snag will look like a boat or a man, hills look higher, a boat looks much more pretentious than she proves to be on meeting.

Firs and spruce have now completely disappeared, also forests of birch, etc., are reduced to brush both on flats and lower parts of hills. Very large portion of the hills in distance just greenish with grass and lichens, not even a brush.

9.45 a. m. Meet the *Matanuska* bound upward. Looked from distance like an ocean steamer; from near, just a lumbering, moderate-sized river boat with a barge in front. But a whole lot better than ours.

The scenery has become monotonous. The gray river, although only one of the "mouths," is broad, and the country is all low. Nothing but bushy or grassy cut banks on the right, and mud flats, "smoking" under the wind, to low banks on left. It is a little warmer and the warm sun shows itself occasionally, but I still need the wrapping of a double blanket. The wind luckily is with us and the waves not too bad.

Noon. Passing "Fish village"; a few huts and tents.

No "camps" here outside the few villages; just an endless dreary waste and water.

New Hamilton—a few native huts only now—no whites.

Reach Old Hamilton—about a dozen houses with a warehouse, a store of the Northern Commercial Co., and a nice looking but now unoccupied school.

Here the governor told me there was somewhere a skull waiting for me, and the storekeeper would tell me of it. But when we arrive there are only two or three natives to meet us. The storekeeper, who is also postmaster, is said to be sick in bed. He is supposed to have an ulcer or some other bad thing of the stomach. So we go to his house and find him in bed, with a lot of medicine bottles on a table next to him. Is alone; no wife. Shows no enthusiasm in seeing me, though heard of my coming. Reads letters—no attention to me. Gets up—I ask him about his illness —answers like a man carrying a chip on his shoulder. Goes to store to attend to mail, and barely asks me to follow. I wait in store; he finishes mail and goes out—orders the Eskimo present out gruffly, and to me says, "You may stay in the store; I'll be back." But I wait and wait, and finally decide the man for some reason is unwilling to help me. Asked him before he went out about the *Matanuska*, but he told me she might not be back from Holy Cross in a month, trying doubtless to discourage me to stay. On going toward the *Agnes* I find him sitting on a log and talking to a couple of men from a tugboat that has arrived—just talk, no business, judging from their laughing. So I go on the boat, write a few words to Mr. Townsend of the Bureau of Fisheries, who makes this place his headquarters, and with some feeling hand this to the man, telling him at the same time that plainly he does not wish to assist me in any way. This, of course, rouses him; he gets red and says a few lame words, ending with, "Do you think I would touch any of them dam things or that I would let any of my men (natives) touch them? Not on your life!" So I leave Old Hamilton, for he is the only white man there now. But the place had other distinctions. Until recently, I am told, they have had

a teacher, a young girl, who in her zeal had the natives collect all the burial boxes with their contents and had them all thrown into the river. Not long after she accomplished that she left. The storekeeper told me that "If I want them so bad I could pick them up (skulls and bones) along the river where the water washed them out after the teacher threw them in." Luckily there were not many "Old Hamiltons."

We met here a boat from St. Michael with Mr. Frank P. Williams, the well-known postmaster and trader of St. Michael, who comes for the two men, my fellow passengers. We get acquainted and, to escape the gases of the *Agnes*, I go with them. The boat is heavier and free from fumes, though without accommodation. At about 7 p. m. we arrive at Kotlik, at the mouth of the river—an abandoned wireless station, a store, and four tents of natives. But the old wireless building, now the storekeeper's house, is the dwelling place of a clean white man, Mr. Backlund, who is now "outside," but with whom Mr. Williams is in some partnership; so we occupy the building. Outside the wind has risen to half a gale and there are squalls of rain and drizzle. The *Agnes* has to "tie to," as she would be swamped in the open. My boxes and bedding, which were on the roof of the *Agnes*, are soaked, though the contents will be dry. So both boats are fastened to a little "dock," and we soon have fire in the stove, supper, and then—it is 11 p. m.—a bed, not overclean, somewhat smelly, but a bed and free from mosquitoes, rain, wind, and cold.

July 10. Up at 6.30. Outside a storm and rain—just like one of the three-day northeasters with us, and cool. Both boats were to leave, but are unable to do so. I find that Mr. Williams's tug will come back here

and go to St. Michael on the 13th, so arrange with Mr. Williams to take me and leave the *Agnes* for good. This partly because I learn of two graveyards near, one 1½, the other 4½ miles distant.

After lunch, rain for a while ceasing, I set out for the nearer burial place. This is already a tundra country —treeless and bush-less flats overgrown with a thick coat of moss, into which feet bury themselves as in a cushion, and dotted with innumerable swampy depressions with high swamp grass. Walking over all this is very difficult—lucky I have rubber boots. Even so, it is no easy matter, except where a little native trail is encountered.

The graveyard, belonging to the now abandoned little village above Kotlik, consists of only about half a dozen adult graves. These consist of boxes of heavy lumber laid on a base raised above the ground level, and covered with other heavy boards. Some of the burials are quite recent. Open three older ones. In two the remains are too fresh yet, but from one secure a good female skeleton, which I pack in a practically new heavy pail, thrown out probably on the occasion of the last funeral. Then back, farther out, to avoid notice, through swamps and over moss, and with a recurring wind-driven drizzle against which my umbrella is but a weak protection.

Reach home quite wet and a bit tired. Have to undress and, wrapped in a blanket, dry my clothes and underwear about the stove.

Nothing further this day and evening—just wind and heavy low clouds and rain.

July 11. Up at 4.40. Weather has moderated. The *Agnes* left at 4 and Mr. Williams's boat, due to favorable tide, must soon go also. Breakfast, and all

leave me before 6.

Yesterday we brought up my needs—i. e., collection of skeletal material—to the few natives here, explaining to them everything, and they do not object in the least. One of them, in fact, is to take me to-day to the more distant cemetery in a rowboat and help me in my work.

My man, after being sent for, comes at a little after 7. He is a good-looking and well-behaving Eskimo of about 35. He brings a good-sized tin rowboat—a whaling or navy boat probably; but "he leaks a whole lot." The oarlocks are not fastened to the boat, the plate of one is loose, and the oars are crudely homemade of driftwood and pieces of lumber fastened on with nails; in one the shaft is crooked, while the other is much heavier. But we start, with the sky still leaden and gray but no wind and calm water. I row and he paddles; then he rows and I paddle. We carry but the camera, a little lunch, a heavier coat each, and a box and two bags for the specimens. We pass a number of broods of little ducks, the mother prancing before us until the young are in safety, and there are several species of new kinds (to me) of water birds, some of which fly right above us, examining us. In the distance we see a big abandoned dredge, then a few empty log houses and "barabras" on the bank of a stream and the edge of the tundra. This is Pastolik, our destination. There is no one anywhere near, an ideal condition for work, if work there'll be. And there will be—for almost immediately upon landing I see, beginning at a few rods distance on the tundra, a series (about 50) of old graves, in all grades of mossiness and preservation. A few are, we later find, quite late, but the majority are old—60 years and over according to

information given by the natives of Kotlik. They do not, except perhaps the few late ones, seem to belong to anyone still living. Yet "Pashtolik," as they wrote it then, used to be a place of some importance in the Russian times, and even later.

We settle in an empty native house, and I start investigation. The older graves are found widely spread in several clusters, but a few are isolated at a distance.

The graves are all aboveground and resemble in substance those along the lower Yukon (Bonasila and downward). They consist of a base of small logs or splits; a rude box about 3 feet long by about 2 feet wide, of heavy, unpainted, unnailed, split boards; four posts near the four corners; a cover, unjoined, of two to three heavy split boards; two crosspieces over this, at head and base, perforated and sliding over the upright posts, and a few half splits (smaller drift logs split in two) laid over the top of the crosspieces.

On the first cover lies as a rule a stone—generally a piece of a slab or a good-sized pebble—unworked, though now and then showing some trace of use. The pebble is generally broken.

When the grave is opened there is usually over the body, as a canopy on a light frame, a large (probably caribou) skin—rarely birch bark. Neither covers or envelops the body but simply forms a covering over it, with some space between it and the body. The body lies flexed, on left or (rarely) right side, with the head toward (or near) the east (same as at Bonasila). It is often covered with or enveloped in a native matting. There are but few traces of clothing on women; none on men. And very seldom is there anything else in the coffin.

Some of the oldest graves were found tumbled down and could not be examined. The moss and roots envelop the bones, and it is a tough job to get them out; also they eat the bones and destroy them. Even in the older boxes, however, the downward part of the skeleton—generally the left—is, due to moisture, usually in much worse state of preservation than the upper.

Children have been buried in large native wooden dishes and these were in some cases placed on the top of adult graves, but more generally about these, or even apart.

Many household articles, from matches and pails to dishes, alarm clocks, lamps, etc., are placed upon the ground near the more recent dead. Excavation would probably recover here many older objects, though wood decays.

The wind has died down and the flat is as full of mosquitoes as a Jersey salt meadow, and there is an occasional gnat. They bite, and, having been almost free of the pest at Kotlik, I failed to take my "juice" along, so just have to do the best possible. The gnats enter even the eyes, however.

Work as never before. Decide to utilize the rare opportunity to the limit, and to take the whole skeletons, not merely the skulls, leaving only the few fresher ones and those that are badly damaged. A great Sunday; burial after burial; opening the wooden grave—taking out and marking on the spot bone after bone—fighting mosquitoes all the while—and packing temporarily in any convenient receptacle. Fortunately there are quite a few boxes and pails and oil cans on the spot, left by the dredge people and the few natives who evidently sometimes

come to the place. At about 2 eat lunch—coffee (the Eskimo put what was for three cups into about two quarts of water, so there is but a suggestion of coffee), raw smoked fish for me and eggs with bacon (left over from breakfast) for my companion, and on again until about 5 p. m. or a little later. Last two or three hours, however, work with some difficulty. A gnat bit me in an eyelid, or got into my eye, and that has now swollen so that I can hardly see with it. My Eskimo, however, is about all I could wish. He just looks at me working in a matter-of-fact way, and carries the filled boxes, or looks around for something I could take with me, and even helps on a few occasions with the bones, finding evidently the whole proceeding quite right and natural. Brings me, among other things, an old copper teakettle, but to his wonder I do not want it and leave it. I find a fine large walrus-ivory doll and a handsome decorated "kantág" (wooden bowl), besides smaller objects, and also a large piece of a poor quality clay pot (no pottery now), with a fragment of a decorated border as on the lower Yukon.

Pack up, we load on the boat—lucky now she is so spacious—get into the shallow river—the tide has run out—push the boat out and start for home.

Thus far we had but slight drizzles. But the clouds now grow heavier, and as we have much farther to row than this morning, due to the low water, we are caught by showers. The last mile or so we have to hurry, see a big rain approaching. My man pushes her with a pole while I row all I can, with both hands, with the heavy oar. Of course the whole population of Kotlik has to see our arrival. And more, too, for in our absence a schooner came in with wood and a number of the natives. They talk, but no

one is either angry or excited. We two carry the boxes, pails, etc.—grass covered—into the house; how lucky I am now alone. Inside I remove the wet grass from them—the bones, too, are somewhat wet —then pay my Eskimo $5, which again is taken as a matter-of-fact thing, without thanks, but he well deserved the amount, even if I rowed a full half.

It is 9 p. m. My man comes again, we have a modest supper, he some left-over meat and I again the smoked fish, which I feel is strengthening me as well as agreeing with my stomach, and then to rest, quite earned to-day. Seldom have done as much in a day. Thirty-three graves collected, with over twenty nearly complete skeletons, and all restored so that I had to take considerable care not to go again into some already emptied. But this place should be dug over. The tundra in a few years swallows up everything on the surface. It literally buries or assimilates bones and all other objects, the moss and other vegetation with probably blown dust covering them very effectively. Finding anything below the surface and that even a foot or more, as was actually experienced, means something quite different under these conditions than it might elsewhere.

Monday, July 12. Slept fairly well and feel refreshed, but the eye still badly swollen. The Eskimo believe, I think, I got it from the bones. Yet they are quite sensible—a marked mental difference between them and the Yukon Indians.

Breakfast before 7—cereal, raw smoked fish, and coffee. Then pack. At the store buy empty gasoline boxes, but no nails to be had, and no packing. Lunch at 1—macaroni, raw smoked fish, sauerkraut, coffee; then pack again, fix boxes, break old ones to get nails, even pull a few unnecessary ones from the

boards of the house, go see my man's wife, a hopeless consumptive, and at 6 through with all except cleaning. Another fair work-day, 12 tightly packed boxes. Then clean up, burn rubbish, and ready for departure early to-morrow.

Supper—macaroni, raw smoked fish, greengage plums, a little sauerkraut, and coffee. Then a little walk outside, watch Eskimo women and children jump the rope (hilariously, but awkwardly), and go in to catch up with my notes. Nobody scowls at me, so that although they probably fear me as a "medicine man" they are not at all resentful for what I did yesterday. They are grown-up children, much more tractable than the Indians. But otherwise they show so much in common with the Indian that the more one sees of them the more he grows drawn to the belief of the original (and that not so far distant) identity of their parentage. It seems the Eskimo and the Indian are after all no more than two diverging fingers of one and the same hand; or they were so a bit farther back. Mental differences there are, yet these are no more than may be found in different tribes of the Indians or different groups of other races.

Tuesday, July 13. Rise a little after 6. Eye still sore after Sunday's gnat and sweat and dirt; must use boric acid frequently. An Eskimo actually said yesterday it was a sickness from touching the bones. A little breakfast—have no more salmon strips, so just cereal, canned plums, and coffee. And then with the help of two young Eskimo carry my spoils and baggage on to the tug, which has come for me. By about 7 start. Good-by Kotlik, what little there is of it.

At 9 arrive at Mr. Williams's reindeer camp farther

up the coast. There are five tents and two small log houses of natives—the herders with their families, dogs, and fish racks; and three whites, Mr. Williams, owner of the boat and of most of the herd of about 8,000 animals; Mr. Palmer, of the United States Biological Survey; and a Dane, Mr. Posielt, here for the Biological Survey of Canada. All are already at the corral some distance over the hill, branding, counting, etc., the great reindeer herd, which belong to several owners.

A short walk along the shore brings me in sight of the herd. The animals can be heard grunting a good distance off. The herd is so large and so compact that it looks like a forest of horns. The animals keep on moving in streams, but remain in the herd. They go to the shore to drink some of the salty water, instead of salt. All is of interest, even though the branding, the cutting off of big slices from the ears, and castration, is rather cruel.

At lunch, for the first time, reindeer meat, a select steak. It is tender and decidedly good. Has no special flavor and is poor in fat, but tender and good.

Afternoon, once more to the corral, and then various things, including a photograph of a little impromptu native group.

Supper once more on reindeer meat. This time prepared as a sort of a stew with onions—again very good. But we were to leave after supper for St. Michael and I see no intention to that effect. Instead they all go once more to the corral to continue the work until about 11 p. m. So I have to settle for the night, with some hope that we may leave in the morning. We sleep four side by side in a tent 10 feet wide. Luckily they had a spare clean blanket or two, and but one of the three snores, and he like a lady;

also the weather has cleared and is warmer, so the night is fairly good.

Wednesday, July 14. Morning bright, calm. Breakfast, and all hurry off to corral without even any explanation—just a few casual words, from which I understand that we shall not go. So I write whole forenoon, though feeling none too good about the delay. Had I my own boat, as one should have in this country, all would be different. As it is I am utterly helpless. At lunch speak to Mr. Williams; and though not much willing, he half promises that we may go to St. Michael to-night.

Afternoon. Walk 8 miles along the beach, to a cape and back, looking in vain for traces of human habitation and collecting along the beach what this offers, which outside of some odd, flat, polished stones is but little. Come back near 6—soon after supper—and hear with much satisfaction that, after all, we will go to-night to St. Michael.

RÉSUMÉ

So ends the Yukon and its immediate vicinity. What has been learned?

1. The great and easily navigable river, extending for many hundreds of miles from west to east, could not but have played a material part in the peopling of Alaska, and quite probably in that of the continent, and all human movements along it must have left some material remains. It seems, therefore, a justified inference that the valley of the Yukon harbors human remains of much scientific value.

2. Such remains, judging from the present conditions, were left exclusively along the banks of the river, on the flood-safe elevated platforms of the

banks, and especially about the mouths of the tributaries of the Yukon of those times.

3. But the banks and mouths of the past are seldom, if ever, those of to-day. The river, with its currents, storms, and ice pack every spring, is changing from year to year. It is ever cutting and eroding in places, and building bars and islands or covering with flood silts in others. In many stretches no one can be sure where the banks were 500 or 1,000 years ago, not to speak of earlier periods.

4. The banks and islands of to-day, therefore, are for the most part recent formations, in which it would be useless to expect anything very ancient. And there is nothing like the successive ocean beaches at Nome and elsewhere, which would guide exploration.

5. The right hilly side of the river alone seems to offer some hope of locating some more ancient sites and remains; yet it is quite certain that the river ran once far to the left, for all the vast flats on that side are of its construction; so that the more ancient remains of man may lie in that direction. But there everything is, from the point of view of archeology, a practically unexplorable jungle and wilderness, and there is no one there who might make accidental discoveries.

6. It would seem that the best hope for the archeologist along the Yukon, so far as the more ancient remains are concerned, lies along the tributaries of the stream, and that particularly at the old limits of the more recently made lands.

7. Nevertheless the banks of the Yukon as they are now are not wholly barren. Up from Tanana, at the Old Station, probably about Ruby and Nulato, about Kaltag and the Greyling River, at Bonasila, Holy

Cross and Ghost Creek, and at the Mountain village, Dog village, Russian Mission, and doubtless a number of other sites, they contain both cultural and skeletal remains that, if recovered, will be invaluable to the anthropological history of these regions.

8. The line of demarcation between the Indians of the Yukon and the Eskimo, outside of language, is indefinite. Traces of old Eskimo admixture are perceptible among the Indians far up the river, and the cultures of the two peoples in many respects merge into each other; while among the Eskimo of the lower river and farther on there are physiognomies that it would be hard to separate from the Indian. Whether all this means simply extensive past mixture, or whether, as would seem, the Alaska Indians as a whole are nearer physically to the Eskimo than are the tribes in the States, remains to be determined. Among the Athapascan Mescalero Apache, who have reached as far south as New Mexico, a somewhat Eskimoid tinge to the face, especially in young women, was by no means very unusual 25 years ago when I studied this tribe. This problem will be touched upon again in this volume.

9. All along the Yukon, from near Tanana (Old Station) to the mouth of the river, in the Indian and in the Eskimo region, there prevailed the same type of winter house, namely, a largely subterranean room with a subterranean tunnel or corridor entrance; and also a similar type of summer dwelling, formerly a skin, now a canvas, tent. The winter dwellings were built within of stout posts and covered with birch bark and sod, looking from outside much like the present-day Navaho hogan; while the pits left by them remind one of the southwestern "pit dwellings," the kashims of the

Pueblo kivas. As a hogan, so these largely subterranean dwellings along the Yukon had a smoke-air-and-light hole in the center of the top, a fireplace in the middle of the floor, and benches (of heavy hewn planks in the north) along the sides. Each village, furthermore, had at least one larger structure of similar nature, the "kashim," or communal house. All this may still be traced more or less plainly on the dead sites along the Yukon, and houses as well as a kashim of this type were seen at Kotlik and Pastolik, at the mouth of the river.

10. The native industry of the river presents also much similarity, though there are differences.

Pottery, of much the same type and decoration, was made at least as far as the lower middle Yukon.

Stone implements were made and used all along the river, and were much alike. But the double-grooved, cupid-bow ax of the Yukon Indian, hafted in the center and used for chipping rather than cutting, is lower down replaced by the same ax, in which one end has been broken off (or has not been finished), and which is hafted as an adze; or by oblong quadrilateral flat axes which have not been found up the river.

The peculiar and apparently very primitive stone industry of Bonasila is, it seems, just a development of local conditions—nature of most available stone, and essentially hunting habit of the people that resulted in many skins which called for numerous scrapers. Nevertheless the site deserves a thorough further exploration.

There was apparently not much basketry along the river, the place of the baskets being taken by the birch-bark dishes of the Indian and the kantág or

ingeniously made wooden dish of the Eskimo part of the river.

Canoes among the Yukon Indians were mainly of birch bark, while the Eskimo had mainly skin canoes.

11. Neither the Indians nor the Eskimo of the Yukon practiced deformation of the head or of any other part of the body, or dental mutilation. The Indians as well as the Eskimo occasionally pierced the septum of the nose, for nose pieces, while the Eskimo cut on each side a slit in the lower lip for the introduction of labrets. The Eskimo cut their hair short in a characteristic way, reminding strongly of certain monks; the Indians left their hair long. But at Anvik the Indians both cut their hair and wore labrets. They also used the wooden dish.

12. From all the preceding it appears that there must have been long and intensive contacts between the Yukon Eskimo and Indians; that, through war or in peace, they became mutually admixed; and that there were mutual cultural transmissions.

13. No further light for the present could be gained on the origin, antiquity, or early migrations of the Yukon Indian. It was determined, however, that he represents but one main physical type, and that this type is the same as that of the Indians of the Tanana and most other Alaskan Indians of the present time.

14. Exceptional skeletal remains were washed out from the bank at Bonasila. They are of Indians (?), but appear to be not those of the Yukon Indian of to-day. They present a problem which is to be solved by further exploration of the site.

15. The Eskimo of the lower parts of the river are in general better preserved and more coherent than the Indians. They are more tractable people and are

taking more readily to work and civilization.

16. These Eskimo show, in the majority of cases, fairly typical Eskimo physiognomies. But their heads are not as those of the northern and eastern members of the race. The head is less narrow, less high, and has but now and then a suggestion of the scaphoid form that is so characteristic of the Greenland, Labrador, or northern Eskimo cranium; also, the angles of the jaws are less bulging and the lower jaws themselves do not appear so heavy.

17. The Yukon Eskimo burials are in all essentials much like those of the Indians up the river. Here again a cultural connection is very evident, in this case there having in all probability been an adaptation of methods by the Eskimo from the Indians.

18. Archeological prospects along the delta flats occupied by the Eskimo appear very limited.

St. Michael

Thursday, July 15. In the morning, after a good trip, reach St. Michael—quite a town from a distance, with many boats on the shore in front of it; but soon find that it is largely a dead city and ships' graveyard, not harbor. With the gold rush over, and the Government railroad from Seward to the Tanana, men and business have departed. Before the summer is over most of the large buildings and the fine large boats are to be demolished, and there will be left but a lonely village.

Unload my collections on the old dock. The postman kindly comes down from his place, which, with Mr. Williams's store, is far up on the hill above the

harbor, the boxes are weighed and stamped for the parcel post, and relieved of them I go to the hotel and spend the day in visiting the teacher, the marshal, Mr. Williams's store, where I see a whole lot of recent Eskimo ceremonial masks decorated with colors and feathers, and the wireless station to send a message to the Institution. All native (Eskimo) character is almost gone from the place, what remains being mainly civilized mix bloods; and also little, if anything, remains to be collected, particularly now when all vacant land is thickly overgrown with grass and weeds. An occasional skull appears, one having been seen recently on the beach and one on Whale Island, but there is little besides, though things could be found doubtless by excavation.

Items of interest in Mr. Williams's store, and also in that of the N. C. Co., are various articles cut handsomely by the Eskimo from walrus ivory, both fresh and "fossil" (old and nicely discolored). There are beads, napkin rings, hairpins, cigar and cigarette holders, and other objects, generally exceedingly well made and decorated. It is, of course, well known that the Eskimo are very apt in this work; it is not, however, so well known that every island or village has certain specialties and types of decoration. This is so true that an observer before long can tell in many instances just where a given article has been made.

The fossil ivory industry is, it was soon learned, becoming a serious detriment to archeological work in these regions; of which, however, more later.

During the day I find that a small boat, the *Silver Wave*, belonging to Lomen Bros., will leave St. Michael for Nome that same evening. As this suits

me very well I engage a berth on the boat, help to get my baggage on deck over a broken landing place, and get ready to depart.

At 6 leave St. Michael. The *Silver Wave* is a tub—too short—am told if it were of proper length they would have to have more help. Result—very unsteady. Fortunately the weather is fair, and the captain gives me a berth in his cabin. I had originally a stateroom, right in the back, with three bunks or beds, so small that one could barely get into the beds; but there came two mix-breed women with a girl and so they turned me out and put me in the "hole"—seven bunks in an ill-ventilated cabin under the deck in the stern of the ship. She is only about 60 feet long by about 15 broad. As it is I have a bunk in what would have been a well-ventilated little cabin, had it not been for rough weather which came on later in the night and which necessitated the closing of the window.

Friday, July 16. The rougher weather came and the boat began to pitch and roll. Luckily I slept for the most part. At about 6.30 the captain called me to breakfast with him. I got up rather groggy from the sea, but managed to wash my face and get to the little messroom, where the cook started to bring eggs, bacon, coffee, etc.—and then I had enough and had all I could do to reach my bunk again without getting seasick. I was kept on the verge of it until after 10, when we arrived off Nome.

This, however, meant no relief. There was no bay, no dock, no shelter for even such a small boat, and so we anchored a few hundred yards off the shore along which stretch the long line of unpainted (mostly), weather-beaten frame dwellings of this northern capital.

By this time I barely keep my feet, but they lowered

a heavy rowboat, and several of us—there were four other men passengers—are helped to tumble in. I get back, and to steady myself catch hold of the borders of the boat, only for this the next moment to be dashed against the larger boat with my hand between. It was almost too much, the seasickness and added to it the very painful hurt. Fortunately the fingers were not crushed, just bruised badly—they might easily have been mashed to a pulp.

They row us in and we tumble out on the sand, and there is no one to receive anybody or take any notice. However, after a while there comes accidentally an old two-seated Ford. Three of us crowd in, leave the few bulkier things we brought along on the beach unguarded, and are driven to the other end of the town, to the Golden Gate Hotel.

This is a big old frame building, out of plumb in several directions. There is no one in the spacious lobby. However, after a time some one, not looking much like a proprietor—more like a groom at work —comes out from somewhere and without much ado shows us each to a room. Mine smells musty, old sweat and blankets and mould, and looks out on a dilapidated tin roof—must ask for another. Finally get one "front" for $3—the other was only $2.50. Musty too, but fairly large, and with a double bed with, at last again, clean covers.

Unshaven—in the khaki worse for rain and work—with fingers so sore they can not bear a touch, feverish, and head still dizzy—I go to lunch. On my way stop at Coast Guard building—no one there; at the Roads Commission—office empty; at the Customs —not a soul. But at the courthouse they tell me where Judge Lomen sometimes lunches, and so I go there. It is near by—nothing here is far distant—and

so I soon sit at Mrs. Niebeling's, a justly famed Nome's "for everybody," at a clean table and to a big civilized dinner. Order reindeer roast—find it this time, in my condition, not much to boast of—one could hardly tell it from similarly done beef—and begin on the coffee when in comes a young man, asks me if I am the doctor, and introduces himself as Mr. Alfred Lomen, the judge's son; and in a minute or two in comes the judge himself, a kindly man of something over 70. It all makes me feel a lot better, though still weak. Have rest of lunch together and talk, but do not get very far in anything that interests me; but the judge takes me to the Catholic Fathers here, who have an orphanage somewhere near where I want next to go, and leaves me with Father Post. The father is kindly, but himself does not know much, and so makes arrangements for me to meet next day Father Lafortune, who works among the Eskimo.

Then I go once more to the Coast Guard building and meet Captain Ross, in charge. The *Bear*, I learn, has just arrived here, and is soon going north. She is my godsend, evidently. So Captain Ross sends me over to see Captain Cochran. The meeting is good, and I have a promise to be taken to the cape and some other stations. But the *Bear* goes first to coal at St. Michael, and then will make a visit to St. Lawrence Island. So I propose to go to Teller first, see what I can of the Chukchee-Eskimo "battle field" near there, and be taken from there by the *Bear*. The priests give me some hope for getting there over an inland route, but later on tell me one of the boats of the orphanage which is located in that region is away and the other has broken down, so that there will be no possibility of making the trip through the Salt Lake and to Teller. But the *Victoria* (the Seattle boat to come to-

night) will go to Teller. Unfortunately, if weather is rough or there are no passengers she will not stop at Nome, so all is again uncertain. The *Silver Wave* goes northward next Monday, but I have a dread of her. All of which is put down merely to show slightly what an explorer without a boat of his own may expect in these regions.

Nome, Saturday, July 17. Poor night again—it surely seems to be the fashion in Alaska. The *Victoria* came at night (or what should be night). The ramshackle big frame hotel, with partitions so thin that they transmit every sound, got about 40 guests, and next room to mine came to be occupied by two women who had visitors, female and male, were taken out for a ride after 12 and returned about 2 a. m. One of them, or their visitor, had a perpetual vocal gush, the others chimed in now and then, and a strong male voice added the bass from time to time, with old Fords noisily coming and going outside, and people going up and down the stairs. So sleep for some hours was out of the question. And there was nothing to do about it.

After breakfast went to meet Father Lafortune, a Catholic missionary priest to the Eskimo, who speaks their language well and who promised to accompany me to their habitations; and together we spent the forenoon on one side of the town, among the natives of the Diomedes, and most of the afternoon on the other end among the people from King Island. It was a good experience, resulting in seeing a good many of the Eskimo and getting some information, a few photographs, and quite a few old specimens. Then we went to the parsonage, where I got a few good photos from Father Lafortune's collection. He is a matter-of-fact, always ready to help, natural he-man,

rather than a priest and teacher, and a great practical helper to the natives, who all are his friends.

Also saw Judge Lomen, arranged for lecture to-morrow, saw Captain Ross about the *Bear*, and various other people; but there is not much to be obtained here about old sites and specimens. Telegraphed Institution, and also to the Russian consul at Montreal for permission to visit the Great Diomede Island. Evening packing. Natives bring walrus ivory, some excellent pieces. Weather whole day cloudy, threatening, occasional showers, cool but not cold.

Sunday, July 18. Heavy sleep 10 p. m. to 7 a. m., regardless of a typewriter going in the next room and the women (now quieter, however) on the other side.

Forenoon spent in talking with people and attending a little service, for the natives mainly, at the Catholic Church of Fathers Post and Lafortune. Poor, simple, but sincere and interesting.

After lunch more consultations, then a visit to bank where they smelt gold dust (even to-day), and then a lecture on "The Peopling of America," at the courthouse. Well attended, and many came to shake hands after. Then a dinner, with examination of a number of interesting and valuable specimens, at Judge Lomen's. Among other objects there is a duplicate, in ivory, of the broken double ax from the Yukon, the two grooves and even the break being well represented. Evening—examination of specimens at Reverend Baldwin's. Cloudy, cool, threatening, but stormy weather abating.

About Nome

Due to the delay with the *Bear*, the next few days until July 23 were spent at and about Nome. They proved more profitable than was expected. Numbers of interesting specimens were found in the possession of some of the dealers, and more of those of scientific value were secured either through gift or by purchase for the National Museum. These collections consisted of objects of stone—i. e., spear points, knives, axes, etc.—but above all of utensils, spear points, effigies, etc., some of them of remarkable artistry and decoration, were made of walrus ivory that through age has turned "fossil."

Among the stone objects were several axes made of the greenish, hard nephrite which came from the "Jade Mountain" on the Kobuk River. The objects from fossil ivory came principally from the St. Lawrence Island, the Diomede Islands, Cape Wales, unknown parts of the nearer Asiatic coast, and here and there from the Seward Peninsula.

A large majority of these objects are now collected by the natives themselves, who assiduously excavate the old sites, and are sold at so much per pound as "fossil ivory" to crews of visiting boats or to merchants at Nome and elsewhere, to be worked up into beads, pendants, and other objects of semi-jewelry that find ready sale among the whites.

In addition a certain part of these objects is reserved by the natives, especially those of the Diomede Islands, and worked up by themselves. The more striking the coloration of the ivory, the more desirable it is for the beads, etc., and the less chance of the object, regardless of its archeological or artistic value, to be preserved. The most artistic pieces, nevertheless, are usually disposed of separately, bringing higher prices than could be

obtained for beads.

In this way hundreds of pounds collectively of ancient implements, statuettes, etc., are recovered each year from the old sites on both the Asiatic and the American side of the Bering Sea, and are cut up, their scientific value being lost. Most of the fossil ivory, fortunately, consists of objects which, though showing man's workmanship, are of relatively little scientific value; nevertheless it was seen repeatedly that specimens of real archeological value and artistic interest would be destroyed if their color and texture made them suitable for some of the higher-priced jewelry.

The Eskimo, as repeatedly found later, have not the slightest hesitation about excavating the old sites, and whatever they can not use, which as a rule includes animal and human bones, and in fact everything else except stone tools and ivory, is left in the excavated soil and lost. The amount of destruction thus accomplished by the women, children, and even men each year is large and promises to grow from year to year as long as the supply lasts. This means that unless scientific exploration of these old sites is hastened there will be little left before long to study.

The fossil ivory trade has become such that many of the officers and the crews even of the visiting vessels, including the revenue cutters, engage in buying the ivory from the natives and cutting it up in their spare time into beads and other ornaments. A captain of a well-known boat who with his crew visited in the summer of 1926 a small island on which there is an extensive frozen refuse heap containing many bones and tools of the natives who once occupied the place, exclaimed, "Gad, there's $50,000 of ivory in sight."

The boat crew took away about "2 bushels" of it, or all that could be removed from the extensive frozen pile. I saw some of this ivory later, all cut up, but with a number of the pieces still showing old human handiwork, and some beads made of other parts of the lot were brought later to my office in Washington.

If American archeology and ethnology are to learn what they need in these regions it is absolutely essential that they take early steps for a proper exploration of the old sites, besides which every effort should be made by the intelligent traders, missionaries, teachers, and officials to save the more artistic and characteristic pieces of human workmanship in the old ivory, and bring them with such data as may be available to the attention of scientific men or institutions. It would in fact be of much value, and the writer has suggested this to the Governor of Alaska, to establish a local museum at Nome, where such objects could be gathered and saved to science.

ABORIGINAL REMAINS

The coast of which Nome is now the human center, up to Cape Wales, together with the nearer islands, was occupied by the Maiglemiut (Zagoskin), or Mahlemut (Dall et al.) subdivision of the Eskimo. They were a strong group, and great traders. During the Russian times the Aziags, from what is now the Sledge Island, with probably others from the coast, visited yearly for trading purposes as far as St. Michael and the Yukon, while the Wales people were known to trade up to fairly recently as far as Kotzebue, both at the same time having trading connections with Asia.

Of these natives, with the exception of those at Wales, there remains but little. On Sledge Island there are only two dead villages, and on the coast from Port Clarence to far east of Nome there is not a single existing native settlement. A few remnants of the people live in Nome, but they have lost all individuality.

Dead sites are known to exist from west to east, at Cape Wooley; at the mouth of the Sonora or Quartz Creek; at the mouth of the Penny River—some natives are said to still go to fish there in summer; at the mouth of a small river 3 miles east of Nome; both west (a larger village) and east (a small site) of Cape Nome; and 18 miles east of Nome (the "Nook" village).

Most of these sites have been peopled within the memory of the oldest inhabitants.

Thanks to the kind aid of the Reverend Doctor Baldwin, I was able to visit several of the sites east of Nome, more particularly the Nook village, and it was still possible to find two skeletons and a skull on these sites.

The Nook site must have been one of considerable importance. It was an especially large village, or rather two near-by villages, in one of which I counted upward of 30 depressions, remnants of the semisubterranean houses with vestibules, such as are elsewhere described from the Yukon.

Here a clear illustration was had of what changes on sites of this nature may be wrought in a short time by the elements.

Fifteen years ago, I was assured, there were still many burials and skeletal remains scattered along

the coast near the Nook village. Then in 1913 came a great southwestern storm, which at Nome ripped up the cemetery and carried away some coffins with bodies, scattering them over the plains in the vicinity. Since that storm not a vestige remains of any of the burials or bones near the large Nook village. On prolonged examination I found nothing but sands overgrown with the usual coast vegetation. Everything had been carried away or buried and the pits of the houses were evidently themselves largely filled in.

The burials on this coast west of Golovnin Bay were evidently all of a simpler nature than those on Norton Sound and the Yukon. There is plenty of driftwood, but for some reason this was not hewn into boards with which to make burial boxes. The dead were merely laid upon and covered with the driftwood, though this was done, as later seen on Golovnin Bay, rather ingeniously. One of the two skeletons found near Cape Nome, an adult male, lay simply among the rocks on the lower part of the slope of the hill.

Old sites, though often small, may be confidently looked for along all these coasts in the shelter of every promontory, at the mouth of each stream, and on the spits which separate the ocean from inland lagoons (as in the case of the Nook village).

Nome—Bering Strait—Barrow

Friday, July 23. Received word to be on the *Bear*, which arrived yesterday, before 10 o'clock this morning. Due to the shallowness of the water the boat, though drawing only 18 feet, stands far out from the shore and makes a pretty sight, looks also

quite large in these waters where there is nothing above a few hundred tons.

Am soon at home. The captain's cabin, with three beds, is nicely furnished, but has the disadvantage of being situated at the very rear of the vessel, above and beyond the screw. There is another passenger, a teacher-nurse for Barrow. I take the isolated bunk on the right, and this becomes my corner for the next six weeks. Toward 11 a. m. the wind begins to freshen, soon after which we leave for St. Lawrence Island. After midday the wind increases considerably, waves rise, and the *Bear* begins to plunge. Before the afternoon is over the wind blows a half gale and we are being tossed about a great deal. Have to take to bed. The boat is being tossed up and down and in all directions. Resist in vain, then at last become ill, and this passes into a long spell of about the worst seasickness I have ever endured. There were a good many sick on the *Bear* that evening and night.

Saturday, July 24. Wind and water slowly quieting down, and the boat is approaching Cape Chibukak off St. Lawrence Island, where is located the main of the two villages of the island, known as Gambell. The *Bear* gradually approaches to within about a half mile of the shore, where we anchor. The water here is quieter, and before long a large baidar (native skin boat) is shoved off from the land and approaches our boat. This is the usual procedure when the sea permits. There are no docks, and closer in there is danger from rocks and shallows. There are a number of natives in the boat, together with the local teacher, and each one, including the teacher, carries a smaller or larger bag of fossil ivory, various articles made of fresh ivory, and some other objects, for sale to the officers and crew of the boat. They climb on

our deck, where they evidently feel quite at home, and in a few minutes carry on a busy trade and barter with everyone. I succeed in getting a fine fossil ivory pick; but the main supply had evidently been preempted and I only see it later in the possession of the officers, who kindly let me have what is of less value to them and more to science.

Some of the Eskimo bring, in addition to the ivory, other articles for sale—fish, birds, and the meat of the reindeer, which are for the ship's messes and constitute very welcome additions to the diet. Besides all this the natives also frequently bring skins of foxes and even bear, which also find buyers. In return the boats carry off the mail and such supplies as they have obtained by barter or purchase. These visits are mutually enjoyable as well as profitable occasions, and afford one the opportunity of seeing many of the natives, even if prevented, as in this case, from visiting their village.

The Eskimo impress one here as in every further locality as a lively, cheerful, and intelligent lot, good traders, and advancing in many ways in civilization. The latter is perhaps especially true of the St. Lawrence Eskimo, who from what was seen now and later must have had especially good missionaries and teachers as well as a considerable freedom from bad influences from the outside.

Savonga

About 40 miles east-southeast of Gambell is the second and smaller village of the St. Lawrence Island, known as Savonga, which was the object of our next visit. It was here that we were to buy two or three reindeer carcasses, the animals being killed and

dressed for us by the natives in an astonishingly short time. The little village is prettily situated on the green flat of the elevated beach. It consists of less than a dozen modern small frame dwellings. One of these, that of the headman, Sapilla (who regrettably died during the following winter), is of two stories—a unique feature for an Eskimo dwelling in these waters. Here we were visited by three boats and the previous scenes were repeated, only, due to the proximity of a rich old site, there were more objects of old ivory.

The captain made me acquainted with Sapilla, whom I found remarkably white-man-like in behavior. Then the ship doctor, not feeling very well after yesterday's storm, filled my pockets with tooth forceps and I was taken to the shore, to see the women and children who would not venture out and to attend to any tooth extraction that might be needed.

We were considerably farther from the shore than even at Gambell, but I was sent on one of our motor boats and so it did not take long to land. Upon landing we came to bright and clean and smiling little groups of women and children, full of color in their cotton dresses, and I was soon in one of their houses. All these dwellings were built by the Eskimo themselves, and it was a most gratifying surprise to find them as clean and wholesome as any similar dwelling of whites could be. Moreover, these houses were furnished with stoves, chairs, tables, crockery and other utensils exactly as if they were those of a good class of whites, with the smell of the seal, which as a rule is so clinging to and characteristic of the Eskimo house, barely perceptible.

It was a busy and interesting hour that I spent at

Savonga. I saw probably all the inhabitants that were at home; pulled five teeth—the teeth of these quite civilized people are no more as sound and solid as were those of their fathers and mothers—and found and purchased cheaply many smaller objects of fossil ivory, which they excavate from a near-by old site.

These objects are obtained from an old village located on the coast about 4 miles farther east, on or near the North Cape, visible from our boat. The natives excavate in this site as far as it thaws every summer, and find many objects. They, moreover, make an occasional trip to the two little rocky Punuk islands located about 12 miles south of the East Cape of the St. Lawrence, which, though accurately charted by the Russians as early as 1849, yet until the summer of 1926 remained practically unknown. On one of these islands there is now known to exist an extensive frozen refuse heap, containing large quantities of old ivory implements as well as other objects of scientific interest.

The land visit was a great tonic after the wild and mean preceding night, and I did not relish at all the *Bear's* whistle calling us away. What a great thing it would be if a revenue cutter could for just one season be given to science!

Sunday, July 25. Left St. Lawrence 9.30 last night, sea quieting. We are now passing, on our right, King Island, isolated rocky mass. Day fair, cool, water getting smooth.

About 50 miles north one can now see plainly Cape Prince of Wales (pl. 5, *a*), and to the left, hazy, the two Diomedes. We are now 95 miles from St. Lawrence. On really clear days one could see from here even the Asiatic heights. Therefore, from the latter on a clear day one sees the Diomedes, the

Cape, the highlands beyond, and King Island, while a little farther south there is on such a day a good view from Asia of the St. Lawrence Island. All this was in good weather easily reached from Asia and must have been utilized from the earliest time in passing onward from one continent to the other.

We can now see also much of the coast in the direction of Teller and the York Mountains behind.

From hour to hour there is growing on one a profound appreciation that the Bering Sea was a most favorable amphitheater of migration, particularly from the less hospitable Asia eastward into America. And practically the whole trend of native movements to this day is from Asia toward America.

Later in the day, now a fine, bright summer day, arrive off Wales. Here again anchor far out. Last year the *Bear* grounded here and our captain is apprehensive. Wales is a straggly village—or two villages—located on a large, flat sandy spit, dotted with water pools, and projecting from the Seward Peninsula toward Asia. Near by are old sites, probably of much archeological value, and in these for some weeks now excavations have been carried on by Dr. D. Jenness, of the Victoria Memorial Museum of Ottawa. Here also is located an exceptionally educated and observant teacher, Mr. Clark M. Garber.

A big umiak comes to us with many natives bringing the usual trade, and on it, much to my pleasure, are both Doctor Jenness and Mr. Garber. Doctor Jenness asks to go with us to the Little Diomede to do some work there. He has had encouraging experience here, finding evidences of occupation dating many centuries back, and has collected some valuable

specimens, including a few with the fine old curved-line decoration. Mr. Garber gives me some valuable information about the skeletal remains of this place and engages to collect for me, who can not leave the boat, a few boxes of these specimens, which promise is fulfilled later.

The natives are a jolly and sturdy lot, even though they bear, and that since their earliest contacts with whites, a rather bad reputation. That this is founded in some fact, at least, is told us in the annals of the Russians, and is also shown by the little structure on the hillside off which we are anchored. This has a tragic and at the same time quaint history. It is the grave of a missionary Doctor Thornton, who was killed, we are told, by two local young fellows. These were apprehended, sentenced to die, and were to be shot by their relatives, which all evidently found quite just. On the appointed day they were taken out to the burial ground, helped to prepare their burials, one asked yet to be allowed to go to the village to get a drink, went and returned, and then both were shot. The executioner of the boy who went to get the drink is said to have been his uncle.

The Diomedes

Late that night we leave slowly for the Diomede Islands, the nearer of which is only about 18 miles distant. The two islands lie, as is well known, just about in the middle of the Bering Strait. One is known as the larger or Russian, the other as the smaller or American Diomede. The boundary line between Russia and the United States passes between the two. Both islands have been occupied since far back by the Eskimo. To-day there is one small village on the American and two small settlements on the

Russian island.

July 26. Up at 5.40, breakfast 6, and off in one of our staunch motor boats, with Jenness, for the Little Diomede. Countless birds flying in streams about the island.

The island is just a big rock, with barren flat top and steep sides, covered where inclination permits with great numbers of larger and smaller granite bowlders. There is neither tree nor brush here. The village, if it deserves that name, with a school, occupies an easier slope, facing the larger island across a strait seemingly about a mile broad. There are but a few dwellings, due to local necessities and conditions built above ground and outside of stone. One that was entered showed a dark fore-room, a storage attic, and a cozy somewhat lighted living and sleeping back room, entered through a low and narrow entrance. The houses seem to be built on old débris of habitations, and there are refuse heaps, one of which was eventually worked in by Doctor Jenness, though without much profit.

The bowlder-covered slope above the village was the burial ground of the natives. (Pl. 5, *b*.) Unfortunately most of the skeletal remains have been collected by a former teacher and then left and lost. With Doctor Jenness and the present teacher, himself an Eskimo, we climb from bowlder to bowlder and collect what remains. The work is both risky to the limbs and difficult in other respects. The large bowlders are piled up many deep; and there being little or no soil, there are all sorts of holes and crevices between and underneath the stones. Deep in these crevices, completely out of sight or reach, nest innumerable birds (the little auk), and their chatter is heard everywhere. But into these impenetrable crevices

also have fallen many of the bones and skulls of the bodies that have been "buried" among the bowlders, and also doubtless many of the smaller articles laid by the bodies.

The burials here were made in any suitable space among the rocks. The body was laid in this space, without any coffin and evidently not much clothing. About it and on the rocks above were placed various articles. We found clay lamps, remnants of various wooden objects, the bone end pieces of lances, and finally one or two pieces of driftwood to mark the place. Here the bodies decayed and what was left had either tumbled or was washed by rain into the crevices. It was suggested, however, that much may have been taken by dogs and foxes. Some of the skulls and here and there one of the larger bones remained, to eventually be covered by moss and eroded. With the help of Doctor Jenness and the teacher I was able to find five male and seven female crania in fair condition, which will be of much value in the study of this interesting contingent of the Eskimo.

No evidence in the graveyard among the rocks of any great antiquity, nothing more than perhaps a few scores of years. But traces of older burials would surely be completely lost among the rocks, though they may lie in the deep crevices and holes where they can not be reached.

Upon return am treated to a cup of good hot coffee—never can get a real hot cup of coffee on the boat—and excellent bread, made by the Eskimo wife of the teacher; and see his family of fine chubby children. Can not help but kiss his girl of about 10—she is so fresh and innocent and pretty. Obtain also from the wife of the teacher a good old hafted "jade" ax,

though she hesitates much to part with it—it used to belong to her grandmother; and from the teacher himself a number of interesting articles in old ivory. Leave Doctor Jenness. Have learned to like him much, both for his careful work and personally, in our short association; and at 11 a. m. return to the boat.

Cold, but calm and sunny. Sit on boxes at the very end of the good old *Bear*. See Asia, the two Diomedes, and Seward Peninsula, all in easy reach, all like so many features of a big lake. Pass around Greater Diomede.

There never could have been any large settlement on the Diomede Islands—they are not fit for it. The Great Diomede has just two mediocre sites, which are occupied now each by about half a dozen dwellings. A small old settlement, a few stone houses, has also once existed, I am told, on the elevated top of the larger island opposite the Little Diomede. On the latter only the one visited—everywhere else the steep slopes or walls come right down into the water, and there is even no landing possible (or only a precarious one at best) except where we landed. The old natives of the Little Diomede are said to have believed that another village had once existed farther out from the present site and that it has become submerged. The evidence cited (told by the native teacher) is not conclusive, and no indication of such a settlement could be seen from the beach. But in front and possibly beneath the native houses, in the old refuse, there may be remnants of older dwellings.

Just passed from Monday to Tuesday, and then back to Monday, all in a few hours—the day boundary. We are now just north of the Bering Strait and see all

beautifully, in moderate bluish haze.

A grand panorama of utmost anthropological interest. A big lake, scene of one of the main migrational episodes of mankind. Sea just wrinkling some, day calm, mostly sunny, mildly pleasant, with an undertone of cold.

How trivial feel here the contentions about the possibilities of Asiatic migrations into America. There can be no such problem with those who have seen what we now are witnessing. Here is a great open pond which on such days as this could be traversed by anyone having as much as a decent canoe. As a matter of fact it has always been and is still thus traversed. (Pl. 6, *a*.) The Chukchee carried on a large trade with America, so much so that we find the Russians complaining of their interfering with their trade. (Pl. 6, *b*, *c*.) The Diomede people stand in connection on one hand with the northeastern Asiatics and on the other hand with the whites as far as Nome, where most of them go every summer to sell their ivory and its products and bring back all sorts of provisions. And in the same way the King Islanders come every summer to Nome, on the east end of which, as the Diomedes on the west, they have their summer habitations. (Pl. 7, *a*, *b*.) Only a year or two ago, the natives tell, an Eskimo woman of St. Lawrence Island set out alone in a canoe with her child to visit a cousin on the Asiatic coast, 50 miles distant, and returned safe and sound after the visit was over.



***a*, Cape Prince of**



***b*, Village and ceme**

BUREAU OF AMERICAN ETH



***a*, Asiatics departing for Siberia fro**



***b*, "Chukchis" loading their boat with goods on Little**

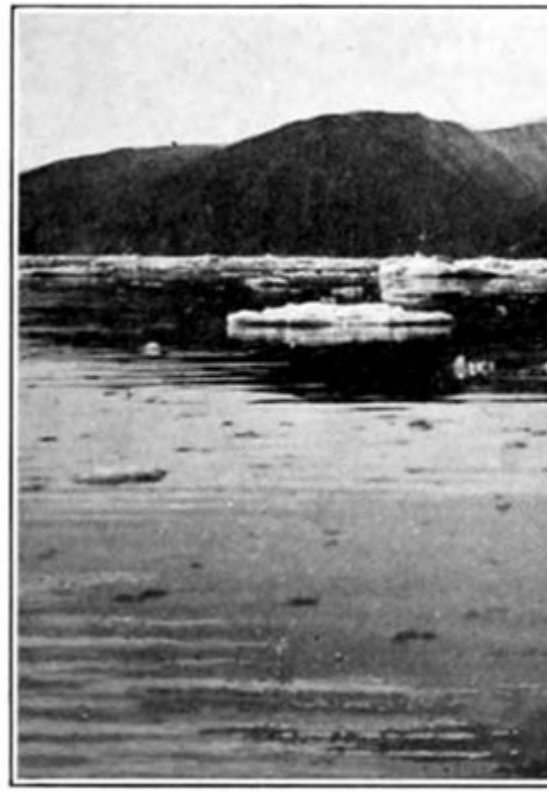


c, **"Chukchis" loading their boat with goods on Little**

BUREAU OF AMERICAN ETH



***a*, Eskimos from**



***b*, East Cape of Asia (**

BUREAU OF AMERICAN ETH



A Grou

(Taker

To bed dressed—the captain tells me we shall soon be at Shishmaref, on the north shore of the Seward Peninsula, and that he will have me called, if I want to visit the village.

Awake 11.30 p. m. At 11.45 word comes that we have arrived and a boat is getting ready. On deck in five minutes. Of course it is still light—there is no real night any more in these regions.

Have a cinnamon roll—the night specialty for the crew on the *Bear*—and a bowl of coffee. The natives, two boats full, already coming, and a fine full-blooded lot they show themselves to be. They are accompanied by Mr. Wegner, a big, pleasant young teacher.

Leave natives trading and set off in ship's boat. The *Bear* is anchored about 1⅓ miles off. Fortunately fairly quiet or we should not be able to go ashore. Teacher and a young English-speaking native go with us. We have the launch and the skin whaleboat. Anchor first off shallow beach and transfer into the skin boat for the landing.

Tuesday, July 27. It is about 12.30 a. m. Many native women, youngsters, and some men gather about us at the school. Talk to them—explain what I want, which is mainly skulls and bones—all quite agreed. Take two young natives, some bags, and proceed to where they lead me.

Find, about half a mile from the present village, a big and important old site, which existed up to the white man's time. But dunes on which burials were made and house sites have been largely graded by a fox-farm keeper and trader, Mr. Goshaw. He had gathered many skulls—shows me a photo of two rows, at least 40—will not tell what he did with them. Says he sent "many things to the Smithsonian," but can give no details, "and to the universities," but will not mention which. Also "buried a lot." Bad business.

Gathering what is possible from the débris thrown out by the Eskimo working for the fox farm, we proceed rapidly from mound (dune) to mound. Find burials still on the surface in situ—i. e., nearly buried by the rising carpet of the vegetation—but skulls

gone. Many of those on remaining heaps imperfect, but at least something can be saved. Collect all that is worth collecting. See Mr. Goshaw—get but little out of him. Donates a few archeological specimens of no great value—has no more.

We hurry on to the other village and burial ground, almost a mile west of the present settlement. Find only a small pile of bones, with one whole male skeleton of fairly recent date.

Then back, as fast as possible, the Indians carrying the bags with bones, and load on boat. My shoes and feet have long since become thoroughly wet, after which Mr. Wegner loaned me wool socks and native shoes that protected my feet. But now these must be left behind and I have to get into my wet, cold shoes —socks too wet. Officers in a hurry to get back. It is now 3.00 a. m.; the sun rose about 1.30. Pay my men, change shoes, photograph women (pl. 8) and then men—all pleasant and willing. See a few poor articles of archeological nature—not worth getting; and after a hearty handshake with the teacher we take off through the somewhat rougher water to the whaleboat, then on to the motor boat and the ship. Arrive with six bags of specimens, reaching boat just a little after 4. Sleepy captain meets us, but luckily shows no grudge, though this stop and his loss of sleep were essentially for me. Though it would seem they could have readily waited for our going ashore until morning, or have given me a little more time at the Diomedes, which would have brought us here later. Am too much awake now and worked up to sleep. Lie down a while but fully awake. Total sleep last night 2½ hours. But it was worth it, except for the vandalism.

Pack—inadequate boxes—until 3.30 p. m. Whole

collection made last night put in order. But back and knees stiff. Weather two-thirds fair (my own estimate), some wind, sea choppy. Lie down but can not sleep.

At 5.30 off Kotzebue. Due to shallowness of water must anchor far out of sight. At 6 go to land in ship's larger launch. Waves rather bad, much tossing about and spray, have to get behind the canvas canopy that is raised over one seat. It is 15 miles from where the *Bear* is anchored to the Kotzebue village—over two hours of (at times) rather violent tossing up and down and sidewise. Run for a part of the time not far from beach—a number of isolated, orderly fish camps—lots of fish drying. Wonder at not getting seasick again—it must be the open air or difference of movement.

Kotzebue village lies around a point on a not very high, flat bank, facing the bay of three rivers (Selavik, Kobuk, Noatak). As we approach I count over 50 clean tents of Eskimos, about 15 frame houses and stores, and many skin and other boats on beach or in water. Many natives hurry to meet us.

Go ashore. Thomas Berryman, the trader, with the local judge and two or three other whites come also to meet us. After getting acquainted inquire about possibility of exploring the Kobuk and reaching the Koyukuk and Yukon. But all that I learn is uncertain and discouraging. There are but few native villages on the river, all Eskimo; and higher up the water is rapid, necessitating much hauling of the boat by the natives, which is costly; upon which follow three or four days' portage. The trip would cost much, and no loads over 40 pounds to a man could be carried.

Only a few old sites hereabouts are known by those whom I have a chance to ask. Say there is a

somewhat important one at Cape Krusenstern. Mr. Berryman has from there a big stone (slate) lance. He also has a huge piece of serpentine, over 80 pounds in weight, with a moderate depression in top and some cutting (old native work), said to have been used as a lamp. Wants to keep this and spearhead, but donates an old rusty tin box full of smaller things and promises to obtain skulls for us; and I get a similar promise from a man (probably one of Mr. Berryman's storekeepers) from farther up the country.

Later meet here Mr. Chance, the school superintendent of these parts; a young and not prepossessing man, but one who steadily improves on closer acquaintance. Learn from him of a skeleton recently dug out from the ground under the schoolhouse.

See many natives, all Eskimo, good looking, clean, and kind. Some mix bloods, but the majority pure. Good to moderate stature, well proportioned though not fat body, medium to somewhat lighter brown color, physiognomies less typical Eskimo than hitherto and often strongly like Indian. Too late and dusky to photograph.

Go to see the teacher and find that the skeleton he dug out was placed by him in an open box, pushed as far as possible under the rafters of the floor of the schoolhouse and covered with gravel and earth. There are four of us—start hurriedly digging for it, remove with shovel, hoe and arms about a ton of the "filling"—and can not reach the box. It is 10 p. m., the wind rising, officer comes and urges me to get back to the boat. So must leave with promise that the box will be gotten out and await me on our return from the north. Have by this time decided the best

policy will be to go with the *Bear* as far as she may go. Load empty boxes, some packing—and one of the young white men who have been digging with us runs up from the distant schoolhouse announcing that they "struck" the box. Urge him to run back as fast as he can and get it. Luckily the postmaster and a good many others who came to see us off delay us; also the transfer of the mail and boxes to the larger boat. Finally, after a good many anxious looks, I see at last the two young men appear, one with a wheelbarrow on which is the box of bones. Bones look not very old, and Eskimoid at first sight, but take box, which contains a good deal of gravel, carry it through the very interested Eskimo to the boat, all get in, hurried good-bys to everybody, and we are off.

A two and a half hours' trip once more, and the last more than half of it very rough. Such tossing and dancing and dipping and twisting, with the spray, fortunately not cold, shooting high up at times, or an angry wave splashing over. But the boat is large and strong and so eventually we reach the *Bear*, which was completely out of sight until about an hour after we started, and in a few minutes off we go to the north. A little fruit, bed, and know nothing more until near 7 the next morning. It was a long day—over 25 hours in a stretch without a wink. Yet did not feel bad; the work and good nature of people about and those met with, with some success, are good tonics.

Wednesday, July 28. All of us have to consult the calendar to be sure of the day and date.

Sort and wash Berryman's specimens—a nice lot of little things, mainly of stone, slate, flint, etc.

Then go after my bones. Find the spray made the

earth and gravel in the box thoroughly wet, so that it is necessary carefully to excavate all the bones. Find a male, rather short-statured, typically Eskimo. May have been a burial of the Russian times. Wire for all details. Must dry bones. Meanwhile try to catch up with notes. Toward evening expect to be in another village. Weather fair. Have passed the Arctic Circle during night, but it is not cold nor in any way strange here. Sunset coloring lasts long and passes into that of sunrise—no real night, no stars; but moon seen late at night and far to the south.

May this weather continue, for in rough weather landing at any of these places—there are no harbors whatever and always shallows and bars and shoals—would be extremely risky or impossible and my work, for which I feel ever more eager, would suffer. If only I could see all worth seeing, and stay a little longer when I find what I am after.

We reach Kevalina. It is just a schoolhouse and about seven sod houses. Only a native school teacher, from whom I do not get much.

No remains or old site very near, but an old village, with "good many things," exists on the Kevalina River within a few hours' distance (by canoe) from Kevalina.

Natives bring old adzes (mounted by them, however), and a harpoon handle from the old site—bought.

Spend rest of day in washing, sorting, and packing specimens.

After supper am invited to the officers' room and given by Lieut. M. C. Anderson a fine selection of old ivory harpoon heads and other things. Many of these are from the old site on the St. Lawrence Island, and

especially from little isles off that island named Punuk. All this strengthens the importance of those islands for regular exploration.

Thursday, July 29. In anticipation of being called up again during the night, at Point Hope, which is evidently another important spot for archeological exploration, for the natives are said to bring many old articles for sale each year, I do not undress and go to bed earlier, but have, because of the anticipation, closeness of air, and a cat jumping on my face just as I am dozing off, a very poor night; and no call came after all. In the morning there are cold showers, the sky is much clouded, and the wind keeps on blowing from the north-northwest, threatening, the officers say, to drive the ice toward this shore, which would be bad for us. It is cool and disagreeable. We have anchored to the south of the spit on which stands the village and can not unload or get ashore. Nor can the natives come here to us.

The village consists of a schoolhouse, a little mission (Rev. F. W. Goodman), an accumulation of houses, semi-subterraneans, and tents. A few tents are also seen a good distance to the right—a reindeer camp. Otherwise there is nothing but the long, low, sandy, and grassy spit projecting far out into the ocean.

Later. The north-northwest still blows, and so the ship has to anchor to the south of the long spit on the point of which is the village. Of this but little can be seen, just a few houses, and it seems near and insignificant.

The captain is evidently waiting again for the natives to come out, and I am helpless. Finally, however, a boat is made ready and I am taken to the shore with the mail. This is piled on the beach, and with two officers we start to walk toward the dwellings

opposite to us, which are the mission. Heavy walking in the loose sand and gravel of the steep beach, and as we ascend it is seen the buildings which seemed so near to the shore are about a mile or more away.

A man coming toward us—the missionary, Archdeacon Goodman. Tell him my mission; says he has some business on the ship, but will come, and there will be no trouble in helping me to a "good deal of what I want," which sounds fine.

In the absence of the missionary, go to see the teacher. The school is over a mile in the direction toward the point. Find him at home and helpful. In 15 minutes, with his aid, engage two native boys, give two sacks to each, and send them out over the long flats (old beaches) to pick up every skull and jaw they can find. They go cheerfully, and we depart shortly after to see Mr. La Voy, a movie-picture man, who has been staying here for some time making movie pictures of the natives, and at the same time collecting all the antiquities they could bring him. We go to see his collection, but find him not home; has gone for mail. The rare mail in these regions is, of course, the most important of events. So back to the school (a good many rods from the sod house part of the native village to the left), and then—it is now near noon—to the mission, a good mile from the school and more from the village.

Road staked on one side with whale ribs about 2 rods distance. Flats on both sides show many parts of bleached human bones. They are a part of the old extensive burial grounds. Unfortunately, about two years ago the predecessor of the present missionary had most of the skulls and bones collected and put in a hole in the new cemetery, now seen in the distance to the right of the mission. This new burial place is

surrounded by a unique whale-rib fence. Reach mission, but no one there. Does not look good. Try one building and door after another—no one—learn later that the missionary has no family. Twenty minutes to 1. Nothing remains but to go back to the school for some lunch. So leave my raincoat, camera, and remaining bags (expecting to do main work on the buried bones) and hurry back to the school, which I reach just after 1, and, thanks to their late clock, just in time for a modest lunch, but with a real hot cup of coffee. Queer that the only genuinely hot cups of coffee I got on this journey were furnished by Eskimo—for Mrs. Moyer, the wife of the teacher, is an Eskimo.

Then comes the mail and Mr. La Voy, and I go to see the latter's collection.

Find a mass of old and modern material, of stone, bone, and wood. All the older things are from an old site on the point. It is an important and large site, as found later (at least 50 houses), which the natives (getting coffee, tea, chewing gum, chocolate, candy, etc., for what they find) are now busy digging over and ruining for scientific exploration. Women dig as well as men, confining themselves to from 2 to 3 uppermost feet that have thawed; but even thus finding a lot of specimens. Bones, of course, and other things are left and no observation whatever on the site is made. It is a pity.

Mr. La Voy donates some stone objects, mainly scrapers, and then I go with a native he employs to the "diggings." Find much already turned over—one woman actually digging—but very much more still remaining. Examine everything—site evidently not ancient but of the richest—and then return with the woman to get some of her "cullings."

On the way am called by a man whose sod house (semisubterranean) we pass. We sit on the top of his house and soon establish a regular trading place, with a big flat stone as a counter. One after another the native women and men bring out a few articles, good, bad, or indifferent, lay them on the stone, I select what I want, lay so much money against the articles, and usually get them. Everybody in the best of humor. The natives surely enjoy the sport, and so do I, if only I was not hurried. Thus trade for at least an hour until my pockets are bulging. Then once more to the school and once more to the mission. In the latter get my things, as nobody is there yet, Doctor Goodman having doubtless been delayed on the boat. I hear that there are prospects of both him and Mr. La Voy going north with us on a little vacation. Send the coat with spare bags to the school by a native I meet, while I go to look at the rib cemetery and photograph it. Find the bones have been interred in its middle and a low mound raised over them, so there is for the moment nothing to do there. Therefore go over the plain a little farther, picking up a few odds and ends, a damaged skull, and finally, from a fairly recent burial box, a fine skull with its lower jaw. Then attempt to pass a pool of water and sink in the mud to above my rubber boots, so that the icy water runs in, wetting me thoroughly, and gurgling henceforth with every step in the shoes. Try to get these off but can not. The feet must be congested. So spill out all I can by raising the feet, and then do some hard walking which takes away the cold.

Evening, though no dusk approaching. Sit on gravel to empty more water from shoes, but can still hardly get one off. And just as I succeed I see, across another long pool, two men, one with a cap of an

officer of the ship, waving their arms, evidently signifying to me that the time is up and I am to return. Call to them to wait. Impossible to make them hear me or for me to hear them. All here is elusive—enchanted-like—distances, sounds. Finally they stop. I catch up with them after passing a broad ditch, and learn that the ship is about to sail and they are waiting for me. My coat, however, and collections are still at the school, over a mile away, so once more it is necessary to hurry to the school and then back to the ship. So things go when promises go wrong and one is alone under a constant apprehension.

The boys collected four bags full. Moreover, they undertook to bring them toward the boat, and are bringing the last two just as I approach the beach. There are Eskimos on the beach with dog teams and sledges waiting to cart off what was unloaded from the ship. Photograph one of the teams and then on into the boat and to the *Bear* with the four bags, a box full, part of another bag, and all pockets full of specimens. Only to learn when we reach the boat that both Doctor Goodman and Mr. La Voy are going with us and that the former after supper is still to go and get his things from the mission. I have no boat to go back with, and so lose several hours.

July 30. Gloomy morning, windy, cool, sea not good. Do not feel easy. But need to pack. One of the officers, Boatswain Berg, lends me his short sheepskin coat, and I pack up to lunch. The sea is getting worse. Have but little lunch and soon after have to take to bed or would again be sick. To avoid the pitching of the end of the boat where my bed is I go to the dispensary and lie until 6. From 6 on the sea moderates somewhat, so that I am able to have a

little supper. After that go to officers' wardroom, play two games of checkers with the doctor, get some more specimens from two of the officers, and retire.

When I boarded the *Bear* it became plain to me that I must earn as much as possible the sympathetic understanding of my work by both the officers and the crew, and so I gave two talks, one to the officers and the other to the men, telling them of our problems in Alaska, of the meaning and value of such collections as I was making, and of other matters that I felt would be useful on this occasion. As a result I had throughout the voyage nothing but the friendliest feelings of all and their cooperation. Sincere thanks to the officers and the crew of the *Bear*, from the captain downward.

Saturday, July 31. At 4.30 a. m. suddenly a heavy bump forward, followed by several smaller ones. Ship rises and shivers. Have struck ice floes. Going very slowly. Further bumps at longer or shorter intervals and occasionally the ship stops entirely. Sea fortunately much calmer.

Up at 7. We are in a loose field of ice—aquamarine-blue ice covered with hillocks of snow, all shapes and sizes, as after a hard winter on the Hudson, only floes mostly larger and especially deeper.

Soon after breakfast hear walrus and seals had been observed on the ice, and shortly before 9 the captain comes down hurriedly to tell us they have just spied —they now have a man in the crow's nest up on the foremast—a white bear.

Run up—everybody pleasurably excited—to the front of the ship. See a black-looking head of something swimming toward a large ice floe about 500 yards in front of us. As we approach the head reaches the

floe, then a big yellowish paw comes out upon the ice, then the shoulders, and finally the whole bear. The officers hurry forward, each with a gun. Soon men all there. Some one fires. Bear stands broadside watching us. The bullet goes way over. Then other shots—still missing—water spouting high in many places. Bear bewildered, does not know what to do, lopes off a little here and there, stops again, looking at us, and now—we are less than 100 yards from him it seems—a bullet strikes him above the loin—we can see him jerk and the red spot following. He runs clumsily, but other shots follow, some seemingly taking effect, and then he drops, first on his belly, then, twisting, turns over on his back. A few more movements with his paws and head, and he lies still, quite dead. Can not but feel sorry for the poor bear, who did not know why he was being killed, and had no chance.

A motor boat is lowered and goes to get him. They find on the floe the remains of a seal on which he fed. Tie a rope to him, drag him into the water, tow him to the *Bear*, which has stopped and where all stand on the bows in expectation and with all sorts of cameras, and prepare to hoist the brute aboard. Captain says it is the second case of this nature in 20 years. Ropes are fastened about the big body, attached to a winch, and the big limp form is hauled up, though not without some difficulty, due to its size and weight. All stand about him, examine, photograph. They will let the natives at Wainwright skin it and give them the flesh. It is a middle-sized, full-grown male. It shows only two wounds, the one in the side and one where the bullet passed through his mouth, knocking out one of the canines.

Cold—must put on second suit of underwear. Very

gloomy, but storm abated. No land in sight—above Cape Lombard all is flat. It rains in that direction. We meander among the floes, now and then bumping and shivering. Should a wind come up and blow the ice landward we would be in danger of being closed in and stopped or delayed.

Evening. Arrive off Wainwright. Village recent—older site 20 miles away. People the usual type of Eskimo. Visit the village, but soon return.

After supper the boat stops—fear the ice. Another passenger is added here, Jim Allen, the local trader, with a bagful of white fox skins and a bear skin. Conditions becoming a bit crowded.

Sunday, August 1. No movement to-day. They are apprehensive of the ice, and so we stay here, the one place of all where there is nothing for me to do. Of course there are the natives, but with the constant uncertainty as to when we shall start and a lack of facilities I can not do much with them.

The weather is quiet but still cloudy, though the sun may possibly peep out. Ice seen in the offing. Would be more interesting to be in it, as yesterday. The bear has been skinned, cut up, and we shall try some of its flesh at noon. Rest of day quiet but still mostly cloudy, though occasionally a little of pale, lukewarm sun. At 3.30 give lecture to the officers and fellow passengers on the subject of evolution. Seems quite appreciated. Reading, writing, and walking the deck fills the time. Ate a little of the bear meat—somewhat tough, otherwise not much different from reindeer or even beef. If better prepared (especially roasted on coals) would be quite palatable.

Yesterday there were several flurries of snow, none

to-day, but air cold enough to make a long stay outside disagreeable.

Toward evening Captain announces that he is going to try to reach Barrow, about 80 miles northeastward, and soon after supper we start. He also tells me we may be there at or not long after midnight and so to be ready, for the boat will be unable to stop more than an hour or two. As the only place where a few skulls and bones may be found is about 1½ miles outside of the village and it takes a good 30 minutes to make a mile over the tundras, I shall have to rush once more. But I am promised a man to help me.

August 2. With clothes on, and anticipation, slept poorly. Ship stopped about 1 a. m. and I imagined we were off Barrow. But on rising find that we have gone on and then backward again, encountering ever more ice. It is cold and foggy outside, and cloudy and gloomy. We now meander among the big floes, now and then bump into one until the whole ship heaves and shivers, and occasionally the siren, stop for a while to diminish the shock. We are now on way back to Wainwright. If we only could go as far back as Point Hope, where there is so much of interest. I might have stayed over, but would surely have reproached myself for missing the remainder of the coast.

Back off Wainwright, cold, windy, sky gloomy as usual.

Late in the afternoon go with the trader to land, to visit the site of an older village, about a mile down the shore. Walk along the beach. Cold wind, raincoat stiffens. Walrus meat and blubber chunks (slabs, etc.) along the beach at several places, also a large skinned seal. Traces, as one nears the village, of

worked stones, but all waterworn and no finished objects. At one place in bank, about 3 feet deep, a layer of clear blue ice about 20 inches thick—strangely pure ice, not frozen earth or even inclusion of any dirt or gravel.

Village site small, along the edge of the low (about 10 feet) bluff. Count remains of eight dwellings. Some animal bones, but nothing else on surface or in vicinity. Burial place not seen. Companion says there is nothing.

A simple supper at the trader's, prepared by his Eskimo wife, and good company: Doctor Smith, of the Geological Survey, with two of his men; Jim Allen, the storekeeper, a big, good-hearted fellow; La Voy, the big, active movie man, who knows all the gossip and enjoys telling it with embellishment; and two men of the trader. Menu: Soup, boiled reindeer meat, underdone biscuits, coffee.

After supper go to a meeting at the school, where our missionary, Doctor Goodman, is to talk to the natives. Large schoolroom crowded. I talk through an interpreter—a serious disadvantage—on cleanliness. Fine study for me on the many present, though like elsewhere on such occasions they are mainly women and children. Good many Indianlike faces, though cheekbones more prominent and more flatness between them. But hair, low foreheads, eyes (except in children where they are more superficial, less sunken, and with more epicanthus than in Indians), lips, and other characteristics the same as in Indians. Some of the faces are strong, many among the younger pleasant, some of the young women handsome. A moderate number of mix bloods, even among the adults. Color of skin in full bloods medium to submedium brown, exactly as in full-

blood Indians along the Yukon, but cheeks more dusky red.

The behavior of these people is in all important points radically that of the Indian, but they are more approachable and open and matter-of-fact people. More easily civilized. Good mechanics. Less superstitious, more easily converted to white man's religion. And good singers. Their singing at the meeting in the schoolhouse would have shamed a good many whites in this respect.

Except for epidemics, I am told, these natives would more than hold their own in numbers. They are fecund, if conditions are right. Sterility is rare. They marry fairly young.

August 3. Still standing, though we had to pull out farther south and away from the shore. The water was pretty rough and I had to go to bed again, but weather moderated.

We are in touch with the world through the ship's radio, but get more trash—same all through the radio service in Alaska—than serious news. Spend time in reading, talking; some play solitaire games; captain and Allen play cribbage. Deck too small for any outside games, even if it were not so cold.

Ice floes floating about us, now scarce, now thicker; water splashing against them and wearing them out into pillared halls, mushrooms, and other strange forms. Due to their snow covering, the water upon them, so far as it results from melting, is sweet, and in it swim many small fishes. It snowed a bit again to-day.

August 4. No change, except that the sea is somewhat calmer, and for a while we have once more seen the sun, but it was hazy and just mildly

warm, while the same wind, from the sea, even though now subdued, has an icy undertone. It snowed a little this morning.

Thursday, August 5. Sea calm, atmosphere hazy, but the wind has turned at last slightly offshore and the sun penetrates through the mists, until it conquers and shines, warm and bright if not wholly clear, once more. Ice visible only on the horizon. At 7.15 we start on another effort to reach Barrow.

Pass Wainwright, and all is well until after lunch, when fog (though fortunately not thick) develops and the floes increase until they are as thick as at the first attempt in this same region. Heavy bumps and strains follow one another and the boat must often go very slow or even stop altogether. Sometimes the heavy ship just staggers from the impact, but the floes are generally broken by the shock and swirl away out of our way, or scraping the ship pass to the rear. All aboard show new interest and energy. The forced stops and inaction were dulling even to the crew.

File a wireless to be sent from Barrow. It will reach Washington to-morrow after we shall have started on the return journey.

Two dogs on board fight fiercely. An officer, the owner of one, trying to separate them is bitten by his own through a finger.

A marine, in swinging the heavy lead with which they are constantly sounding the depth, gets the cord caught about his hand and suffers a bad sprain with fracture.

The captain's little black cat, Peter, helps to entertain us by his antics. No wonder sailors in their often monotonous existence like all sorts of mascots.

Friday, August 6. Of course our dates got mixed, and more than one has to consult the calendar and count. The *Bear* had to turn back once more last night; ice too heavy. Anchored, however, not far to south. This morning very cloudy, rainy, chilly, but wind from near to east, and so from about 6 a. m. we are once more laboriously on our way. Now and then a bump, heave, stagger, then again the screw resumes its cheerful song. We are passing through the most dangerous part of all the coast here where many vessels have been lost, sometimes whole small fleets of whalers. But very few come here now—we have seen but one since leaving Kotzebue. They call this stretch "the boat graveyard."

Saturday, August 7. Stalled, about 30 miles from Barrow. Anchored in the protection of a great grounded flat, in a clear pond of water, with ice all around it, but especially seaward, where the pack seems solid. Some open water reported beyond it, but wind (wild) keeps from the wrong quarter and the captain will make no further attempt until conditions change. Of course it is cloudy again and has rained some during the night and morning, but the temperature is somewhat higher, so that one does not need an overcoat and gloves, although the officers wear their sheep-lined short coats which are nice and warm.

After noon asked the captain for the skin whaleboat to explore the shore. The latter is nearly a mile distant and shows about 60 feet high dirt bluffs. Got the boat and went with the boatswain. Berg, a young "hand," Weenie, and the movie man, La Voy. Rowed with La Voy. Had a wholesome two and a half hours exploring. Found a little stream, with traces of native deer camp (collected two seal skulls); a moderate

number of flowers and grasses (collected some mushrooms); some fossil shells from the bluffs; and two Eskimo burials. One of these, a woman, nearly all washed away and lost; of the other, a man, secured the skull, jaw, one shoulder blade and part of a diseased femur with corresponding socket (mushroom arthritis), also the two humeri. A good specimen. Returned, rowing again, near 4. All there playing cribbage and solitaire.

Am tempted to walk to Barrow; but there are some streams in the way which it might be impossible to ford. Moreover, no one knows the distance.

Sunday, August 8. Morning finds us once more thwarted, and standing at our place of refuge. No change in conditions, but there will be a change of moon to-night, so I at least have hopes. In my travels I learned too much about the moon not to believe in it. Toward evening ice begins to move out.

Monday, August 9. At 12.30 a. m., unexpectedly, a new start. The wind has turned at last (new moon!) to northeast, but is mild. Soon in ice. Many bumps and much creaking and shaking. Captain's collie gets scared and tries to get into our beds, one after another. But very little sleep under these conditions.

In the morning we find ourselves in a thicker ice field than any before, with floes on all sides. Boat barely creeps. Toward 10 a. m. further progress found almost impossible, and so forced to turn backward once more. However, can not even go back and so, near 12, anchor about a mile offshore opposite a small river with lagoon-like mouth and two tents of natives—"Shinara," or "Shinerara."

Ask captain for a boat to visit and explore the coast. Consents, and so at 1 we go forth, about eight of us,

with the captain's dog. Reach Eskimo, photograph the group. All look remarkably Indianlike. Then go to look for skeletal material. Nothing near, so return for the Eskimo boy. He leads me about a mile over the highland tundra to two burials in boxes—not old. Look through crevices shows in one an adolescent, in the other a female (or a boy) with hair and skin still on. Leave both.

Then into the boat once more after buying some fossil teeth, and with the boy Isaac—his father is Abraham—try to go into the river, and soon get stuck in the stickiest mud (oily shale) imaginable—great work to clean even the oar with which we had to push ourselves off. Land then on the beach and for the next two hours explore that side of the basin. Find remains of two small settlements—seven huts in all, none very old.

Gather five skulls with parts of four skeletons, most bones missing; also some mushrooms, several interesting humeri of seals, and a piece of pumice-like fossil bone. Near 4.30 begins to rain a bit so we hurry to boat, and in a little while, after depositing Isaac near his camp, reach the *Bear*.

Eskimo on shore had two skinned seal lying on the ground, and there were many reindeer horns. A pile of them was over a fire, being smoked.

The wind has been the whole day from the northeast, the long-wished-for wind, and the ice has moved out sufficiently to induce the captain to make another start. So at 5 p. m. off we go again, and for quite a while the screw sings merrily, until we reach some remaining ice, when there are more bumps and staggers.

The waters about the ship show, whenever calmer,

the heads of swimming seal, grown and little. But they are wary and keep at a distance. Otherwise the only live things are an occasional gull, and rarely a couple of ducks. In the icy water, however, on and about the floes, are seen again numerous small, dark fish (from the size of a big minnow to that of a tomcod); and along the shore swim merrily hundreds of very tame and graceful little snipes, lovely small birds, too little, luckily, to be hunted.

Little enthusiasm about my collecting, but the boatswain and some at least of the men are genuinely helpful. I believe some of the others are a bit superstitious. But I get some chance at least, and that is precious.

Expect to reach Barrow before 12 p. m., and to start back before morning—a big chance for some sleep again if I want to do some collecting. Sleep, through the frequent lack of it, has become a kind of obsession in one's thoughts, yet when there were chances during the days of waiting it would not come.

August 9, evening, to 10 next morning. This is a land of odds and wonders. In the morning things looked hopeless; toward evening the wind has driven away enough ice to make a narrow open lane near the shore, and utilizing this we arrived without difficulty at 8 p. m. at the long unreachable Barrow. At 9 boat takes us ashore. At 9.30 p. m. I start with an Eskimo and a seaman (Weenie) from the *Bear* on a collecting trip over about 3 square miles of tundra behind Barrow, and at 12.30 return to ship with four bags of skulls and bones. But sleep! Hardly any since 12.30 last night, and very little after return to-day, for due to fear of ice they called in everybody from shore before 3 a. m., and the newcomers keep on walking

and talking and banging with their baggage until 5, when, fearing a return of the ice, we start once more southward, toward—it feels strange, but it is so—home. It was a remarkable good fortune, our getting there thus and getting out again, as we did, without damage.

Barrow is a good-looking and rather important place. It stretches about 2 miles along the low shore, in three clusters, the two main ones separated by a lagoon. It has a radio station, a mission hospital, and a school. There are over 200 natives here, and also quite a few whites, including Mr. Charles Brower, the trader, observer and collector, with his native wife and their family, the teacher, the missionary and his family, and the nurses.

The burial place here is the most extensive in the Eskimo territory. Taking the older parts and the new, it covers over a square mile of the tundra, beginning not far beyond the site of the hospital and extending to and beyond a small stream that flows over a mile inland. But the burials were grouped in a few spots, the rest being barren.

This extensive burial ground is now about exhausted for scientific purposes, except for such skeletons and objects as may have been assimilated—i. e. buried—by the tundra. That such exist became quite evident during our search, and they naturally are the oldest and most valuable. We secured two good skulls of this nature. They were completely buried, only a little of the vault showing, and had there been time we should doubtless have found also parts of the skeletons. The skulls were discolored brown.

Of the later skeletal material we found but the leavings, the best having been carried off by other

collectors. There were remnants of hundreds of skulls and skeletons, but for the most part so damaged as not to be worth saving. Nevertheless our diligent midnight search was not in vain, and we brought back four sacks full of specimens, the Eskimo carrying his with the utmost good nature. The destruction here is due to sailors and other whites and to dogs, foxes, and reindeer.

The reindeer herds, going in hundreds over the ground, help materially to scatter and damage the bones. So, the older material gone, while the more recent burials are, at least so far as the younger element is concerned, quite worthless to science, containing many mix bloods of all sorts—even occasionally with the negro (men from the wrecked whaleboats). The collection now secured was the last one possible from this locality, except through excavation.

Tuesday, August 10. The boat is now crowded. We lost one woman and got three; also about five or six men—newspaper, movie, radioman, a dog teamster, a trapper. Quite a variety, in every way, and most are to go with us at least as far as Nome. They will have to hang up two hammocks in our little cabin each night, and some must sleep elsewhere.

Packing the whole morning. Five boxes. My man of last night helping, a fine, big young fellow. This aid in the work is a great boon to me, and the transportation of the many specimens by the *Bear* down to Seattle or San Francisco will be a fine service to the Institution.

The older of us, that is those who have been longer on the ship, feel like veterans and are drawn closer together. The new lot, heterogeneous, do not attract, particularly one of the women. An older one,

evidently a well-liked nurse, goes off at Wainwright, which we reach once more at 8 p. m. Here goes off also Jim Allen, the trader, who is a good fellow in a rough shell and whom I learned to like. He helped us all a good deal while in the ice.

The movie man from Point Hope is a somewhat spoiled, gossipy, and roughshod, but otherwise, a good-hearted big kid—not very wise, but not mischievous, and more than efficient in his own calling. Is 40, but already aging, like a weather-beaten poplar—not pine or oak. Is violently against all "kikes," or eastern money-lending Jews, from whom he used to borrow at usurious interest and who sold him out once or twice when he could not pay.

Lost Jim Allen and dropped the nurse, but are still too many. At 10 p. m., just as the minister and I have retired, there comes a call for the former to go up. A couple of Eskimos have arrived, with their friends, to be married. So he dresses and performs the function. I am too weary to rise and dress to go and look at it. He says it was quite tame. Then the anchor, and once more we are off. No ice any more, and the sea has again a swell, which was absent in the ice-covered waters.

Wednesday, August 11. Swell, but not bad, though one of the women, another nurse, is ill, and the other, a "writer," etc., will not get up for breakfast. Quite a problem now to get washed and shaved. Both the minister (archdeacon) and the movie man like to use perfumed things, and the former takes much time with his toilet, so I endeavor as before to be first up.

August 12. A great day. Was called a little after 12.30 a. m., after but little sleep (through anticipation), to examine a site ashore—a coal mine,

a water source, and possibly something human. Two miles to shore, in semidarkness; no night yet in these regions. A long tramp over the mossy and grassy tundra; mosquitoes. One native igloo, and on a little elevation some distance off a grave of a child; otherwise nothing. After examination of the coal strata, a curious secondary inclusion in sand and gravel, and the stream of water (good to drink, even if not clear), we depart and reach ship again after 4 a. m.

Beginning to be—in fact am already—a "night doctor," for sure. Never thought I could stand such doings, but am standing it, and that even with some cold and bothersome night cough. But am sure short on sleeping, for it is impossible for me to catch up during the days; am not a day sleeper. I suppose when one is most of the time half hungry his mind naturally reverts to hunger, as mine does to sleep.

We are due to-day again at Point Hope, and I am anxious for a little time there.

At night. This was a day of harvest. Reached Point Hope about 3 p. m., but had to go around again to the other side, due to the swell and surf on the north. I went to shore in the first boat, about 4 p. m. Doctor Goodman, with whom we are very friendly, was with me and promised to go over and help me get some men with whom I want to excavate the burial hole of his predecessor. But when on the shore stays behind and remains. So we go on with my man from the ship to the whalebone graveyard. Near there see two Eskimo men with some dogs. They smile; so I tell them what I want; in two minutes have engaged them; in about three more we begin to dig, and in about five minutes after strike first bones.

My good friend the boatswain, Mr. Berg, comes to

help, and as I now have four to work I take a bag and go on collecting a little more over the plains beyond where we are. Get a good bag. Find another good-natured Eskimo, Frank, coming from fishing, engage him to help carrying and eventually to take place of one of my first workers, who is an old man. Then we see Doctor Goodman, far away, coming to the mission. Borrow two more shovels from his stock and a few coal bags. Meanwhile bone and skull pile is fairly exposed from one side and top gravel partly removed, so I give up intended trip to old village site and, as we were given only to 9.30 p. m., go to work on the pile.

A great deal here. More than anticipated, though all is a jumble, with the long and other bones of the skeleton on the top. The work is to get down in the moist gravel, disengage one bone and skull after another as rapidly as possible, give it a rapid look-over, and either save, if fairly well preserved or showing some special feature, or discard. If saved, the specimen is handed to one of the Eskimo, who cleans it of gravel, lays it out to dry a little, and then places it gently in a bag.

Many of the bones and skulls were found so damaged that they had to be left. But much was also good. The strenuous work, however, had to go on without interruption and at the fullest possible speed, if the main part of what was there was to be saved. So no supper, no stop for even a minute, until after 8 p. m. Sixteen bags full, and some of the sacks quite spacious. At last had to give up—no more time, no sacks, and lower down everything frozen as hard as flint. The main part, however, secured—183 good skulls, several hundred lower jaws, and a lot of long and other bones. This, together with the rest of the

material from this place, ought to give us data of much value.

But now, how shall the lot be got on the boat. Luckily, one of the Eskimo that has been working for me has a dog team and sled. So I engage these; and shortly after we finish putting everything in order—in the presence now of Doctor Goodman, who comes to look at us—the man arrives, with a good-sized sled and 13 whitish dogs. Load all the bags on—and then a sight never to be forgotten—the dogs pulling the load across the tundra, depressions, gravels, right down to the water's edge and to the motor boat that is waiting for us. How they strained, pulled with all will, and obeyed. A wise leader in front, six pairs behind. No reins, only a few calls from the Eskimo, and they knew just what to do. Tried to photograph them, but light already poor—advancing season. (Pl. 9, *a. b.*)

Then hurry to the teacher, not home; to La Voy, not home. Find teacher in tent, sick, trembling; I fear beginning of typhoid. Did not get anything for me in our absence. La Voy promised to give me some things from his collections, but now is not here. A native woman, however, meets me far out on the beach, and I learn she has dug out for me since our first visit five good skulls from the ground—some, she shows, deep to above the elbow. She has them near the ship—we go on—on the road boys and women overtake me with a few things to sell. Then the woman brings her skulls, in a bag on her back, in excellent condition. I pay her for her trouble. Reach our boat, and the bell on the *Bear* rings 9.30.

The bone pile—the sled and dogs and load over the tundra—the woman carrying a native (seal) bag with skulls—will be three rare, indelible pictures.

On the *Bear* at 10. A little sandwich, fruit, and a cinnamon cake with coffee, and to bed. But irritating tire-cough keeps me up for another hour.

Friday, 13th. Packing. A nice day. Toward evening stop at Kevalina. Obtain a few things and pictures. To bed soon, but cough still bothers. I have nothing for it; there is but little on the boat in the way of medicines outside of the most ordinary things.

Saturday, 14th. Up 5.30, early breakfast, and 6.45 start once more for Kotzebue. The *Bear* has anchored about 12 miles off, so do not reach village until 8.35, and have to go back at 9.10. Rush to store, get boxes, barrels, and packing. And then to the schoolhouse, where I expect some information about the skeleton found under the house and obtained on my former visit. Also promised information from Mr. Chance, the supervisor, about old sites. But Mr. Chance is gone, and no letter or message—it came later, to Washington. A few words with the teacher, and one of the boys from our boat is already calling me.

Return at 11 a. m. and spend the rest of the day packing, finishing just at supper. A curious sunset at 8, a horizontally banded sun, several clear-cut, fairly broad, dark bands. Sea getting rougher.

Sunday, August 15. Bad sea, wind, waves, fog. Have to take to bed and do without breakfast. Stay in until lunch. We could not stop again at Shishmareff; could not get ashore. The next stop, late afternoon, is to be at the Little Diomede, to take off Jenness; but if too rough we shall go on to Teller. The wind is from the northwest and the foghorn keeps on blowing.

The whole day continues rough, foggy, unfriendly. The ship can not stop at the Diomede, nor go to Teller; obliged to go to Nome. After supper all chairs

and movable articles have to be tied up. Most day in bed, but escaped real seasickness, and got some sleep.

Monday, 16. Weather moderated. We are in lee of the mountainous part of Seward Peninsula. After breakfast off Nome, and at 11 a. m. in town. First stop at Lomen's. Then from one to another till 4.55 p. m., when Dan Sutherland, the Alaska Delegate to Congress, escorts me to the boat. Saw many friends, got some mail, and, best of all, got a fine deposit collection for the National Museum from Mr. Carl Lomen. The judge asked me for another lecture for next Saturday, when we are to see Nome for the last time.

About 5 a. m. arrive at Golovnin Bay to take water. At this place this is generally a day of partial rest and recreation for the crew. The water is taken from a small stream fed by a spring that comes out from a cave of the mountain, and is put direct into the whaleboats, brought to ship, and pumped into its tanks.

Shortly after breakfast the captain gives us the larger motor boat, and with Mr. Berg and two of the seamen I start for a little survey trip along the northern shore of the bay. In less than an hour we reach a sheltered nook with a small stream, where there is an old frame dwelling with some out-structures, all evidently abandoned, though various articles of use hang or lie about, including several guns of old patterns.

On a bluff to the left of the house are six burials, some old, wood near all rotten, some more recent. The latter, two in number, both show a large animal skin covering of the body, besides which the latter shows remnants of clothing. Secure two good

skeletons, practically complete; also head and a few parts of a newborn (or near) child. A unique feature —with one of the male skeletons is found a complete skeleton of an eagle. Could have got also a female skeleton, but was still unclean, and we perceived a small native motor boat coming toward us from the reindeer camp about 1½ miles farther inward. So we replaced everything (outwardly) and started off to meet the native boat. Found in it two young men and three women. Inquired about old sites and learned of one about 3 miles farther inward.

Stopped at the reindeer camp. Found there about a dozen individuals. Got more information, also a young man to go with us, bought for the *Bear* a dozen good-sized silver salmon—caught this morning and lying for protection against flies, in a pool of water—and left for the old site "around the point."

A nice site, but small. Fine beach for bathing if it were in a warmer climate. Remains of about a half dozen semisubterranean houses. A copper nail from one shows they were not very ancient. And no burials left, save one, more recent, of a child, most of which is gone. But there is a green elevated plane rising from the beach and we soon find several varieties of berries, especially large and good blueberries, a variety of huckleberry, and a sort of wine-tasting dwarf blackberry. Collect enough for immediate consumption—a most welcome diversion in every way—and get some for the captain.

Leave near 1 p. m. A little lunch on boat, then once more the reindeer camp, where the young women make us good hot coffee with as good biscuits as one could find anywhere. Buy more berries from them, load our fish (12 salmon ranging about 12 pounds each, for $3), and start off for another site just

around Stony Point.

Round up one point, then another and another, up to five, and by that time the going has become so rough that we get much tossed about, ship water, dog gets frightened and near sick, and just as we reach what we thought must be the last point there juts out still another. It is now so rough that the boatswain thinks we could not land, and so nothing remains but to turn back to the mother boat. Reach there near 3.30 p. m. Soon all boats are hoisted, and at 4 the *Bear* is on her way to St. Michael.

August 18. Arrived about midnight off St. Michael; must stay outside due to shoal water. Somewhat rough.

In the morning boat coaling, dirty work, so all who can go ashore. Meet Mr. Williams again; buy a few native articles in stores, visit Mrs. Evans, the teacher-nurse, who has on an occasion successfully amputated a native's finger. The deputy marshal takes me to his house, gives me some dried deer meat and smoked salmon strips, and promises to be on a lookout for specimens for us. Near noon return. Still rough.

At night a bad blow and the ship tossing a great deal, almost as during the storm to St. Lawrence. Feel it considerably, but after 3 a. m. wind and water moderate. Feel effects of it, however, whole morning. For an explorer to be ever in rough weather subject to seasickness is a horrid affliction.

August 19. Off Nome once more. Everything, city, mountains, appear exceedingly, unnaturally clear—not a good sign. After 9 a. m. go to town. Soon at the Lomens' headquarters, and the sons, particularly Carl, bring out three smaller boxes full of things from

St. Lawrence and Nunivak Islands, and give me the choice of all. And after I am through—near two hours' fast work—Carl adds one beautiful tusk (carved) from Nunivak Island, and then adds another, and two big bones of a mammoth, some as gifts, some as an addition to his loan to our institution. Excellent men.

Lunch with Ralph and Carl; then a good walk in the open; and then another lecture. All pleased, and two bring me specimens for our museum. Slowly back to boat and 4.45 on the *Bear* again. Nice day, but getting cooler and blustery.

Captain Ross comes to port, the graphophone starts its usual jazz songs next (ward) room, then the supper, all visitors gone, and the *Bear* raises anchor to be off for the north once more.

August 19, evening. A new, final chapter begins with to-day. What will it contain when over?

August 20. Rough. Go north until in plain sight of the Diomedes as well as Cape Wales, and then the captain decides landing would be risky, if not impossible; and so reluctantly we turn back and proceed toward Teller. What a tantalizing experience this must have been to poor Jenness, who is waiting for us on the Little Diomede, a most dreary place, to be taken off; and I, too, expected collections at both the Diomedes and the Cape.

Saturday, August 21. Port Clarence, off Teller. This proved a day never to be forgotten; for failure of a rigid system, for bad weather, for strain and endurance, and nearness to almost anything.

My purpose was to utilize the *Bear's* visit to Teller for a survey of a Chukchee-Eskimo battle field, of which I heard repeatedly from the Yukon onward.

Sometime during the earlier half of the last century the Chukchee from Asia are said to have made an invasion of the peninsula and to have reached as far as the Salt Lake, east of Teller, when they were met by the united Eskimo and badly defeated. The exact spot where this happened is, however, somewhat uncertain, and it was to locate it, examine, and collect what might be possible of the remains that were said to be still there that I asked Captain Cochran to let me have one of the motor boats, to which he kindly consented, uniting the trip with some topographical observations for his own purposes.

The evening before I was told by the second officer that we shall start some time soon after midnight for that part of the old battle field—there seemed to be two of them—at the eastern point of the Salt Lake. As a result could not undress, and after ship stopped in Port Clarence, near 11 p. m., had but a little rest. The call came at 4 a. m. A little breakfast, a package of lunch, and start at 5.10.

First note. Ship about 7 miles from Teller. Water deep enough much nearer, but we came at night. Here there are already dark nights between about 9 p. m. and 4 a. m., and so they were cautious.

Second. The officer says he has orders not to stop at Teller, where there is an old Indian (Dunak) from whom I expected to get exact bearings, and where there is also a white trader, Mr. Peterson, who knows the place and might possibly have accompanied us.

Third. Distances, as usual, longer than estimated. We find eventually that the destination is about 32 miles from Teller.

Fourth. A brisk head wind and sea retarding us.

Fifth. As we approach our spot, a shoal water, with grass, preventing us from going straight to the most likely place, and no other way was tried. It is 11 a. m. and already I hear an intimation that we shall not have time for anything except to make a lunch. This is the same officer, a very good man at his post but rigid and without much interest in anything else than his own field, who after 10 miles' trip to Kotzebue gave us 25 minutes there, when it required 15 minutes alone to reach the school from the boat.

So we end by landing on the extremity of a spit there to make lunch, and I have only the time it takes to prepare the latter. I find, in hurry, remains of five old semisubterranean dwellings on the northern side of the point, and about as many low mounds with remnants about of rotten driftwood—undoubtedly old burials. Probably the skeletons have been assimilated by the tundra vegetation and blown material. A single native skull, a female, without face, is lying about. Collected.

While lunch is being made ready the officer and the boatswain, Mr. Berg, each shoot a duck. Then the lunch, a hurried loading, and departure, after some delay in setting the sail, at 1.30 p. m. I saw nothing that looked like a battle field. Its determination and survey must be left for some future explorer.

Sail rapidly. Wind fresh, with us, also waves. Cross Salt Lake, and Tussoc "River." About 4.30 reach Grantly Harbor and wind increases; also waves. We run fast, and well enough, but the umiak (skin boat) we are pulling begins to suffer. It rides crazily and is jerked over the seething waves. The crossbar by which it is partly held breaks, and now the boat goes more sidewise, with water lapping over its border and getting in. Wind now quite a gale, breaking

waves everywhere—every now and then a big one—whitecaps all over. A dim view of Teller in distance, when the skin boat begins to fill more rapidly and sag. Must stop engine—waves toss us like mad—one could be thrown bodily out of the boat if not careful in bending or moving and holding. The sail comes down and the mast is laid down, a bad piece of work. Berg and Pete Brant (an elderly trapper with us but formerly of Coast Guard Service at Nome, a good sailor and knowing these waters) work very hard and well. The skin boat has to be pulled alongside and bailed out by young Weenie, a very hard and dangerous task. Mr. Berg's rain hat ("souwester") blows off and is lost in the seething waves. Later Weenie nearly loses his—snatches it out between the boats with a narrow escape for his head. Then Weenie climbs into the skin boat—a brave act—and finishes the bailing, but is much "in" after getting back. Then our big staunch motor launch starts again at reduced speed. But the skin boat does great antics and threatens to fill again or break; so Pete Brant holds the rope and is jerked every now and then, until I fear that he may any moment be jerked out into the waves and watch to catch his legs. Fortunately he succeeds in preventing it, but there was a slim margin.

It has drizzled or rained, besides the wind, most of the afternoon, and there is a lot of spray to splashes from the waves. All this has to be taken as it comes, but the water is not cold, and our boots and oilskins give protection. Nevertheless my right knee to hip gets thoroughly wet and chilly, and I was not alone. But there is little time to think of such things. We see at Teller the waves breaking high on the shore, some boats already on the beach and others being driven there, a few people looking helplessly on.

About 5.50 we round the Teller spit and come in the lee of it into calmer water. But the visibility over the water is probably not over a mile now, and we see no trace of the *Bear*. The gasoline supply is getting rather low; and all are more or less cold, though dressed warmer than I and, due to their hip-high rubber boots—mine reach only to the knee—not wet. I now shake a lot with the cold, without being able to stop it. So we skirt the protecting bluffs southward to where everyone thinks the *Bear* is, near a little stream from which they were to take fresh water. But though we all strain our eyes to the limit, there is no trace of the ship.

Thus reach Cape Riley and the stream, which is found dry, without a drop of water. Get on the pebbly beach, turn skin boat over to get the water out, and hurry to chop wood. No wood save the water troughs, so chop these. Must have fire. I warm up a little by running around and chopping. They pour gasoline on the wood, make a big fire, cook a pot of coffee, and with bread and preserved meat make a supper, though it is mainly coffee.

Near 8 and getting dark. Storm, outside of protection of cliffs, unabated. There is a second watering place, 7 or 8 miles across the bay, and our only chance to find the *Bear* is to rush for this. But to do this we must go diagonally across the waves and similarly against the wind—a bad prospect. Also, we have only just about enough gasoline to reach the place. But there is no help.

Thus a new start, and before long we are once more in the waves. It is now quite obscure. The waves break now and then and splash over us. Before long the skin boat is again sagging and in danger of sinking. Once more pull alongside and dangerous,

exhausting bailing by Weenie.

And so on, tossed, driven aside, but thanks to the good engine never stopping. I hold to seat not to be thrown against things or even out; the others are becoming gruff, irritable. And then Higsby makes out a faint light far ahead. No one certain, but in a while it seems moving. A solitary small light somewhere far on the shore, probably, not the boat.

But soon another stronger light discerned, seemingly moving to the left, and later several—the ship in all probability.

We toss and reel and stagger nearer, but motor still going strong. For the skin boat they found at last a position in which it takes but little water. Finally see decisively a blinking light, the mast signal. We show our lantern a few times. Then the ship looms before us, but there is still the risky task of getting alongside and aboard. However, all is accomplished without real damage.

The cabin—the good and anxious captain—a little canned grapefruit, and bed. But head falls and rises, the events of the day reappear, wonder what has become of the trade schooner we saw being driven on the beach—and so on until consciousness passes into deep sleep. The *Bear* is fairly quiet, not in the brunt of the weather. And this eventually moderates, so that a little after 4 we start again, only to anchor once more at 6, a little below where last night we had our supper.

August 22. Cloudy, drizzly, rough still, and wireless news of widespread bad storms, even in the States. So we shall wait. One more hope for my collections at the Cape and with Jenness.

Captain says this morning the officer misunderstood

his orders about Teller. The trip demonstrated a number of things. One of the main and most gratifying was the sterling quality of the men with me, officer, boatswain, motorman. Weenie, Pete, in the teeth of real danger. They were all that men should be under such conditions, which is the best way I can express it. The trip may have been in vain so far as its scientific object was concerned, but it brought a number of men face to face with life's stresses and found their mettle of the truest quality, without exception, to witness which was worth the whole experience.

August 22-23. During the night have left Port Clarence and endeavored once more to reach Wales and the Diomedes, to be again turned away by fog and rough weather. The captain doubts if there will be any more decent "spells." The season for this stormy sea is too far advanced. Unable to land anywhere.

The day is followed by another horrid night, again off the St. Lawrence Island. Boat tossing and heaving and rolling, waves reaching and even splashing over the level of the high upper deck in the back, everything tied tip and cleared or fastened, a danger in making even a few steps of being thrown against something, or on the deck of being thrown overboard, and everything constantly cracking, creaking, with every few minutes an impact big thud-like or a splash of a wave, the floor heaving and twisting; and thus from before evening until morning. Then a trace easier, but the whole day gloomy and rough and the night again more unsettled. To-day better, wind which began east then turned northwest, then almost north, now stopped, but a heavy swell is running, heaving us nearly as

much as yesterday. We have gone very slowly.

Have arrived off Savonga. The sky is now clear and there is not much wind, but the swell is and keeps on such that, notwithstanding the repeated calls of our siren, the Eskimo whom we see above the beach near their boats, do not dare to launch these and come, nor does the captain care to risk one of our own launches, though we need fresh reindeer meat and all would like once more to meet the nice lot of natives of this village. After a prolonged wait and as conditions show no improvement, nothing remains but to leave the island.

Our next stop, if the weather permits, is to be at Nunivak Island. This is a large island off the Alaskan coast, well below the present delta of the Yukon and some distance above Kuskokwim Bay. The island is one of the least explored, and the people living upon it one of the least known. It is only during the last few years that a trading and a reindeer post has been established on this island, and only the second year that there is a teacher. What little is known of the natives, a branch of the Eskimo, shows that they have many different habits from those farther north, in clothing, decoration, etc. They make rather good black pottery, and from this island come the most elaborate carvings in ivory, reminding strongly of small totem poles. A photograph of a group of these people, seen at the Lomen Studio at Nome, showed remarkably broad and short faces, unlike the Eskimo of the north. All of which made me very anxious to visit the island.

To be brief such a visit, though promised to me by the captain, could not be realized. The waters about the island are so imperfectly charted that in weather that continued half rough it was thought unwise to

risk a landing. I felt this keenly, as the various other impossibilities of the trip. But I could never forget all the unexpected help I received from the Revenue Cutter Service, for which I was deeply grateful, and had to acknowledge the justice of the captain's position. We came so near that the land birds from the island were already about us, but then turned toward the Pribilofs and Unalaska....

Only little remains to be told. At the Pribilof Island, St. Paul, we stopped at night, to take on four live fur seals for the Academy of Sciences of San Francisco, and there we ran once more into stormy weather. Here are a few notes from this period:

August 27. Toward evening again a gale, southwest. At night worse. Ship tossing rather wildly. No possibility to me of either getting up or resting. Barely keep from being horribly ill again.

Later in night ship had to be turned back and just drift.

August 28. All day the storm continues. I could take no meals, not even a drop of water. In bed and barely standing it. Ship hove to at last and just drifting.

August 29. Gale keeps on just as bad, howling till 1.30 a. m. Then it moderates somewhat and ship starts going again. Last night we were only 60 miles from Unalaska, now a good deal farther out. Steam, still in half a gale and big sea, until after midday, when, not without some difficulty and danger, we reach the fine little protected harbor of Unalaska. Feel weak, near worn out.

August 30, p. m. Rest, and all is well again. Secure a little rowboat and go with old Pete Brant to near-by islands. Storm over for the day and fair, though not

entirely. Row, climb hills, pick berries and mushrooms, watch a bearlike semiwild pig, out whole afternoon, returning strengthened, refreshed. Only no appetite yet. Found no traces of human occupancy, but heard of some in the "Captain's Bay" and at other spots.

The few Aleuts in Unalaska at this time show physiognomies akin to the brachycephalic Indian, and not the Eskimo type.

August 31-September 1. A new gale, with drizzles. Luckily we are at a dock, but I can do little. They are cleaning the boilers and coaling. Evening of 1st have a good dinner—captain and the rest of us from the *Bear's* cabin—at a friendly local trader, Louis Strauss, and after that give lecture on "Man's Origin, etc." Introduction by Capt. Van Buskirk, local commodore of the Revenue Cutter Service. Lecture well received, make numerous friends, get good information. Strauss's supper was the first I could eat with some taste and hunger. But the lecture did me good.

September 2. Coaling and overhauling of boilers finished. Gale stopped. Ship leaves 1 p. m. Day fairly sunny. Everyone sees us off. Harbor and hills look fine, though sky again clouded. Outside quite a swell after the gales. Pass the *Haida*, practicing with her cannon. The *Algonkin* was here too, with the story of their visit to the Punuk Islands. The fresh green steep mountains toward the entrance of the harbor are refreshing to the eye.

Pass through Akitan. Pass picturesque, especially the outstanding isolated rocks near the islands.

Toward evening, far to the left (east), see under the clouds a glorious icy cone, the "Pogrovemoi," and later a lower but still great mountain a little farther

and to the right an old but not so very old volcano. Other volcanoes there are, the captain tells me, now hidden by the low clouds.

Have a new passenger, Mr. Charles Brower, the trader of Barrow. Came from the *Brower*, ship of his own company, a little larger and faster than the *Bear*, and going also to San Francisco, but with poorer accommodations. Brings with him a box of archeological specimens from the Barter Island, in the north. Examine them, but find little of special interest.

It takes us a little less than 10 days of a fairly good journey to reach San Francisco. Dock at Oakland late in the evening. The next morning, after breakfast, the boxes and barrels with collections are taken on the dock—a big pile. Then the Santa Fe officials kindly run a flat freight car to the pile, the boxes, etc., are loaded on, the main part taken to the freight depot, the most valuable ones to express, shipped, and shortly after what remains of the expedition is on the Santa Fe Limited for Chicago. It only needs to be added that, notwithstanding the variety of receptacles and the difficulties of packing, the collections reached the Institution without damage to a single specimen. Thanks once more for the help received in making all safe to the captain and officers of the *Bear*, to Mr. Berg, the best of boatswains, to the carpenter, and to all those of the crew who assisted.

THE YUKON TERRITORY—SITES, THE INDIANS, THE ESKIMO

The Tanana

BRIEF HISTORICAL DATA

The Tanana is the largest tributary of the Yukon. It is over 600 miles in length, and in its breadth, though not in its volume, it appears to equal, if not to exceed, the Yukon at their junction. The first white men to see the mouth of the Tanana were the Russian traders (about 1860), followed before long by the employees of the Hudson Bay Co. Dall says that it has long been noted on the old maps of Russian America, under the name of the River of the Mountain Men, while the Hudson Bay men called it the Gens-des-Buttes River. (Alaska and Its Resources, 281-282.) Dall mapped the junction of the river with the Yukon. The first who descended a part of its course were two traders, Harper and Bates, who reached the river higher up, sometime in the late seventies. The name of Harper is preserved by having been given to the big bend of the stream, 12 miles above its mouth. Its scientific exploration begins only in 1885, with the passage down nearly its entire length of Lieut. Henry T. Allen, United States Army; [5] the main work concerning the geography and geology of the river being done in 1898 by A. H.

Brooks.[6]

FOOTNOTES:

[5] Allen, Henry T., Military Reconnaissance in Alaska. Comp. Narr. Expl. Alas., 415-416, 446-452.

[6] Brooks, A. H., Reconnaissance in the Tanana and White River Basins. Twentieth Ann. Rept. U. S. Geol. Surv., Washington, 1900, pt. VII, 437-438; also the Geog. and Geol. Alas., U. S. Geol. Surv. Doc. 201, 1906.

POPULATION

The native population of the Tanana has always been remarkably scarce. Dall obtained an estimate of their whole number as about 150 families.[7] Petrof, in 1880, thought they numbered perhaps seven or eight hundred;[8] Allen in 1885 estimated them at between 550 and 600;[9] Brooks, in 1898, thought there were less than 400;[10] and the 1910 United States Census gives the total number of the "Tenan-kutchin," full bloods and mix bloods, as 415.[11]

According to Brooks (Reconnaissance, 490-491), the Tanana natives were separated into two geographic contingents, the eastern or highland and the northwestern or lowland groups. The most easterly group included the Indian settlements in the vicinity of Forty-mile and Mentasta Pass trail; the northwestern comprises to-day those from Nenana to the mouth of the river.

The Tanana Indians were generally regarded by other natives as warlike and dangerous, but so far as their relation with the whites was concerned there

was little justification for this notion.[12] Physically they were reported by Brooks to "average rather better than the Indians of the Yukon" (Reconnaissance, 492). There are but a few and scanty other references to them in this connection.

FOOTNOTES:

[7] "Their numbers are supposed not to exceed 150 families." Alaska and Its Resources, p. 108.

[8] Notes Alas. Ethn., 161.

[9] Brooks, op. cit, 493.

[10] Brooks, op. cit., 493.

[11] Population, III, 1137.

[12] See Castner, J. C., A Story of Hardship and Suffering In Alaska: Comp. Narr. Expl. Alaska, 686-709.

Indian Sites and Villages Along the Tanana

Upper course.—On this much larger part of the river it is possible to report but indirectly.

A. H. Brooks, in 1898, reports thus on this subject:[13] "Several Indian houses are found on and near the Tanana between the Good-paster and Salchakat and constitute a subgroup of the upper Tanana Indians. * * * The most thickly settled part of the region is along the sluggish portions of the lower Tanana. The largest villages are at the mouth of the Cantwell and Toclat Rivers, and each of these consists of a number of good cabins. In the intervening region there are a number of isolated houses and fishing stations, which are marked on the accompanying map."

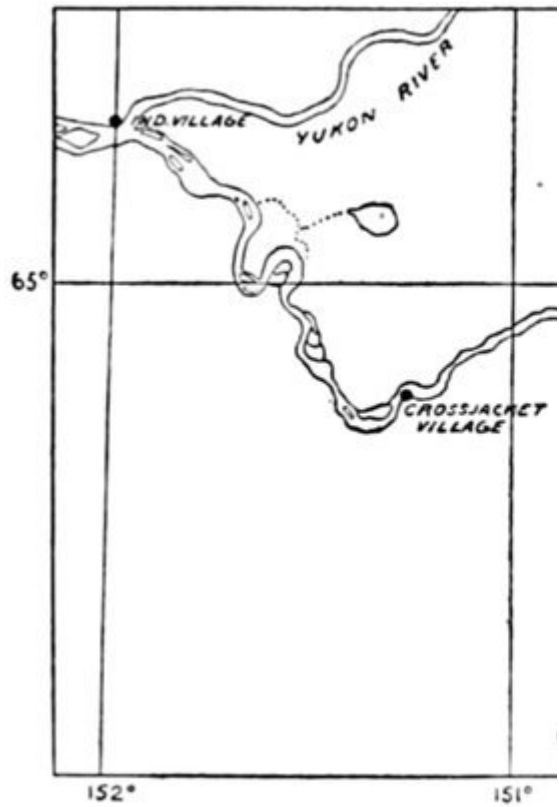


Figure 1.—The Tanana River

To which Lieutenant Castner, who explored the upper Tanana, adds the following:[14] "On 750 miles of the Tanana proper and its tributaries I saw seven small hamlets, and not to exceed 100 Indians—men, women, and children."

From information obtained by me at Fairbanks, at the United States marshal's office and from miners, it appears that the following villages are better known:

Village, 150 miles east of Fairbanks.
Mansfield Lake village, 300 miles east of

Fairbanks.
Tetlen, 410 miles east of Fairbanks.
East Tetlen, 7 miles southeast of Tetlen.

FOOTNOTES:

[13] Brooks, A. H., A Reconnaissance in the White and Tanana River Basins, Alaska, in 1898: Twentieth Ann. Rept. U. S. Geol. Surv., 1900, pt. VII, p. 491.

[14] Castner, op. cit., p. 706.

LOWER TANANA, NENANA TO YUKON

No old sites were learned of on this part of the river, and few, if any, are probably preserved, due to lowness of banks and extensive destruction (cutting of the banks) by the river.

The present Indian villages on the river are as follows:

1. Nenana (or Tortella), about a mission, half a mile from the railroad station and town of the same name, on the left bank of the Tanana and near the mouth of the Nenana River. (Fig. 1.)

2. "Old Minto," 27 miles from Nenana, right bank; but a small number of Indians there now.

3. Village at the mouth of the Tolovana, right bank (where the Tolovana enters the Tanana); the village is on the distal (downstream) point. Nearly abandoned; only two families there now. Summer (fishing) camp on the opposite point.

4. A small settlement at mouth of Baker Creek, right bank, about 4 miles upstream from Hot Springs.

5. "Crossjacket village," on left bank, about 45 miles above Tanana, 40 miles below Hot Springs. Used to be called "Cosna." Occupied, though only a few there.

6. Near 5, but on the opposite bank, a few habitations.

During the open season the Indians live scattered along the river in fishing camps. This is especially true along the right bank downstream from Nenana.

The Yukon Below Tanana

BRIEF HISTORY

The Yukon is the principal river of Alaska. It is one of the greatest and most scenic rivers in the world. It is approximately 2,300 miles long (from the headwaters of the Lewes River), in its middle and lower courses ranges at times with its sloughs to several miles in breadth, and includes many hundreds of islands of its own formation. Its scenery is still essentially primeval, affected but little by human occupation or industry. It has, in fact, gone considerably back in these respects since the gold rush was over.

This great stream has been known to the white man for less than a century. Cook, in September of 1778, sailed near, discovering Stuart Island and Cape Stephens of the St. Michael Island, but missed the river.

In 1829 P. E. Chistiakof, director (1826-1830) of the Russian-American colonies, sent the naval officer Vasilief to explore the coasts between the Alexander Redoubt (at the mouth of the Nushagak) and the Shaktol or Norton Sound, and in 1830 Vasilief

explored the larger part of the Kuskokwim River, of which the Russians knew already from their earlier explorers. Here they heard of an even greater stream to the north.

In 1831, on the recommendation of Vasilief, Michail Dmitrievich Tebenkof was sent to Norton Sound with the view of further exploration and the establishing of a post in that region. Tebenkof discovered that Cape Stephens was not a part of the mainland but of an island; and he built here a fortified post which in honor of his patron saint is called St. Michael, a name which subsequently passed to the whole island. The post was to serve both trade and further exploration.

From St. Michael, at the end of 1834, a small party is sent out under the leadership of an educated "kreol" (son of a native mother and Russian father), Andrei Glazunof, and on January 26, 1835, they reach the good-sized Indian village of Anvik, on the Kwikhpak, or Yukon.[15] From here Glazunof travels down the river to the large village of Aninulykhtykh-pak (above Holy Cross), the last Indian (as distinguished from Eskimo) village down the river, whence Glazunof sends most of his party back to St. Michael and himself proceeds to the Kuskokwim.

In 1836 the Russians effect the first settlement on the Yukon, at Ikogmiut (Zagoskin, 6), later known as the Russian Mission.

In 1838 Malakof, over land portage, reaches Nulato and builds there a trading post, which, during his absence the next winter, is burned by the natives. In 1841 Dieriabin rebuilds and fortifies this post, becomes its headman, and is there eventually (1851) killed by the Indians.

In 1841 Lieut. Laurenti Alexief Zagoskin is delegated to explore the "Kwikhpak," with its portages to the Kotzebue Sound, and the Kuskokwim River; and in 1843 he navigates and maps 600 miles of the Yukon, or from about the mouth of the Apkhun (northern) pass to the mouth of the Novitna River, with approximately 100 miles of each, from their mouth, of the Koyukuk and of the Ittege (or Innoko) Rivers.

The Russian post at Nulato remains until the sale of their American dominions by the Russians to the United States in 1867. From it and from St. Michael individual Russian traders ranged over the river and its lower affluents, but there was no further noteworthy scientific exploration. In 1863, however, Lukin, who after Vasilief and Kolmakof helped to explore the Kuskokwim, reached to Fort Yukon.

Meanwhile the river has been visited by both the English and the Americans. In 1847 Mr. Bell, of the Hudson Bay Co., having heard of the great stream from some of the Indians who visited the fort on Peels River, set out in quest of it, accompanied by a native guide, and reached it by the Rat and the Porcupine Rivers.[16]

Between 1843 and 1867 the river in its lower and middle reaches is freely traversed by the Russian traders. In 1851 Nulato is reached by Lieutenant Barnard, of H. M. S. *Enterprise*, in search of Franklin, only to be massacred there with some of the Russians and natives by the offended Indians of the Koyukuk. In 1861 Robert Kennicott traverses a part of the Yukon, and in 1865 he, with Capt. Charles S. Bulkley, leads there the expedition of the Western Union Telegraph Co., which is accompanied by William H. Dall and Frederick Whymper, and results in much information. Already, however, in 1863,

Strahan Jones, commander of the Peels River Fort, has descended the Yukon to the mouth of the Novitna River or the uppermost point reached by Zagoskin, thus completing its identification as one and the same great stream. This point and the Tanana mark the westernmost penetration by the English (the Hudson Bay Co.).

In 1865 begin American explorations proper. In that year, under an agreement with the Russians, Maj. Robert Kennicott, heading a party of the Western Union Telegraph explorers, crosses from St. Michael to Nulato. Kennicott dies in Nulato a year later, but the explorations are carried on to result eventually in a series of valuable publications, more particularly by Dall and Whymper.[17]

The researches under the auspices of the Western Union Telegraph Co., themselves backed by the Government, are followed by explorations under the direct auspices of the American Government. Thus, in 1869 there is a reconnaissance of the river by Capt. C. W. Raymond; in 1883, that by Lieut. Frederick Schwatka; in 1885 by Lieut. Henry T. Allen; in 1898 by Capt. W. P. Richardson; and these are succeeded by the geological surveys of A. H. Brooks and companions.[18]

From 1878 on commenced placer and mining explorations for gold in Alaska leading gradually to the eventual great gold rush of the later nineties, which brought a whole flotilla of large river steamers and other craft to the Yukon and led to a rapid growth of some of the old and the establishment of a number of new settlements along its banks. The rash passed in turn, many of the miners and others departed, boats became idle and were beached or taken to the St. Michael ship "bone yard," where,

together with most of the buildings, they are now (1926) being broken up; and the Yukon has reverted in a large measure to its former primeval, dormant, lonely state.

Such, in brief, is the white man's history of the Yukon, with all of which the river remains but half known, at best. It has never been fully surveyed, which would be a vast and unending task. It contains a large number of barely known little tributaries that are lost in the jungle-covered flats with their many pools and lakes. It has innumerable islands and channels, in which the traveler is easily lost, and it cuts and builds constantly during the open season. Its valley is squally and rainy. The stream may one moment be like a great, liquid, softly flowing mirror, to be in a few minutes churned into an ugly and dangerous roughness from which every smaller boat must seek shelter. Its shores are inhospitable, except for the native fisherman and hunter, and torment man with swarms of gnats and mosquitoes.

But there is no malaria; no snakes or other poisonous things. And when the weather is decent the water, the wooded shores, and the fresh, clean virginal parklike islands have a greatness and charm that compensate for much. Besides which there is the still more intensive allure of original exploration. Botany, zoology, and above all paleontology, find here still a fruitful field, while for anthropology, and especially archeology, the land is still largely a terra incognita.

FOOTNOTES:

[15] There is some confusion about the exact date of Glazunof's journey, partly due perhaps to the fact that he started on Dec. 30. Wrangell (Stat. and Ethnog. Nachricht., 138) says that

Glazunof's expedition was outfitted the same year (1833) in which the St. Michael redoubt was established. In Zeleny's abstract of Zagoskin's report (p. 212) and by Zagoskin himself (pp. 6, 23) the departure of the expedition is put a year later, or 1834, which is probably correct. Dall's remarks (Alaska and Its Resources, 276, 338) on the subject contain several errors, both of dates and facts. There is also considerable confusion as to the names Kvikhpak and Yukon. The term Kvikhpak (Kvikh, river; pak, large) is of Eskimo origin and was applied by these to that part of the river which they occupied. The name Yukon, or something near this, is of Indian derivation and was applied to those parts of the river, below Tanana at least, that were peopled by the Khotana or Indians.

[16] Richardson, J., Arctic Searching Expedition, London, 1851, II, 206.

[17] For details see Dall's Alaska and Its Resources, Boston, 1870.

[18] See Compilation of Explorations in Alaska, Senate Rept. 1023, Washington, 1900; and reports on Alaska of the United States Geological Survey.

The Yukon Natives

Upon their arrival on the Kvikpak and Yukon, the Russians found the banks of the stream peopled in its upper and middle courses by Indians and lower down by the Eskimo.[19] The last Indian village downstream was Aninulykhtykh-pak, since completely gone. Its site is identifiable with one that used to exist in front of the present mission of Holy Cross or just above. The first Eskimo village of some

note was Paimute.

As to the Indians of the Yukon and its tributaries, there is a considerable confusion of names, almost every author using his own spelling and subdivisions. It is evident that there were two sets of names of the various Indian contingents, namely the names, sometimes contemptuous, given to them by outsiders, and the names in use among themselves, which generally meant the people of this or that locality. The facts are that they all belonged to the Tinné or Dené family;[20],[21] that there were two probably related generic names for them, namely Kutchin (used especially on the upper Yukon) and Khotana (used mainly along the central and lower parts of the stream); and that along the Yukon itself, with its channels, there were three main subdivisions of the people: The Kutchin (with various qualifications) on the upper parts of the river, down to Fort Yukon; the Yukonikhotana, from Fort Yukon to Nulato;[22] and the Kain (Petrof) or Kaiyuh (Dall) Khotana, or Inkaliks (of the Russians), from Nulato to Holy Cross.

In addition there were the Tenan-kutchin Tenan-khotana or Mountain-men of the Tanana; and the Yunnaka-khotana (Zagoskin) or Koyukuk-khotana (Dall), the people of the Koyukuk.

These groups were settled in a moderate number of permanent or winter villages along the rivers, in the summer spreading along the streams in camps. The population found by the first Russian explorer, Glazunof, from Anvik to Aninulykhtykh-pak, was seemingly a rather large one. He is reported by Wrangell to have counted, at Anvik, 240 grown males; at Magimiut, 35; and at Aninulykhtykh-pak 300. At the last-named village in particular there

were present "many people," Glazunof estimating altogether nearly 700. These figures, except for Magimiut, seem too large and were not even approached later; but before the next count, that by Zagoskin, all these settlements had been visited by smallpox; and at the big village Glazunoff may have seen a potlatch, such as may still yearly be witnessed at some settlements on the river.

Zagoskin in 1843 made a detailed and evidently reliable count of all the villages that became known to him. His data in this respect, as in others, being of fundamental value, are here given, the Eskimo, for convenience, being included.

FOOTNOTES:

[19] See Auszug aus dem Tagebuche des Schiffer-gehülfen Andreas Glasunow. In Wrangell. Ferd. v., Statistische und ethnographische Nachrichten ü. d. Russichen Besitzungen a. d. Nordwestküste v. Amerika. Ed. by K. C. v. Baer, St. Petersburg, 1839, 137-160. Zagoskin, A., Pešechodnaia opis časti russkick vladenii v. Amerikě. 2 parts, St. Petěrsburg. 1847-1848, pp. 1-183, 1-120, and 1-43; with a map.

[20] Dall, Contr. N. A. Ethn., vol. 1, p. 17.

[21] Zagoskin: "* * * great family of the Ttynai nation, which occupies the interior of the mainland of our colonies and known to us under various names—Yug-elnut, Tutna, Golcaně or Kilčaně [according to the pronunciation of those giving the information], Kenaici, Inkaliti, Inkalich-liuatov [distant Inkaliks], and others—names given to them by the neighboring coastal people."

[22] Petrof, Ivan, p. 161: "This tribe, comprising the Yunakhotana and the Kutchakutchin of Dall, inhabits the banks of the Yukon River from Fort Yukon westward to Nulato."

Native Villages on the Yukon and in the Vicinity, 1843 (Zagoskin, III, 39-41)[23]

Villages	Total	Adult males[24]	Houses
INDIANS			
Inkalit-Iugelnut:			
Inselnostlende	33	8	2
Khuingitatekhten	37	11	3
Iltenleiden	100	30	6
Tlego	45	14	

	3
Khuligichagat	
	70
	25
	5
Kvygympainag-miut	
	71
	25
	3
Vazhichagat	
	80
	18
	5
Anvig	
	120
	37
	5
Makki	
	44
	9
	3
Anilukhtakpak	
	170
	48
	8
Total	
	770
	225
	43

Inkiliks proper:

Kunkhogliuk

11
5
2

Ulukak

35
10
4

Ttutago

32
8
2

Kakoggo-khakat

9
3
1

Khutul-khakat

16
4
2

Khaltag

9
3
1

Khogoltlinde

60
17
4

Takaiak

81
27
7

Khuli-kakat	
	11
	3
	1
Total	
	264
	80
	24
Yunnaka-khotana:	
Notaglit	
	37
	8
	3
Tlialil-kakat	
	27
	7
	3
Toshoshgon	
	30
	5
	2
Tok-khakat	
	6
	3
	1
Nok-khakat	
	50
	11
	3
Kakhliakhlia-kakat	

	26
	7
	2
Tsonagogliakhten	
	11
	4
	1
Tsogliachten	
	7
	2
	1
Khotyl-kakat	
	65
	19
	4
Unylgakhtkhokh	
	17
	2
	2
Nulato	
	13
	2
	1
Total	
	289
	70
	23
Tlegon-khotana:	
Innoko natives seen on the Yukon	
	44

	33
	3
Village totality	
	45
	14
	3
Total	
	89
	47
	6
All Indians counted on Yukon and Koyukuk	
	1,359
	[25]422
	132
ESKIMO	
Kavliunag-miut	
	11
	3
	1
Nygyklig-miut	
	13
	4
	1
Kanyg-miut	
	45
	11
	4
Ankachag-miut	
	122

	32
	6
Takchag-miut	
	40
	12
	3
Ikuag-miut	
	130
	35
	6
Nukhluiag-miut	
	60
	17
	4
Ikogmiut	
	92
	22
	5
Ikaligvig-miut	
	45
	14
	3
Pai-miut	
	123
	35
	5
Total of Kvikhpag-miut	
	681
	185
	38

Dall, referring to 1866-67 (Contr. Am. Ethn., I, 23,

39), estimated the number of the Yukon Eskimo at 1,000 and that of the Yukon and Koyukuk Indians, from the mouth of the Tanana downward, at 2,800. Only a few sites of villages are incidentally given by Dall.

Ivan Petrof, as a special agent for Alaska of the United States Census for 1880, reports himself the following Indian settlements and numbers of inhabitants on the Yukon (Compil. Narrat. Expl. Alaska, 68; gives also data on Eskimo, but his arrangement and unidentifiable localities prevent these data from being used here):

Anvik station and village	94
Single house	20
Single house	12
Single house	15
Tanakhothaiak	52
Single house	15
Chageluk settlements	150
Khatnotoutze	115
Kaiakak	124
Kaltag	45

Nulato, station and village	163
Koyukuk settlements	150
Terentiefs station	15
Big Mountain	100
Single house	10
Sakatalan	25
Yukokakat	6
Melozikakat	30
Mentokakat	20
Soonkakat	12
Medvednaia	15
Novo-kakat	106
Kozmas	11
Nuklukaiet	27
Rampart village	110
Fort Yukon	82

Later demographic records on the Yukon and its tributaries and on the coast comprise additional data by Petrof, published as a part of the Eleventh (1890) United States Census and arranged by districts and linguistic groups; and the data of three subsequent United States Censuses, 1900, 1910, and 1920, which are given in differing ways, but in the main by major ethnic and territorial or jurisdictional subdivisions.

Due to incomplete enumerations; to the use of native estimates for actual count (as seems to have been the case with Dall's figures, as well as others); the different methods and classifications employed; and the inclusion of units now into one and now into another group (as with Petrof, who includes three Indian villages below Anvik among the Eskimo, etc.), the various counts are not comparable and give but hazy ideas of the true conditions. Yet they are not without value, particularly in showing the earlier population of the villages and the relative proportion of the sexes and ages. The more helpful details are given in the appendix; for still others see references in bibliography.

FOOTNOTES:

[23] See also Petrof (Ivan), Tenth Census Rep., Wash., 1880, VIII, 37; but his transliteration of names is not always correct.

[24] This doubtless included many subadults.

[25] 31 per cent, or 1 in 3.2.

PRESENT CONDITIONS

To-day, judging from all the obtained evidence, which comprised information, the witnessing of a

potlatch at Tanana at which were assembled practically all the Indians above Nulato, and a visit below the Tanana of nearly all the villages where the Indians still live, the total number of the Tinneh on the lower Tanana (from Fairbanks to the mouth of the river) and on the Yukon from Tanana to Anvik, can scarcely be estimated to reach 1,000. It is probably well below that number. Moreover, not one-half of the adults and much fewer among the young are still full bloods. Disease, bad liquor (Yukon), and mostly as yet imperfect accommodation to changing conditions are steadily diminishing the numbers. Since our visit many have died from influenza, especially at Anvik. Their future is not hopeful. On the Tanana, however, and with the more educated in general, conditions are better, and much good is being done by the four missions on the two rivers (Nenana, Tanana, Anvik, and Holy Cross).

The old Indian settlements along the Yukon are gone, with a few exceptions. On some of the sites, as at Tanana, Nulato, Kaltag, etc., there are new villages bearing the old names but built by or in imitation of whites and sheltering a mixed population. The very names of not a few of the older Indian sites have gone into oblivion; or the natives call those they still know by a corruption of a white man's name, such as "Ulstissen" (for Old Station). Anvik alone has kept its original site and some of its old character, the mission and the white trader being across the river.

In the Eskimo part of the Yukon, below Holy Cross, conditions on the whole appear to be somewhat better. There has also been a diminution in population. The majority of the old villages have ceased to exist, while under the influence of whites some new settlements or names have appeared. Yet

there are respectable remnants of the Eskimo, and, being better workers than the Indian and seemingly more coherent, they manage to sustain themselves somewhat better than he does. Their greatest handicap is disease. The beneficial effect among them of the old Russian Mission has declined, but there are a number of Government schools which have a good influence. They are more tractable, sensible, and in some respects perhaps more able than the Indians.

But there exists to-day no clear-cut demarcation, geographical, cultural, or even physical, between the two people. Anvik, the last Indian village downstream, is in every respect at least as much Eskimo as Indian; more or less Eskimo-like physiognomies are seen again and again among the Indians; and Indianlike features are common among the Eskimo. There has either been an old and considerable admixture on both sides, or there are some fundamental similarities of the two groups; perhaps both.

Archeology of the Yukon

Up to 1926 no archeological work had been done along the Yukon or its tributaries, and barring a few isolated specimens there were no archeological collections from these regions.

The archeology of the river consists, (1) of the dead but formerly known villages; (2) of older sites, "dead" and unknown before even the Russians arrived; and (3) of random stone objects worked by man that now and then are washed out from the river banks or are found in working the ground. Except in details conditions are much alike along the whole river and

will best be dealt with as a whole.

THE RANDOM SPECIMENS

Wherever the beach of the river shows more or less of stones that are not talus or just pebbles, there are generally found stones worked by man. Such localities are scarce. The first exists between Tanana (the village) and the mission above it. Here specimens are found occasionally on the beach and occasionally in the soil of the local gardens. Other such sites were located at Bonasila, below Anvik, and in four places between Paimute and the Russian Mission. A few are also present from Marshall seaward.

An examination of the terrain adjacent to such parts of the beach shows mostly, but not always, traces of an old settlement.

The specimens consist of characteristic axes or adzes, stone scrapers, hammers, stone knives (along the Eskimo part of the river), tomahawk heads (probably), objects less well defined, and chips. There may be semifossilized animal bones, and rarely a bit of charcoal, a piece of pottery (for details see Narrative), or an object of ivory.

The ax proper is peculiar. It is a cupid's-bow ax, double-edged, and with one or two grooves across its middle. (Pl. 10.) It is as a rule made of heavy basaltic stone, and its edges are sharpened by polishing. Rough parts may have been polished also on the body. Its distal surface is convex (from sharp edge to sharp edge), its proximal surface straight or mildly convex. I succeeded in getting a specimen remounted recently by one of the Indians near Tanana. This form of an ax is still remembered by the old Indians

when in use. They cut trees with it, cutting sidewise and detaching the wood in splinters. They also remember clubs with stone heads, and told me they were carried on the back over the right shoulder so as to be ready for instant and effective use.

These axes have apparently been used by both the Indians and the Eskimo, but there is an interesting difference. The several specimens I obtained or saw from Tanana to Ruby were all complete. But from, about the vicinity of Ruby downstream the bi-edged ax seems to disappear, or, rather, one-half of it disappears, the butt henceforth either being left unfinished or one-half of the double ax being broken off and the remainder being mounted now as an adze on a shorter handle. This form, and it exclusively, with various secondary modifications, is found over a wide area among the Eskimo and may reach into Asia, for I obtained a specimen of it from one of the Diomede Islands. It connects directly with the Bering Sea Eskimo ivory adze and chisel. On the other hand the bi-edged ax appears, in various modifications, to extend widely over Indian Alaska.

The remaining stone implements need but little mention here. They will be studied and reported separately by our archeologist. A special note will, however, be necessary later about the very primitive stone industry of Bonasila, below Anvik. (See p. 144.)

Of pottery I have seen no example above Anvik, but this can not be taken as evidence of its absence above that point. At Anvik, Bonasila, and farther down the pottery is like that of the western Eskimo. It is coarse ware, hand shaped, and of rather poor quality. It consists of small round bowls to fairly large, more or less conical, jars. It is never painted

but is frequently decorated with thumb marks and especially with grooves running parallel with the border.

Ivory implements were encountered first at Bonasila and consisted of a few fine long points barbed on one side, looking like those of the Eskimo and probably of Eskimo origin. There were also a few tools of bone, generally scrapers.

Russian beads, especially those of the large blue variety, are occasionally encountered, usually singly or in small numbers, especially in some spots.

A unique archeological specimen from the lower middle portion of the Yukon Valley is the large stone dish obtained by Mr. Müller, the trader at Kaltag. (See p. 34.)

Besides these random specimens, other cultural objects are found along the Yukon in connection with old burials. These consist of an occasional wooden dish, sharpening or polishing stones, rarely a figurine (doll?) in ivory, Russian snuffboxes, fire sticks, dishes of birch bark, etc. The cullings in this field are quite poor, but there has been no excavation of older burials that have been assimilated by the tundra and lie now in the earth beneath.

The archeology of the old habitation sites, on the other hand, particularly perhaps on the Shageluk and between Holy Cross and Marshall, is decidedly promising and invites careful excavation.

Location of Villages and Sites on the Yukon

Especial attention was given to the location of the numerous dead villages and older sites along the Yukon. This task was found, in most instances, fairly easy with villages that "died" since the Russo-American occupation, for mostly they still show plain traces and are generally remembered by the old Indians or even old white settlers. Their precise allocation on a map, however, is not always easy or certain. As to the prehistoric sites the search is much more difficult and depends largely on chance discoveries.

The villages still existing give only a partial clue, in many cases, to the old, even where these bore the same name, for on occasions a village changed its location, though remaining in the same general vicinity and retaining the same name. Thus there existed at different times apparently, between the earliest contacts with whites and the present, at least 2 Nuklukhayets, 2 Lowdens, 3 Nulatos, 3 Kaltags, 2 Anviks, etc.; besides which there were differences in recording the names and changes due to efforts at translation of the native term, or an application by the whites of a new name, often that of a trader or settler, to an old site.

In places even late village sites, in others burials, were witnessed being undermined by the river or the sea. Such sites with their contents will probably sooner or later be completely lost from this cause. Many doubtless have thus been lost previously.

The villages and sites located along the Yukon are here enumerated and as far as possible charted. Information about them was obtained from the older Indians or river Eskimo and from such whites as had direct knowledge in that line. Most of these sites were examined personally, but in some instances this

was impossible. The details concerning those seen will be found in the Narrative, but a few generalizations may here be useful.

BUREAU OF AMERICAN ETH



***a*, My "spoils," loa**



***b*, The load is heavy and sled**

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXTH AN

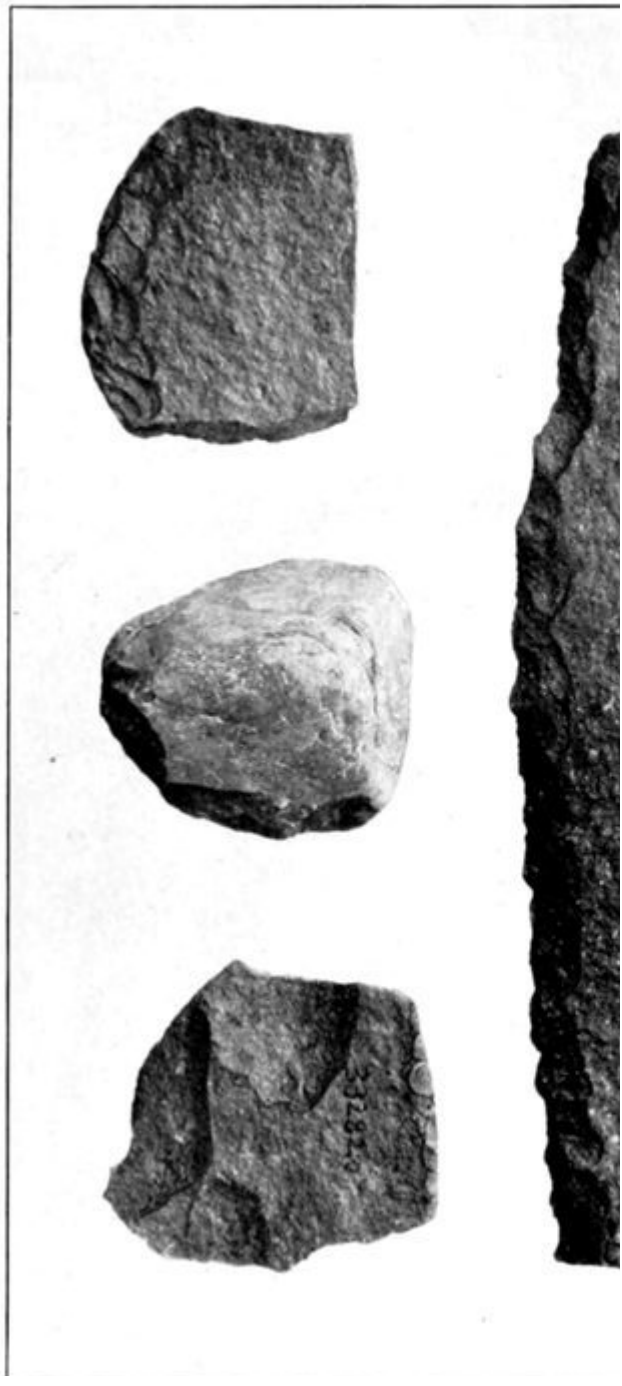




Characteristic Stone Axes. Middle Y

(A. H. coll., 1926.)

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXT

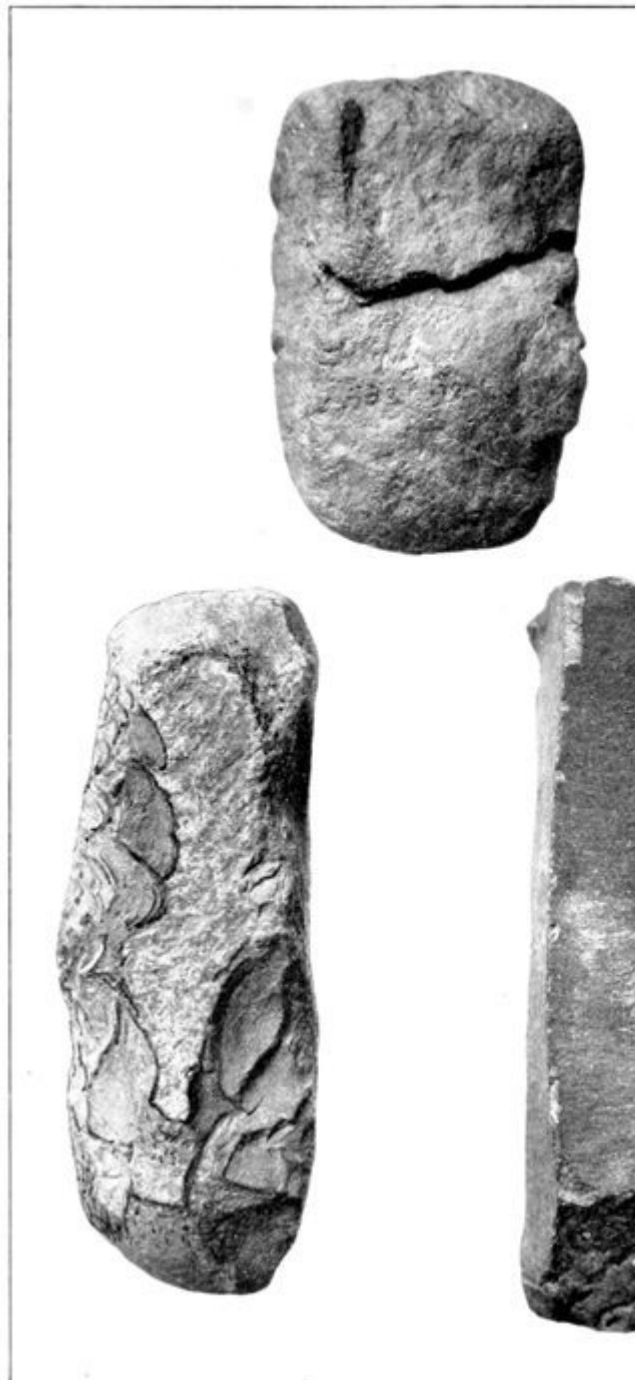




Crude Stone Artifacts, Found at Bonasila

(A. H. coll., 1926.)

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXTH A





Crude Stone Artifacts, Found at Bonasila. Lov
(A. H. coll., 1926.)

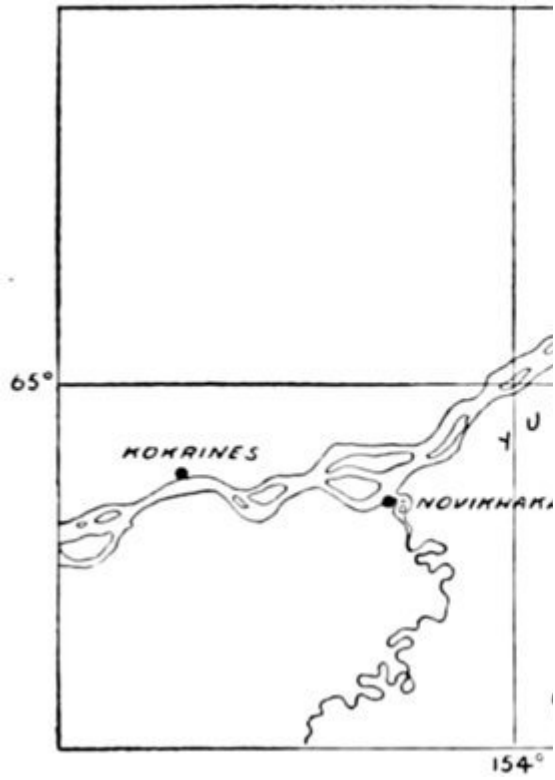


Figure 2.—The Y

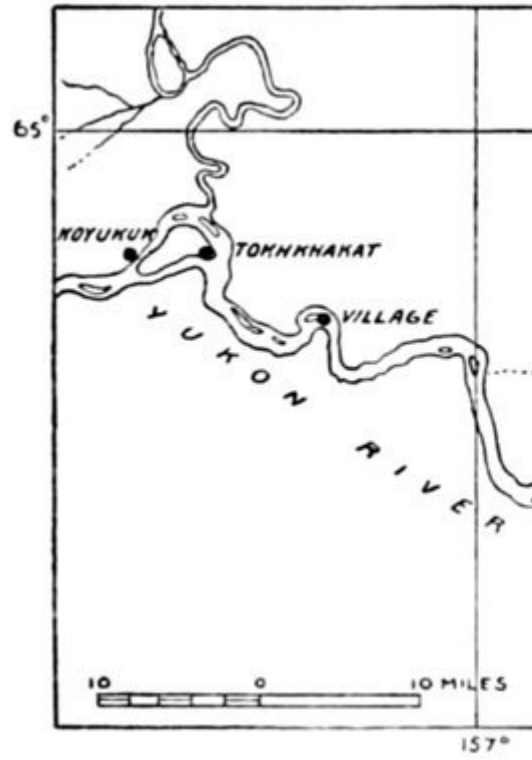


Figure 3.—The Yuko

The dead village sites are much alike along the whole river. They are generally located at the mouth, of some inland stream that carries clear fresh water, particularly if on the other side there is the protection of a hill. The dwellings were invariably on a flat and were throughout semisubterranean and of the same general type; which applies also to the larger communal houses or "cashims." The sites can often be told from afar in summer by the rich grass that covers them.

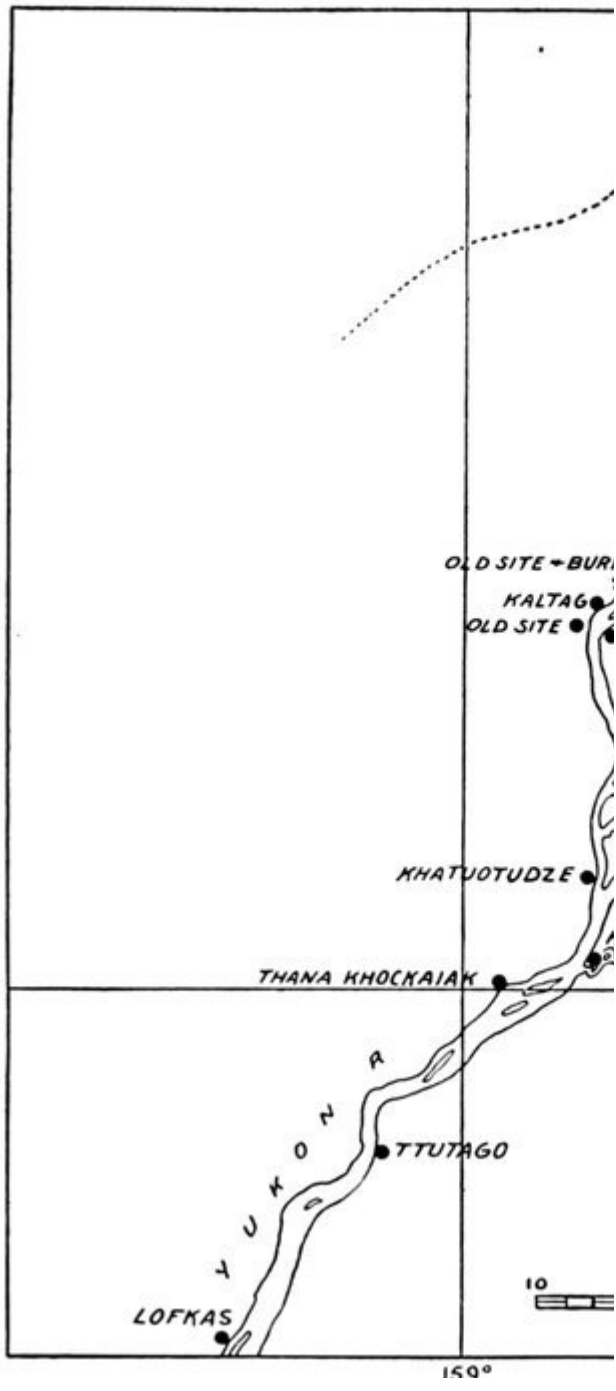

OLD SITE
KALTAG
OLD SITE
KHATUOTUDZE
THANA KHOCKAIAK
YUKON
TTUTAGO
LOFKAS
10
159°



Figure 4.—The Yukon from below I

The burials were as a rule not far from a village and preferably on the slopes of the nearest hill. They were mostly above ground, but under the influence of Russians there were also shallow-ground burials. The latter can readily be told by the sawed planks of the coffins and the iron nails by which they are fastened. In many places no surface burials remain or there are mere traces. In such, places little mounds may betray old burials assimilated by the tundra. Trenching in likely spots would doubtless reveal others of which no trace remains on the surface.



Figure 5.–

No excavations of any of these sites have ever been attempted, but many of the surface burials were

disturbed or destroyed by seekers of relics and the curious vandal, who is present on the Yukon as in other parts of the country.

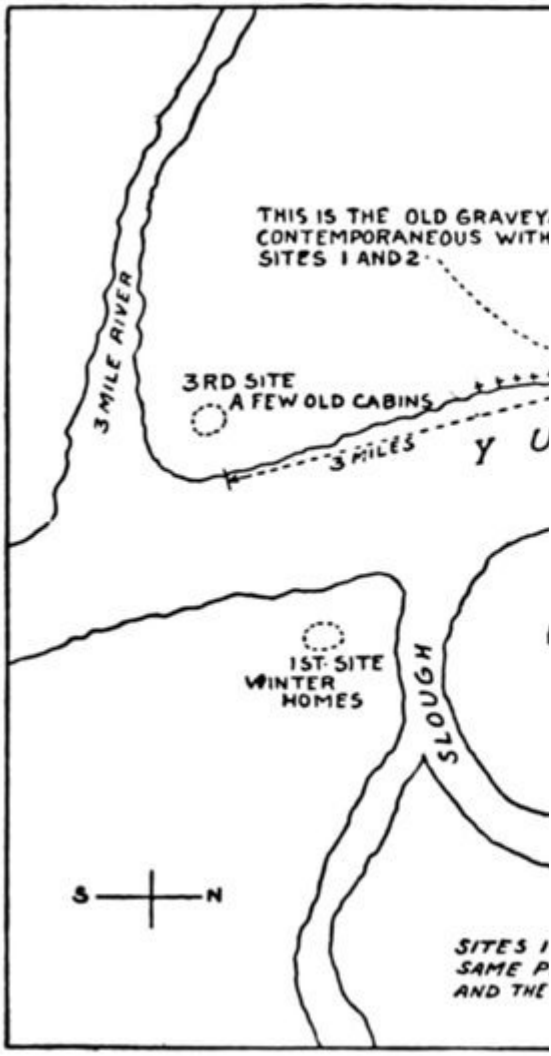
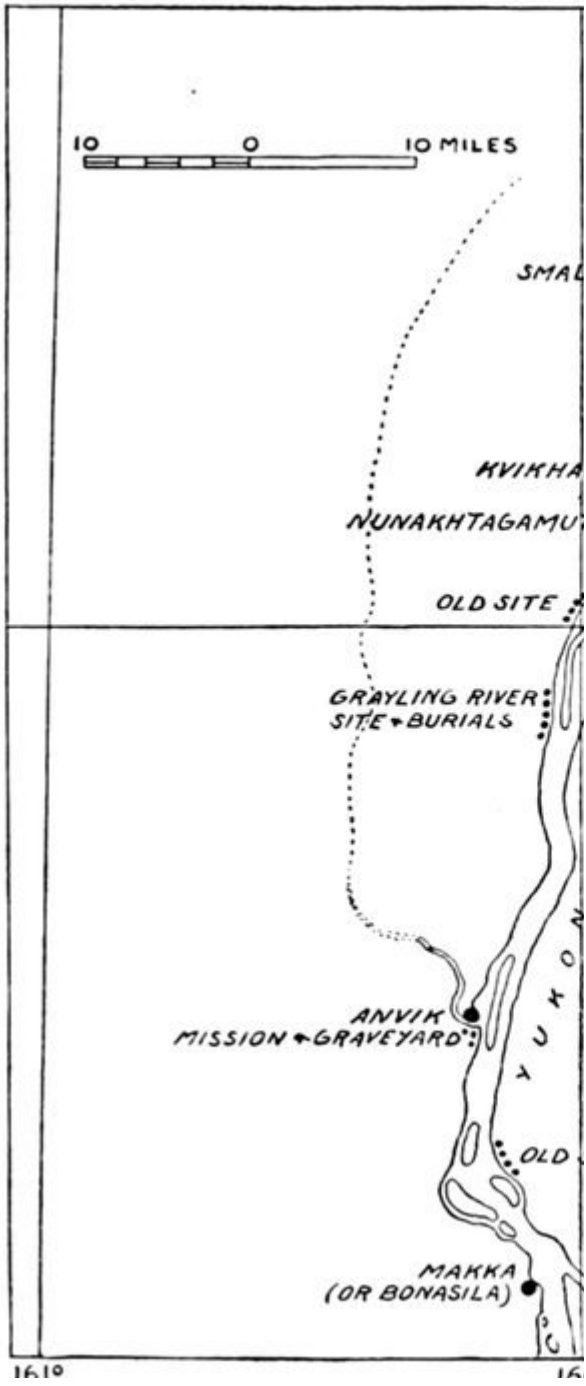


Figure 6.—Map

The maps shown here were made under my direction

on the basis of maps and charts provided by the Geological and Geodetic Surveys, in Washington. Additional old sites will doubtless be located in the future and may be added to these records.

Pre-Russian Sites


10 0 10 MILES
SMAL
KVIKHA
NUNAKHTAGAMU
OLD SITE
GRAYLING RIVER
SITE + BURIALS
ANVIK
MISSION + GRAVEYARD
YUKON
OLD
MAKKA
(OR BONASILA)

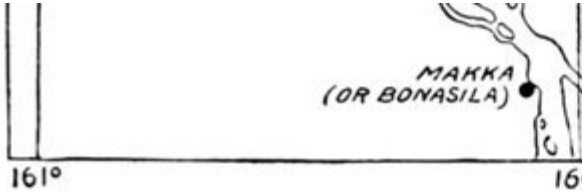


Figure 7.—The Yukon from E

As already told in the Narrative, a search for truly ancient sites along the Yukon has proven largely negative. A more intense and prolonged archeological survey, with exploratory trenches wherever there is promise, may one day prove more fruitful. But, as pointed out before, much can never be expected. Man could at no time have occupied the Yukon Valley and watershed in large numbers. He would not have found enough sustenance. Even with fair resources he would hardly have tarried in these inclement regions as long as the ways toward the south were open. He never built here of lasting materials and had little chance to develop or even keep up any higher culture, and since he is gone the ever-cutting river has taken away whatever it could reach and scattered it through its silts and gravels. There is nevertheless a number of small elevated plateaus along the right bank that ought to be sounded by exploratory pits or trenches, particularly perhaps where there are traces of later habitations.

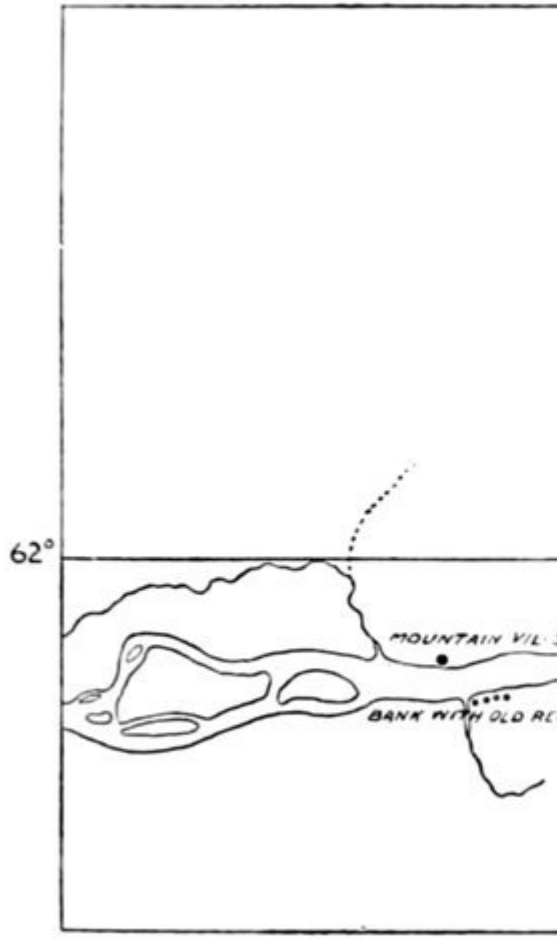


Figure 8.—The Yukon fro

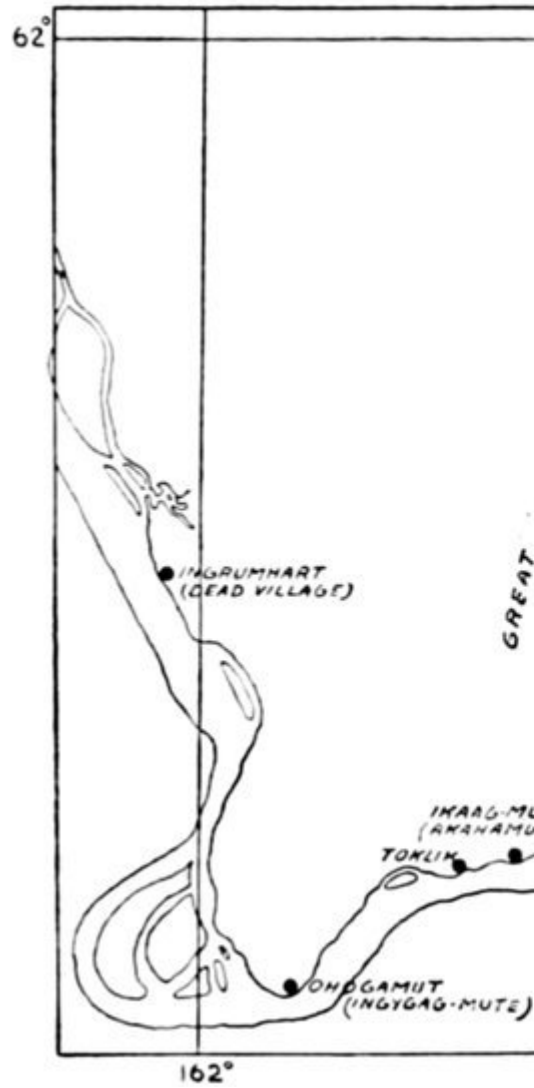


Figure 9.—The Yukon fr

There are, of course, some sites that are older than others. The most interesting of these was found at Bonasila, beneath the old site of Makki or Magimute,

18 miles downstream from Anvik. (See Narrative.) The main facts concerning this site are as follows:

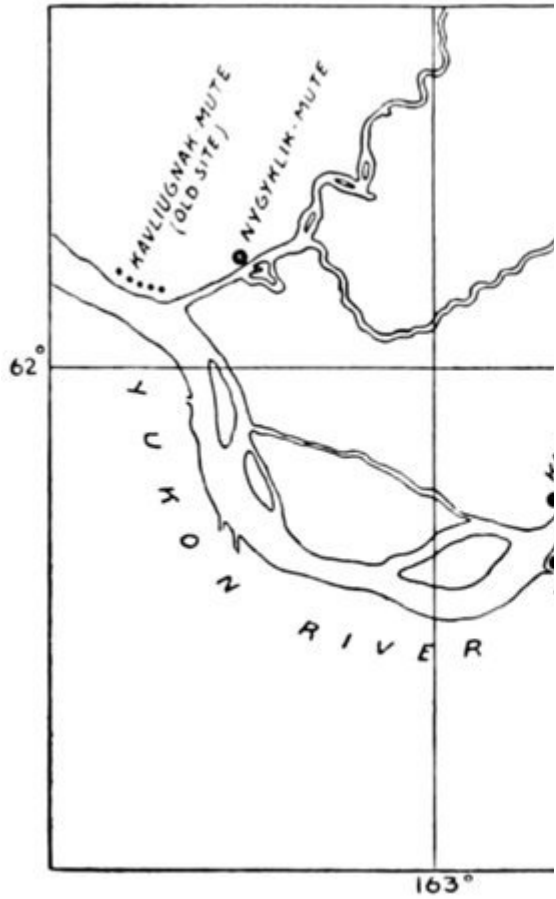
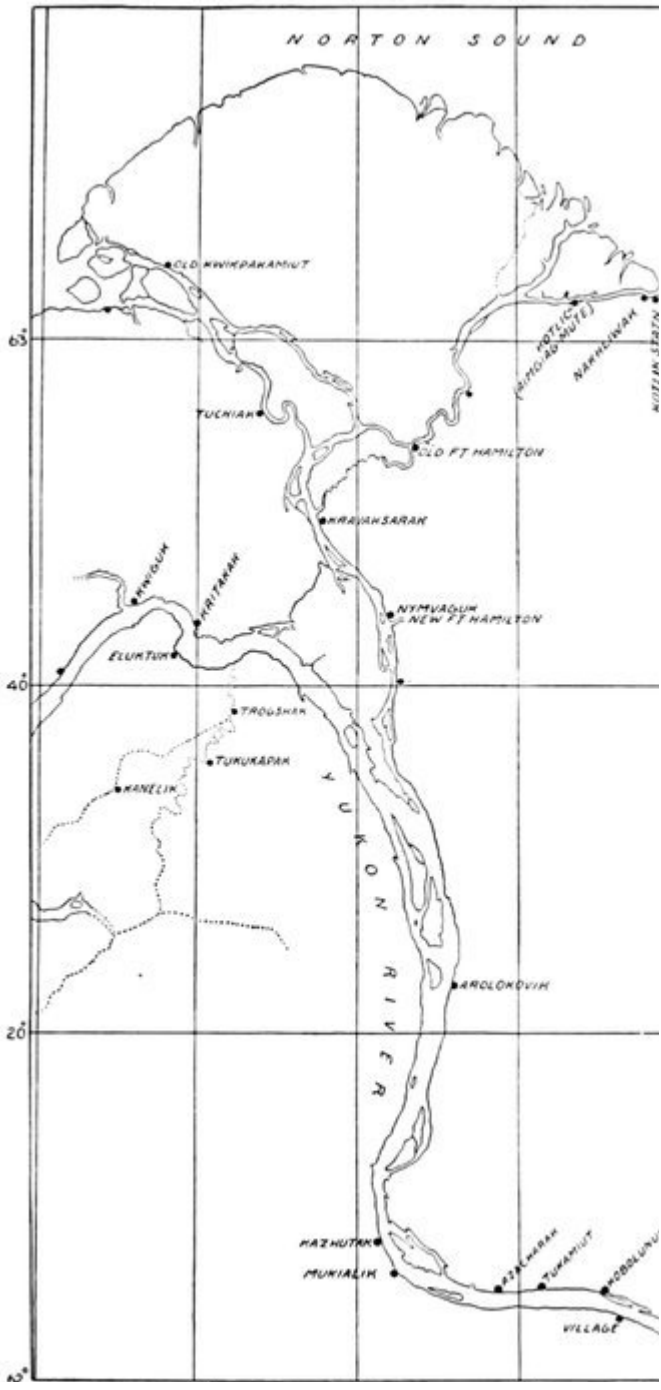


Figure 10.—The Yuko

At the above distance from Anvik, on the right bank of the river and following a wooded hill, is a low flat backed by rising ground and cut across by a little stream. The flat is narrow, at present about 300 feet; and the part above the stream is deeply pitted by the remains of semisubterranean houses of a "dead"

native village, which I believe is identifiable with the Magimute of the Russians. On the slope behind the village were still about a score of old surface burials, with an article here and there of Russian derivation.

The bank of the flat rises at present only about 4 feet above the beach of the river, but the flat behind is higher. The bank itself contains many specimens showing human workmanship, consisting of objects of stone, birch bark, bone, and rarely also of ivory, besides many fragments of pottery, many bones of wild Alaskan animals, and here and there a human skeleton. Some of these objects are low down in the bank. All the bones from the bank, including the human, and even the rare points of ivory, are semifossilized; the stone industry is peculiar; and the human remains differ plainly from both those of the later Yukon Indian and from those of the Eskimo. They are apparently Indian (see section on physical characteristics), but a tall Indian of a type that now is only met with much farther south.


NORTON SOUND
OLD KWIKPAKAMIUT
63°
TUCHIAK
OLD FT HAMILTON
KRAUHSARAK
NYMVAQUK
NEW FT HAMILTON
ELUKTUK
40°
TROUSHAK
TUKUKAPAK
KANELIK
YUKON RIVER
ARGOLOKOVIK
20°
KAZHUTAK
MUKIALIK
TUKAMIUT
VILLAGE

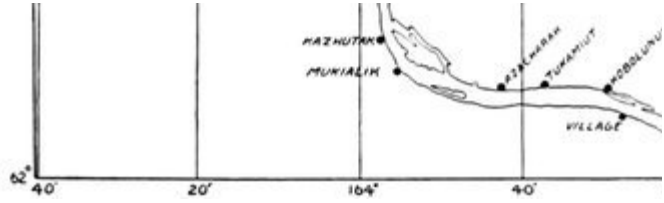


Figure 11.—From above Kobolunuk to mouth of

The stone industry from the bank appeared at first sight so primitive that even the term "paleolithic" would not fit and the only term that seemed to meet the situation was "protolithic." It consists predominantly of scrapers and knockers, with here and there a tool sharpened for cutting. The scrapers look especially crude. They consist simply of pieces of smaller or larger andesite-like volcanic slabs broken to the desired size and chipped more or less roughly along what was to be the scraping edge. A closer examination of the stones, which were obtained from a base of a cliff farther down the river, showed, however, that they were of material which is hard to work, and that the chipping, under the circumstances, was not really bad. (Pls. 11, 12.) Pottery must have been fairly plentiful and quite up to the average of the river, both in make and decoration.

Two fine long, partly fossilized ivory points picked up formerly on the site were obtained from Mr. Lawrence. They are handsomely barbed on one side and show a high grade of skill. They must have come from the Bering Sea and may belong to the old fine ivory culture of the western part of that region, of which more later.

There are also some fairly ancient sites farther down the river (see Narrative), but just what they are and how old remains to be determined.

A report on the archeological remains from the bank of Bonasila by Mr. H. W. Krieger, one of the curators

of the Department of Anthropology, United States National Museum, follows:

ARCHEOLOGY OF CENTRAL ALASKA

Ancient Stone Culture

"Until the results of Doctor Hrdlička's Alaskan reconnaissance were first made known to science it had been generally assumed that Alaskan and Canadian subboreal regions were archeologically barren. It had been currently accepted that only as one approached the great river valleys of the Skeena, the Fraser, and the Columbia could anthropological exploration be conducted to advantage. One might expect to uncover cemeteries and ancient village sites only there where a dense and sedentary population had long been established. Through the discovery of ancient village sites and centers of population in the lower and middle Yukon River Valley, Doctor Hrdlička has extended the northern archeological horizon into the sub-Arctic.

"Of the many sites examined, the old village site at Bonasila, 18 miles below the confluence of the Anvik and Yukon Rivers, yielded the most interesting data. Crudely flaked implements of trap rock with cutting edges showing evidence of chipping and grinding were uncovered. These implements are unique among Alaskan artifacts and have no relationship with known types of Eskimo or Indian stonework. In the shaping technic employed by their aboriginal

makers; in form, and in type; and, generally, in their undeveloped character, the stone artifacts from Bonasila and other ancient archeological sites on the middle Yukon may be classified as primitive neolithic.

"The stone implements uncovered at Bonasila are so crudely fashioned and are apparently of such an improvised nature as to suggest an extreme conservatism in culture development, or perhaps a degeneration, due largely to lack of better materials. Due to the lack of basalt, jadeite, or other hard stone in the valley of the lower middle Yukon, recourse was had to sandstone and trap rock by the primitive makers of stone axes and celts.

"Crude pottery vessels and potsherds were discovered associated with the objects of stone. This ware incorporates elementary decorative designs distinct from the known historic Eskimo or Indian types of pottery decoration. There can be no intimation that this ware is archaic or that it belongs to any archaic culture offshoot from farther south. It therefore becomes a question of some unknown earlier Asiatic culture connection that manifested itself in crude forms of flaked and ground stone implements and in unique pottery forms. It is uncertain that the ancient fossil ivory culture of northwest Alaska, of which Doctor Hrdlička has brought in some excellent examples, is in any manner associated with the primitive neolithic stone and pottery forms uncovered at Bonasila. It is established, however, beyond a doubt that both cultures and types of artifacts are Asiatic in origin and have little or no connection with the culture of the western Eskimo.

"The Eskimos of the lower Yukon Valley made extensive use of slate and of jadeite in the production

of their polished knives and celts. Slate knives and polished celts of jadeite are characteristic of Eskimoan culture throughout the whole of its extent in Alaska. Each of these materials as well as the finished products shaped from them were subjects of native barter. Eskimos often undertook long journeys for their procurement. It is therefore noteworthy that no single object fashioned from slate or jadeite and but few points of fossilized ivory were recovered at any of the sites characterized by the primitive stone culture and pottery of the Bonasila type.

"The most characteristic finds at Bonasila are the crudely flaked implements of stone, some of which show incipient chipping and grinding. The coarse type of pottery is unlike that of the modern Eskimo in tempering, firing, and decorative design.

"The stone culture of the site, although rich in forms, is deficient in technical development and is scarcely worthy of being classed as neolithic. There were found in numbers the following types of artifacts: Circular, discoidal stone pebbles with rim fractures due to use; river wash pebbles of irregular form used as improvised scrapers and hammerstones; basaltic, discoidal hammerstones with abraded edges and pitted at the center; large flake saws of trachyte (trap rock) triangular in section but provided with sharply fractured cutting edges; slender flaked fragments of trap rock tapered to the form of wedges with intentionally worked end sections and cutting edges; crudely flaked stone knives with evidence of secondary chipping at cutting edges; other knives of thin slabs of trap rock with flaked and bilaterally ground beveled cutting edges; oblong axes of flaked sandstone with hafting notches struck off at the edges midway from the base; abrading tools of

sandstone; celts of sandstone with ground and beveled working edge and notched for hafting as an ax; stone scrapers with ground and beveled cutting edges; fragmentary perforators of stone; re-chipped, flaked knives shaped by grinding; roughly worked, multiple-grooved hammers or mauls; and many stone objects unformed and unworked but classified generally as hammerstones.

THE POTTERY

"About a hundred pottery shards and smaller pottery vessels were recovered from the site at Bonasila. Pottery vessels representative of the Bonasila culture were shaped out of the solid and show no trace of coiling. In this respect they conform to the generalized north Asiatic and Eskimo ware. There is, however, no check stamp decorative design that is applied with a paddle by the Eskimo nor evidence that pottery vessels had been built up about a basketry base. The paste is light buff or gray in color, the buff ware being better fired and of the same color on the inside, while the gray ware is either gray or black on the inner surface. A well-defined unfired area covers one-half of the sectional diameter. Both buff and gray wares show evidence of better firing than in modern Eskimo pottery. Tempering is of coarse fragments of steatite, which is much more durable than tempering materials such as blood, feathers, and ashes formerly employed by the primitive Eskimo potter.

"The pottery from Bonasila is utilitarian and consists of shallow spherical lamps, globose bowls, and cooking pots without feet or bases. The ware is coarse, side walls and bottom varying from 1 to 2 centimeters in sectional thickness. This type of

pottery is practically duplicated in shards recovered by Doctor Hrdlička from what is now Eskimo territory in the Yukon Valley near the Russian Mission. It is probable that further search would bring to light an extensive region yielding this type of ancient pottery of distinctive design and unrelated either to Tinné or Eskimo ware.

"Decorative attempts consist of bold incised parallel transverse lines on the upper sector of the outer surface of the vessel. Deep corrugations appear on the inside of the rim flare. Both corrugations and incised line decorations were made with a paddle or wood splinter shaped for the purpose. Some of the shards have deeply incised punctations irregularly encircling the outer surface of the vessel just below the rim extension.

"Shallow spherical pottery lamps accompanied surface burials at Bonasila. These lamps have a less durable tempering material than the other pottery fragments recovered. The paste is porous and is poorly fired. Decorative designs incised on the interior surface of the lamps are reminiscent of typical Eskimo punctate designs as traced on the inner circumference of rectilinear or curvilinear etchings on ivory and bone. It is very probable that these pottery lamps are of a later date and are of Eskimoan handicraft.

THE ALASKAN GROOVED STONE AX
[Pl. 10]

"The grooved stone ax is a typical New World implement. Its distribution is limited to tribes of the eastern maize area, the Pueblo tribes of the Southwest, the Athapascans, and the northern

woodlands tribes. Elsewhere in America grooved stone implements of any description are rare, although not unknown. The groove for the attachment of cord or sinew binding is common also to the stone adze, which is characteristic of Indian tribes of the Pacific Northwest and of the Eskimo of Arctic America. The distribution of the stone adze is more intensive but is much less extensive than is that of the grooved stone ax and appears to be an environmental form borrowed from the Arctic tribes by the Indian of southeast Alaska and of British Columbia.

"The double-bitted, multiple-grooved stone ax has two areas of distribution in North America. One of these is the country of the northeastern woodlands Indians, extending as far south as the Central Atlantic States. The other area of distribution is the extreme northwest, or the mainland of Alaska.

"In the collection brought to the National Museum from Alaska by Doctor Hrdlička are eight grooved stone implements. All but one of these have cutting edges for use as axes or adzes. The exception, Cat. No. 332809, U.S.N.M., is a grooved spherical stone maul or club 9.5 centimeters (3.7 inches) long and 7.5 centimeters (2.9 inches) in sectional diameter. This grooved object was found near Tanana on the beach of the Yukon River. Like the grooved stone axes in Doctor Hrdlička's collection, the groove is incomplete. A flattened space of approximately 2 centimeters is left un-grooved for the hafting of a flat surfaced handle end with binding, which is passed around the transverse groove and then through a hole in the wooden handle.

"Three single-grooved, double-bitted stone axes were collected from various points on the Yukon River.

These are of interest because of their similar grooving and double cutting edges. Each is identical in form, each has been shaped by pecking, except in the sector near the cutting edges where they have been sharpened and polished by grinding. Between the raised borders of the centrally pecked groove and the cutting edges the surface has been shaped to a slight concavity by pecking. In Cat. No. 332805, U.S.N.M., this concavity is replaced by a well-defined convex bevel. The pecked groove is at right angles to the longitudinal axis and is comparatively shallow but has a wide diameter of 2 centimeters or more. The material is uniformly of basalt. The axes are 20 centimeters or more long, while the sectional diameter varies from 6 to 10 centimeters according to whether the ax is flattened or oval in section.

"Grooved, double-bitted stone axes similar to those collected by Doctor Hrdlička from the Middle Yukon region have since become known also from stations farther south in Alaska. One was plowed up in a field near Matanuska and is now in the chamber of commerce exhibit at Anchorage, while another was collected in 1927 by the writer from near Chitna, Alaska. This Alaskan type of grooved ax is practically identical with that of the central Atlantic seaboard States, as figured by Walter Hough in the Proceedings of the United States National Museum, volume 60, article 9, page 14.

"Another grooved type of stone object brought to the National Museum by Doctor Hrdlička is a stone war club of unusual type. It was found on the Yukon River beach 1½ miles below the Mission at Tanana. It is 20 centimeters (7.9 inches) long and is slender, the maximum sectional diameter being but 3.5 centimeters (1.4 inches). Like the single-grooved

axes, it was shaped by pecking, but much of the surface was also ground. The reverse or hafting surface is flat; the obverse is convexly tapered to sharp cutting edges which are at right angles to the haft. The material is basalt. The hafting grooves, two in number, are comparatively deep and closely spaced. As to form this stone weapon is unique, appearing, so far as is known to the writer, nowhere else on the American Continent. It has been entered on the records of the National Museum as Cat. No. 332807, U.S.N.M.

"One form of the double-bitted, multiple-grooved stone axes resembles closely ivory forms made from walrus tusks in the Bering Sea region. This form also gives evidence of secondary modification, specimens having been broken intentionally to reduce the tool to a simple adze. The material is basalt and its range in the north is limited to the Eskimo area, but becomes widespread to the south in southeastern Alaska and in British Columbia. The form of this widely diffused stone adze is approximated in a series of broken stone axes collected by Doctor Hrdlička. Two such broken and originally double-bitted axes, Cat. Nos. 332806 and 332810, U.S.N.M., were collected from the banks of the Yukon at an old village site below Anvik. These axes are broken with a crude irregular fracture just above the upper transverse groove. Another stone ax, Cat. No. 332812, U.S.N.M., is from Ruby, Alaska, and is practically identical with the double-bitted but single-grooved stone ax from Tanana.

"It would appear from this brief presentation that there is a remarkable similarity of form, approaching identity, in the ancient stone axes from the river valleys of central Alaska. Whether the particular ax

has one cutting edge or is double-bitted; whether it is provided with one or with two parallel transverse hafting grooves, the general identity of form remains. The striking thing about the presence of the double-bitted ax among archeological finds from central Alaska is that we do not find it represented in such numbers anywhere until it again reappears in the Atlantic seaboard States. The very interesting cultural objects discovered by Doctor Hrdlička and supplemented by my collection in 1927 show that Alaska is far from sterile or fully known archeologically and make further exploration both promising and important."

ANTHROPOLOGY OF THE YUKON

Notes on the physique of the Yukon natives are found in the reports of all the explorers of the river, but they are imperfect and of little scientific value; the principal ones are given below.[26] Anthropometric observations on the living people of the middle and lower Yukon, with its tributaries, are nonexistent.[27] As to crania, there are a few measurements on two "Yukon Indian" skulls (No. 7530, and probably No. 7531), and on three crania of the Yukon Eskimo, by Jeffries Wyman (Proc. Bost. Soc. Nat. Hist., 1868, XI, 452); on one "Ingaleet" and three "Mahlemut" or Norton Sound Eskimo skulls by George A. Otis (List of Specimens, etc., 35); and on four skulls collected by Dall, one from Nulato and the rest presumably from St. Michael, by Hrdlička (Catal. of Crania, p. 30, Nos. 242925, 242899, 242901, 242936).

FOOTNOTES:

[26] Glazunof (Wrangell, Stat. und Ethnog. Nachr., 146-147): "The men are big, brunette, with bristly black hair."

Zagoskin (pt. II, 61-62): "The Tinneh belong in general to the American family of redskins, but marked external differences are perceptible in those who are mixed with the Eskimo. The

Tinneh are of medium stature, rather dry but well shaped, with oblong face, forehead medium, upright, frequently hairy, nose broad and straight, hooked, eyes black and dark brown, rather large * * * expression intelligent, in those of more distant tribes somber, roving; lips full, compressed; teeth white, straight; hair straight, black to dark brown, fairly soft; many of the men hairy over the body and with fairly thick, short mustache and beard; hands and feet medium, calves small; in general lively, communicative, cheerful, and very fond of pleasure and song."

Dall, William H., Alaska and Its Resources, 53-54: "The Ingaliks are, as a rule, tall, well made, but slender. They have very long, squarely oval faces, high, prominent cheek bones, large ears, small mouths, noses, and eyes, and an unusually large lower jaw. The nose is well formed and aquiline, but small in proportion to the rest of the face. The hair is long, coarse, and black, and generally parted in the middle. * * * Their complexion is an ashy brown, perhaps from dirt in many cases, and they seldom have much color. On the other hand, the Koyúkuns, with the same high cheek bones and piercing eyes, have much shorter faces, more roundly oval, of a pale olive hue, and frequently arched eyebrows and a fine color. They are the most attractive in appearance of the Indians in this part of the territory, as they are the most untamable. The women especially are more attractive than those among the Ingaliks, whose square faces and ashy complexion render the latter very plain, not to say repulsive." (Some of these statements were evidently somewhat in error. —A. H.)

Schwatka, F. (Milit. Reconn. (1883), Comp.

Narr. Explor. Alas., 350): "As regards these Ingaliks as a class, they are, as a rule, of average height, tolerably well built, but slender, differing in this respect from the natives farther down the river. They have long black hair and a complexion brown by nature, but often verging toward black on account of a liberal covering of dirt."

See also Richardson, J. (Arctic Search. Exp., I, 379). Jones, S., The Kutchin Tribes (Smiths. Rept. for 1866, 320-327). Whymper, F., Travel and Advent., etc.; and later writers (including Bancroft's "Native Races," etc., I, 127 et seq.).

[27] Ten (8 m. 2 f.) Loucheux, or Kucha-Kuchin, from the upper Yukon, were measured by A. J. Stone and reported by F. Boas (Bull. Am. Mus. Nat. Hist, New York, vol. XIV, pp. 53-68, 1901).

The Living Indian

Notes on the living Indians of the Yukon have already been given in the Narrative. They will be briefly summarized in this place. Measurements of the living were impracticable during the journey.

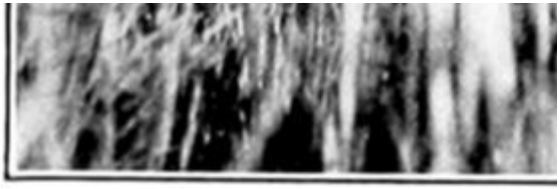

TANANA
INDIAN
ALASKA



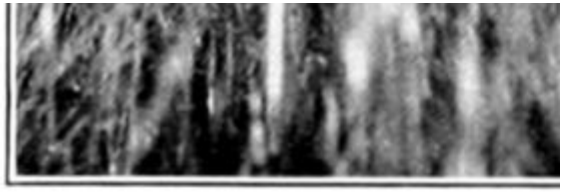
Tanana Indian Woman

BUREAU OF AMERICAN ETHNO









Chief San Joseph,

BUREAU OF AMERICAN ETHN



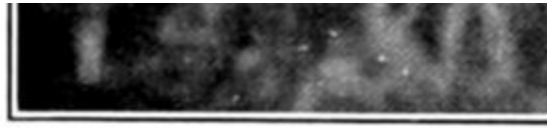
a. **Jacob and Andrew, Yukon Indian**



b**, Yukon In**

BUREAU OF AMERICAN ETHN





***a*, Marguerite John**





***b*, Lucy John, Koyuku**

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXTH A
PLATE 17





***a*, George Halfway, Nulato, on the Yukon. (A. I**





***b*, Jack Curry, of Nulato, 41 years old. (Now at Ruby, Eskimoid physiognomy)**

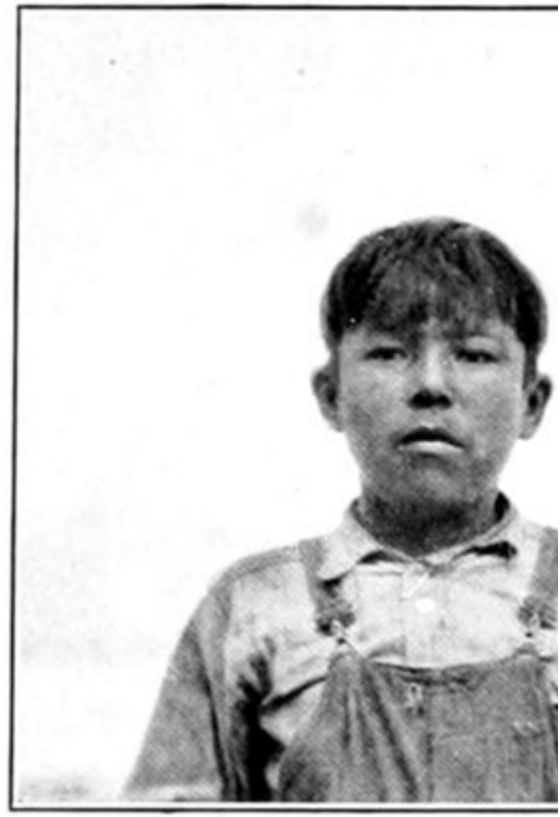




c, Arthur Malamvot, of Nulato

Yukon Indians

BUREAU OF AMERICAN ETHN



a, Indian children, Mis



***b*, Indian children, Mis**









***c*, Two women of A**

Pure bloods.—The Yukon Indians are a sparse and largely mixed population. The mixture is especially evident in the children and the younger generation. It is mainly that with whites, but in the lower settlements there is also a good deal of older mixture with the Eskimo. There is fortunately as yet no Negro admixture.

General type.—The full bloods are typically Indian, though not of the pronounced plains type. The type is fairly uniform, but there is not seldom, even up the river, as elsewhere in Alaska, a suggestion of something Eskimoid in the physiognomy.

Color.—The color in general is near medium brown, ranging to lighter rather than darker. The hair is the usual full black of the Indian.

Stature and strength.—- The stature and build are generally near medium, rather slightly below than above.

Head form.—The head is generally moderately rounded high meso- to moderately brachycephalic. The face is medium Indian.

Body.—The body proportions seldom impress one with unusual strength, yet some of the men are by no means weaklings. The most fitting term by which to characterize conditions in this respect is again "medium," with an occasional deviation one way or the other.

Photographs.—The accompanying photographs, taken by the writer from Tanana to Anvik, show a few of

the physiognomies. Some of the girls and women, as well as boys and men, are quite good looking. (Pls. 13-18.)

From Anvik downward along the river the type of the people becomes plainly more Eskimoid and on the whole more robust. But as one can frequently meet farther up the river individuals who remind one more or less of the Eskimo, so here it is frequent to see faces that look like Indian. Whether due to old mixture or to other reason, the fact is that there is no line of somatological demarcation in the living populations of the river, and the same applies, as will be seen later, to the skulls.

Skeletal Remains of the Yukon

The first Yukon Indian skull measured was that of a half-chief of the Nulato group, collected in the early sixties by William H. Dall. There are now three records of this skull, originally and again now a Smithsonian specimen, one in Wyman ("Observations on Crania," Proc. Bost. Soc. Nat. Hist., 1868, XI, 452, No. 7530), one in the Otis "Catalogue" (35, No. 259), and one in Hrdlička's "Catalogue of Human Crania in the United States National Museum Collections" (p. 30, No. 242925). It is a normal, well-developed male skull, which gives no suggestion of mixture. The true measurements of this "type" specimen, taken by present-day instruments and methods, are as follows:

Yukon Indian skull No. 242925

Vault:		
Length		
	cm	
		18.4

Breadth	
cm	
	14
Height to bregma	
cm	
	13.8
Cranial index	
	76.1
Mean height index	
	85.2
Height-breadth index	
	98.6
Cranial module (mean diameter)	
cm	
	15.40
Cranial capacity	
c. c.	
	1,520
Face:	
Menton-nasion (teeth but slightly worn)	
cm	
	12.1
Alveolar point-nasion	
cm	
	7.3
Diameter bizygomatic maximum	
cm	
	14
Facial index, total	
	86.4
Facial index, upper	

		52.1
Facial angle		
		69°
Alveolar angle		
		53.5°
Orbits:		
Right—		
Height		
	cm	
		3.25
Breadth		
	cm	
		4.2
Left—		
Height		
	cm	
		3.45
Breadth		
	cm	
		4
Mean index		
		81
Nose:		
Height		
	cm	
		5.1
Breadth		
	cm	
		2.5
Index		
		49

Upper alveolar arch:		
Length		
	cm	
		5.7
Breadth		
	cm	
		6.7
Index		
		85.1
Basio-facial diameters:		
Basion-alveolar point		
	cm	
		10.6
Basion-subnasal point		
	cm	
		9.4
Basal-nasion		
	cm	
		10.5

The skull is seen to be mesocephalic, rather high, and of good brain capacity; the face is of medium Indian proportions; the orbits are unequal, rather low; the nose is of medium height and breadth; the upper dental arch, the basic-facial diameters, and the facial and alveolar angles, are all near medium Indian.

There was another Indian skull in the five Wyman reported, but its identity is uncertain. A later collection by Dall included three Indian female crania from Alaska, but their exact provenience is uncertain; their measurements are given in my catalogue.

On the 1926 trip I succeeded in collecting directly from the burials along the lower middle Yukon 17 adult skulls and skeletons. Such material is both scarce and difficult to obtain, due to the attitude of the Indians. All the specimens in the collection are from the Russian times on the river. A few of the skulls show traces of Eskimoid in their features, but none offer a suspicion of a mixture with the whites. The measurements are given below. They partly agree, partly disagree, with those of the Nulato skull. The vault, the breadth of the nose, the dimensions of the dental arch, are much alike, but the height of the face, nose, and orbits in the Nulato specimen is somewhat lower. These may be tribal but also simply individual differences. We may generalize by stating that the lower middle Yukon Indian was mesocephalic, with a fairly high vault, and moderate capacity. The face was of relatively good height but moderate breadth, resulting in a high upper facial index. Facial and alveolar prognathism and other features approach the prevalent Indian medium.

LOWER MIDDLE YUKON INDIAN CRANIA
SEX: MALE
Catalogue No.
Collection
Locality
Approximate age of subject
Vault: Diameter antero-posterior maximum (glabella ad maximum)
Diameter lateral maximum
Basion-bregma height
Cranial index

Mean height index		
Height-breadth index		
Cranial module		
Capacity, in c. c. (Hrdlička's method)		
332512		
A. Hrdlička		
Magi (Bonasila)		
Adults		
		18.4
		13.8
		14.0
		75.0
		87.0
		101.4
		15.40
		1,480
332517		
	do	
Ghost Creek, near Holy Cross.		
	do	
		18.1
		13.8
		13.4
		76.2
		83.8
		97.1
		15.10
		1,375
332514		
	do	
	do	

	do	
		18.0
		13.9
		14.0
		77.2
		87.5
		100.7
		15.30
		1,425
332503		
	do	
Greyling River (above Anvik).		
	do	
		[28](17.3)
		(13.4)
		(12.7)
		77.5
		82.5
		94.8
		(14.47)
		(1,220)
332507		
	do	
Ghost Creek		
	do	
		18.2
		14.1
		13.2
		77.5
		81.5
		93.6
		15.17

		1,480
332526		
	do	
	do	
	do	
		18.5
		14.4
		13.7
*77.*8		
		83.5
		95.1
		15.53
339752		
H. W. Krieger		
	do	
	do	
		17.5
		13.9
		13.5
		79.4
		86.0
		97.1
		14.97
		1,515
332502		
A. Hrdlička		
	do	
	do	
		17.8
		14.2
		13.3

		79.8
		83.1
		93.7
		15.10
		1,370
	(7)	
	(7)	
	(7)	
	(*7*)	
	(*7*)	
	(*7*)	
	(7)	
	(6)	
Total		
		126.5
		98.1
		95.1
		106.57
		8,645
Average		
		18.07
		14.01
		13.59
		77.5
		84.7
		96.9
		15.22
		1,441
Minimum		
		17.5

	13.8
	13.2
	75.0
	81.5
	93.6
	14.97
	1,370
Maximum	
	18.5
	14.4
	14.0
	79.8
	87.5
	101.4
	15.53
	1,515

Catalogue No.
Teeth: Wear menton-nasion height (a)
Alveolar point-nasion height (b)
Diameter bizygomatic maximum (c)
Facial index, total $\frac{(a \times 100)}{c}$
Facial index, upper $\frac{(b \times 100)}{c}$
Basion-alveolar point
Basion-subnasal point
Basion-nasion
Facial angle

Alveolar angle
Height of symphysis
332512
[28]12.3
7.5
13.4
91.8
56
10.2
8.9
10.2
68.5
51
3.9
332517
7.4
13.4
55.2
10.2
8.9
9.7
64.5
51.5
4
332514
[29]13
7.7
13.3
97.7
57.9
10.2

	9.4
	10.4
	69
	63.5
	4.5
332503	
	[30]12.8
	8.1
	13.6
	94.1
	59.6
	10.5
	9.5
	10.4
	66.5
	59.5
	3.7
332507	
	[31]
	14.1
	8.6
	10
	3.7
332526	
	10.4
332552	
	[32]
	13.6
	8.8

	10.1
	3.8
332502	
	[28]13
	8.1
	14.1
	92.2
	57.4
	10.4
	9.2
	9.7
	62
	53
	4.2
	(4)
	(5)
	(5)
	(*4*)
	(*5*)
	(5)
	(7)
	(8)
	(5)
	(5)
	(7)
Totals	
	51.1
	38.8

	67.8
	51.5
	63.3
	80.9
	27.8
Averages	
	12.78
	7.76
	13.56
	93.9
	57.2
	10.3
	9.04
	10.11
	66
	55
	3.97
Minimum	
	12.3
	7.4
	13.3
	91.8
	55.2
	10.2
	8.6
	9.7
	62
	51
	3.7
Maximum	
	13

	8.1
	14.1
	97.7
	59.6
	10.5
	9.5
	10.4
	69
	63.5
	4.5
	(7)
Totals	
	95.5
Averages	
	13.64
Minimum	
	13.3
Maximum	
	14.1

[33]

Catalogue No.

Orbits: Height, right, left	
Breadth, right, left	
Orbital index, mean	
Nose: Height	
Breadth, maximum	
Nasal index	
Palate: external length (a)	
External breadth, maximum (b)	
Palatal index (b × 100) a	

332512

	3.65
	3.65
	3.8
	3.8
	96
	5.3
	2.55
	48.1
	5.5
	6.4
	85.9

332517

	3.35
	3.45
	3.9
	3.8
	88.3
	5
	2.6

52
5.6
6.5
86.2

332514

3.5
3.5

3.7
3.7

94.6
5.5
2.3
41.8
5.3
7
75.7

332503

3.65
3.6

4
3.95

91.2
5.7
2.45
43
5.4
6.3
85.7

332507

3.75
3.7

	3.85
	3.95
	95.5
	5.2
	2.5
	48.1

332526

332552

	3.5
	3.5
	3.9
	3.9
	5.35
	2.5

332502

	3.45
	3.4
	4.15
	4
	84
	5.8
	2.95
	50.9
	5.9
	6.5
	90.8

Right

(7)
(7)

	(7)
Left	
	(7)
	(7)
	(7)
	(7)
	(7)
	(7)
	(5)
	(5)
	(*5*)
Totals	
	r. 24.85
	l. 24.80
	27.30
	27.10
	37.85
	17.85
	27.7
	32.7
Averages	
	r. *3.55*
	l. *3.54*
	3.90
	3.87
	91
	91.5
	5.41
	2.55

	47.2
	5.54
	6.54
	84.7
Minimum	
	r. 3.35 l. 3.4
	3.7 3.7
	5
	2.3
	41.8
	5.3
	6.3
	75.7
Maximum	
	r. 3.75 l. 3.7
	4.15 4
	5.8
	2.95
	52
	5.9
	7
	90.8

SEX: FEMALE
Catalogue No.
Collection
Locality
Approximate age of subject

Vault: Diameter antero-posterior maximum (glabella ad maximum)	Diameter lateral maximum	Basion-bregma height	Cranial index	Mean height index	Height-breadth index	Cranial module	Capacity, in c. c. (Hrdlička's method)
332506							
A. Hrdlička							
Magi (Bonasila)							
Adult							
							18.2
							13.4
							13.1
							73.6
							82.9
							97.8
							14.90
							1,400
332520							
	do						
Ghost Creek							
	do						
							17.9
							13.2
							12.7
							73.7
							81.4
							96.2

		14.60
		1,335
332508		
	do	
Magi		
	do	
		17.2
		12.8
		13.1
		74.4
		87.3
		102.3
		14.37
		1,225
332519		
	do	
Ghost Creek		
	do	
		16.2
		12.3
		12.3
		75.9
		86.6
		100.0
		13.60
		1,070
332510		
	do	
Magi		
	do	
		17.6
		13.5

		13.2
		76.7
		84.6
		97.8
		14.77
		1,375
332504		
	do	
	do	
	do	
		17.9
		13.8
		13.5
		77.1
		85.4
		97.8
		15.07
		1,355
332525		
	do	
Ghost Creek		
	do	
		17.4
		13.5
		12.5
		77.6
		81.2
		92.6
		14.47
		1,260
332525		

	do	
Magi		
	do	
		17.2
		13.4
		12.6
		77.9
		82.4
		94.0
		14.40
		1,230
332522		
	do	
Novi River		
	do	
		16.7
		13.4
		12.8
		80.2
		85.3
		95.5
		14.30
		1,210
339751		
H. W. Krieger		
Magi		
	do	
		16.4
		13.4
		12.6
		81.7
		84.6

	94.0
	14.13
	1,210
(10)	
(10)	
(10)	
(*10*)	
(*10*)	
(*10*)	
(10)	
(10)	
Totals	
	172.7
	132.7
	128.4
	144.6
	12,670
Averages	
	17.27
	13.27
	12.84
	76.8
	84.1
	96.8
	14.46
	1,267
Minimum	
	16.4
	12.3

	12.3
	73.6
	81.2
	92.6
	13.60
	1,070
Maximum	
	18.2
	13.8
	13.5
	81.7
	87.3
	102.3
	15.07
	1,400

Catalogue No.
Teeth: Wear menton-nasion height (a)
Alveolar point-nasion height (b)
Diameter bizygomatic maximum (c)
Facial index, total **(a × 100)** **c**
Facial index, upper **(b × 100)** **c**
Basion-alveolar point
Basion-subnasal point
Basion-nasion
Facial angle

Alveolar angle
Height of symphysis
332506
[34]12.1
7.5
12.7
95.3
59.1
9.9
8.8
-10
-69
-54
3.8
332520
6.9
13.3
51.9
10.6
9.4
9.7
-63
-52
332508
[35]10.8
-7
12.6
85.7
55.6
9.6
8.5

	9.9
	-71
	-51
	-3
332519	
	6.7
	12.1
	55.4
	9.3
	7.8
	8.8
	64.5
	42.5
332510	
	+11.6
	-7
	-12
	96.7
	58.3
	9.7
	8.4
	9.5
	-67
	-51
	3.7
332504	
	[34]13.1
	-8
	13.6
	91.8
	56

	10.4
	9.1
	10.5
	-68
	54.5
	3.9
332525	
	[36]
	12.9
	8.7
	9.9
	3.6
332505	
	[37]11.8
	6.8
	12.8
	92.2
	53.1
	9.5
	8.4
	9.6
	-70
	-51
	3.7
322522	
	7.1
	13.3
	54.1
	9.2
	8.6
	-10

	74.5
	-64
332751	
	[38]11
	6.7
	13.1
	-84
	51.1
	9.6
	8.5
	9.3
	-67
	48.5
	3.35
(6)	
(9)	
(10)	
(*6*)	
(*9*)	
(9)	
(10)	
(10)	
(9)	
(9)	
(7)	
Totals	
	70.4
	63.7

	128.4
	87.8
	86.2
	97.2
	25.05
Averages	
	11.73
	7.08
	12.84
	91.7
	55.1
	9.76
	8.62
	9.72
	-68
	-52
	3.58
Minimum	
	10.8
	6.7
	-12
	-84
	51.1
	9.2
	7.8
	8.8
	-63
	42.5
	-3
Maximum	
	13.1

	-8
	13.6
	96.7
	59.1
	10.6
	9.4
	10.5
	74.5
	-64
	3.9

Catalogue No.	332506
Orbits: Height, right, left	3.55 3.6
Breadth, right, left	3.8 3.8
Orbital index, mean	*94.1*
Nose: Height	5.5
Breadth, maximum	2.2
Nasal index	
Palate: external length (a)	
External breadth, maximum (b)	
Palatal index (b × 100) a	

40
5.2
6.1
85.2

332520

3.3
3.4
3.7
3.7
90.5
4.75
2.4
50.5
5.4
6
90

332508

3.7
4
92.5
5.2
2.5
48.1
5.2
5.8
89.7

332519

3.4
3.5

3.7
3.65
93.9
4.7
2.3
48.9
5.4
5.5
98.2

332510

3.3
3.2
3.55
3.55
91.6
4.7
2.3
48.9
5.3
6.4
82.8

332504

3.7
3.65
3.95
4.05
91.9
5.4
2.15
39.8
5.7
6.7

	85.1
332525	
	———
	3.25
	———
	3.8
	85.5
	5.15
	2.2
	42.7
332505	
	3.8
	3.6
	3.95
	3.85
	94.0
	4.9
	2.35
	48
	5.3
	5.8
	91.4
332522	
	3.7
	3.6
	3.95
	3.95
	92.4
	5.45
	2.3
	42.2

	5
	6.6
	75.8

332751

	3.1
	3.2
	3.8
	3.7
	84
	5
	2.4
	48
	5.3
	6.5
	81.5

Right

(9)
(9)
(*9*)

Left

(9)
(9)
(*9*)
(10)
(10)
(*10*)
(9)
(9)

(*9*)
Total
r. 31.55 l. 31
34.4 34.05
50.75
23.1
47.8
55.4
Average
r. *3.51* l. *3.44*
3.82
3.78
91.7
91
5.07
2.31
45.5
5.31
6.16
86.3
Minimum
r. 3.1 l. 3.2
3.55 3.55
4.7
2.15
39.8
5

	5.5
	75.8
Maximum	
	r. 3.8
	l. 3.65
	4
	4.05
	5.5
	2.5
	50.5
	5.7
	6.7
	98.2

FOOTNOTES:

[28] Premature occlusion of sagittal and subdevelopment of vault; probably a moron, facial and skeletal parts all normal.

[29] Medium.

[30] Slight.

[31] Moderate.

[32] Cons.

[33] Unknown; all lost.

[34] Slight.

[35] Cons.

[36] Medium.

[37] Moderate.

[38] U. medium; l. moderate

Skeletal Parts

There are seven adult skeletons of males and seven of females. For present purposes it will suffice to take the males alone and to restrict consideration to the long bones. The essential data on these are given on page 160, where they are contrasted with those of North American Indians in general, and with those of the western Eskimo.

The bones show both relations to as well as differences from the bones of Indians in general and fair distinctness from those of the Eskimo.

Contrasted with the long bones of miscellaneous North American tribes taken together, the Yukon Indian bones show absolutely slightly shorter humerus (or arm), somewhat shorter radius (or forearm), a slightly shorter femur (or upper part of the leg), and a plainly shorter tibia. These Indians had therefore relatively somewhat shorter forearm and especially the leg below the knees than their continental cousins. These facts are plainly evident from the radio-humeral and tibio-femoral indices of the two groups. In this relative shortness of the distal parts of the limbs the Yukon Indian approaches the Eskimo, standing near midway between the Indian in general and the Eskimo. There might be a ready temptation to attribute this to a mixture with the Eskimo; but an examination of the records will show that the same condition, so far at least as the upper limb is concerned (lower?), is already present in the old Bonasila skeleton, which gives no suggestion of an Eskimo mixture. It is more likely, therefore, that these are generalized characteristics of functional origin such as a considerable use of the small canoes. This view seems to be supported by the relative strength of the bones. In the Yukon Indian the humerus is stouter, the femur of the same strength,

and the tibia very perceptibly weaker than they are in Indians in general. In the Eskimo, with even greater dependence on the canoe, both the humerus and the femur are notably stouter, while the tibia is weaker, than are similar bones in the Indians in general.

The humero-femoral index in the Yukon Indians is unusually high, indicating a relative shortness of the femur. This character is not present in the Eskimo, nor in the continental Indian. It is probably also of old functional origin, though, this for the present must remain a mere suggestion.

All of this shows clearly the interest and value of other skeletal parts than the skull, and particularly of the long bones, for anthropological studies.

Skeletal Remains from the Bank at Bonasila

The skeletal material from the bank at Bonasila consists now of portions of three adult skulls, one male and two females, and of 13 bones of the male skeleton. All the specimens are more or less stained by manganese and iron and all are distinctly heavier than normal, showing some grade of fossilization. They closely resemble in all these respects the numerous animal bones from the bank and in all differ from the later surface burials of the place.

THE CRANIA

The male skull, No. 332513, is represented by the frontal bone united with a larger part of the face, a separated left temporal, and the right half of the lower jaw. A large Inca bone, recovered from the

beach a year later, may also belong to the same specimen. The missing parts are probably still somewhere in the sands of the beach where there is going on a very instructive scattering and redeposition on a 4 to 6 feet lower level of the contents of the old bank.

The skull is that of a male of somewhat over 50 years of age, judging from the moderate to marked wear of the remaining teeth. It is a normal undeformed specimen, and the same applies to the bones of the skeleton.

Notes and measurements.—The frontal shows a medium development, no slope. The supraorbital ridges are rather weakly developed for a male, leaving the upper borders of the orbits rather sharp.

	Cm.
Diameter frontal minimum	9.75
Diameter frontal maximum	11.8
Diameter nasion-bregma	11.5

The skull as a whole was evidently mesocephalic, and neither low nor very high. The thickness of the frontal is about medium for an Indian.

The face is of medium proportions and strength, with rather large orbits, good interorbital breadth, medium malars, medium broad nose, and but moderate alveolar prognathism. The nasal bridge is not high, nasal bones fairly broad, spine moderate, lower borders well defined though not sharp. The sub-malar (canine) fossae are shallow.

Measurements

Alveolar point-nasion height

cm

7.8

Facial breadth about medium for an Indian.

Nose:

Height

cm

5.5

Breadth, near

cm

2.75

Index

50

Left orbit:

Height

cm

3.75

Breadth

cm

4

Index

93.7

Minimum interorbital distance

cm

2.6

Upper dental arch:

Length, approximately

cm

5.6

Breadth, approximately

	cm
	7
Index, approximately	
	80
Lower jaw:	
Height at symphysis approximately	
	cm
	4.1
Thickness at M_2 (with the tooth held midway between branches of compass)	
	cm
	1.5
Height of asc. ramus	
	cm
	6.9
Breadth minimum of asc. ramus	
	cm
	3.7

The condyloid process of the lower jaw is high, mandibular notch deep. The whole jaw is strong but not thick or massive. It is Indianlike, not Eskimoid, in all its features. The teeth are of good medium size.

Skull No. 333383.—Of this skull I brought the right parietal with about one-third of the frontal; Mr. Krieger, a year later, the remainder of the frontal. Other parts are missing.

The specimen was evidently, a good-size female skull, normal, undeformed, probably mesocephalic in form, and moderately high. The thickness of the bones is not above moderate.

Cm.

Diameter frontal minimum
9.7
Diameter frontal maximum
12.5
Diameter nasion-bregma
11.1

Skull No. 333950.—Of the third skull, recovered from the sands of the beach at low water in 1927 by Mr. Lawrence, there are only the two parietals. The specimen is that of a young adult female. The bones, rather submedium in thickness, indicate a skull of slightly smaller size and slightly shorter than the preceding but of much the same general type.

The skeletal parts of male No. 332513.—Humeri: The long bones all give the impression of straightness, length, and of a certain gracility of form combined with strength, but without massiveness. The right humerus presents a small but distinct supracondylar process, a rarity among Indians. The fossae are not perforated. Measurements:

Length, maximum:
Right
cm
35.8
Left
cm
35.3
Major diameter at middle:
Right
cm
2.5
Left

cm

2.4

Minor diameter at middle:

Right

cm

1.65

Left

cm

1.6

Index at middle:

Right

66

Left

66.7

Type of shaft at middle, prismatic:

Right

cm

1

Left

cm

1

Right radius:

Length, maximum, near

cm

27

Radio-humeral index, approximately

75.5

The shaft approaches type IV (quadrilateral). There is but small curvature.

Right ulna: Lacks the olecranon; shaft prismatic, with anterior and posterior surfaces fluted; but a moderate

curvature backward upper third.

Femora:

Length, bicondylar, right

cm

48.2

Humero-femoral index

74.3

Diameter antero-posterior maximum at middle—

Right

cm

3.05

Left

cm

3.2

Diameter lateral maximum at middle—

Right

cm

2.5

Left

cm

2.65

Index at middle—

Right

82

Left

82.8

Diameter maximum at upper flattening—

Right

cm

3.5

Left

cm

3.7

Diameter minimum at upper flattening—

Right

cm

2.1

Left

cm

2.25

Index at upper flattening—

Right

60

Left

60.8

Type shaft at middle—

Right

1

Left, near

1

The bones, especially the right, are remarkable for their graceful form and approach to straightness. The linea aspera is high but not massive or rough.

Right tibia: Length (?), extremities wanting. A moderate physiological curvature forward, middle third.

Diameter antero-posterior at middle, right

cm

3.25

Diameter lateral at middle

	cm
	1.95
Index at middle	
	60

The bone is distinctly platycnaemic, as the femora are platymeric and the humeri platybrachic, a harmony of characters which is often met with in the continental Indian.

ADDITIONAL PARTS

These include four ribs, the atlas and two lumbar vertebræ. The first rib approaches the semicircular in type and is rather large, indicating a spacious chest. Otherwise there is nothing special.

A comparison of the long bones of this interesting skeleton with those of the later Indians from the same and near-by localities as well as with those of the western Eskimo (see table, p. 160) shows a number of striking conditions. The length of the bones of the skeleton is far above the mean of both those of Indians and the Eskimo, indicating a stature of at least 10 centimeters (4 inches) higher. In none of their characteristics are the bones near to those of the Eskimo, making it doubly certain that the subject was not of that affiliation. Compared with those of the later Indians of the same territory, the bones show in one line remarkable differences, in another remarkable likenesses. The differences concern all the relative proportions of the shafts—the bones of the old skeleton give without exception indices that are markedly lower; they are distinctly more platybrachic, platymeric, and platycnaemic. But the more basic humero-femoral and radio-humeral

indices are practically the same; showing fundamental identity. The humero-femoral index is especially important in this case. It is exceptionally high in the Yukon Indians, due to a relatively long humerus, and the same condition is seen in the old skeleton. It seems safe, therefore, to conclude that the owner of the old skeleton was not only an Indian but an Indian of the same physical stock from which were derived the later Indians of the Yukon; but he was evidently of an earlier and different tribe or of a purer derivation than those who followed. To more fully establish and then trace this type, both as to its derivation and extension, will be tasks of future importance.

YUKON INDIANS: MAIN LONG BONES
SEX: MALES[39]

Paired bones	
Yukon Indians	
Miscellaneous North American Indians	
Western Eskimos	
Older skeleton at Bonasila	
From Russian times	
Humerus:	
(2)	
(10)	
[40](378)	
[41](76)	
Mean length	
	35.55
	31.17
	31.8
	30.88

At middle—

Diameter, major

2.45
2.38
2.22
2.42

Diameter, minor

1.68
1.67
1.63
1.82

Index

66.4
70
73.1
75.2

Radius:

(1)
(10)
(378)
(76)

Mean length

n. 27
23.61
24.7
22.85

Radio-humeral index

n. *75.5*
75.7
77.7
74

Femur:

(2)	
(14)	
[40](902)	
(84)	
Mean length (bycondylar)	
	48.2
	41.92
	42.7
	42.70
Humero-femoral index	
	74.3
	74.5
	n. *72.5*
	n. *-72*
At middle—	
Diameter, antero-posterior, maximum	
	3.12
	2.96
	2.95
	3.03
Diameter, lateral	
	2.57
	2.58
	2.58
	2.71
Index	
	82.4
	87.1
	87.3
	89.5

At upper flattening—		
Diameter, maximum		
		3.60
		3.25
		3.27
		3.37
Diameter, minimum		
		2.18
		2.30
		2.42
		2.48
Index		
		60.4
		70.7
		74
		73.5
Tibia:		
	(1)	
	(14)	
	(324)	
	(84)	
Mean length		
		34.19
		36.9
		33.61
Tibio-femoral index		
		81.5
		84.4
		78.7
At middle—		

Diameter, antero-posterior, maximum	
	3.25
	3.04
	3.28
	3.10
Diameter, lateral	
	1.95
	2.
	2.16
	2.12
Index	
	60
	66
	65.8
	68.5

FOOTNOTES:

[39] See also data in writer's "Physical Anthropology of the Lenape," etc., Bull. 62, Bur. Amer. Ethn., Washington, 1916; and his "Anthropology of Florida," Fla. Hist. Soc. Pub. No. 1, Deland, Fla., 1922.

[40] These numbers apply to length only; under the other items the numbers are in some cases smaller, in some larger. The differences are due to defects in some of the old bones.

[41] See also data on p. 165.

The Yukon Eskimo

THE LIVING

As with the Indians farther up the river, the necessities of the writer's journey did not permit more than visual observations, but in 1927 Henry B. Collins, jr., succeeded in measuring six adult males at Marshall.

In general, the people of the Yukon delta and from this to Paimute are true Eskimo. By this is meant that in the majority of individuals they can readily be told as a type apart from the Indian and belonging plainly to that of the extensive family of the Eskimo. But when the differences are to be defined the task is not easy; some of the distinguishing marks, though well appreciated, are somewhat intangible.

The physical differences are essentially those of the physiognomy. The head is neither narrow nor scaphoid, or even very high. The Indian face is more prominent and more sculptured; that of the Eskimo appears fuller, especially in the lower part, and flatter. Part of this is due to the bony structure, part to the differing amounts of fat. An eversion of the angles of the lower jaw, which is relatively frequent and sometimes excessive in the Eskimo male while almost absent in the Indian, may give the Eskimo face almost a square appearance. Take with this the seemingly somewhat low Eskimo forehead, the not very widely open and somewhat on the whole more slanting eye, and the characteristic Eskimo nose with its rather narrow and not prominent nasal bridge, the ridiculous monk-like cut of the hair (in the older males), the often rather full lips with, in the males, a tuft of sparse mustache above each corner of the mouth; add to all this a mostly smiling or ready-to-smile "full-moon" expression, and it would be impossible to take the subject for anything else than an Eskimo. The Indian's face is more set, less fat, in

the males at least, less broad below, with seemingly a higher forehead, sensibly made-up hair, not seldom a bit more mustache, and a nose that generally is both broader and more prominent.

But the differences are less marked in the women and still less so in the children, especially where similarly combed and clothed. And there are, particularly on the Yukon, not a few of both Indian and Eskimo who even an expert is at a loss where to class. They may be due to old mixtures; no new ones are taking place; but it seems that there may be present another important factor, that of a far-back related parentage.

In the color of the skin and eyes, in the color and nature of the hair, there is no marked difference between the two peoples of the Yukon. In stature the Eskimos are slightly higher.

MEASUREMENTS ON LIVING YUKON ESKIMO

The exact provenience of the six men measured at Marshall is uncertain, but they seemingly were all from the lower Yukon and all were apparently full-blood Eskimo. But the measurements are rather peculiar. They are given, for comparison, with those of the western Eskimo in general (p. 165). They approach nearest to those of the Togiak Eskimo, well down below the Kuskokwim. They show a higher stature than all of their relations farther south, except the Togiaks, and they have a rounder head. They are, in fact, moderate brachycephals, a very unexpected form in this strain of people. The Togiaks also are brachycephalic. The vault is relatively somewhat higher than it is in the other groups, though the height is not excessive. The nose is

slightly lower as well as narrower than it is in all the other contingents. The face is close to those of St. Lawrence Island. The ear is perceptibly smaller and especially narrower than elsewhere, but perhaps the age factor enters into the case. The hand is much like that of Togiak and St. Lawrence, the index being identical.

The brachycephaly of the group for the present is hard to explain. It can not be ascribed to a mixture with the river Indians, for these, as has been seen from the skulls, were meso- rather than brachycephalic. There is need here for further inquiry.

SKELETAL REMAINS OF YUKON ESKIMO

As with the Indian, such remains are still rare. Some measurements of three "Smithsonian Mahlemute" skulls from the Yukon, collected by William H. Dall, are given by Jeffries Wyman, and probably the same specimens appear in the Otis Catalogue, the measurements in which are regrettably not very reliable. These specimens can not now be located, and the scarce data are of but little value. The three skulls examined by Wyman were all mesocephalic.

It is now possible to report on 40 adult skulls from the lower Yukon and the delta. An abstract of the measurements is given in the next table. The data indicate a considerable local variation. All the skulls, or very nearly all, are mesocephalic; but they differ considerably in height and in all the facial features. The Pilot Station group, from the apex of the delta, and hence the midst of the Eskimo territory on the Yukon, is especially peculiar. Both the vault and the face, in the series as a whole, range from low to high,

and much the same is true of the height of the nose and that of the orbits, while the palate is exceptionally broad, giving a low index, all of which would seem to indicate instability or conditions in change, together probably with admixtures from farther up the river. We need more material, particularly from the stretch of the river between the apex of the delta and Paimute.

YUKON ESKIMO CRANIA
UNITED STATES NATIONAL MUSEUM:

	Number of adult skulls	Collector
17 males	(3)	
23 females	(1)	
Pilot Station	(2)	
"Lower Yukon"	(11)	
Kashunok (of Yukon)	(1)	
Kotlik and Pastolik	(3)	
Paimute	(1)	
Pilot Station	(18)	
Kashunok mouth		
Kotlik and Pastolik		

	[42]
	[43]
	[44]
	[44]
	———
	[43]
	[44]
Vault:	
Length	
	18.90
	18.8
	18.45
	18.44
	18.7
	17.80
	18.7
	17.72
Breadth	
	15.07
	14.2
	14.10
	13.90
	14
	14
	13.9
	3.62
Height	
	13.77
	13.7
	13.65
	13.60
n. 13.5	

	13.20
	12.4
	13.04
Module	
	15.91
	15.57
	15.40
	15.31
	15.40
	15
	15
	14.81
Capacity	
	1,660
	1,535
	1,468
	1,486
	1,442
	1,359
Cranial index	
	79.7
	75.5
	76.4
	75.4
	74.9
	78.7
	74.3
	76.8
Mean height, index	
	81.6
	83

	83.9
	84.1
	n. 82.3
	83
	76.1
	83.2
Height-breadth, index	
	91.4
	96.5
	96.8
	97.8
	n. 96.4
	94.3
	89.2
	95.8
Face:	
Menton-nasion	
	12.40
	12.67
	11.90
	11.82
Alveolar point-nasion	
	7.85
	7.1
	8.25
	7.78
	7.40
	7.49
Diameter bizygomatic maximum	
	14.97

	14.4
	14.25
	14.13
	13.47
	13.90
	13.26
Facial index, total	
	82.4
	90.1
	89.1
	89
Facial index, upper	
	52.2
	49.3
	57.9
	55
	55
	56.5
Orbits:	
Mean height	
	3.58
	3.55
	3.80
	3.67
	3.54
	3.50
	3.62
Mean breadth	
	4.07

	4
	3.91
	3.98
	3.89
	3.80
	3.86
Mean index	
	87.7
	88.7
	97.1
	92.3
	91
	92.1
	94.1
Nose:	
Height	
	5.27
	5.05
	5.65
	5.53
	5
	5.50
	5.19
Breadth	
	2.57
	2.15
	2.28
	2.51
	2.33
	2.45

	2.31
Index	
	48.7
	42.6
	40.3
	45.4
	46.7
	44.5
	44.5
Upper alveolar arch:	
Length	
	5.70
	5.4
	5.4
	5.57
	5.40
	5.45
Breadth	
	7.40
	6.6
	6.65
	6.70
	6.60
	6.38
Index	
	77
	81.8
	81.2
	83.4
	81.8

	85.4
Basi-facial diameters:	
Basion-alveolar point	
	10.35
	n. 10.3
	10.15
	10.40
	10.17
	10.09
Basion-subnasal point	
	9.07
	9.4
	9.10
	9.17
	8.80
	8.90
	8.86
Basion-nasion	
	10.60
	10.8
	10.15
	10.41
	9.97
	10.20
	9.98
Facial angle	
	70
	74
	66
	68

	67
	67
Alveolar angle	
	55
	60
	60
	52
	52
	53
Height of lower jaw at symphysis	
	3.63
	3.75
	3.67
	3.56

FOOTNOTES:

[42] Howgate & Schwatka Exp.

[43] Rev. P. I. Delon.

[44] A. Hrdlička.

SKELETAL PARTS OF THE YUKON ESKIMO

The next table gives the measurements of the long bones in both sexes in the Yukon Indian (for comparison), in the Yukon Eskimo, and in the western Eskimo, the latter coming mainly from the coast south of the Yukon and from the Nunivak and St. Lawrence Islands. The Yukon Eskimo material, collected from intact burials by the writer, is unfortunately limited to the northern mouth of the river. The skeletons from St. Lawrence Island were

collected on the Smithsonian expedition to the place in 1912 by Riley D. Moore, 1927 expedition by H. B. Collins, jr., and T. D. Stewart, all of the National Museum.

The Yukon Eskimo show perceptibly longer bones than do either the Indians or the southeastern and midwestern Eskimo, indicating a somewhat taller stature.

The humerus in the males is less broad than either in the Indians or the midwestern and southwestern Eskimo and has as a consequence high shaft index; but in the females the index in the Yukon and western Eskimo series is identical. The radius is relatively even shorter in the Yukon that it is in the other Eskimo, giving low radio-humeral index.

The femur is notably less platymeric in the male and slightly less so in the female Yukon Eskimo than it is in both the Indians and the rest of the southwestern and midwestern Eskimo, giving a higher index at the upper flattening. The meaning of these facts is not obvious and they may undergo some modification with more material.

As to strength, measured by the mean diameter of the shafts, the Yukon Eskimo in comparison to the southwestern and midwestern show a slightly weaker humerus, and in the males a slightly weaker femur at middle, but in the males again, a slightly stronger tibia. If, however, the mean diameters of the bones are taken in relation to the length of the bones, then in both sexes and in all the parts the southwestern and midwestern Eskimo are slightly stronger. This would seem to indicate more exertion, with harder life, among the coastal and insular than among the river Eskimo. As a matter of fact Kotlik and the near-by Pastolik, from which our skeletons came, were

favorably situated at the northern mouth of the river.

The Yukon Eskimo females, as compared with the males, have a somewhat weaker and especially somewhat flatter humerus, with a consequently lower shaft index; they have relatively even a shorter radius, giving a lower radio-humeral index; their humerus itself is relatively short, giving a lower humero-femoral index; their femur is relatively somewhat flatter at the upper flattening, giving a lower index of platymery; while their tibia is relatively less strong antero-posteriorly, resulting in an index that is more than four points higher than that of the males.

YUKON INDIAN, YUKON ESKIMO, AND WESTERN ESKIMO LONG BONES[45]

Paired bones of the two sides
Male
Female
Yukon Indian
Yukon Eskimo
Southwestern and midwestern Eskimo
Yukon Indian
Yukon Eskimo
Southwestern and midwestern Eskimo
Humerus:
(10)
(16)
(143)
(4)
(16)
(136)

Mean length (right and left)	
	31.17
	32.10
	30.69
	28.12
	28.31
	28.40
At middle—	
Diameter, major	
	2.38
	2.83
	2.40
	1.90
	2.07
	2.10
Diameter, minor	
	1.67
	1.80
	1.80
	1.40
	1.51
	1.54
Index	
	70
	78.2
	75.1
	73.7
	73.2
	73.2
Radius:	
(10)	

	(16)	
	(98)	
	(4)	
	(16)	
	(109)	
Mean length		
		23.61
		23.44
		22.90
		21.10
		20.18
		20.50
Radio-humeral index		
		75.7
		73
		74.5
		75
		71.3
		72.2
Femur:		
	(14)	
	(22)	
	(195)	
	(8)	
	(27)	
	(132)	
Mean length (bicond.)		
		41.92
		43.78
		42.50
		40.15
		41.11

	39.36
Humero-femoral index	
	74.5
	n. 73
	72.2
	73
	n. 69
	72.2
At middle—	
Diameter antero-posterior maximum	
	2.96
	3.05
	3.08
	2.59
	2.74
	2.69
Diameter lateral	
	2.58
	2.67
	2.70
	2.45
	2.44
	2.46
Index	
	87.1
	87.6
	87.6
	94.7
	88.8
	91.5
At upper flattening—	

Diameter, maximum		
		3.25
		3.31
		3.35
		2.84
		3.02
		3.02
Diameter, minimum		
		2.30
		2.57
		2.51
		2.16
		2.27
		2.26
Index		
		70.7
		77.4
		75
		75.8
		75.4
		74.5
Tibia:		
	(14)	
	(22)	
	(141)	
	(8)	
	(27)	
	(147)	
Mean length (I. A.)		
		34.19
		35.14

	33.86
	31.97
	32.01
	31.32
Tibio-femoral index	
	81.5
	80.3
	79.7
	79.6
	79.8
	79.6
At middle—	
Diameter antero-posterior maximum	
	3.04
	3.16
	3.12
	2.72
	2.61
	2.71
Diameter, lateral	
	2
	2.15
	2.12
	1.82
	1.90
	1.89
Index	
	66
	68.3
	67.9
	66.9

	72.8
	69.9

FOOTNOTES:

[45] See also data on p. 160.

NOTES ON THE ARCHEOLOGY OF THE WESTERN ESKIMO REGION

Archeological work in the vast area of the western Eskimo is still in its infancy. Until the 1926 Smithsonian expedition nothing whatever had been done in this line in the Eskimo parts of the southwestern coasts of Alaska[46] or on the Kuskokwim or Yukon Rivers.

Some time between 1877 and 1881 E. W. Nelson made limited excavations on St. Michael Island[47] (see p. 170) and also dug on Whale Island.

In 1912 V. Stefánsson excavated at Barrow.[48] Having two months to spend at this place he engaged numerous Eskimo of the village and had them excavate the native village sites in the neighborhood. He says (p. 388): "It was a small army that turned out to dig wherever there was a ruin or a kitchen midden, and they worked energetically and well. While the excavations were not done as methodically and scientifically as could have been wished, still we were able to get from them a collection of over 20,000 archaeological specimens within the space of six weeks. This collection (which is now safely stored in the American Museum of Natural History) brings out many significant and some revolutionary ideas with regard to the prehistoric history of the Eskimo.

My method was to dig as much as possible myself, and to go around as best I could to see the others at work. In many cases I was able to see the exact position from which the important finds were taken." The specimens have since in part been described by Wissler.[49] Stefánsson brought also some archeological specimens from Point Hope, where, however, no excavations were made; and collected a valuable series of crania from Point Barrow.

In 1917-19 excavations near Barrow were conducted by W. B. Van Valin, leader of the John Wanamaker expedition to northwestern Alaska, for the University Museum at Philadelphia. The excavations were made in some mounds located about 8 miles southwest of Barrow and about 1,000 yards back from the beach on the tundra, and uncovered six old igloos containing, aside from many cultural objects, the skeletal remains of 83 individuals. These remains have since been found to be those of an intrusive group of people and to be of special interest.[50]

In 1924 Rasmussen during the last parts of his great journey gathered numerous archeological specimens at Point Hope and from other localities along the west coasts of Alaska.

In 1926, finally, the year of my survey, some careful initial excavations, with very interesting results, were carried on at Wales and on the Little Diomede Island by Dr. D. Jenness, of the National Museum of Canada, Ottawa. A preliminary report on the results of this work has been published in the annual report of the National Museum of Canada for 1926.

Besides such more professional work a good deal of archeological collection has been done in the regions under consideration by local people, particularly traders and teachers; and the demand for specimens

has made assiduous excavators of some of the Eskimo themselves, particularly at Point Hope and at St. Lawrence Island.

Beginning with the north, the first white man to be mentioned in this connection is Charles Brower, the well-known trader at Barrow. Mr. Brower has not only aided all the explorers who have reached this northernmost point, but he has also been directly instrumental in excavating and the making of archeological collections, though, regrettably, some of these have been scattered.

During 1925-26 there lived at Point Hope a very active and interesting man, sent there by the Fox Film Co. to photograph the Eskimo—Mr. Merle La Voy. La Voy, whom I met at Point Hope and who for a time became our fellow-passenger on the *Bear*, had not only succeeded remarkably in his own line, but had also amassed during his stay a large archeological collection. He did not excavate himself, and unfortunately paid no attention to the scientific side of the case; but by offering the natives sugar, tea, chocolate, chewing gum, tobacco, etc. in exchange for specimens, he so stimulated them that they engaged most assiduously in the excavation, or rather picking over as they thawed, of their old ruins, and brought him thousands of objects, some of which are of considerable interest. At the time of my visit there were several barrels full of specimens, largely of stone and ivory. Skulls and bones, regrettably, were neglected and reburied in the débris. Later this collection was transported to San Francisco, where it remains at the date of this writing, in Mr. La Voy's possession.

At Kotzebue Mr. Tom Berryman, the trader, has made some collections of Eskimo archeological

material, from which I benefited for the National Museum; and the local teacher, Mr. C. S. Replogle, informed me that he had a large collection at his home in the States.

At Nome I found a valuable lot of specimens in fossil ivory, pottery, and stone, in the possession of the well-known Lomen brothers, members of one of the foremost families in Alaska. The best parts of this collection I was fortunate to secure for exhibit in the United States National Museum.

A large and valuable collection of western Eskimo archeological material was made some years ago by Dr. Daniel Neuman. A part of this collection is in the museum at Juneau; the whereabouts of the rest and of Doctor Neuman himself I was unable to discover. There are several collections of archeological material from the western Eskimo region at Seattle and San Francisco, but none represents scientific excavation.

The names of Joe Bernard, Prof. H. N. Sverdrup, and O. W. Geist should be mentioned in this connection, all having collected archeological objects in the western Eskimo region. Many specimens of value collected by these men and others are in various museums or in private hands in Fairbanks, along the west coast or in Europe.

My own small part in the archeology of Bering Sea and the northwestern coast of Alaska was, as already stated, mainly that of making a survey of conditions. The object was to obtain a good general view of what there was in the line of archeological sites and remains, and thus help to lay a foundation for more organized research in the future. In addition all possible effort was made to collect and obtain specimens of distinct archeological value. Both of

these endeavors met with results of some importance.

FOOTNOTES:

[46] Dall, W. H., and Jochelson, W., made, as is well known, valuable excavations in the Aleutian Islands; but the Aleuts were not Eskimos. (See Cat. of Crania, etc., U.S.N.M., 1924, 39.)

[47] Nelson, E. W., The Eskimo About Bering Strait; Eighteenth Ann. Rept. Bur. Amer. Ethn., pt. 1, Washington, 1899, p. 263.

[48] My Life with the Eskimo, N. Y., 1913, 387, 388. See also his The Stefánsson-Anderson Arctic Expedition: Preliminary Ethnological Report. Anthrop. Papers Am. Mus. Nat. Hist., XIV, N. Y., 1914.

[49] Wissler, Clark, Harpoons and Darts in the Stefánsson Collection. Anthrop. Papers Am. Mus. Nat. Hist., N. Y., 1916, XIV, 401-443.

[50] See section devoted to this find, p. 318.

Old Sites in the Region of the Western Eskimo

The shores of the Alaska rivers, the littoral parts of Alaska, the more northern Bering Sea islands, and those portions of the Asiatic coast that were once or are still occupied by the Eskimo, are strewn with "dead" villages and old sites. Many of these dead villages or sites are historic, having been abandoned, or very nearly so, since the coming of the whites; some are older, in instances doubtless considerably older. Collectively they offer a large, almost wholly virginal and highly important field to American

archeology. They may contain much of the secrets of Eskimo origin and of his cultural, as well perhaps as physical, evolution. But these secrets are not to be given up easily. They are held within a perpetually frozen ground, which on one hand preserves everything, but on the other will not yield its contents except to assiduous and prolonged labor.

Ruined or "dead" villages began to be encountered by the earliest Russian and other explorers. Beechey (1826) tells us that between approximately the latitude of Nelson Island and Point Barrow (60° 34´ to 71° 24´ N.) they noticed 19 (Eskimo) villages, some of which were very small and consisted only of a few huts, and others appeared to have been deserted a long time.[51]

Hooper, in 1884, reports Eskimo ruins on the Asiatic side:

"Near the extremity of the cape [Wankarem] we found the ruins of houses similar to those now in use by the Innuits, half underground, with frames of the bones of whales. Probably they were former dwellings of Innuits, who for some reason crossed the straits and attempted to establish themselves on the Siberian side. These houses have been found by different travelers at many places along this coast, and various causes assigned for the abandonment of the attempt to settle here by the Innuits. * * *

"At Cape Wankarem and at other places on the Siberian coast we found the ruins of houses similar to those now in use by the Innuits. These houses, which have been found by different travelers at many places along that coast, are not at all like those used by the Tchuktchis, which, on account of the migratory habits of the reindeer tribes, are so

constructed that they can be taken down and put up again at will."[52]

Ray and Murdoch both speak of old sites. The very spot they selected for their observatory at Barrow was one of these. Ray says of it:

> "A point about 12 feet above the sea level, lying between the sea and a small lagoon three-fourths of a mile northeast from Uglaamie, was finally selected. The soil was firm and as dry as any unoccupied place in that vicinity, and as it was marked by mounds of an ancient village would be free from inundation."[53]

And farther on:

> "That the ancestors of those people have made it their home for ages is conclusively shown by the ruins of ancient villages and winter huts along the seashore and in the interior. On the point where the station was established were mounds marking the site of three huts dating back to the time when they had no iron and men 'talked like dogs'; also at Perigniak a group of mounds mark the site of an ancient village. It stands in the midst of a marsh; a sinking of the land causing it to be flooded and consequently abandoned, as it is their custom to select the high and dry points of land along the seashore for their permanent villages. The fact of our finding a pair of wooden goggles 26 feet below the surface of the earth, in the shaft sunk for earth temperatures, points conclusively to the great lapse of time since these shores were first peopled by the race of man."[54]

The village of Sidaru, southwest of Cape Belcher, which in Ray's time had a population of about 50, has since gone "dead."

The most direct attention to this subject has been given by Nelson. In his excellent large memoir on "The Eskimo about Bering Strait"[55] he states as follows:

"Ruins of ancient Eskimo villages are common on the lower Yukon and thence along the coast line to Point Barrow. On the Siberian shore they were seen from East Cape along the Arctic coast to Cape Wankarem....

"On the shore of the bay on the southern side of St. Michael Island I dug into an old village site where saucer-shape pits indicated the places formerly occupied by houses. The village had been burned, as was evident from the numerous fragments of charred timbers mixed with the soil. In the few cubic feet of earth turned up at this place were found a slate fish knife, an ivory spearhead, a doll, and a toy dish, the latter two cut from bark. The men I had with me from the village at St. Michael became so alarmed by their superstitious feelings that I was obliged to give up the idea of getting further aid from them in this place. I learned afterward that this village had been built by people from Pastolik, at the mouth of the Yukon, who went there to fish and to hunt seals before the Russians came to the country.

"On the highest point of Whale Island, which is a steep islet just offshore near the present village of St. Michael, were the ruins of a kashim and of several houses. The St. Michael people told me that this place was destroyed, long before the Russians came, by a war party from below the Yukon mouth. The sea has encroached upon the islet until a portion of the

land formerly occupied by the village has been washed away. The permanently frozen soil at this place stopped us at the depth of about 2 feet. Here, and at another ancient Unalit village site which was examined superficially, we found specimens of bone and ivory carvings which were very ancient, as many of them crumbled to pieces on being exposed.

"Along the lower Yukon are many indications of villages destroyed by war parties. According to the old men these parties came from Askinuk and Kushunuk, near the Kuskokwim, as there was almost constant warfare between the people of these two sections before the advent of the Russians.

"Both the fur traders and the Eskimo claim that there are a large number of house sites on the left bank of the Yukon,[56] a few miles below Ikogmut. This is the village that the Yukon Eskimo say had 35 kashims, and there are many tales relating to the period when it was occupied. At the time of my Yukon trips this site was heavily covered with snow, and I could not see it; but it would undoubtedly well repay thorough excavation during the summer months. One of the traditions is that this village was built by people from Bristol Bay, joined by others from Nunivak Island and Kushunuk. One informant said that a portion of this village was occupied up to 1848, when the last inhabitant died of smallpox, but whether or not this is true I was unable to learn.

"Another informant told me that near the entrance of Goodnews Bay, near the mouth of the Kuskokwim, there is a circular pit about 75 feet in diameter, marking the former site of a very large kashim. A few miles south of Shaktolik, near the head of Norton Sound, I learned of the existence of a large village site. Both the Eskimo and the fur traders who told

me of this said that the houses had been those of Shaktolik people, and that some of them must have been connected by underground passageways, judging from the ditch-like depressions from one to the other along the surface of the ground. The Shaktolik men who told me this said that there were many other old village sites about there and that they were once inhabited by a race of very small people who have all disappeared.

"From the Malemut of Kotzebue Sound and adjacent region I learned that there are many old village sites in that district. Many of these places were destroyed by war parties of Tinné from the interior, according to the traditions of the present inhabitants.

"On Elephant Point, at the head of the Kotzebue Sound, I saw the site of an old village, with about 15 pits marking the locations of the houses. The pits sloped toward the center and showed by their outlines that the houses had been small and roughly circular, with a short passageway leading into them, the entire structure having been partly underground.

"The Eskimo of East Cape, Siberia, said that there were many old village sites along the coast in that vicinity. These houses had stone foundations, many of which are still in place. There is a large ruined village of this kind near the one still occupied on the cape.

"On the extreme point of Cape Wankarem, and at its greatest elevation, just above the present camp of the Reindeer Chukchi, a series of three sites of old Eskimo villages were found."

To this, on pages 269 et seq., Nelson adds an account of the villages that "died" on St. Lawrence Island during the winter of 1879-80. Capt. C. L. Hooper, in

the "Cruise of the Corwin in 1881, Notes and Observations" (published in Washington, 1884, p. 100) gives the date as 1878-79, and adds further details about these villages.

FOOTNOTES:

[51] Beechey, F. W., Narrative of a Voyage to the Pacific and Bering's Strait. Phila., 1832, 474.

[52] Hooper, C. L., Report of Arctic Cruise of the Revenue Steamer *Corwin*, 1881. Washington, 1884, 63, 99.

[53] Ray, Lieut. P. H., Report of the International Polar Expedition to Point Barrow, Alaska. Washington, 1885, 22.

[54] Ray, P. H., Ethnographic Sketch of the Natives. Report of the International Polar Expedition to Point Barrow, Alaska. Washington, 1885, 37.

[55] Eighteenth Ann. Rept. Bur. Amer. Eth., pt. 1, Washington, 1900, 263 et seq.

[56] This is the "village of 32 kashims," which I mention in the Narrative and of which I heard independently (p. 71). The present Eskimo claim that it existed on the right bank, about 12 miles below Russian Mission (Ikogmut). My visit and subsequently that of Mr. Chris Betsch, the kind and interested trader at Russian Mission, the latter with an old Eskimo, failed to definitely locate the site, but further efforts are desirable.

Present Location of Archeological Sites

Through personal visits, wherever possible, and

through information from all available sources, an effort was made to locate and learn the character of as many of the old sites as could be traced. In this endeavor I was aided by many whose services are hereby gratefully acknowledged. Especial thanks are due to Captain Cochran with the officers and men of the *Bear*, particularly Boatswain H. Berg; to the Lomen brothers and their esteemed father, at Nome; to Father B. La Fortune and the Reverend Baldwin at Nome; to Mr. Sylvester Chance, superintendent of the northwestern district, Bureau of Education; to Mr. Charles D. Brower, trader at Barrow; to Mr. Jim Allen, trader at Wainwright; and to Dr. E. P. Walker, head of the Biological Survey of Alaska. The list to follow, supplemented by maps, will give in brief the name, location, and description of the remains.

The old sites occur, (1) in the form of refuse heaps; (2) as late village sites, smaller or larger areas of ground covered with mostly circular elevations and depressions, with occasionally the wooden remains of igloos or kashims, or only partly ruined dwellings; such remains are the most common; (3) as old village sites in the form of a long irregular ridge mound or of more or less separate heaps; (4) as heaps or "mounds" of individual structures. And as "passed" sites, covered completely by sand or silt and unknown until uncovered through the washing away by the sea or rivers of some of the deposits.

In addition there are the remains of burial grounds which are occasionally marked by small low mounds or hummocks produced by decayed burials that have been more or less assimilated by the tundra. Stony beaches with chips, implements, etc., such as are found off old sites on the Yukon, have not been seen in the region now dealt with in any instance.

The ruined dwellings and communal houses throughout this region, with a few minor exceptions, were of one general type. They were circular, yurta-shaped, semisubterranean structures, with a more or less subterranean tunnel approach, built of hewn driftwood and earth. These dwellings, when the wood decays and the dome falls in, leave characteristic saucer-and-handle-like depressions. But where such dwellings were close, and especially where they were heaped up or superimposed on older ones, the remains, together with the refuse, may form an irregular elevated ridge or a large irregular mound.

On the Diomede Islands the dwellings are built of stone, and ruins of stone houses have been reported to me from inland of the westernmost parts of the Seward Peninsula. Stone dwellings were also known on Norton Sound.

Some of the ridges and heaps, as at Shishmaref, Point Hope, one of the Punuk Islands, etc., are large and may be up to 15 feet and over in depth, but mostly the remains are of moderate to small size. The latter sometimes could easily be confounded with natural formations. The older remains may superficially be indistinguishable even to an experienced observer; and if there is anything still more ancient, it lies somewhere in the old sands and beaches where, except through some fortunate accident, it can not be discovered. Except for their surface, the remains are generally frozen hard, and no excavation is possible except through gradual exposure and the melting of layer after layer by the warmth of the sun or a melting of the ground with water or by some other artificial means.

Some at least of these ruins are rich archeologically.

They greatly exceed in this respect a large majority of village ruins and mounds in the interior of the continent. This appears from their gradual excavation by the natives at Barrow, Point Hope, St. Lawrence Island, and elsewhere. The natives have now for many years been selling thousands of articles thus obtained to traders, teachers, and crews of visiting vessels. A regular and growing trade detrimental to archeology is now being carried on in "fossil ivory," which generally consists of pieces showing human workmanship and occasionally includes specimens of rare beauty and importance.

The archeological contents of such old sites as that near Savonga on the St. Lawrence Island, or those at Wales, Point Hope, Barrow, etc., are varied, and in instances exceedingly interesting. They comprise a large variety of objects of stone, ivory, bone, and wood, while in the more superficial layers are also found occasionally glass beads or objects of metal. Some ruins, such as those at Point Hope and Kotzebue, are very rich in stone objects; others, as those at the St. Lawrence Island, are rich in articles of ivory and bone. Pottery is generally scarce. Articles of stone comprise mainly points, knives, adzes, and lamps; those of wood, goggles and masks; of bone, various parts of sleds, a large assortment of snow and meat picks, and scrapers; of ivory, barbed points, harpoons, and lance heads, and a large variety of tools, fetishes, and ceremonial objects; of clay, a few dishes and pots for culinary purposes. Traces of objects made of whalebone or even birch bark may also appear.

The stones used were mainly slate and flint, but there may also be met with quartz, quartzite, and especially the Kobuk "jade." The workmanship is as a

rule good to excellent. The arrow points show a number of interesting, not yet fully known, types, the long blade with parallel sides predominating. The stone lamps and rare dishes also need further study. The knives all approach the Asiatic semilunar variety.

The bones and wooden objects and the pottery from this region are fairly well covered by the writings of Ray, Murdoch, Nelson, Rau, Thomas, and others; the masks need further study.

The most interesting archeological specimens from the region of the western Eskimo, however, are some of those in "fossil ivory," the term being applied to walrus ivory that through long lying in the ground has assumed more or less of a pearly yellow, variegated, sepia-brown or black color. These objects are known as yet very imperfectly. They are scarce at and especially north of Point Hope, and again along the west coast south of Norton Sound. Their center of frequency comprises seemingly the St. Lawrence Island, some parts of the Asiatic coast, the Diomedes, and parts of the Seward Peninsula. But they occur at least up to Point Hope, while west of Bering Strait they are said to appear as far as the river Kolyma.

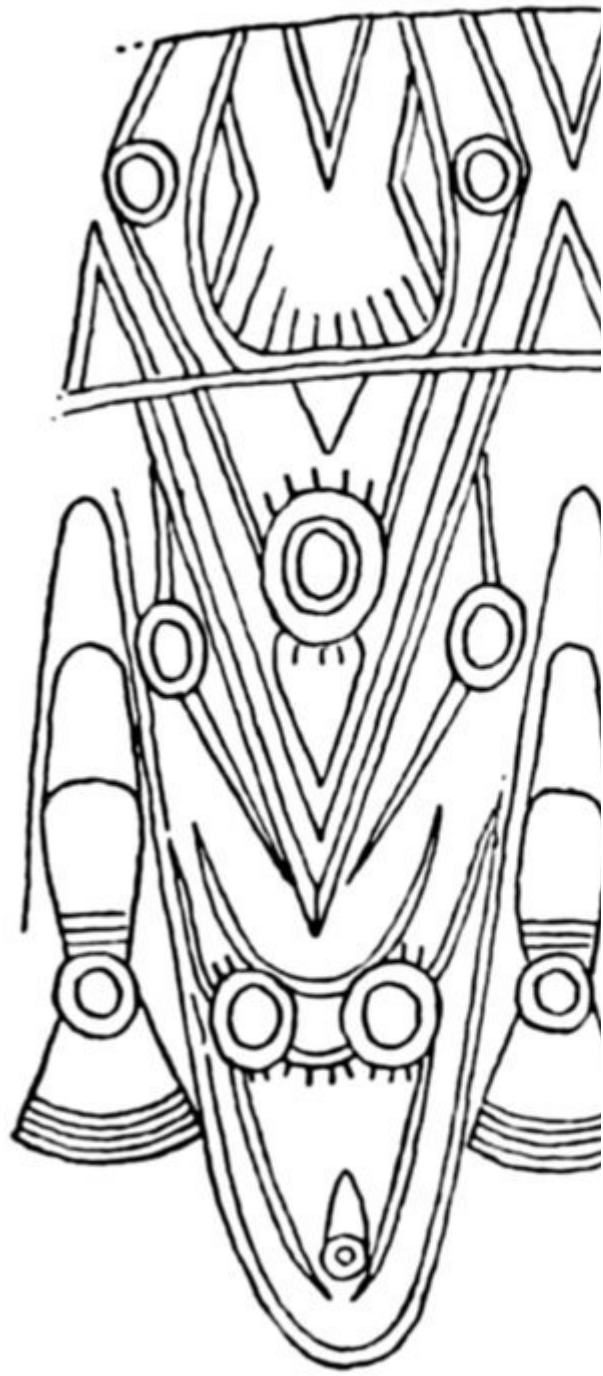


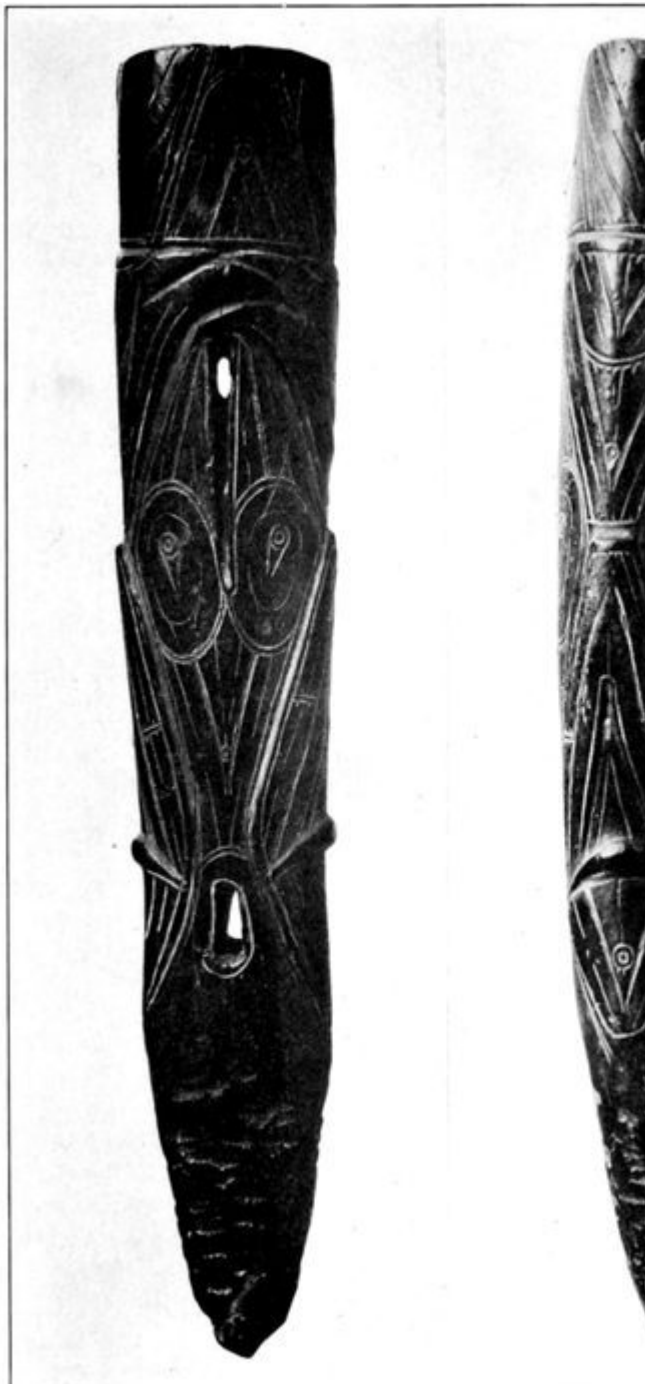


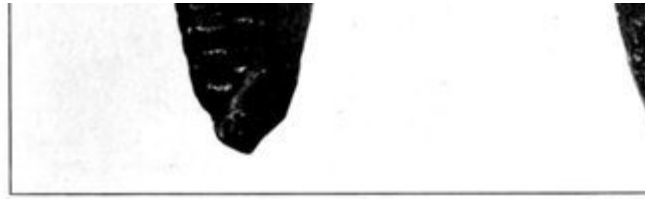
Figure 12.—Conventionalized design from fossil

Some of the objects in fossilized ivory show the well-known Eskimo art, with geometrical design. But besides these there occur here and there beautiful specimens, harpoon heads, figures, needle cases, etc., which are of the finest workmanship and which both in form and design differ from the prevailing Eskimo types. They are examples of high aboriginal art; and their engraved decorative lines are not geometrical but beautifully curvilinear. (Fig. 12.) The accompanying illustrations of specimens I succeeded in obtaining from different sources will show the nature of this art. (Pls. 19-26.) Isolated specimens of this nature have been secured before by Nelson, Neuman, Sverdrup, Stefánsson, and others. Jenness in 1926 dug out a few from the old sites at Wales. There are several in the Museum of the American Indian in New York. But the largest and best collection of these remarkable articles is now that of the United States National Museum.[57]

The large fossil ivory figure (20.3 cm. maximum length, pl. 26) collected by Mr. Carl Lomen and now in the National Museum is of special interest. It comes from the Asiatic side. It is a handsomely made piece, belonging in all probability to the high fossil ivory culture. Its peculiarity is the bi-bevel face, a face made by two planes rising to a median ridge. It is so far a unique specimen of its kind. But with the aid of Mr. H. W. Krieger, curator of ethnology, United States National Museum, we found similar bi-beveled faces in wooden figures from northeast Asia, in wooden Eskimo masks from the Yukon, and in

wooden ceremonial figures from Panama. The latter are shown herewith. (Pl. 27.) The whole presents evidently a nice problem for the archeologist and student of culture.





Terminal Piece of a Lance or Harpoon. Northe

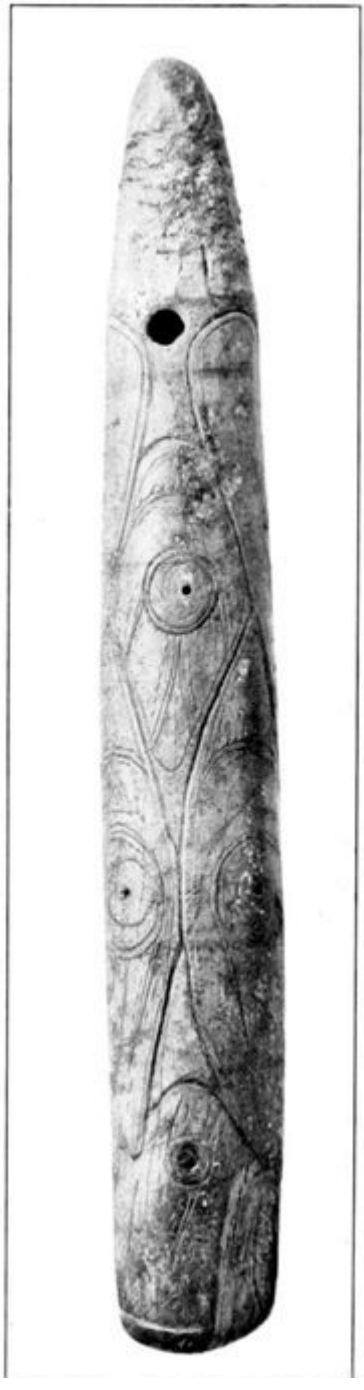
Black, high natural polish. Most beautiful piece of the
1926, U.S.N.M.)

BUREAU OF AMERICAN ETHNOLOGY
FORTY-SIXTH ANNUAL REPORT PLATE 20









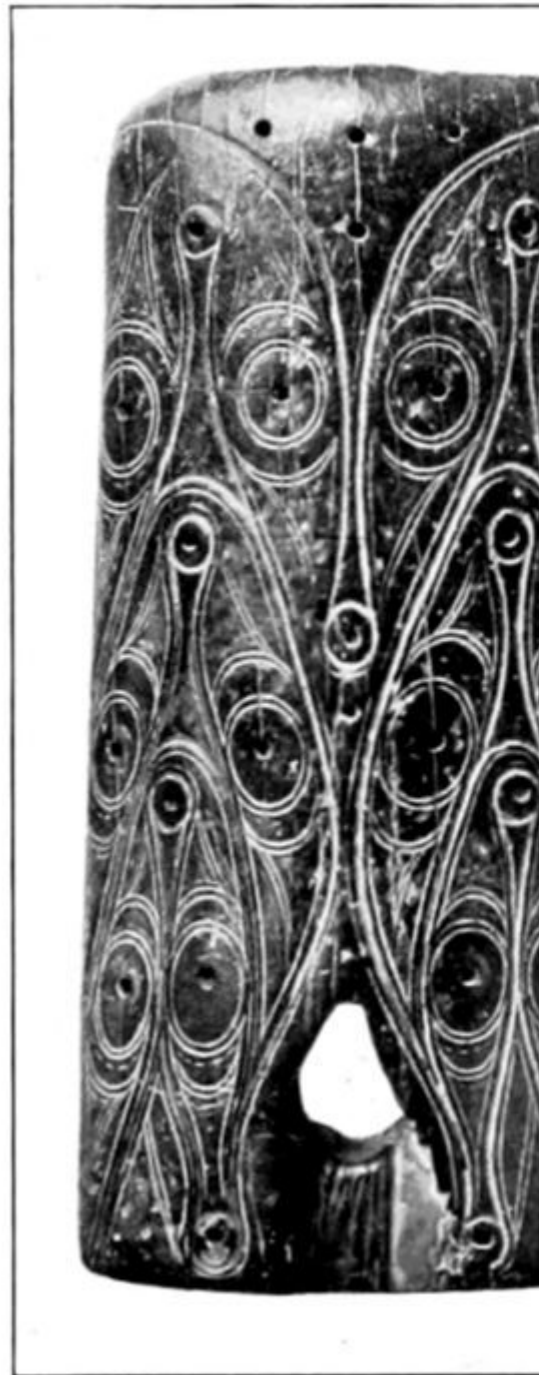


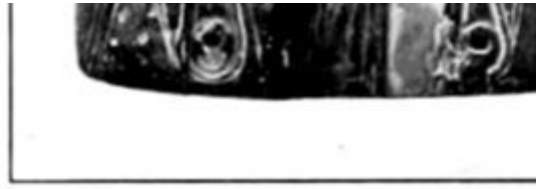
Fossil Ivory Specimens Showing the Old Curvilinear Designs. Northern Bering Sea

(A. H. coll., 1926, U.S.N.M.)





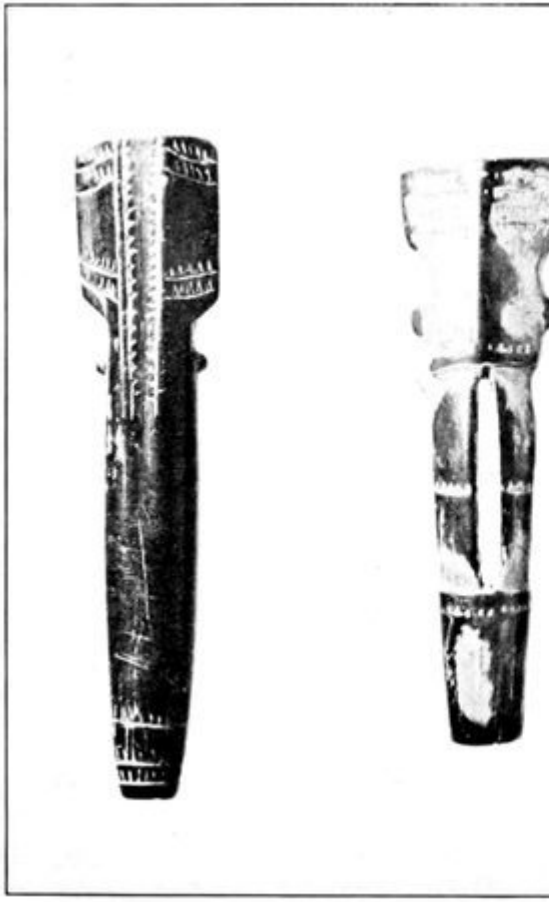




Objects Showing the

(U.S.N.M.,

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Fossil Ivory Needle Cases and Spear

(A.

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a, Small, finely made objects in fossil ivory ar



***b*, Old fossil ivory objects, northern Bering Sea. The arti**

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Fossil Iv

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Fossil Ivory Objects From

(Museum of the A

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXTH A





Old Black Finely Carved Fossil Ivory Figure, From the

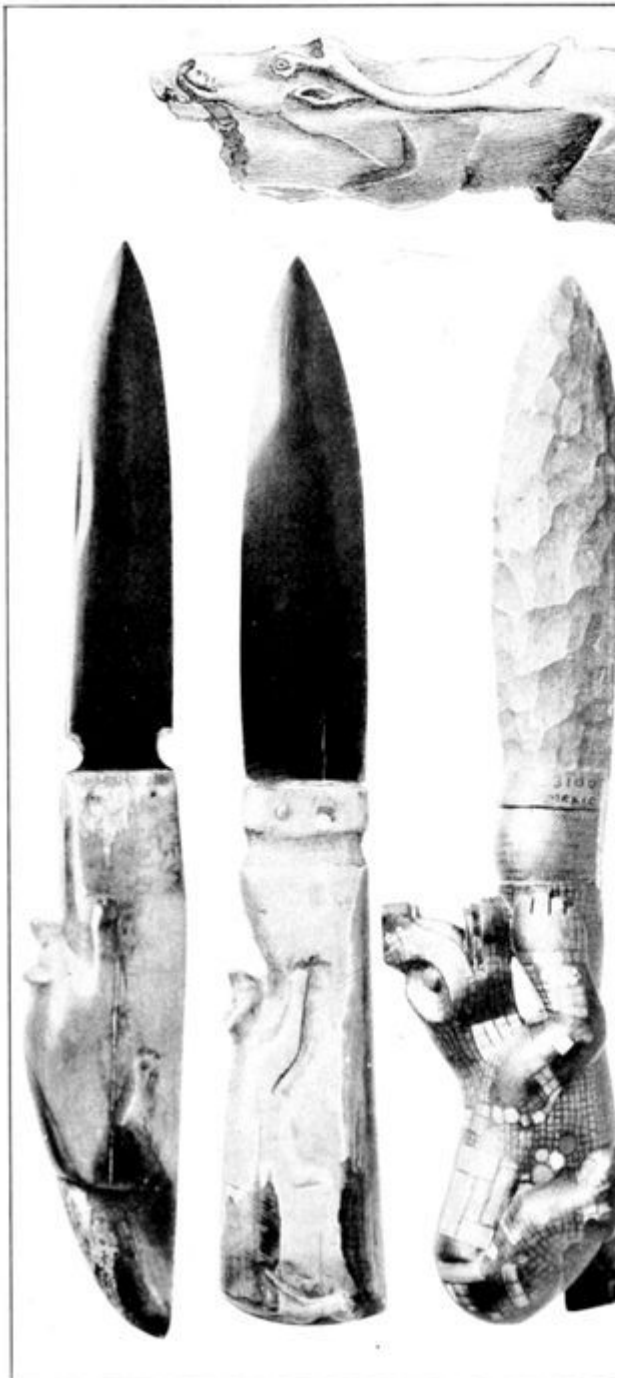
(Loan to U.S.N.M. by Mr. Carl Lo

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Wooden Figurines Fro

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXT





Top: Manche de poignard en ivoire, avec sculpture re
(Peccadeau de l'Isle; in de Quatrefages (A.), Homn

Left: Two beautiful knives of fossil mammoth ivory la
Eskimo. (Gift to the U.S.N.M. by

Right: Two old ceremonial Mexican

I had further the good fortune to secure, through the kindness of Reverend Baldwin, two handsome and remarkable knives from fossil mammoth ivory. These knives were said to have been made recently by the Eskimo of the Seward Peninsula. They are shown in Plate 28. They each bear on the handle a nicely carved crouching animal figure. With them are shown, somewhat more reduced, two probably ceremonial knives from Old Mexico; and also the handle of a late palaeolithic poignard from France, illustrated by De Quatrefages.[58] Regarding the latter form we read the following in Mortillet:[59] "D'autres poignées de poignard, faites dans des données pratiques et artistiques analogues, ont été recueillies dans diverses collections. Les plus remarquables sont deux poignées en ivoire trouvées par Peccadeau de l'Isle, à Bruniquel. L'une se rattachait à la lame, comme dans la pièce précédente, par le train de derrière; l'autre, au contraire, par la tête." Knives with similar crouching animal figures on the handle are being made by the King Islanders.

Here, evidently, is one more interesting problem for the archeologists.

The art shown by these objects, the

conventionalization, and especially the decorations, appear to show affinity on one hand to deeper eastern Asia and on the other to those of the American northwest coast and even lower. This may prove to mean much or little. The fact that these specimens establish beyond question is that at one time and up to a few hundreds of years ago there existed in the lands of the northern Bering Sea native art superior to that existing there later and at the present, and comparable with the best native Siberian or American.

The meaning of this fact seems to me to be of importance. The evidence suggests, aside from other things, that American cultural developments may after all not have been purely local or even American, but that they may, in part at least, have been initiated or carried from Asia. In view of these and other recent developments it seems rational to consider that America may have been peopled by far eastern Asiatic groups that not merely carried with them differences in language and physique but also in some cases relatively high cultural developments. But these for the present are mere hypotheses.

There is no definite indication as yet that the people of the high fossil ivory art in the northern Bering Sea and neighboring parts were any others than the ancestors of the Eskimo. The skeletal remains from these regions, as will be shown later, rather support this view. But those ancestors may not yet have represented the characteristic present type of the people. Here, too, nothing definite can be said before the results of sufficient scientific excavations become available.

FOOTNOTES:

[57] MacCurdy described the first specimen of this kind in 1921 as "An Example of Eskimo Art," in Amer. Anthrop., vol. 23, No. 3, pp. 384-385. See also Collins (H. B., jr.), Prehistoric Art of the Alaskan Eskimo, Smith. Misc. Coll., vol. 81, No. 14, 52 pp., Washington, 1929.

[58] Quatrefages, A. de., Hommes fossiles et hommes sauvages. Paris, 1884.

[59] Mortillet, G. de., Le préhistorique origine et antiquité de l'homme. Paris, 1900, 206-207.

Sites and Villages

The location of the western Eskimo villages has received more or less attention by most of the explorers in their region from the Russian time onward; but such efforts are generally limited to the living villages in the area visited by the observers.

Perhaps the earliest Russian map of value in this connection on the Bering Sea region is that which I find in Billings and Gall's Voyage or "Putěshestvie" of 1791, printed in St. Petersburg 1811. The map bears no date, but is evidently quite early. It gives three villages on the western point and north coast of the Seward Peninsula, namely Kiemile (later Nykhta, now Wales), Chegliukh, and Tykiak. (Pl. 29.)

The most notable and valuable of the Russian contributions to this subject is that of Zagoskin. This refers to the period of 1842-1844 and is contained partly in his "Peshechodnaia Opis," etc. (St. Petersburg, 1847), but especially on his maps. There are, I find, two of these maps—the "Merkatorskaia Karta Časti Sieverozapadnago Berega Ameriky" and the "Merkatorskaia Generalnaia Karta Časti Rossijskich Vladěnii v Amerikě." I came across the

first in one copy of Zagoskin's invaluable account, which should long ago have been translated into English, and the other in another copy. Part of the second is here reproduced. (Pl. 30.) Both bear the statement that they were made by Zagoskin as the result of his explorations on the Yukon in 1842-1844. The second ("general") map is much the clearer and richer. Both maps, but especially the second, give a good number of villages, especially about Norton Sound and along the southern shore of Seward Peninsula. The orthography differs somewhat on the two charts.

The Tebenkof Atlas of 1849 includes a remarkably good map of the St. Lawrence Island. As on other Russian maps it gives the Punuk Islands, that later are lost by most map makers, and indicates the location of what probably were all the living settlements of that time, except on the Punuk. (Fig. 27.)

Finally, in 1861, Tikhmenief, in his "Istoričeskoie Obozrenie" (history of Russian America) gives a detailed map with many locations of Eskimo villages.

The Aleutian Islands and Kodiak are excellently dealt with by Veniaminof and also Tikhmenief, though little special attention is given to the location of the settlements.

None of the Russian explorers, regrettably, report verbally on the deserted sites or ruins. But their registration and location of many villages that have since become "dead" is of much historical as well as anthropological value.



F

Of later and particularly American authors who gave attention to the location of the western Eskimo settlements, the foremost is E. W. Nelson. Beginning in 1877 with the St. Michael Island and ending with the cruise of the *Corwin* in 1881, Nelson made trips down the coast to the Kuskokwim, up the Yukon to Anvik, over the Bering Sea, the St. Lawrence Island and parts of the Chukchee Peninsula, and finally, with the *Corwin*, along the northern coasts to Point Barrow. And these journeys were devoted largely to biological and ethnological observations and

collections, the latter including the location of the western Eskimo habitations of that time. His locations are given on the accompanying map (fig. 15) taken from his classic memoir, "The Eskimo about Bering Strait," published in 1900 in the Eighteenth Annual Report of the Bureau of American Ethnology. This memoir contains a section of "Ruins" (pp. 263-266), a brief account of the recently dead villages on St. Lawrence Island (p. 269), and an instructive section on Eskimo burials (pp. 310-322). Nelson brought also the first more substantial collection of Eskimo crania.

The next deserving man in these connections is Ivan Petrof. Of Russian-American extraction, Petrof was charged in 1880 with the census enumeration of the natives in Alaska, and he later published[60] a valuable report on his work, together with detailed demographic data and a map on which are given all the living settlements of his time. Nelson's map is partly based on Petrof's data.

Since Nelson and Petrof but little has been done in this field. But the maps of these two observers have been utilized more or less by the map makers of the United States Coast and Geodetic Survey, the Geological Survey, and other Government agencies concerned with Alaska. The result is that some of these charts are exceptionally useful to the anthropological explorer in Alaska; nevertheless the data they carry are incomplete and the locations or names are not always exact, a good many of the villages shown are now dead, and old ruins, as usual, have received no attention.



Figure 14.—Dall's map of the distrib

A very valuable supplement to all the maps has in 1902 been published by the United States Geological Survey. It is the Geographic Dictionary of Alaska, by Marcus Baker. This volume, besides brief but serviceable historical data, gives in alphabetical order nearly all the then-known names of localities

in Alaska, including those of the Eskimo and Indian settlements; and each name is accompanied by brief but in many instances most helpful information. This highly deserving volume, indispensable to every student of Alaska, has for many years been out of print, but it is understood that a new revised edition is slowly being prepared.

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Billings and Gall's Map

BUREAU OF AMERICAN ETHN



Eskimo Villages and Sites. Norton Sound and Bay and


180°
175°
170°
165°
WRANGELL I.
70°
SIBERIA
DIOMEDE IS.
KINOGUMUT
ST. LAWRENCE I.
NUNIVAGMUT
60°
LEGEND
ESKIMO
YUIT
CHUKCHI
ATHAPASCAN
SCALE OF MILES
0 40 80 120 160

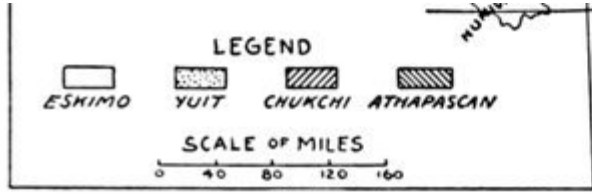


Figure 15.—Nelson's map. (Eighteenth Ann. R

Other useful publications in these connections are the United States Coast Pilots of Alaska, the various accounts of travelers, explorers, and men in collateral branches of science (geology, biology, etc.), the publications of the Alaska Division of the United States Department of Education, the annual reports of the Governor of Alaska, and the decennial reports on Alaska of the United States Census.


180°
172°
164°
156°
ARCTIC
POIN
SIBERIA
ARCTIC
BERING SEA
PACIF
ESKIMAUAN
ATHAPASCAN

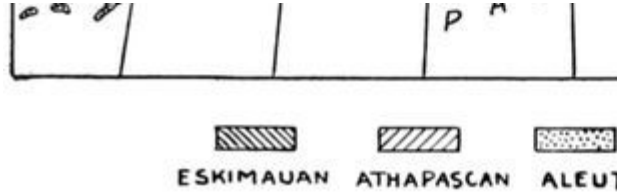


Figure 16.—Linguistic map, United

The object of the following notes and data is some measure of usefulness to future anthropological and archeological workers in Alaska. They are surely incomplete and very imperfect, yet they may be of some service.

Archeological and anthropological research in the highly important western Eskimo region is bound to develop in a not far distant future; for this is the region through which in all probability America was peopled. It is this region that promises to solve the problem of the antiquity of the Eskimo and may throw much light upon the origin of these people, and one that, as shown, above, has begun to reveal highly interesting old cultural conditions. And it is a region in which destruction of the remains by nature, but most so recently by the natives themselves, proceeds at an alarming pace.

The information on which these notes and the accompanying charts are based has been obtained largely from the Russian and other maps, from local traders, teachers, missionaries, and natives, and from a few explorers.[61] Only in a minority of cases was it possible to visit the places in person; to have visited all would have been a task of pleasure, but would have required a staunch boat of my own and at least three full seasons.

Many of the sites to be given are now "dead" and there may be several old sites in the vicinity of a living village. Others combine ruins with present habitations. Still others are partly or even wholly

abandoned a part of the year when the inhabitants go camping or hunting, and are partly or wholly occupied during the rest of the year. Finally, there are some new settlements, with modern dwellings and ways, and their number will increase, the Eskimo taking kindly to civilization and individual property.

The data to be given here are limited to the Eskimo territory in southwestern and western Alaska, leaving out those in Siberia where much is uncertain. Due to the uncertainties of the Prince William Sound region they will begin with Kodiak Island. There are also on hand, principally due to Dr. E. P. Walker, numerous locations of old sites and villages in the Indian parts of southern and southeastern Alaska, but these will best be reserved for another occasion.

The Eskimo area will be roughly seen from the accompanying map published on the basis of the enumeration by the Fourteenth United States Census of 1920. A very great part of the territory allotted to the Eskimo, as well as that of the Indian, is barren of any population or its traces; the divisions represent the hunting grounds or grounds claimed by each people, not an occupied territory. The data will be given in south-to-north order.

Nearly all the settlements in these regions are now, and have evidently always been, on the shores of the seas and bays, as close to the water as safety would permit. A few villages and sites occur also, however, on inland lakes and rivers. The favored locations have been an elevated flat near the mouth of a fresh-water stream or the outlet of a lagoon, a sufficiently elevated spit projecting into the sea, or an elevated bar between the sea and an inland lake. The essentials were an elevated flat, a supply of fresh

drinking water, and a location favorable for fishing and hunting; if there was some natural protection, so much the better. There were no inland settlements except on the lakes and rivers. In a few cases, as at the Kings and the Little Diomede Islands, very difficult locations were occupied only because outweighed by other advantages.

Caves throughout the occupied region north of the Aleutian chain are absent, and there was therefore no cave habitation.

None of the settlements were very large, though a few were much larger than others. They ranged from one or two family camps or houses to villages of some hundreds of inhabitants. A large majority of the settlements had from but two or three to approximately a dozen families.

There were two main types of dwellings, the semisubterranean sod houses for the winter and the skin tents for summer. In some places the two were near each other; in others the summer dwellings were in another and at times fairly distant locality.

The "zimniki" (in Russian) or winter houses were throughout the region of one general type. They were fair-sized circular semisubterranean houses, made of driftwood and earth, and provided with a semisubterranean entrance vestibule. Their remains are characterized everywhere by a circular pit with a short straight trench depression, the same pot-and-handle type as found along the Yukon. Rarely for the construction of the houses, where driftwood did not suffice, recourse was had to whale ribs and mandibles. The "letniki," or summer houses, were constructed on the surface of wood, sod and skins, or of whale ribs and skins, approaching on one hand the summer huts of various continental tribes and on the

other the "yurts" of the north Asiatic peoples. The "kashims," or communal houses, were built, much as on the Yukon, like the family dwellings, but occasionally quadrilateral and much larger. Smaller semisubterranean storage houses of driftwood and sod near the winter dwellings were seemingly general.

Ruins of stone dwellings, without mortar, are said to exist in places on Norton Sound and Bay and on a lagoon near the western end of the Seward Peninsula. The few houses on the Little Diomede are made of loose unhewn stone slabs. The dwellings of the King Islanders are built on the rocky slope of the island on platforms supported by poles, all of driftwood.

There is as a rule an absence of separate refuse heaps near the villages. The refuse apparently has been dumped about and between the houses rather than on separate piles.

Dead villages abound. On consulting the older Russian records, however, it is seen that nearly all were still "living" as late as the early forties of the last century. Yet there are sites that were "dead" already when the Russians came, and the accumulations in other cases denotes a long occupation.

The site of a dead village, in summer, is generally marked by richer and greener vegetation; same as on the Yukon. The site itself is usually pitted or humped in a line forming a more or less elevated ridge, or the pits may be disseminated without apparently much order. And there may be irregular mound-like heaps without external traces of any structure.

In the older sites no trace of wood is visible; in the

later rotten posts, crosspieces, parts of the covering of the house or tunnel, or even a whole habitation may be present. In the old sites the wood is hewn with stone axes; in the later it is sawed, and there may be nails.

Older accumulations lie occasionally beneath more recent ones, though no interruption of continuity may be traceable. Of a superposition of villages no trace was observable.

FOOTNOTES:

[60] Tenth Census, VIII; reprinted in Compilation of Narratives of Explorations in Alaska. U. S. Senate Rept. 1023, Washington, 1900, 55-281.

[61] I am especially indebted to the two maps of Zagoskin (one prepared by himself, one from his data); to the 1849 Russian map of the St. Lawrence Island; to the various maps of the U. S. Geological Survey and the U. S. Coast and Geodetic Survey; to the maps and data of W. H. Dall, E. W. Nelson, and Ivan Petrof; to the various reports of the *Corwin* and other voyages in the Bering Sea and the western Arctic; to the Geographic Dictionary of Alaska, by Marcus Baker, and to the U. S. Coast Pilots of Alaska; to the data of the Alaska Division, U. S. Department of Education; to Dr. E. P. Walker, of the Biological Survey; to Father La Fortune, the Reverend Baldwin, and to Mr. Carl J. Lomen at Nome; to Mr. Sylvester Chance, superintendent in 1926 of the schools of the Kotzebue district; to Messrs. James Allen at Wainwright and Charles Brower at Barrow; and to numerous other friends who aided me in this direction.

Burial Grounds

Due to the impossibility of digging sufficiently deep into the frozen ground the western Eskimo buried their dead near or on the surface or among rocks. Occasionally they utilized also, it seems, old dwellings for this purpose, and in more recent times at least the surface burials, wherever there was driftwood, would be protected by heavy rough-hewn planks put together in the form of boxes or by driftwood. They bear close fundamental resemblance to those of the Yukon. On the Nunivak Island occur graves made of rough stone slabs piled up without much order. (Pl. 31, *a*, *b*.)

Throughout the region the burials were located near the village, but the distance varied according to local conditions and habits. In some of the Eskimo villages of the lower Yukon, as at Old Hamilton, some burials were close to the houses of the living. In the Bering and Arctic regions the burial grounds, though sometimes of necessity not far from the houses, as at the Little Diomede, in other places, as at Point Hope and Barrow, were at a distance extending to beyond a mile and a half from the village.

As a rule the wood of burials older than about 80 years was found fully decayed with the bones secondarily buried. Of earlier burials there is generally no trace on the surface, but on excavation skeletal remains are found at various depths below the surface. These characteristic self-burials, or rather tundra burials, may prove of much importance to anthropology in the future. As outlined before (see Narrative, pp. 77, 79) the process is a decay of the wood; the sagging down of the bones, covered more or less by the decayed material; an encroachment of

moss or other vegetation on the little mound thus produced; and gradual accumulation through wind or water carried materials of more covering over the bones, until the mound disappears and the remains, generally still in good condition, are buried as if intentionally inhumed.

The Eskimo everywhere were found to be exceedingly sensible about the older, and even recent, skeletal remains, and assisted readily in their collection, as well as in excavation, offering thus the best possible conditions for anthropological and archeological work in these regions.

The notes, charts, and a detailed list of the sites and villages follow. In numerous cases it was found impossible to say whether a site was completely "dead" or still occasionally partly occupied, so that distinctive markings had to be abandoned.

Prince William Sound, Kodiak Island, Alaska Peninsula

Very largely still a terra incognita for anthropology and archeology. Partly occupied by Indians (Prince William Sound, Kodiak Island?), partly by mix-blood Aleut (parts of Peninsula, and of Kodiak), partly by Eskimo. There is but little skeletal or archeological material from the whole extensive territory.

KODIAK ISLAND AND NEIGHBORHOOD [Fig. 17]

1. *Litnik* (probably the Russian "Lietnik," the name for a summer village).—Indian village on Afognak Bay, Afognak Island. This name is found on a map made by the Fish Commission in 1889. Apparently it

is the Afognak of other maps (G. D. A.).[62]

2. *Afognak.*—On the southwestern part of Afognak Island. Village or row of scattered dwellings on shore of Afognak Bay, in southwestern part of Afognak Island. Population in 1890, 409. (G. D. A.) According to Walker, "an important, occupied native village which has probably been occupied for a long time. No doubt there are other native villages in this immediate vicinity."

3. *Spruce Island.*—Ouzinkie, or Uzinki; an occupied native village and cannery. (E. P. W.).[63]


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KODIAK
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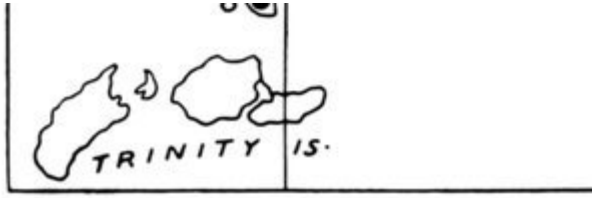


Figure 17.—Villages and site

4. *Eagle Harbour or Ugak Bay.*—Possibly the native village "Orlova" of the Russians. (G. D. A.)

5. *Kiliuda.*—Native village, on the north shore of Kiliuda Bay, Kodiak. Has been generally written Killuda. (G. D. A.)

6. *Nunamiut.*—Native village, on the shore of Three Saints Harbor, Kodiak. (G. D. A.) Better known locally as Three Saints Bay. There was formerly an old native and Russian settlement at this point and vicinity, and fishing operations are frequently now conducted here. (E. P. W.)

7. *Kaguyak.*—Village, at Kaguyak Bay, on the southwestern shore of Kodiak. It may be identical with the Kaniag-miut of the Russian-American Co., in 1849. (G. D. A.) An old native village at present occupied by only one or two families. Possibly an old site. (E. P. W.)

8. *Aiaktalik.*—Village on one of the goose islands, near Kodiak. Population in 1890, 106. (G. D. A.) An occupied native village consisting of about a dozen houses, but which has probably been occupied for a long time. (E. P. W.)

9. *Akhiok.*—Native village on the northern shore of Alitak Bay, Kodiak. Native name from Petrof, 1880. Apparently identical with Oohaiack of Lisianski in 1805. (G. D. A.) An occupied native village consisting of about a couple of dozen houses. This or possibly other villages in the vicinity have undoubtedly been occupied for a long time. It is

possible that there was a native settlement at Lazy Bay near this point, for Lazy Bay was formerly a native headquarters for sea otter hunting. (E. P. W.)

10. *Karluk.*—Village at mouth of Karluk River, Kodiak. Native name from the Russians. (G. D. A.)

11. *Uyak.*—Bay indenting the northwestern coast of Kodiak; also a village. Native name from the Russians. Lisianski, 1805, spells it Oohiack and the village Ooiatsk. Petrof, 1880, writes it Ooiak. Has also been written Uiak. (G. D. A.)

12. *Larsen Bay.*—A cannery has been located at this point for a number of years, and there is an old native trail from Larsen Bay to Karluk River, so presumably natives have frequented this section and no doubt have at some time had settlements there. Definite information regarding this is not available. (E. P. W.)

13. *Uganik.*—Native village at head of Uganik Bay. Shown by Lisianski, 1805, who spells it Oohanick. (G. D. A.) An occupied native village and one which has apparently been in use for a considerable period. (E. P. W.)

FOOTNOTES:

[62] G. D. A.: Geographic Dictionary of Alaska, by Marcus Baker, U. S. Geol. Surv., Washington, 1902.

[63] E. P. W.: Dr. E. P. Walker.

ALASKA PENINSULA
[Figs. 18, 19]

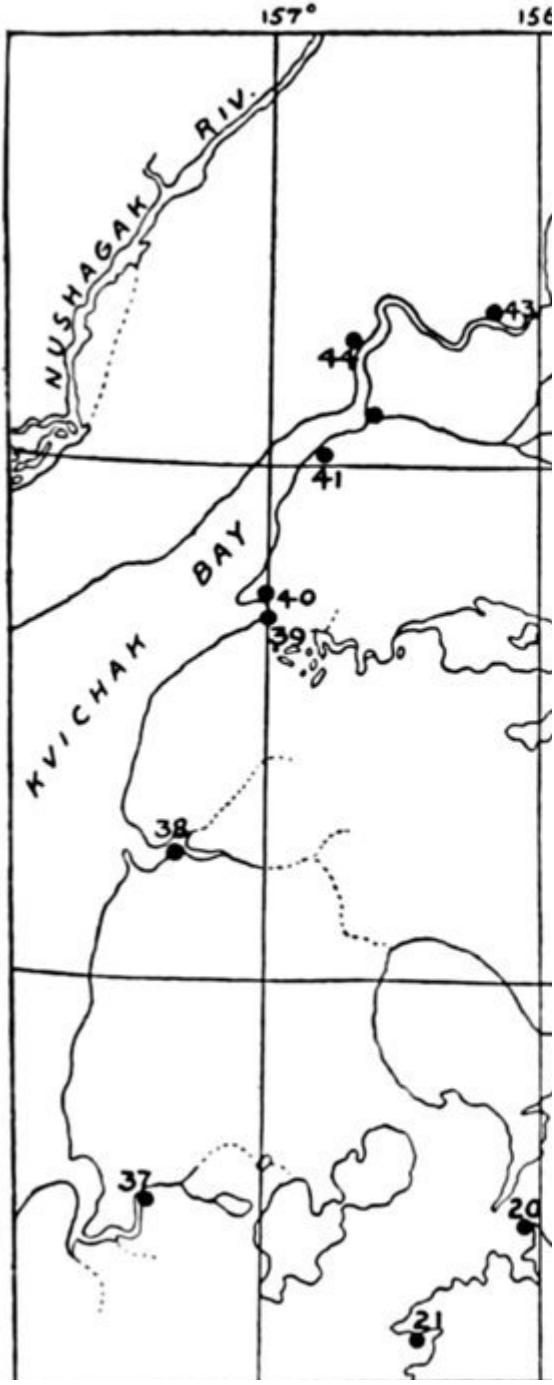
Native settlements or old villages at one or more

points in Kamishak Bay, Ursus Cove, or Iliamna Bay are reported, but there is nothing definite on the subject. (E. P. W.)

14. *Iliamna.*—An occupied native village, and undoubtedly there are various village sites on Iliamna Lake regarding which information could be obtained from parties in Iliamna. (E. P. W.)

15. *Ashivak.*—Native village (population 46 in 1880), near Cape Douglas, Cook Inlet. Native name reported by Petrof in 1880. (G. D. A.)

16. *Kayayak.*—Village, on Svikshak Bay, Shelikof Strait, about 25 miles southwest of Cape Douglas. Tebenkof, 1849, has Kaiaiak settlement, which has on many charts appeared as Kayayak. (G. D. A.)


157°
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NUSHAGAK RIV.
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44
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BAY
40
39
KVICHAK
38
37
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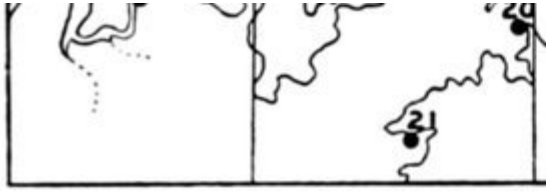


Figure 18.—Villages and

17. *Kukak.*—Native village on Kukak Bay. Lütke, 1835, has Koukak Bay and village. (G. D. A.)

18. *Katmai.*—Village, on Katmai Bay, Shelikof Strait, northwest of Kodiak. This is one of the most important of the native villages. Population in 1880, 218; in 1890, 132. (G. D. A.) A native village which was occupied up to the time of the Katmai eruption but was abandoned at that time. (E. P. W.)

19. *Cold Bay.*—Small village.

20. *Kanatak.*—A native village consisting of about half a dozen houses until in 1922, when oil activity in the vicinity caused a small white settlement to locate at this point. This, however, has since been almost entirely abandoned by whites. (E. P. W.)

21. *Kuiukuk.*—Small village.

22. *Chignik.*—Fishing station on Chignik Bay, Alaska Peninsula. Population in 1890, 193. (G. D. A.) There are three canneries in this immediate vicinity, a number of natives, and undoubtedly some native villages and probably old village sites. (E. P. W.)



Figure 19.—Villages an

23. *Kaluiak.*—Native village, on the southern shore of Chignik Bay, Alaska Peninsula. So given by Petrof in 1880 and the Fish Commission in 1888. (G. D. A.)

24. *Mitrofania.*—An old native village which has recently been abandoned or practically abandoned; was apparently a rather important village at one time. (E. P. W.)

25. *Perryville.*—A recently established native village consisting of natives from various points along the Alaska Peninsula who were moved there primarily by the Bureau of Education since the Katmai eruption. (E. P. W.)

26. *Kujulik.*—Walker has been informed that there is an old village site of that name either in this bay or on Kumlik.

27. Old village mentioned on this island; uncertain.

28. *Wosnesenski.*—An old village site on this island reported. (E. P. W.)

29. *Pavlof.*—Rev. D. Hotvoitzky, of Belkofski, informed Walker that there is a very old abandoned village site at the head of this bay.

30. *Belkofski.*—Bay, cape, and village on south coast of Alaska Peninsula. Named, by the Russians as early as 1835 and probably earlier. (G. D. A.) The most important occupied native village on the Alaska Peninsula. Quite an old village and a former headquarters for sea-otter hunting. (E. P. W.)

31, 32. *Morzhovoi.*—Native village at western end of Alaska Peninsula. Named Morzhovoi (Walrus) by the Russians. Variously spelled. There are or were two villages, one called Old Morzhovoi, the other New Morzhovoi, being about 12 miles apart. Old Morzhovoi was at the head of Morzhovoi Bay; New Morzhovoi is on Traders Cove, which opens into Isanotski Strait. The Greek church here is named Protassof, and Petrof, 1880, called the settlement

Protassof. (G. D. A.) An occupied native village. The natives from this village also live during the canning season at the cannery in False Pass directly across the strait from Morzhovoi and at Ikatan a short way to the south. (E. P. W.)

33. *Herendeen.*—Walker has been informed that there are some shell mounds or kitchen middens about this bay. Walter G. Culver, formerly an employee of the Bureau of Education, but who is at present in Anchorage in care of the Alaska Railway, can give information regarding this and can also give information regarding most of the other native villages along the Alaska Peninsula. (E. P. W.)

34. *Port Moller.*—Eskimo site somewhere in this vicinity; name and exact location uncertain.

35. *Unangashik.*—A native village, or portage, near Port Heiden.

36. *Meshik.*—A village on Port Heiden.

37. *Ugashik.*—A native village on the Ugashik River. Reported by Petrof, 1880.

38. *Igagik (or Egegik).*—A village at the mouth of the Egegik River.

39. *Kiniak (or Naknak, or Suvorof).*—A village (of "Aleuts," Sarichef) at mouth of Naknak River, Bristol Bay, south side.

40. *Pawik (or Pakwik).*—Eskimo village, at mouth of Naknak River, Bristol Bay, north side.

41. *Kogiunk.*—Eskimo village at mouth of Kvichak River, Bristol Bay. Native name, reported in 1880 by Petrof, who spelled it Koggiung. (G. D. A.)

42. *Lockanok.*—Small village.

43. *Kashanak.*—Small old village.

44. *Kvichak.*—Old Eskimo village on river of same name between Kvichak Bay and Iliamna Lake.

Bristol Bay to Cape Romanzof

From the northern part of Bristol Bay to Cape Romanzof a partial survey of the coast was made in 1927 by Collins and Stewart (U. S. National Museum Expedition). In these regions and on the Nunivak Island it was possible to locate a series of villages some of which are still "living," others in ruins. In the late seventies of the last century, as stated before, the coast between Kuskokwim Bay and St. Michael Island was visited and its villages recorded by Nelson. A detailed archeological survey of this coast remains for the future. Doctor Romig, formerly a medical missionary at Bethel, told me of a number of old sites on the river. Some notes of interest by T. D. Stewart are given in the details. Mr. F. W. Bundy, for a time my companion on the *Bear*, told of an old site on the Kuskokwim. In March, 1927, H. W. Averill, writing from Bethel, tells of a deep-lying old site on the southern coast of the Kuskokwim Bay. (See details.) And later the same year Father Philip I. Delon, of the Holy Cross Mission, sent in three skulls from Kashunuk, in the Yukon delta, with information of much additional material in that locality.

45. *Nushagak.*—Old Russian post, "Alexandrovsk." Eskimo village, a few whites; a number of old native sites scattered about head of Nushagak Bay.

46. *Ekuk.*—Eskimo settlement near the mouth of Nushagak River. Name from Lütke, 1928, who spelled it Ekouk. Has also been written Yekuk. (G. D. A.)

46a. Reported site of Eskimo village.

47. *Ualik.*—Native village, on the western shore of Kulukak Bay, Bristol Bay, Bering Sea. Given by Petrof, 1880, as Ooallikh and by Spurr and Post as Oallígamut; i. e., Oallik people. (G. D. A.)

48. *Togiak.*—Old Eskimo settlement.

49. *Ekilik.*—Possibly the same as Togiakmute, reported in 1880 by Petrof. Eskimo village on the west bank of Togiak River, about 10 miles from its mouth. Eskimo name obtained by Spurr and Post, in 1898, who write it Ekilígamut; i. e., Ekilik people.

50. A small Eskimo village.

51. *Mumtrak.*—Eskimo village at head of Goodnews Bays, Bering Sea. Population in 1890, 162. Name from Petrof, 1880, who spelled it Mumtrahamute. (G. D. A.) Visited 1927 by Collins and Stewart; collections.

52. Site of a village, at junction of Bessie Creek and Arolic River.

53. *Arolik.*—A village. H. W. Averill of Bethel writes me under date of March 3, 1927, as follows: "I am sending you some old stone pieces that came from the Aralic River, a tributary of the lower Kuskokwim River, that were washed up by a bend in the river from an old village that is now 6 feet underground."

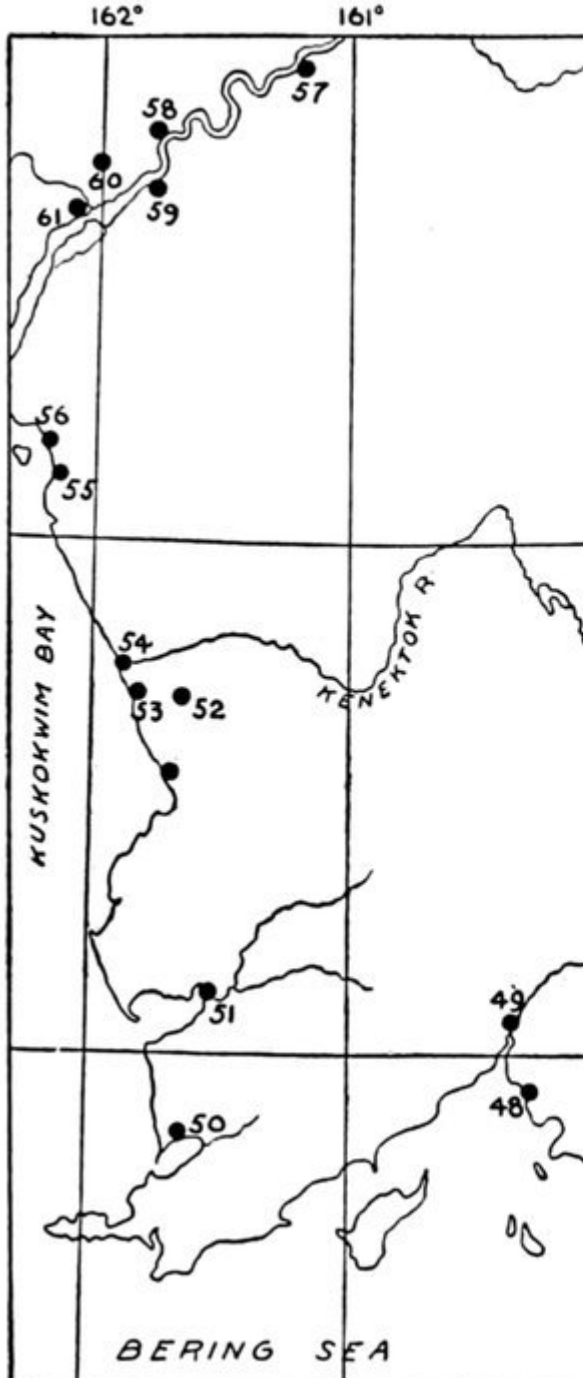

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BERING SEA



Figure 20.—Eskimo villages and sites

54. *Kwinak.*—Eskimo village on the eastern shore of Kuskokwim Bay, at the mouth of the Kwinak or Kanektok River, Bering Sea. So given by Sarichef, 1826, and Tebenkof, 1849. Petrof, 1880, writes it Quinehahamute, or, omitting the termination *mute*, meaning *people*, it would be Quene-a-ak. (G. D. A.)

55. *Apokak.*—Eskimo village on the eastern shore of Kuskokwim Bay, at the mouth of Apoka River. According to Nelson, 1878-79, its native name is Apokagamute; i. e., Apokak people. In the Eleventh Census, 1890, it is called Ahpokagamiut. (G. D. A.)

56. *Eek.*—Eskimo village at mouth of Eek River.

57. *Akiak.*—Eskimo village on the right bank of the Kuskokwim, about 30 miles above Bethel. Petrof, 1880, wrote its name Ackiagmute; i. e., Akiak people. Spurr and Post, 1898, write Akiagmut, following Missionary J. H. Kilbuck. (G. D. A.) Reindeer camps in vicinity.

58. *Bethel.*—White and Eskimo settlement and mission at or near the old Eskimo village Mumtrelega.

59. *Napaiskak.*—Eskimo village on the left bank of the Kuskokwim, about 4 miles below Bethel. According to Nelson, 1878-79, its native name is Napaskiagamute, and according to Missionary Kilbuck, 1898, it is Napaiskagamut; i. e., Napaiskak people.

60. *Old sites.*—Mr. Bundy, my companion for a time on the *Bear*, gives the following details: "Specimens

found about 12 miles below Bethel, Alaska, at the mouth of the Kuskokwim River, beneath about 10 or 12 feet of alluvial soil deposits of sand and clay.

"Mr. Jack Heron, of Bethel, first noted the presence of old implements, and upon returning with him about August 1, 1923, we found the river had cut into the bank quite a bit and had brought to view, after the high waters had receded, additional specimens.

"Those found included: A large copper kettle of perhaps 8 gallons capacity of early Russian pattern, several arrowheads of slate or dark gray flint, and two spearheads of bone with several broken knife blades of slate and one or two small ivory ornaments resembling birds."

61. *Napakiak.*—Eskimo village on the right bank of the Kuskokwim, about 10 miles below Bethel. Nelson, 1878, reports the native name as Napahaiagamute. (G. D. A.)

62. *Kinak.*—Eskimo village on right bank of the lower Kuskokwim. Visited by Nelson in January, 1879, who reported its native name to be Kinagamiut; i. e., Kinak people. Its population was at that time about 175. Population in 1880, 60; 1890, 257. (G. D. A.)

63. Village site (?).

64. *Kuskovak.*—Eskimo village, on the right bank of the Kuskokwim River, near its mouth. Name from Nelson, who passed near it in January, 1879, and who writes it Kuskovakh. (G. D. A.)

65. *Popokak.*—Native village.

66. *Kulvagavik.*—Eskimo village, on the western side of Kuskokwim Bay, Bering Sea. Visited by Nelson in

January, 1879, and its native name reported by him to be Koolvagavigamiut. (G. D. A.)

67. *Kongiganak.*—Eskimo village (of about 175 people in 1878) on north shore of Kuskokwim Bay. Visited by Nelson in December, 1878. (G. D. A.)

68. *Anogok.*—Eskimo village, on the mainland shore just west of Kuskokwim Bay, Bering Sea. Visited by Nelson in December, 1878. (G. D. A.)

69. *Chalit.*—Eskimo village, of about 60 people in 1878, on left bank of the Kuguklik River, northwest of Kuskokwim Bay. Visited by Nelson in December, 1878. (G. D. A.)

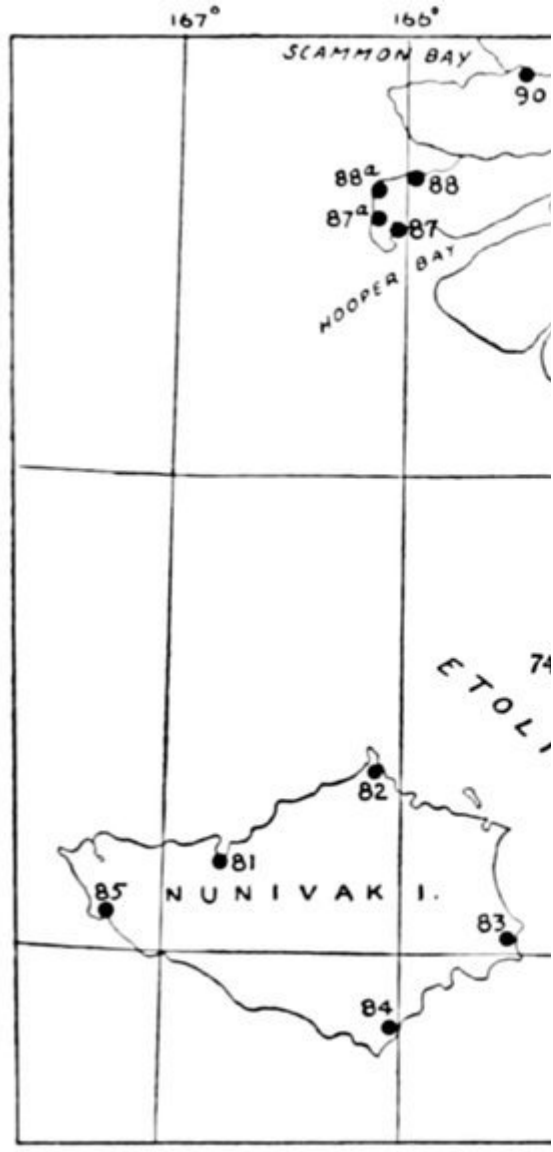


Figure 21.—Eskimo villag

70. *Chichinak.*—Eskimo village on the mainland, east of Nunivak Island, Bering Sea. Visited by Nelson in

December, 1878. (G. D. A.)

70a. Old village site.

71. *Sfaganuk.*—Eskimo village, on the mainland, east of Nunivak Island, Bering Sea. Visited by Nelson in December, 1878. (G. D. A.)

72. *Agiukchuk.*—Eskimo village, on the mainland, east of Nunivak Island, Bering Sea. Visited by Nelson in December, 1878. (G. D. A.)

73. *Kashigaluk.*—Eskimo village, on Nelson Island, Bering Sea. Visited by Nelson in December, 1878. (G. D. A.)

74. *Kaliukluk.*—Eskimo village, on Nelson Island, near Cape Vancouver, Bering Sea. Visited by Nelson in December, 1878. (G. D. A.)

74a. Old village site.

75. *Tanunak.*—Eskimo village, at Cape Vancouver, Nelson Island, Bering Sea. Name from Nelson, who visited it in December, 1878. Visited 1927 by Collins and Stewart; collections.

75a. Village site.

76. *Ukak.*—Eskimo village, in the Yukon Delta, on shore of Hazen Bay. Visited by Nelson in December, 1878, and its name reported by him as Ookagamiut; i. e., Ukak people. Petrof, 1880, calls it Ookagamute. (G. D. A.)

77. *Unakak.*—Eskimo village, in the Yukon Delta, near Hazen Bay. Nelson, who visited it in December, 1878, reports its name to be Oonakagamute; i. e., Unakak people. Petrof, 1880, calls it Oonakagamute. (G. D. A.)

78. *Kvigatluk.*—Eskimo village, in the Big Lake

country, between the Yukon and Kuskokwim. Nelson in 1879 passed near it and reports its name to be Kvigathlogamute. (G. D. A.)

79. *Nunochok.*—Eskimo village, in the Big Lake region. Visited by Nelson in January, 1879, who reports its native name to be Nunochogmute; i. e., Nunochok people.

80. *Nanvogaloklak.*—Eskimo village, in the Big Lake country. Visited by Nelson in January, 1879. Population in 1880, 100; in 1890, 107. (G. D. A.)

81. *Nash Harbor.*—Living village, Nunivak Island; school; Collins and Stewart, 1927, anthropometric data, collections (also from other parts of island).

82. *Koot.*—Village, Nunivak Island, near Cape Etolin; partly occupied. Population in 1890, 117.

83. *Inger.*—(In Eleventh Census: Ingeramiut.) Dead village, in southeast part of Nunivak Island. Population, 1890, 35.

84. *Kvigak* (*or Kwik*).—Dead village, southern part of Nunivak Island.

85. *Tachikuga.*—Dead village, Nunivak Island, below Cape Mohican.

86. *Kashunuk.*—Eskimo village; some collections; skeletal material in vicinity reported 1927 by Father Delon, of the Holy Cross Mission, Yukon.

87. *Askinuk.*—Eskimo village on the southern shore of Hooper Bay, Yukon Delta. Native name, from Nelson. Population 1878, 200. (G. D. A.)

87a. Village site.

88. *Agiak.*—Eskimo village on promontory north of Hooper Bay.

88a. Village site.

89. *Igag.*—Small village.

90. *Kut* (*Kutmiut*).—Small village on Kut River, head of Scammon Bay.

Cape Romanzof to Northern (Apoon) Pass of the Yukon and Northward

On this coast there is little information since the time of Nelson. There are a number of occupied villages as well as of old sites. The region is bleak and the Eskimo there are reported to live miserably.

The principal Eskimo villages and sites along the lowermost branch of the Yukon have been given previously. (Fig. 11.)

From the northernmost pass of the Yukon to St. Michael Island the coast is poor in Eskimo remains. A site of interest here is the old camping ground, with a few permanent houses, of Pastolik, and there are two small sites farther up the coast. Pastolik to the writer's visit was still occasionally occupied by a few Eskimo families. There are only three houses, but a relatively large and old cemetery speaks of a larger population, probably camping here in tents during the summer seasons of the past. The burial grounds were found to be rather extensive and give indications of containing human bones as well as artifacts below the present surface (buried by the tundra). The main part of the burial grounds may well repay an excavation.

ST. MICHAEL ISLAND.—Eskimo remains exist on the northeastern point of the island beyond the present white man's village, and also on the rock (Whale

Island) opposite this point. During my visit the ground was so overgrown by high weeds that details were hidden. On this same northeastern point near the extension of the white settlement is a small living Eskimo village, most of the inhabitants of which are now of mixed blood. Across St. Michael Bay are said to be some old traces of Eskimo, and Nelson reported an old site in the southern part of the island. Finally at Cape Stephens, in the western extremity of the island, there is "Stebbins," another living village. Nothing could be learned of any human remains on the opposite Stuart Island.

NORTON SOUND.—North of St. Michael Island is Norton Sound and Norton Bay. Along the east coast of the Sound there are three villages still occupied, but with old accumulations. It is reported that in this region there are some ruined houses in which mammoth tusks had been used in the construction, but nothing definite could be learned as to the location of these houses and the whole may be but a story. The village of Unalaklik was of importance in the past and its older remains would probably repay excavation. Old sites are reported from the vicinity of Shaktolik and at Cape Denbigh.

The Norton Bay region (fig. 22), now almost depopulated, had in 1840 a whole series of moderate-sized living Eskimo settlements, both on the east and the west shore. These shallows are but little visited, and it is probable that the remains of the villages and some at least of the skeletal material of their burying grounds are well preserved. They call for early attention.

To the west of Norton Bay, on the southern coast of Seward Peninsula, is Golovnin[64] Bay. On the eastern shore of this bay are now, as there were in

Russian times, two settlements, but the name of one has been misplaced. On Zagoskin's map it is clearly seen that the village Ching or Chinig corresponds in location to what now is the mission, while what is now called "Cheenik" was in 1840 Ikalik or Ikalikhaig. There will soon be seen another instance of such a misapplication of the original names.

To the west Golovnin Bay is bounded by a large promontory ending in Rocky Point. To the east of this point is a shallow bay, where I found a late Eskimo house and on the elevated shore a little to the left four fairly recent adult burials. Farther down the bay was an Eskimo camp, without signs of anything older; but Zagoskin's map gives a settlement, probably also a camp, at this place, named Knikhtak. From this a rocky point projects eastward into the bay. Behind this point is a shallow cove with elevated ground above the beach, and at the inland end of this bay I found the remains of a small old village. Traces of burials were seen on the elevated ground but skeletal remains were absent.

On the southwestern shore of the promontory that bounds Golovnin Bay on the west the Russians (Zagoskin) recorded two villages, the one near to Rocky Point being Chiukak, that on a point farther northwest being named Chaimiut. Later the name Chiukak became applied to the former Chaimiut, while Chiukak proper was dead and forgotten. On latest maps, such as Chart 9302 United States Coast and Geodetic Survey, neither of the old names appears. The name Bluff denotes a small settlement in about the location of the former Chaimiut. Some Eskimo met in Golovnin Bay said that there are skeletal remains near the original Chiukak, but an attempt to reach the place failed through rough

water.

FOOTNOTES:

[64] This is the correct orthography. See Russian maps.

South Shore of Seward Peninsula West of Bluff

A number of dead villages are found along this coast. The first and largest is located a few miles west of Port Safety, 18 miles east of Nome. This was a large village extending for a considerable distance along the elevated beach separating an inland lagoon from the sea. The depressions of the dwellings, of the usual dipper-with-handle type, are very plain. Old settlers at Nome remember when the village was still occupied. Nearer the sea the beach is said to have been lined with burials, but the storm of 1913 took or covered everything. (See Narrative, p. 90.)

A small Eskimo settlement existed on a rocky elevation east of Cape Nome. There are some house sites, but the place gives little promise of archeological importance. We found evidence that the site must have been occupied until fairly recently. Among the bowlders were found two skeletons.

A larger dead village is located near the mouth of a little stream west of Cape Nome. It is doubtless the Azachagiag of the Zagoskin general map. It gives no great promise archeologically.

From Nome to Point Spencer there are several old sites, all "dead"; and there are one or two recently

"dead" villages on Sledge (the old Aiak or Aziak) Island. Of the coast sites, the most important is reported to be that at Cape Woolley. It is said to have been the stopping point of the King Islanders and may have been their old mainland village.

A number of old sites and burial grounds have been seen or learned of in Port Clarence and Salt Lake. They are marked on the map, and those of the lake have been discussed in the Narrative (p. 117). Those on Salt Lake (Imuruk Basin) deserve attention.

Between Port Clarence and Cape Prince of Wales only one, and that evidently not a very large site, was learned of at Cape York.

The most important site of the peninsula region is doubtless that at the cape. Thanks to the able local teacher of that time, Mr. Clark M. Garber, I am able to present a detailed map of this locality. It is here that Doctor Jenness in 1926 conducted some excavations with interesting results. But the site has barely been touched. It is the nearest point to Asia. There are ample indications that it has been occupied for a long period and by relatively large numbers of people. Besides the ruined parts and old heaps there are still the skulls and bones of many burials among the rocks about the village, and there is evidence that more are in the ground. It is one of the chief sites of the far northwest for systematic thorough exploration, and such exploration is a growing necessity for all branches of anthropology interested in the problems of the Bering Sea and Asiatic-American connections.

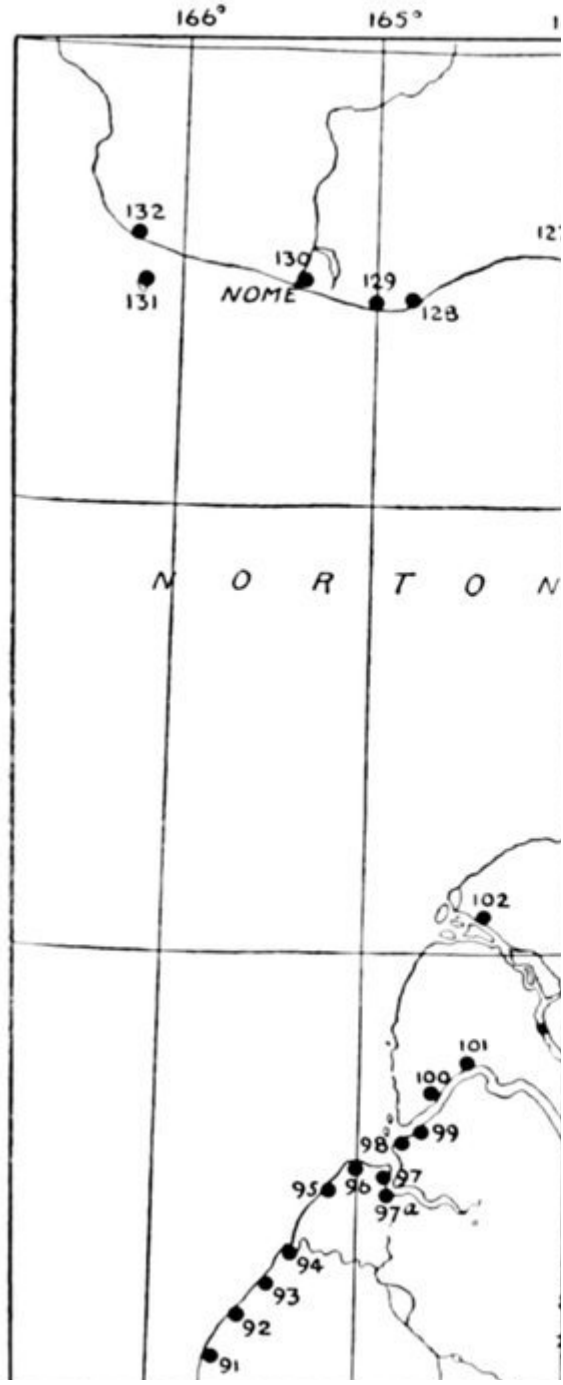
Scammon Bay, Norton Sound, South Coast of Seward Peninsula, to Cape Rodney

[Fig. 22]

91. *Melatolik.*—A small coast village.

92. *Bimiut.*—A small coast village.

93. *Kwikak.*—Eskimo village on the outer coast in the Yukon Delta, a little south of the mouth of Black River. Native name, from the Coast Survey, 1898, which gives it as Kwikagamiut. (G. D. A.)


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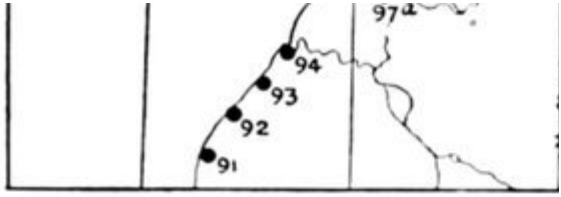


Figure 22.—Eskimo Villages and sites, Sc

94. *Kipniak.*—Eskimo village and Coast Survey tidal station at mouth of Black River in the Yukon Delta. Nelson, 1879, reports its name to be Kipniaguk and Dall writes it phonetically Kip-nai-ak. (G. D. A.)

95. *Kogomiut.*—A small village.

96. *Waklarok.*—A small village.

97. *Nunamekrok.*—A small village.

97a. *Eleutak.*—A small settlement.

98. *Nilak.*—A small village.

99. *Kwikluak.*—A small village near the mouth of the Kwikluak Pass of the Yukon, south bank.

100. *Alakanuk.*—A small settlement.

101. *Kwiguk.*—A village on Kwikluak Pass of the Yukon, north bank.

102. *Kwikpak.*—Village near mouth north bank of pass of same name, Yukon River.

103. *Nakhliwak.*—A small village, occupied part of time, about 2 miles from mouth of Apoon Pass, Yukon; visited by the writer; small skeletal collection.

104. *Kotlik Point.*—A store and Eskimo camp (summer) at mouth of Apoon Pass, north bank. (A. H.)

105. *Pastolik.*—Four Eskimo houses, occupied winter. Extensive burial ground near. Collections, A. Hrdlička. Good prospects for excavation in burial

places.

106. *Pikmiktalik.*—Eskimo village, near the mouth of Pikmiktalik River, about 30 miles to the south of St. Michael, western Alaska. (G. D. A.)

106a. *Pastoliak.*—A site near mouth of next small stream to the north. A few houses. Some burials.

107. *St. Michael and Whale Island.*—Old sites, northeast end of St. Michael and on Whale Island, opposite. A small living village near the point of the main island, mostly mix bloods. (A. H.)

107a. Dead village. Nelson reports it had been peopled by the Pastolik Eskimo ("Eskimo about Bering Strait," p. 263).

108. *Stebbins.*—A living Eskimo village at Cape Stephens.

110. *Golsova.*—A small camp at mouth of river of same name.

111. *Unalakleet* (*or Unalaklik*).—Important old Eskimo village, Norton Sound; western end of portage to Yukon. Population in 1880, 100; in 1890, 175.

112. *Shaktolik.*—Eskimo village, at mouth of Shaktolik River, Norton Sound. Population in 1880, 60; in 1890, 38. (G. D. A.) Old settlement; several old sites in this region.

113. *Nuklit.*—Eskimo village, on the eastern shore of Norton Sound, immediately behind Cape Denbigh. (G. D. A.) Originally given on Zagoskin's general map. (A. H.)

113a. *Tapkhalik.*—Old village on east shore of Norton Bay.

114. *Unakhtuglig or Unagtulig.*—Originally given on

Zagoskin's general map. (A. H.)

115. *Kviguk.*—Eskimo village, on north shore of Norton Bay, at mouth of the Kviguk River. Eskimo name, from the Russians. Tikhmenief, 1861, has Kviegmiut and Kvieguk-miut; i. e., Kviguk people. (G. D. A.) Originally on Zagoskin's general map.

116. *Kvig-miut.*—Old village, above the preceding; originally on Zagoskin's general map.

117. *Kvinkhak* (*now Inglestat*).—Old village at head of Norton Bay. Originally on Zagoskin's general map.

118. *Tulukhtulig* (*at or near Elim*).—Old village on west coast of Norton Bay.

119. *Atnik.*—Old village below the preceding.

120. *Camp* (*Reindeer*).

121. *Chinig.*—Old village at or near the site of present mission; name now erroneously applied to village at Point Golovnin.

122. *Ikalikhvig.*—Present Cheenik, at Point Golovnin.

123. Old site; located 1926 (A. H.); a moderate-sized village; not promising for excavation.

124. *Knikhtak.*—Originally on Zagoskin's general map; now a camp, no old remains in evidence; a house and four burials on same shore, 2 miles farther south; collection (A. H.).

125. *Chiukak.*—Dead village; on Zagoskin's general map; some skeletal material remaining; name now applied to a village farther up the coast.

126. *Chaimiut.*—Dead village; originally on Zagoskin's general map; name belonged to village nearer the point.

127. *Ukvikhtulig.*—Dead village at Topkok Head;

originally on Zagoskin's general map.

128. Dead village, 18 miles east of Nome, near Port Safety. (A. H.)

129. *Azachagiag.*—Dead village, west of Cape Nome; originally on Zagoskin's general map.

130. *Nome.*—Probably small native village at this site in the past. Now principal white settlement in western Alaska. King Island, Diomede, and some Wales natives reside on the outskirts during summer.

131. *Aziak Island* (*Sledge Island*).—Two dead villages; the principal one at the northern point of the island. Visited by Collins, 1928. Collections.

132. *Sinuk.*—Small old site.

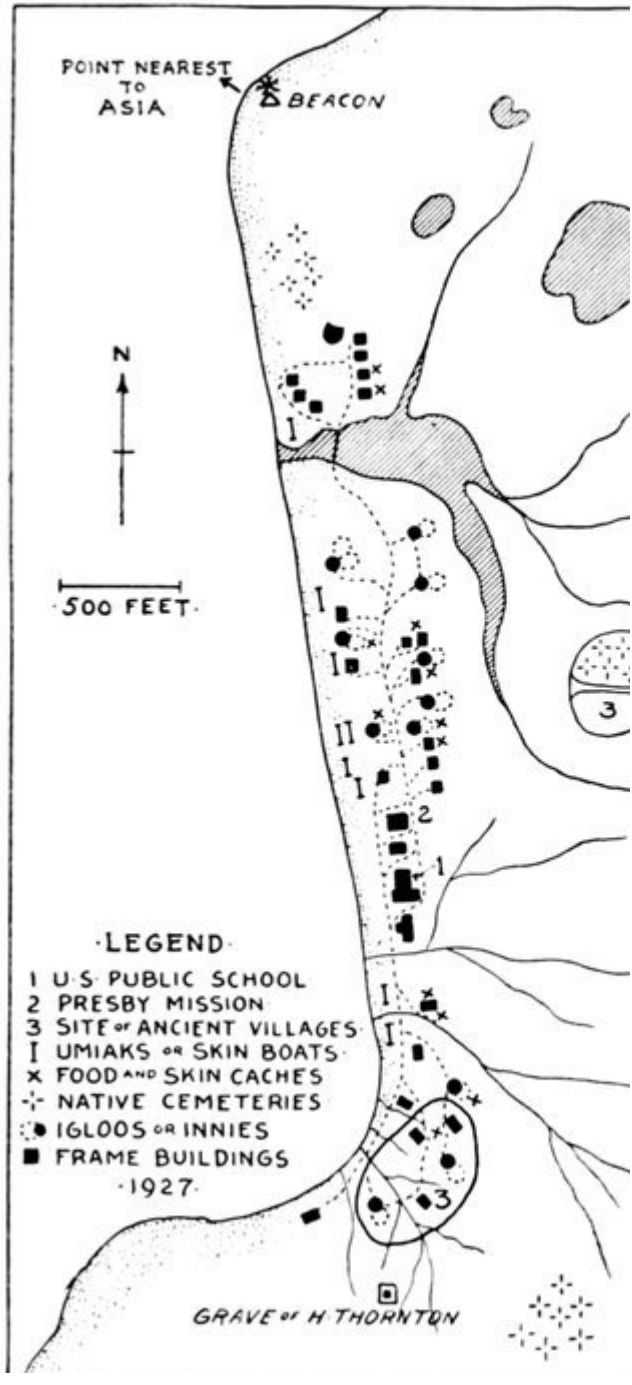
133. *King Island* (*Ukiook*).—Old village, still occupied in winter; in summer inhabitants live at Nome.

133a. A village site at Cape Woolley; said to be the stopping place of the King Islanders.

134. Dead sites.

135. Burials.

136. *Siniak.*—Now a Lutheran Mission for the Eskimo.


POINT NEAREST TO ASIA
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500 FEET
LEGEND
1 U.S. PUBLIC SCHOOL
2 PRESBY MISSION
3 SITE OF ANCIENT VILLAGES
I UMIAKS OR SKIN BOATS
× FOOD AND SKIN CACHES
NATIVE CEMETERIES
IGLOOS OR INNIES
FRAME BUILDINGS
1927
GRAVE OF H THORNTON



·LEGEND·
1 U·S· PUBLIC SCHOOL·
2 PRESBY MISSION·
3 SITE of ANCIENT VILLAGES·
I UMIAKS or SKIN BOATS·
X FOOD and SKIN CACHES·
✛ NATIVE CEMETERIES·
O IGLOOS or INNIES·
■ FRAME BUILDINGS·
·1927·

Figure 23.—Eskimo villages and sites, Wales. (By

137. *Teller.*—Old Eskimo site; some still live here with, a few whites. A few Eskimo camps along Tuksuk Channel.

138. *Salt Lake* (*Imuruk Basin*).—Ruins seen on north shore. (A. H.)

139. Old sites near eastern end of lake; a Chukchee-Eskimo battlefield in vicinity. (A. H.)

140. Old village site on the St. Marys River.

141. Burials reported.

142. *Wales.*—Old Nykhta, Zagoskin's maps; see special description; collections.

The Northern Shore of the Seward Peninsula

This shore is but little known to science. It is dangerous of approach to any except small boats.

The only place that could be visited by me was Shishmaref, a good-sized thriving Eskimo village, on both sides of which along the sea are remains of old sites with burials. The more important old settlement was that to the east of the village. Here are found large and extensive heaps, the tops of which have recently been leveled for fox cages, the whole site belonging, regrettably, to a newly established fox farm. It is an old site, though probably occupied up to white man's times, and is doubtless of some importance. Excavations would still be possible, as the bulk of the remains is intact; and though the surface skeletal material has been removed (part saved for our collections), there are indications of surface burials (assimilations by the tundra) in the ground.

Between Wales and Shishmaref are several dead sites, as shown on the map, and some of them, judging from the information obtained, are of promise. One of these settlements, "Tapkhaig," was evidently still a living village at the time of Zagoskin (1840).

Northeast and east of Shishmaref the coast is known even less than that to the west. A few miles off Shishmaref I saw from a distance—the boat could not approach nearer—what to all appearances was a large ridge of ruins, and from various maps and other sources information was obtained of several other sites, all of which represent former villages. From one of these sites on the Bucknell River Mr. Carl Lomen secured a fine piece of fossil ivory carving, and the site is said to be of much promise. The whole coast is a virgin field for archeology.

143. *Mitletukeruk.*—Old village site. Visited by Collins, 1928; collections.

144. *Tapkhaig or Ekpik.*—Old village site, originally shown in Zagoskin's general map.

145. *Sinrazat.*—Old site.

146. *Karatuk or Shishmaref.*—Living village, with ruins on both sides. Visited by A. H.; collections.

147. *Kividlow.*—Old site.

148. Old site reported.

148a. *Siuk.*—Old site.

149. Old site (?).

150. *Paapkuk.*—Old site.

151. *Deering.*—Recent settlement, but old sites probable in vicinity.

151a. *Kualing.*—Old village, now long dead, shown by Zagoskin. (General map.)

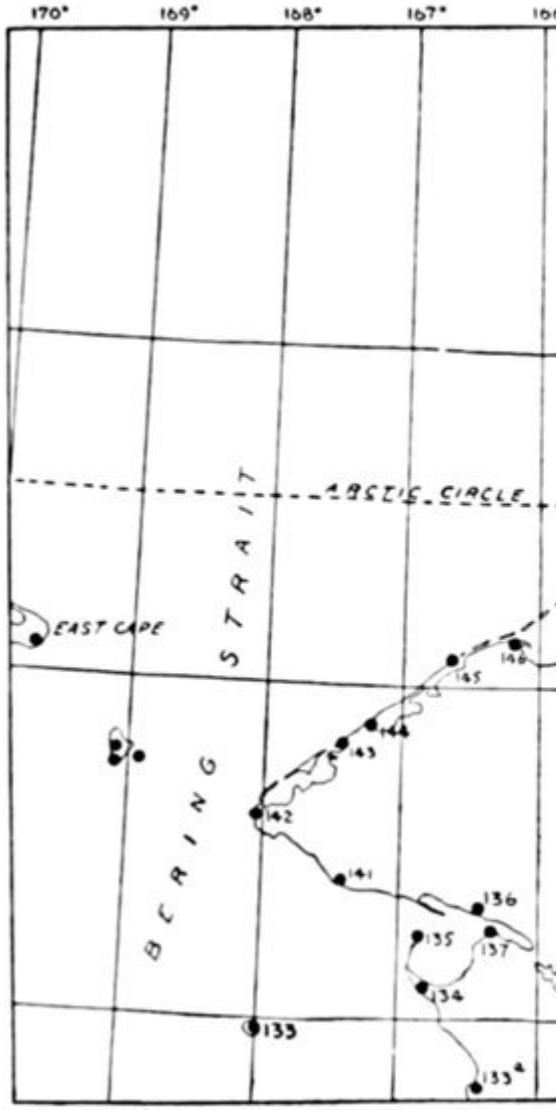


Figure 24.—Eskimo villages and sites, Sev

152. *Kiwalik.*—A village at mouth of river of same name.

153. Dead villages reported on the two promontories; promising archeologically. On Elephant Point Nelson saw the site of an old village "with about 15 pits marking the locations of the houses." (Eskimo of Bering Strait, 264.)

153a. Buckland River. Camp sites.

153b. Old village site.

154. Old whaling place, occupied summers only. (S. Chance.)

155. *Selawik.*—Old village. Old igloos and camps at various places in the Selawik Basin. (S. Chance.)

156. Camps. (S. Chance.)

156a. *Chilivik.*—A village, now long dead, shown on the general map of Zagoskin.

157. Fish camps. (A. H.)

Kotzebue Sound, Its Rivers and Its Coast Northward to Kevalina

Figure 24 shows the village sites that it was possible to locate in these regions. Nearly all these are now "dead villages," though some Eskimo may still occasionally camp in their vicinity. A large present settlement of the Eskimo, well advanced toward civilization, is found at Kotzebue, and fish camps extend from here along the shore in the direction of Cape Blossom. Another important recent living village and school center is Noorvik on the lower Kobuk River.

Inquiries as to old sites in this region were greatly assisted by Mr. Sylvester Chance, at the time of my visit the supervisor of the Government schools of the

district. At my request and with the aid of the natives Mr. Chance has compiled a list of such sites and settlements as could still be remembered, and the information has been incorporated into these records.

Among the more important ruins of this vicinity are apparently those at and near Cape Krusenstern, and again those near Kevalina farther to the northward. Archeological specimens of considerable interest were seen and partly secured from both localities. The old Kevalina especially should receive early attention, for it is being excavated by the Eskimo of the present village, though fortunately this is at some distance.

Seward Peninsula, Kotzebue Sound, and Northward

158. *Kotzebue.*—Old name: Kikikhtagiuk. (Zagoskin, general map.) A small white with a large Eskimo settlement. Old burials in ground (assimilated). A. H. collections.

159. *Noorvik.*—White and native village; school center.

160. *Oksik.*—Old camp, still occupied. (S. Chance.)

161. *Kiana.*—Old village, still occupied. (S. Chance.)

162. *Shesoalik.*—Old camp, still occupied in summer. (S. Chance.)

162a. *Kubok.*—Old village shown on general map of Zagoskin.

163. *Aniyak.*—Old camp, still occupied. (S. Chance.)

164. Old site reported here; said to be promising archeologically.

165. *Tikizat.*—Eskimo village, at Cape Krusenstern, Arctic Ocean. Eskimo name, from Petrof, 1880, who reported a population in that year of 75.

166. *Kiligmak.*—Old camp, still occupied.

167. *Noatak.*—A living village.

168. Old camp, exact location not certain. (S. Chance.)

169. *Matthew or Aniyak.*—Old camp.

170. *Ottala.*—Camp, occupied. (S. Chance.)

171. Old site reported; exact location (?).

172. Old site, rich archeologically, exact location undetermined; small collection. (A. H.)

173. *Kevalina.*—Living Eskimo village.

174. *Pingo.*—Old dead village. (S. Chance, Jim Allen.)

Kevalina—Point Barrow

POINT HOPE (TIGARA)

This is the most important ruin as well as living Eskimo village in Arctic Alaska. It is unanimously declared by the Eskimo of the coast to be one of the oldest settlements and has always been the largest native center on the coast. The point was called Golovnin Point by the early Russians; it was called Point Hope by Beechey in 1826 in honor of Sir William Johnston Hope. At the time of its visit by the revenue cutter *Corwin*, 1884, there are said to have been two villages;[65] the second being possibly at the site of the old whaling station. Rasmussen, who visited the village about 1924, speaks of it in part as

follows:[66] "Point Hope or Tikeraq, 'the pointing finger,' is one of the most interesting Eskimo settlements on the whole coast of Alaska, and has doubtless the largest collection of ruins. The old village, now deserted, consists of 122 very large houses, but as the sea is constantly washing away parts of the land and carrying off more houses, it is impossible to say what may have been the original number. Probably the village here and its immediate neighborhood had at one time something like 2,000 souls, or as many as are now to be found throughout the whole of the Northwest Passage between the Magnetic Pole and Herschel Island."

The ruins are to the northwest and west of the present village. Those to the northwest consist of imposing heaps, which together form an elevated ridge facing the sea. It is said that this old settlement was abandoned because of the encroachments upon it by the sea, particularly during storms.

The ruins of this main compound have been for several years assiduously excavated inch by inch by the local Eskimo, and thousands of articles of great variety, of stone, bone, ivory, and wood, with here and there in the uppermost layers an object of metal, are being gathered and sold to all comers. With these are found a few human skulls and bones, but especially the skulls and bones of various animals, all of which unfortunately have hitherto been left behind in the mud. But the probably most valuable central and lower portions of the piles remain. The locality calls loudly for proper exploration, which will well repay any museum by the quantity and value of the specimens that are sure to be recovered.

FOOTNOTES:

[65] Healy, M. A. Cruise of the *Corwin* in the Arctic Ocean 1884. Washington, 1889, p. 27.

[66] Rasmussen, Knud, Across Arctic America. New York, London, 1927, 329-330.

POINT HOPE TO POINT BARROW

Information about this part of the northwesternmost coast of Alaska was obtained principally from Jim Allen, the trader at Wainwright, and Charles Brower, the trader at Barrow; but parts of the coast were also examined in person. The number of old sites is rather large, but it appears that there is not much of special promise until we reach near Barrow.

Old "igloos" southwest of Barrow: From 5 to 8 miles southwest of Barrow and at some distance (up to about 400 yards) from the shore there existed, and in part still exist, a series of elevations which the natives of Barrow always regarded as natural. On excavation the larger of these elevations proved to be old structures with numerous burials and cultural objects, and the remains, as shown elsewhere, are exceptional for this coast. Six of these "mounds" have been excavated by the University of Pennsylvania Expedition (Van Valin), while several are still remaining. It is very important that these should be carefully excavated before they are attacked by the natives of Barrow for mercenary purposes.

BARROW AND POINT BARROW

Two large living villages, with old sites and inhumed (natural) burials in their vicinity, and with some old remains between them. Barrow is the most important present mixed settlement and center of civilization in

the Arctic. Besides the school, it contains a mission hospital and recently a meteorological observatory and wireless station. The tundras to the east of the village for about 1½ miles show patches of burials, particularly in the more distant parts of this region on the elevations to both sides of a small stream.

Much archeological work remains to be done about Barrow, particularly in the remainder of the old "igloos." East of Point Barrow the population is very sparse and no ruins of any note or settlements are reported before those of the Barter Island and the mouth of the Colville River.

175. *Pingishuguruk.*—A small old site.

176. *Ketchemeluk.*—A small old site.

176a. *Ipnot.*—Eskimo village on the Arctic coast, near Cape Thomson, a little south of Point Hope. Name from Petrof, who wrote it Ip-Not and Ipnot, and reported a population of 40 in 1880.

177. Old whaling station.

178. *Point Hope or Tigara.*—Eskimo village at Point Hope, Arctic Ocean. It is Tiekagag-miut of Tikhmenief, 1861; Tikirak of Petrof, 1880, who reports a population in that year of 276. Spelled Tikera in the Eleventh Census. Herendeen gives Tik-i-rah. The Eskimo name of the settlement is said to be Tik-i-rah-mum. Visited by A. H.; important collections.

179. *Wewuk* (*or Wevok*).—Eskimo village on the Arctic coast, near Cape Lisburne. Eskimo name, published by the Hydrographic Office in 1890. (G. D. A.) (Jim Allen.)

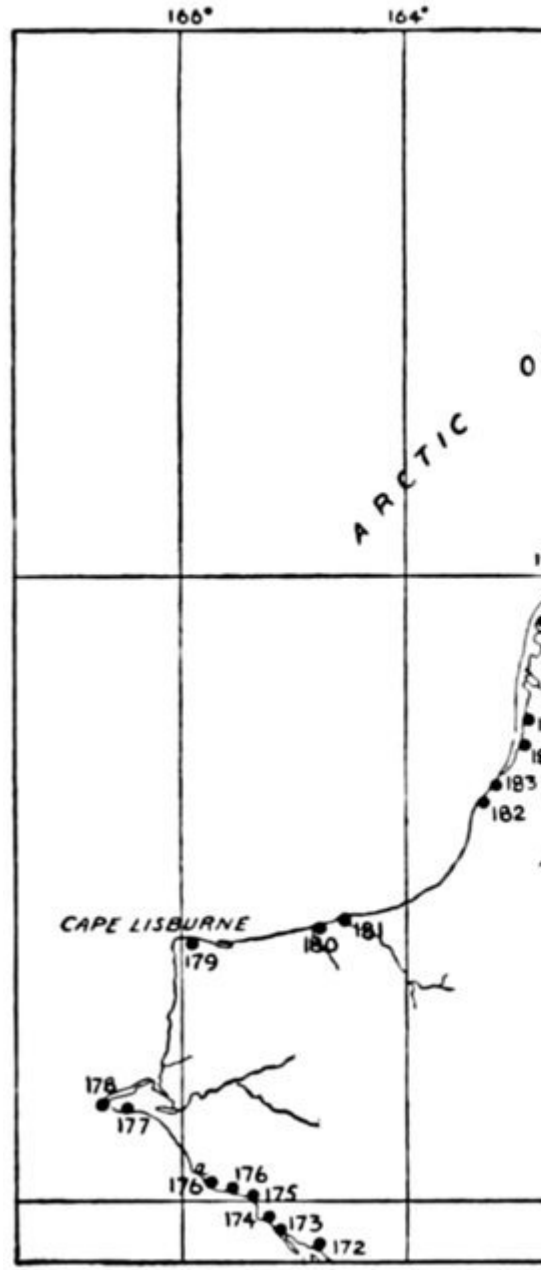

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Figure 25.—Eskimo v

180. *Iniktilik.*—Small village, occupied. (S. Chance.)

181. *Pitmegia.*—A small old site at the mouth of river of same name, north side. (Jim Allen, S. Chance.)

e. Napayochak.—Old camp, two igloos. (S. Chance.)

f. Tolageak.—A small old site. (S. Chance.)

g. Emelik.—A small old site. (S. Chance.)

h. Pingasoogarook.—Old village, still occupied. (S. Chance.)

182. *Umalik.* }
}
183. *Koochik.* }
} Trapping stations; igloos. (S. Chance.)
184. }
}
185. }

186. *Kokolik.*—Eskimo settlement, at Point Lay, Arctic coast. (G. D. A.) Old but still partly occupied village. (S. Chance.) Kelik. (Jim Allen.)

187. *Napayochik.*—Old camp, two igloos. (S. Chance.)

188. *Tolageak.*—Old dead igloos. (S. Chance.)

189. *Utukok.*—Old small settlement at northern mouth of Utukok River.

190. *Emelik.*—Old deserted igloo. (S. Chance.)

191. *Kayakshulik.*—A live village at Icy Cape. (Jim Allen, S. Chance.)

192. *Nokotlik* (*?*).—Old igloo. (S. Chance.)

193. *Mitliktavik.*—A dead moderate-sized village, about 5 miles below Kilik. (Jim Allen.)

194. *Kilimantavic.*—Eskimo village, near Wainwright Inlet, Arctic coast. Tikhmenief, 1861, calls it Kilametagag-miut; Petrof, 1880, calls it Kolumakturook; Hydrographic Chart 68 calls it Kelamantowruk, while later charts omit it or call it Kilimantavic. According to Murdoch this name is Ke-lev-a-tow-tin (sling). (G. D. A.) A large dead village about 20 miles below Wainwright. (Jim Allen.) Kilamitavic. (S. Chance.)

195. Old abandoned camp. (S. Chance.)

196. *Wainwright.*—A large living native village; some remains of old habitations on its eastern outskirts. (A. H.) About a mile south of present settlements are the remains of the old village once occupied by the Wainwright people. (Jim Allen.)

197. *Kululin.*—Old site.

198. *Sedaru.*—Old dead village.

199. *Atnik.*—Old dead village. (S. Chance.) Possibly same with next.

200. *Itanik.*—On maps Atanik. Old village, still partly occupied. (S. Chance, Jim Allen.) Called Ataniek in Tikhmenief, 1861. (G. D. A.)

201. *Pinoshuragin.*—Petrof, 1880, shows a native village of this name (population 29) on the Seahorse Islands. On British Admiralty Chart 593 (ed. of 1882) it is called Pingoshugarun. (G. D. A.) Pingasoogarook: Old village, still occupied. (S. Chance.)

202. *Kokolak.*—Two old igloos, still occupied. (S. Chance.)

203. *Sakamna.*—Small camp.

204. *Sinaru.*—Small camp about 22 miles from Barrow; visited by A. H.; small skeletal collection.

205. *Walakpa.*—A small dead old settlement about 12 miles from Barrow.

206. *Nunava.*—Small camp.

207. "*Old Igloos.*"—A very important site archeologically. Explored partly by Van Valin. (See special section devoted to this site.)

208. *Barrow.*—Known also as Utkiavik, Uglaamie, or the Cape Smyth village. Important white and Eskimo settlement. Old remains. Extensive burial grounds east of village. (A. H. collections.)

209. *Nunawa.*—Remains of old camping site, about 4 miles from Barrow.

210. *Point Barrow.*—The Eskimo Nuwuk. Good-sized living village. Remains of older habitations. Population in 1853, 309. (G.D.A.)

The St. Lawrence and Diomede Islands

ST. LAWRENCE ISLAND

Ranking in archeological and anthropological importance with Wales and in some respects perhaps even exceeding the latter, is the large island of St. Lawrence, with the almost forgotten little Punuk group at its eastern extremity.

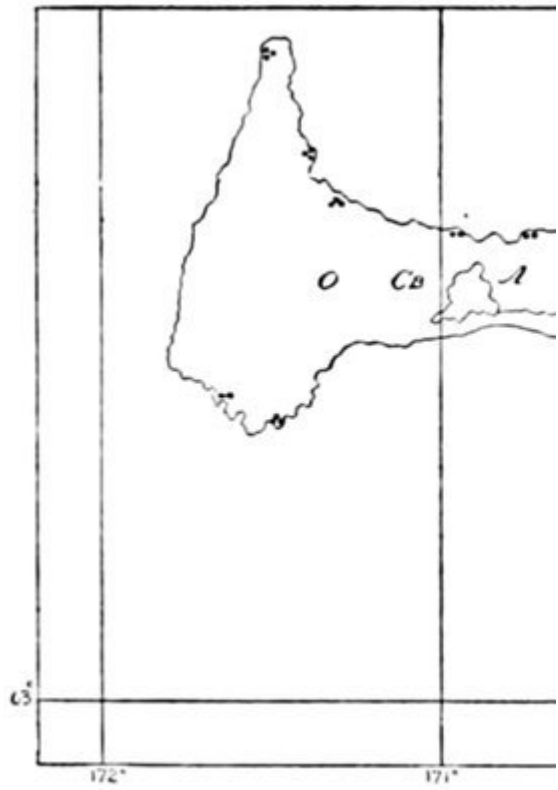


Figure 26.—Russian m

The main island was discovered by Bering on St. Lawrence Day, August 10, 1728, and it was found peopled by the Eskimo. In 1849 an excellent map of it was published by Tebenkof in Novo-Archangelsk, and on this map (fig. 26) are indicated about a dozen smaller or larger Eskimo settlements, some of which, however, are not named and may already have been "dead."

About 1878 there were still six settlements with somewhat less than 1,500 Eskimo inhabitants on the island. That winter (1878-79) not less than 1,000 of

the population died of famine (Hooper), three of the villages becoming completely depopulated and a fourth nearly so. The Punuk Island village may have become extinct about the same time.

To-day there are on the St. Lawrence Island but two living settlements, the main one, now known as Gambell, at the old site of Chibukak on the northwestern cape, and the other, Savonga, about 40 miles east of it, near Cape North.

A number of the old sites on this island, and also that on one of the Punuks, indicate a long occupation, antedating by far the advent of the Russians. The accumulations rise in some places to imposing heaps or ridges. Their frozen contents yield quantities of fossil ivory, all of which shows the work of man, and among them occur specimens with fine curvilinear designs and of high scientific as well as artistic value.

Through Nelson in 1881 and R. D. Moore in 1912 the Smithsonian Institution has acquired a large quantity of human skeletal material from the main island, and there is now (1928) an expedition of the Institution under Collins on the Punuk as well as the St. Lawrence exploring some of the principal ruins.

THE DIOMEDE ISLANDS AND THE ASIATIC COAST [Figs. 27 and 28]

The smaller or American Diomede, though a very inhospitable place, supports, and that evidently since long, a small Eskimo village of stone houses, below and about which there is a considerable accumulation of refuse. Doctor Jenness dug here for a short time in 1926.

The larger or Russian Diomede has two villages, each

of which is larger than the one on the smaller island. There are also said to be some remains in a broad depression on the eastern side of the island, while skeletal remains are reported by the natives to exist among the rocks on the top. This island is in need of thorough attention. Its people are reputed to be skilled ivory workers. They come yearly to Nome, where they were visited and seen at their work by the writer. They bring each year some fossil ivory, said to come mainly from the Asiatic coast, and among this are occasionally articles of much interest.

Ruins of Eskimo villages are also present along the coasts of the Chukchee Peninsula, both those facing the Bering Sea and those along the Arctic. Very little is definitely known or can be found from the American Eskimo about these ruins, and some of them may not be Eskimo. Nelson in his book (p. 265) reports briefly on a few about Cape Wankarem. Interesting objects of the fossil ivory culture are said to occur in these old sites as far west as the Kolyma, but nothing is certain except that there are ruins, that a good number of them are probably Eskimo, and that fossil ivory, both worked (walrus) and unworked (mammoth), comes from these coasts. A noteworthy report is that of a large native cemetery on the Bering Sea side, with hundreds of burials in rough stone-slab graves. Information of this was given me by Joe Bernard, well known in connection with Bering Sea explorations, who had seen the site in person.

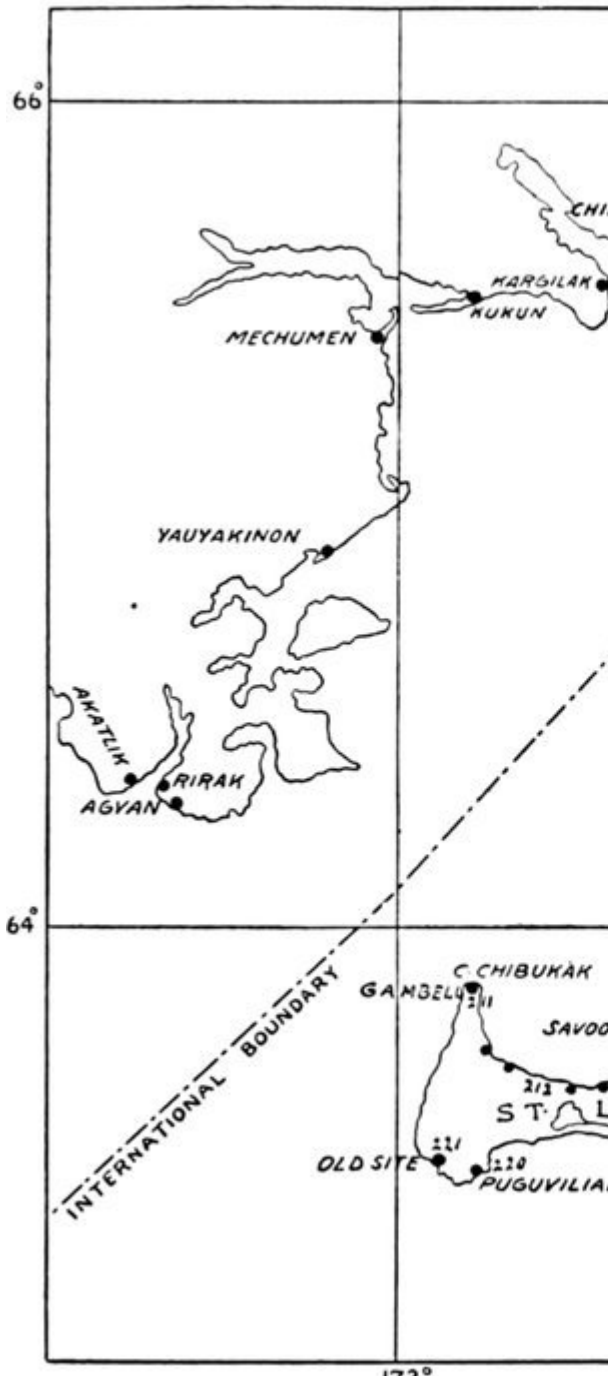

66°
MECHUMEN
YAUYAKINON
AKATLIK
RIRAK
AGVAN
64°
INTERNATIONAL BOUNDARY
C. CHIBUKAK
OLD SITE



Figure 27.—Eskimo villages and sites, St. Lawrence Isla

211. *Gambell* (*or Chibukuk*).—Old Eskimo settlement on the northwest cape of St. Lawrence Island. United States National Museum expedition, 1912, by Riley D. Moore; anthropometric data; important collections.

212. Small sites, north bay, St. Lawrence Island, indicated on 1849 Russian map (q. v.).

213. *Savonga.*—A small modern Eskimo village. A. H., 1926; some collections.

214. Ruins of an old site 4 miles northeast of Savonga. Important archeologically.

215. *Kukuliak.*—Dead village.

216. Former summer site. Given on the 1849 Russian map.



Figure 2

217. Important old site with large accumulations on one of the two Punuk Islands. Explored 1928 by Collins; collections.

218. *Kialegak.*—Dead village. Important archeologically. Partly explored by Collins, 1928;

collections.

219. *Chitnak.*—One of the dead villages of 1879. (Nelson, Hooper.)

220. *Puguviliak.*—One of the dead villages of 1879. (Nelson, Hooper.)

221. Old site; no details available.

222. Living small village on the smaller (American) Diomede Island. Some old accumulations. A. H., 1926, collections; some excavations same year by D. Jenness.

223. *Nunarbuk.*—Village still occupied, on greater (Russian) Diomede, located on an elevated slope around the southern cape of the island. Skeletal and other remains reported on top of mesa.

224. Village, still occupied, on an elevated saddle near middle of west coast of island.

225. Eskimo village, East Cape of Asia. Other villages indicated along the coast of Chukchee Peninsula. Others on north coast. (See Nelson, The Eskimo of Bering Strait, p. 265.)

PHYSICAL ANTHROPOLOGY

Earlier Data

The previously published data on the western Eskimo are few in number and mostly not as well documented as would be desirable. There are, however, a good number of references to the physical characteristics of the people by explorers. The main of these are given below. These references in general are not of much scientific value, yet in some instances they approach this closely and are of considerable interest collectively.

1784, Cook:[67]

> The inlet which we had now quitted, was distinguished by Captain Cook with the name of Prince William's Sound. * * * The natives whom we saw were in general of a middling stature, though many of them were under it. They were square or strong chested, with short thick necks, and large broad visages which were for the most part rather flat. The most disproportioned part of their body appeared to be their heads, which were of great magnitude. Their teeth were of a tolerable whiteness, broad, well set, and equal in size. Their noses had full round points, turned up at the tip; and their eyes, though not small, were scarcely proportioned

to the largeness of their faces. They had black hair which was strong, straight, and thick. Their beards were in general thin or deficient, but the hairs growing about the lips, of those who have them, were bristly or stiff and often of a brownish color; and some of the elderly men had large, thick straight beards. * * * The complexion of some of the females, and of the children, is white without any mixture of red. Many of the men, whom we saw naked, had rather a swarthy cast, which was scarcely the effect of any stain, as it is not their custom to paint their bodies.

Vol. 3, page 31: All the Americans we had seen since our arrival on that coast (west coast of Alaska) had round, chubby faces, and high cheek bones, and were rather low of stature.

Ibid., page 72: *Norton Sound.*—The woman was short and squat and her visage was plump and round. * * * Her husband was well made and about 5 feet 2 inches in height. His hair was black and short, and he had but little beard. His complexion was of a light copper cast. * * * The teeth of both of them were black, and appeared as if they had been filed down level with the gums.

1821, Kotzebue:[68]

Kotzebue Sound.—The Americans [i. e., Eskimo] are of a middle size, robust make, and healthy appearance; their countenances * * * are characterized by small eyes and very high cheek bones.

1832, Beechey:[69]

> The western Esquimaux appear to be intimately connected with the tribes inhabiting the northern and northeastern shores of America, in language, features, manners, and customs. They at the same time, in many respects, resemble the Tschutschi, from whom they are probably descended. * * *
>
> They are taller in stature than the eastern Esquimaux, their average height being about 5 feet 7½ inches. They are also a better looking race, if I may judge from the natives I saw in Baffin's Bay, and from the portraits of others that have been published. At a comparatively early age, however, they (the women in particular) soon lose this comeliness, and old age is attended with a haggard and careworn countenance, rendered more unbecoming by sore eyes and by teeth worn to the gums by frequent mastication of hard substances.

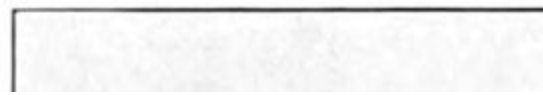
1850, Latham:[70]

> Physically the Eskimo is a Mongol and Asiatic.
>
> The Eskimos of the Atlantic are not only easily distinguished from the tribes of American aborigines which lie to the south or west of them, and with which they come in contact, but they stand in strong contrast and opposition to them—a contrast and opposition exhibited equally in appearance, manners, language, and one which has had full justice done to it by those who have written on the subject.

> It is not so with the Eskimos of Russian-America, and the parts that look upon the Pacific. These are so far from being separated by any broad and trenchant line of demarcation from the proper Indians or the so-called red race, that they pass gradually into it, and that in respect to their habits, manner, and appearance, equally. So far is this the case that he would be a bold man who should venture, in speaking of the southern tribes of Russian-America, to say here the Eskimo area ends and here a different area begins.

1853, Hooper:[71]

> *Kotzebue Sound Esquimeaux.*—The men generally were taller than the average of Europeans, strongly built and well formed; some had well-marked features * * *. The women, were generally short, the visages of the younger ones tolerably good but * * * the very reverse was the case with the dames of more advanced age. Their figures inclined to the squat, their mien and expression promised intelligence and good nature. Although both sexes had in most instances the round flat face of the Mongolian cast, a few individuals possessed well-defined, though petite features, and all had fine eyes.







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***a*, Children, Nunivak I**

***b*, Adults, Nunivak Isl**

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King Isl

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King Island Native

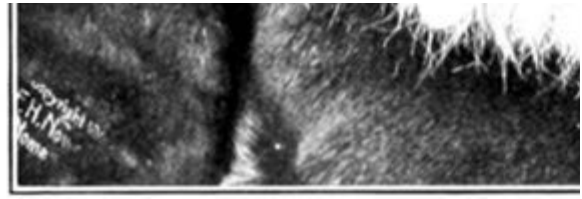
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***a*, Young Eskimo woman, northern Ber**

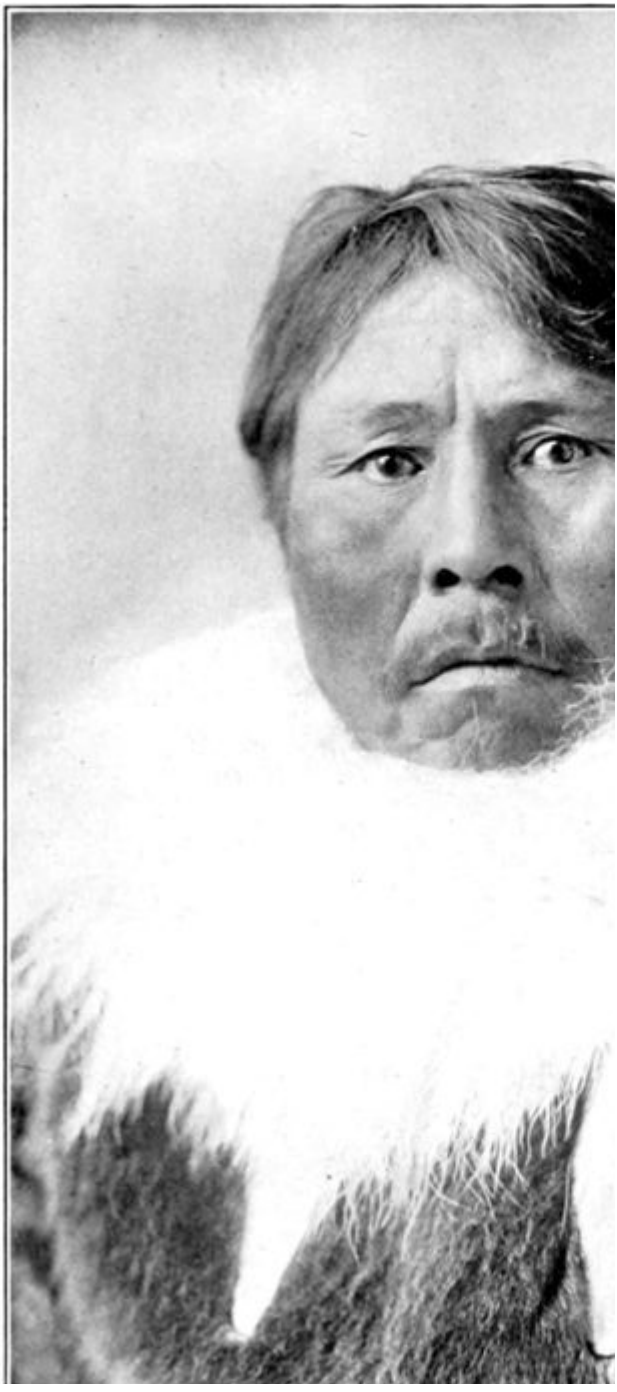


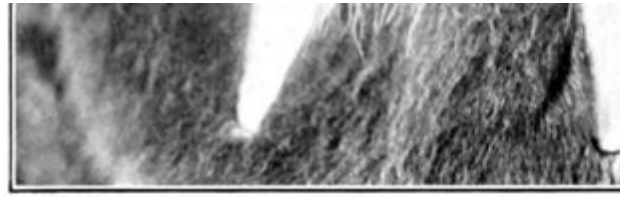


***b*, Eskimo, northern Bering Sea**

A Fine Full-blood Eskimo Pai

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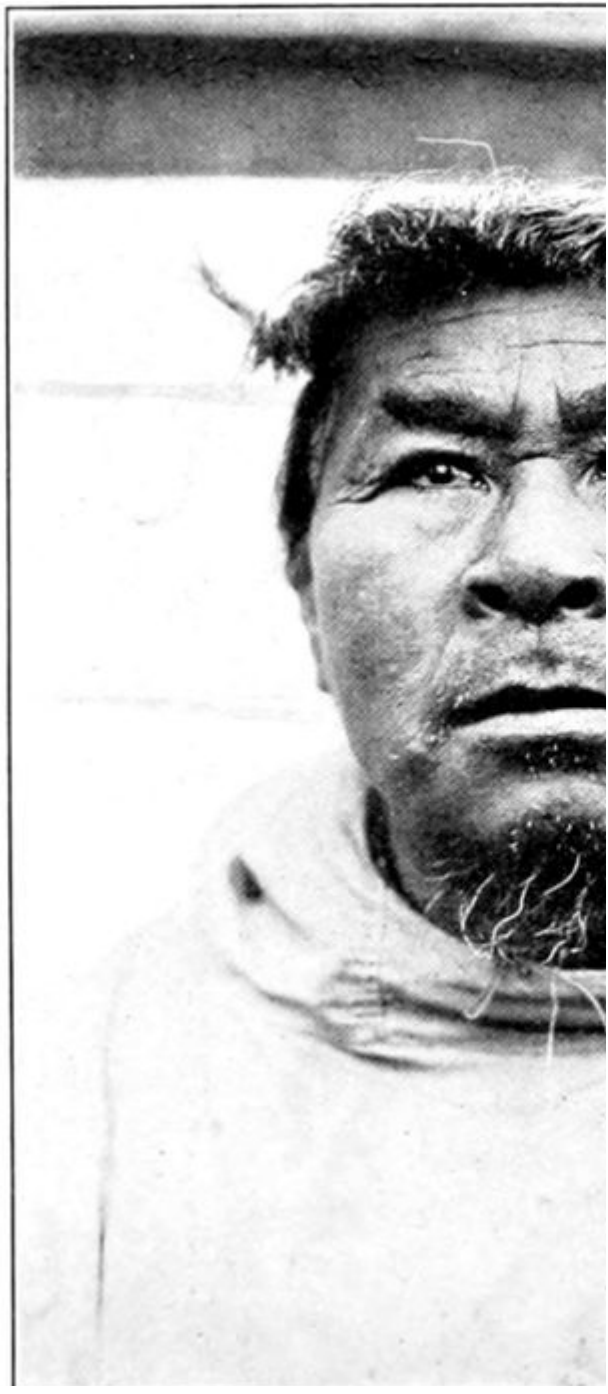


Typical Full-blood Eskimo. Norther

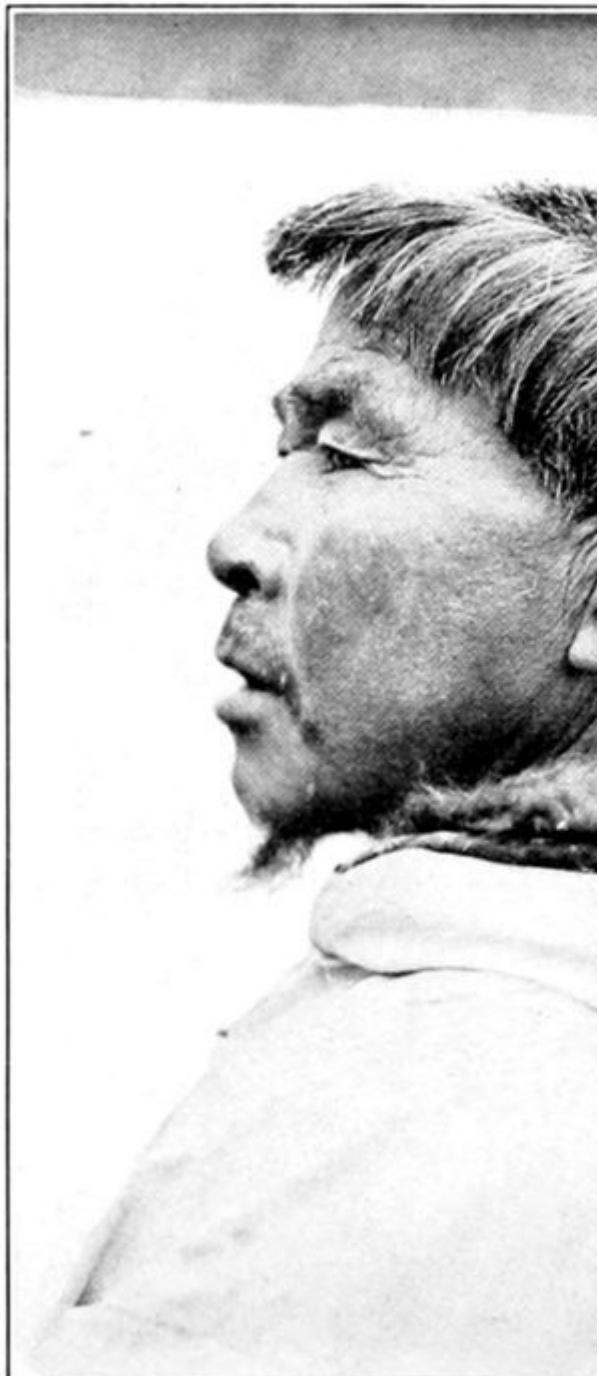
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Elderly Man, St. Lav

(Photos by R. D. Moore,

1853, Seemann, vol. II, pages 49-51:[72]

> *The Eskimos.*—By comparing the accounts transmitted by different writers we find that the various tribes, however widely separated geographically, differ but slightly from each other in appearance, manners, customs, or language. They are, however, by no means as uniform in size as might have been expected. Those inhabiting the vicinity of Norton and Kotzebue Sounds are by far the finest and tallest, while those living between Cape Lisburne and Point Barrow are, like the tribes of the eastern portions of America, much shorter in stature, and bespeak the inferiority of the districts in which they live.
>
> Both sexes are well proportioned, stout, muscular, and active. The hands and feet are small and beautifully formed, which is ascribed by some writers to their sedentary habits, but this cannot be the case, as probably no people take more exercise or are more constantly employed. Their height varies. In the southern parts some of the men are 6 feet; in the more northern there is a perceptible diminution, though by no means to the extent generally imagined.
>
> Their faces are flat, their cheek bones projecting, and their eyes small, deeply set,

and, like the eyebrows, black. Their noses are broad; their ears are large, and generally lengthened by the appendage of weighty ornaments; their mouths are well formed, their lips are thin. * * *

The teeth of the Eskimos are regular, but from the nature of their food and from their practice of preparing hides by chewing, are worn down almost to the gums at an early age. Their hair is straight, black, and coarse; the men have it closely cut on the crown, like that of a Capuchin friar, leaving a band about two inches broad, which gradually increases in length towards the back of the neck; the women merely part their hair in the middle, and, if wealthy, ornament it with strings of beads. The possession of a beard is very rare, but a slight moustache is not infrequent. Their complexion, if divested of its usual covering of dirt, can hardly be called dark; on the contrary, it displays a healthy, rosy tint, and were it not for the custom of tattooing the chin some of the girls might be called pretty, even in the European acceptation of the term.

1861, Richardson:[73]

The Eskimos are remarkably uniform in physical appearance throughout their far-stretching area, there being perhaps no other nation in the world so unmixed in blood. Frobisher's people were struck with their resemblance in features and general aspect to the Samoyeds and their physiognomy has been held by all ethnologists to be of the Mongolian or Tartar type. Doctor Latham

calls the Samoyeds Hyperborean Mongolidae, and the Eskimos he ranges among the American Mongolidae, embracing in the latter group all the native races of the New World. The Mongol type of countenance is, however, more strongly reproduced in the Eskimos than in the red Indians—the conterminous Tinné tribes differing greatly in their features, and the more remote Indians still more.

Generally the Eskimos have broadly egg-shaped faces with considerable prominence of the rounded cheeks caused by the arching of the cheek bones, but few or no angular projections even in the old people, whose features are always much weather beaten and furrowed. The greatest breadth of the face is just below the eyes, the forehead tapers upward, ending narrowly, but not acutely, and in like manner the chin is a blunt cone; both the forehead and the chin recede, the egg outline showing in profile, though not so strongly, as in a front view. The nose is broad and depressed, but not in all, some individuals having prominent noses, yet almost all have wider nostrils than Europeans. The eyes have small and oblique apertures like the Chinese, and from frequent attacks of ophthalmia and the effect of lamp smoke in their winter habitations adults of both sexes are disfigured by excoriated or ulcerated eyelids. The sight of these people is, from its constant exercise, extremely keen, and the habit of bringing the eyelids nearly together when looking at distant objects has in all the grown males produced a striking

cluster of furrows radiating from the outer corners of each eye over the temples.

The complexions of the Eskimos when relieved from smoke and dirt are nearly white and show little of the copper color of the red Indians. Infants have a good deal of red on the cheeks, and when by chance their faces are tolerably clean are much like European children, the national peculiarities of countenance being slighter at an early age. Many of the young women appear even pretty from the liveliness and good nature that beams in their countenances. The old women are frightfully ugly * * *.

The young men have little beard, but some of the old ones have a tolerable show of long gray hairs on the upper lip and chin. * * * The Eskimo beard, however, is in no instance so dense as a European one.

The hair of the head is black and coarse, the lips thickish, and the teeth of the young people white and regular, but the sand that, through want of cleanliness, mixes with their food, wears the teeth down at an early age almost to the level of the gums, so that the incisors often have broad crowns like the molars.

The average stature of the Eskimos is below the English standard, but they can not be said to be a dwarfish race. The men vary in height from about 5 feet to 5 feet 10 inches or even more. They are a broad-shouldered race, and when seated in their kayaks look tall and muscular, but when standing lose their apparent height by a seemingly

disproportionate shortness of the lower extremities. This want of symmetry may arise from the dress, as the proportions of various parts of the body have not been tested by accurate measurements. The hands and feet are delicately small and well formed. Mr. Simpson (Blue Book, 1855) observed an undue shortness of the thumb in the western Eskimos, which, if it exists farther to the east, was not noted by the members of the searching expeditions.

1870, Dall:[74]

Page 136: The Innuit, as they call themselves, belong to the same family as the northern and western Eskimo. I have frequently used the term Eskimo in referring to them, but they are in many respects very different people. * * * It should be thoroughly and definitely understood that they are not Indians nor have they any known relation, physically * * * to the Indian tribes of North America. Their grammar, appearance, habits, and even their anatomy, especially in the form of the skull, separate them widely from the Indian race. On the other hand, it is almost equally questionable whether they are even distinctly [distantly?] related to the Chukchees and other probably Mongolian races, of the eastern part of Siberia.

The Innuit of Norton Sound and the vicinity are of three tribes, each of which, while migrating at certain seasons, has its own peculiar territory. The peninsula between Kotzebue and Norton Sounds is inhabited by

the Kaviaks or Kaviagemut Innuit. The neck of this peninsula is occupied by the Mahlemut Innuit. The shore of Norton Sound south of Cape Denbigh to Pastolik is the country of the Unaleets or Unaligmut Innuit. The habits of these tribes are essentially similar. They are in every respect superior to any tribe of Indians with which I am acquainted.

Their complexion I have described as brunet. The effect of the sun and wind, especially in summer, is to darken their hue, and from observing those who lived in the fort, I am inclined to think that a regular course of bathing would do much toward whitening them. They are sometimes very tall; I have often seen both men and women nearly 6 feet in height and have known several instances where men were taller. Their average height equals that of most civilized races. Their strength is often very great. I have seen a Mahlemut take a 100-pound sack of flour under each arm and another in his teeth and walk with them from the storehouse to the boat, a distance of some 20 rods, without inconvenience.

Page 140: The women * * * are often of pleasing appearance, sometimes quite pretty. They preserve their beauty much longer than Indian women. Their clear complexion and high color, with their good humor, make them agreeable companions, and they are often very intelligent. A noticeable feature is their teeth. These are always sound and white, but are almost cylindrical, and in old

people are worn down even with the gums, producing a singular appearance. The eyes are not oblique as in the Mongolian races, but are small, black, and almost even with the face. The nose is flat and disproportionately small. Many of the Innuit have heavy beards and mustaches, while some pull out the former.

Page 17: I * * * made the acquaintance of a fine-looking young Mahlemut who * * * introduced me to his wife and child, the latter about 2 years old. The former was not particularly ugly or pretty. * * * The husband was a fine-looking, athletic fellow, standing about 5 feet 5 inches, with a clear brunet complexion, fine color, dark eyes, and finely arched eyebrows. The flat nose, common to all the Eskimo tribes, was not very strongly marked in him, and a pleasant smile, displaying two rows of very white teeth, conquered any objection I might have felt to his large mouth. The baby looked like any other baby. * * *

Page 376: It has been frequently remarked that the Tuski and Innuit tribes have a Mongolian cast of countenance. This, upon an actual comparison, will be found to be much less than is usually supposed. The real points of resemblance are principally in the complexion, which is somewhat similar, and in the eyes. But the eyes of the Innuit are not oblique, as in the Chinese. They have an apparent obliquity, which is due to the peculiar form of the zygomatic arch, but the eyes themselves are perfectly horizontal. The

prominent characteristics of the Orarian[75] skull are the strongly developed coronary ridge, the obliquity of the zygoma, and its greater capacity compared with the Indian cranium. The former is essentially pyramidal, while the latter more nearly approaches a cubic shape.

The mean capacity (in cubic centimeters) of three Tuski skulls from Plover Bay, according to Doctor Wyman, was 1,505; that of 20 crania of northern Eskimo, according to Doctor Davis, was 1,475, and that of 4 Innuit crania of Norton Sound was 1,320; thus showing a wide variation. The mean capacity of 20 West American Indian crania was only 1,284.06. The mean height of all the Orarian skulls above referred to was 136.55 millimeters, against a breadth of 134.47 millimeters, while the height of the Indian skulls was 120.14 millimeters, against a breadth of 100.025 millimeters. The zygomatic diameter of the Orarian crania was 134.92 millimeters, while that of 12 Indian skulls was 134.65 millimeters. The Orarian skulls were most dolichocephalic, and the Indian most brachycephalic. The latter averaged 378.71 cubic centimeters less capacity than the former. The average height of the Orarians, except among the stunted tribes of the extreme north, will average as great as that of their Indian neighbors. The strength and activity of the former far exceed that of any northern Indians with whom I am acquainted.

Page 401: The Kaniagmuts are of middle

> stature and a complexion more reddish than that of the Aleutians or more northern Innuit. They are stoutly built, with large broad faces, and their hair is coarse, black, and straight.
>
> Page 407: The Magemuts * * * are tall, finely formed, and have very fair complexions. Blue eyes are not unknown among them, but their hair is black and their beards are very light.
>
> The Ekogmuts. * * * A noticeable feature in many of them is the extreme hairiness of their persons. Many have very strong black beards and hairy bodies.
>
> Page 410: The Point Barrow tribe are said by Richardson to be called Nuwungmëun. * * * These northern Innuit are very few in number. * * * Simpson mentions that their thumbs appeared to be disproportionately short. The same may be true of the Norton Sound Innuit; at all events, no white man can wear one of their mittens comfortably until the thumb is lengthened.

Doctor Otis, of the United States Army Medical Museum, says that the skulls found in the northern mounds have the same peculiarities which distinguish all Orarian crania, and that both are instantly distinguishable from any Indian skulls.

1874, Bancroft (compilation):[76]

> "The physical characteristics of the Eskimos are: A fair complexion,[77] the skin, when free from dirt and paint, being almost white; a medium stature, well proportioned, thickset, muscular, robust, active,[78] with small and beautifully shaped hands and feet;

[79] a pyramidal head;[80] a broad egg-shaped face; high rounded cheek bones; flat nose; small oblique eyes; large mouth; teeth regular, but well worn;[81] coarse black hair closely cut upon the crown, leaving a monk-like ring around the edge,[82] and a paucity of beard."[83]

Simpson, 1875:[84]

These people are by no means the dwarfish race they were formerly supposed to be. In stature they are not inferior to many other races and are robust, muscular, and active, inclining rather to spareness than corpulence. The tallest individual was found to be 5 feet 10½ inches, and the shortest 5 feet 1 inch. The heaviest man weighed 195 pounds, and the lightest 125 pounds. The individuals weighed and measured were taken indiscriminately as they visited the ship, and were all supposed to have attained their full stature. Their chief muscular strength is in the back, which is best displayed in their games of wrestling. The shoulders are square, or rather raised, making the neck appear shorter than it really is, and the chest is deep; but in strength of arm they can not compete with our sailors. The hand is small, short, broad, and rather thick, and the thumb appears short, giving an air of clumsiness in handling anything; and the power of grasping is not great. The lower limbs are in good proportion to the body, and the feet, like the hands, are short and broad with a high instep. Considering their frequent occupations as hunters, they

do not excel in speed nor in jumping over a height or a level space, but they display great agility in leaping to kick with both feet together an object hanging as high as the chin, or even above the head. In walking, their tread is firm and elastic, the step short and quick; and the toes being turned outward and the knee at each advance inclining in the same direction, give a certain peculiarity to their gait difficult to describe.

The hair is sooty black, without gloss, and coarse, cut in an even line across the forehead, but allowed to grow long at the back of the head and about the ears, whilst the crown is cropped close or shaven. The color of the skin is a light yellowish brown, but variable in shade, and in a few instances was observed to be very dark. In the young, the complexion is comparatively fair, presenting a remarkably healthy sunburnt appearance, through which the rosy hue of the cheeks is visible; before middle life, however, this, from exposure, gives place to a weather-beaten appearance, so that it is difficult to guess their ages.

The face is flat, broad, rounded, and commonly plump, the cheek bones high, the forehead low, but broad across the eyebrows, and narrowing upwards; the whole head becomes somewhat pointed toward the crown. The nose is short and flat, giving an appearance of considerable space between the eyes. The eyes are brown, of different shades, usually dark, seldom if ever altogether black, and generally have a soft

expression; some have a peculiar glitter, which we call gipsy-like. They slope slightly upwards from the nose, and have a fold of skin stretching across the inner angle to the upper eyelid, most perceptible in childhood, which gives to some individuals a cast of countenance almost perfectly Chinese. The eyelids seem tumid, opening to only a moderate extent, and the slightly arched eyebrows scarcely project beyond them. The ears are by no means large, but frequently stand out sideways. The mouth is prominent and large, and the lips, especially the lower one, rather thick and protruding. The jawbones are strong, supporting remarkably firm and commonly regular teeth. In the youthful these are in general white, but toward middle age they have lost their enamel and become black or are worn down to the gums. The incisors of the lower jaw do not pass behind those of the upper, but meet edge to edge, so that by the time an individual arrives at maturity, the opposing surfaces of the eye and front teeth are perfectly flat, independently of the wear they are subjected to in every possible way to assist the hands. The expression of the countenance is one of habitual good humor in the great majority of both sexes, but is a good deal marred in the men by wearing heavy lip ornaments. * * *

While young the women are generally well formed and good looking, having good eyes and teeth. To a few, who besides possessed something of the Circassian cast of features, was attributed a certain degree of brunette

beauty. Their hands and feet are small, and the former delicate in the young, but soon become rough and coarse when the household cares devolve upon them. Their movements are awkward and ungainly, and though capable of making long journeys on foot, it is almost painful to see many of them walk. Unlike the men, they shuffle along commonly a little sideways, with the toes turned inwards, stooping slightly forward as if carrying a burden, and their general appearance is not enhanced by the coat being made large enough to accommodate a child on the back, whilst the tight-fitting nether garment only serves to display the deformity of their bow legs. * * *

The physical constitution of both sexes is strong, and they bear exposure during the coldest weather for many hours together without appearing inconvenienced, further than occasional frostbites on the cheeks. They also show great endurance of fatigue during their journeys in the summer, particularly that part in which they require to drag the family boat, laden with their summer tent and all their moveables, on a sledge over the ice.

Extreme longevity is probably not unknown among them; but as they take no heed to number the years as they pass, they can form no guess of their own ages, invariably stating "they have many years." Judging altogether from appearance, a man whom we saw in the neighborhood of Kotzebue Sound could not be less than 80 years of age. He had long

been confined to his bed and appeared quite in his dotage. There was another at Point Barrow, whose wrinkled face, silvery hair, toothless gums, and shrunk limbs indicated an age nothing short of 75. This man died in the month of April, 1853, and had paid a visit to the ship only a few days before, when his intellect seemed unimpaired, and his vision wonderfully acute for his time of life. There is another still alive, who is said to be a few years older.

1877, Dall:[85]

Page 9: The Orarians are distinguished * * * by a light fresh yellow complexion, fine color, broad build, scaphocephalic head, great cranial capacity, and obliquity of the arch of the zygoma.

Page 17: The Ekogmut inhabit the Yukon delta from about Kipniuk to Pastolik * * *. Their most noticeable personal peculiarity consists in their hairy bodies and strong beards.

1884, Hooper:[86]

About 3,000 Innuits inhabit the northwest coast of America, from the Colville River, on the east, to Bering Strait, including the islands therein, on the west. Many of these came under my observation while cruising in the Arctic Ocean in command of the *Corwin*.

In appearance they are tall and muscular, many being 6 feet in height, and some were seen that would exceed that even. Their peculiar dress gives them a squat appearance, and their stature seems less than

it is in reality. The women are much shorter than the men, but both sexes are strong and active, though not equal in these respects to the Tchuktchis and other reindeer tribes of Siberia.

The face of the Innuit is broad below the eyes, the forehead is narrow and receding, the chin and lower jaw broad and heavy. The nose is usually broad and flattened, but not always; occasionally one is seen whose features are well formed and handsome. In the young children this is the almost invariable rule; many of them are really beautiful. The eyes are small and black, and appear to be slightly oblique, and for this reason, perhaps more than any other, they have been classed with the Mongolidae. They have large mouths, thick, loosely hanging lips, and fine, strong teeth. These, however, from eating raw food, are usually very much worn. The labrets worn in the lips are hideous-looking things, made of bone, glass, stone, ivory, or in fact anything within the reach of the native which can be worked into the requisite shape.

They have rather light skin, very different from the Indians of the plains; and in this also they differ from the Tchuktchis, being much lighter, and when cleansed from the dirt which usually covers them, and freed from the sunburn and tan due to long exposure, they become quite fair. They have small, well-formed hands and feet, much smaller in proportion than white men. This was particularly noticeable when buying

boots and mittens from them for our use; only the largest sizes made by them could be used at all. They are generally without beard, but as the men grow old, they sometimes have a thin, straggling mustache and beard, but it is never full and regular. The hair is coarse and black.

1885, Ray:[87]

Pages 37-38: The following table will show that physically the Inyu of North American coast does not conform to the typical idea of the Eskimo. They are robust, healthy people, fairer than the North American Indian, with brown eyes and straight black hair. The men are beardless until they attain the age of from 20 to 25 years, and even then it is very light and scattering, and is always clipped close in the winter; at this season they also cut off their eyebrows and tonsure their crown like a priest, with bangs over their forehead. Their hands and feet are extremely small and symmetrical; they are graceful in their movements when unincumbered by heavy clothing.

Page 46: Physically both sexes are very strong and possess great powers of endurance.

1888, Murdoch:[88]

In stature these people are of a medium height, robust, and muscular, inclining rather to spareness than corpulence, though the fullness of the face and the thick fur clothing often gives the impression of the latter. There is, however, considerable individual

variation among them in this respect. The women are as a rule shorter than the men, occasionally almost dwarfish, though some women are taller than many of the men. The tallest man observed measured 5 feet 9½ inches and the shortest 4 feet 11 inches. The tallest woman was 5 feet 3 inches in height and the shortest 4 feet ½ inch. The heaviest man weighed 204 pounds and the lightest 126 pounds. One woman weighed 192 pounds and the shortest woman was also the lightest, weighing only 100 pounds. The hands and feet are small and well shaped, though the former soon become distorted and roughened by work. We did not observe the peculiar breadth of hands noticed by Doctor Simpson, nor is the shortness of the thumb which he mentions sufficient to attract attention. Their feet are so small that only one of our party, who is much below the ordinary size, was able to wear the boots made by the natives for themselves. Small and delicate hands and feet appear to be a universal characteristic of the Eskimo race and have been mentioned by most observers from Greenland to Alaska.

The face is broad, flat, and round, with high cheek bones and rather low forehead, broad across the brow and narrowing above, while the head is somewhat pointed toward the crown. The peculiar shape of the head is somewhat masked by the way of wearing the hair and is best seen in the skull. The nose is short, with little or no bridge—few Eskimo were able to wear our spring eyeglasses—and broad, especially across the alæ nasæ,

with a peculiar, rounded, somewhat bulbous tip, and large nostrils. The eyes are horizontal, with rather full lids and are but slightly sunken below the level of the face.

The mouth is large and the lips full, especially the under one. The teeth are naturally large, and in youth are white and generally regular, but by middle age they are generally worn down to flat-crowned stumps, as is usual among the Eskimo. The color of the skin is a light yellowish brown, with often considerable ruddy color on the cheeks and lips. There appears to be much natural variation in the complexion, some women being nearly as fair as Europeans, while other individuals seem to have naturally a coppery color. In most cases the complexion appears darker than it really is from the effects of exposure to the weather. All sunburn very easily, especially in the spring, when there is a strong reflection from the snow.

The old are much wrinkled, and they frequently suffer from watery eyes, with large sacks under them, which begin to form at a comparatively early age. There is considerable variation in features, as well as complexion, among them, even in cases where there seems to be no suspicion of mixed blood. There were several men among them with decided aquiline noses and something of a Hebrew cast of countenance. The eyes are of various shades of dark brown —two pairs of light hazel eyes were observed —and are often handsome. The hair is black,

perfectly straight, and very thick. With the men it is generally coarser than with the women, who sometimes have very long and silky hair, though it generally does not reach much below the shoulders. The eyebrows are thin and the beard scanty, growing mostly upon the upper lip and chin and seldom appearing under the age of 20. In this they resemble most Eskimo. Back, however, speaks of the "luxuriant beards and flowing mustaches" of the Eskimo of the Great Fish River. Some of the older men have rather heavy black mustaches, but there is much variation in this respect. The upper part of the body, as much as is commonly exposed in the house, is remarkably free from hair. The general expression is good humored and attractive.

The males, even when very young, are remarkable for their graceful and dignified carriage. The body is held erect, with the shoulders square and chest well thrown out, the knees straight, and the feet firmly planted on the ground. In walking they move with long swinging elastic strides, the toes well turned out and the arms swinging. * * *

I should say that they walked like well-built athletic white men. The women, on the other hand, although possessing good physiques, are singularly ungraceful in their movements. They walk at a sort of shuffling half trot, with the toes turned in, the body leaning forward, and the arms hanging awkwardly.

A noticeable thing about the women is the

> remarkable flexibility of the body and limbs and the great length of time they can stand in a stooping posture. * * * Both men and women have a very fair share of muscular strength. Some of the women especially showed a power of carrying heavy loads superior to most white men. We were able to make no other comparisons of their strength with ours. Their power of endurance is very great, and both sexes are capable of making long distances on foot. Two men sometimes spend 24 hours tramping through the rough ice in search of seals, and we knew of instances where small parties made journeys of 50 or 75 miles on foot without stopping to sleep.
>
> The women are not prolific. Although all the adults are or have been married, many of them are childless, and few have more than two children. One woman was known to have at least four, but investigations of this sort were rendered extremely difficult by the universal custom of adoption. Doctor Simpson heard of a "rare case" where one woman had borne seven children. We heard of no twins at either village, though we obtained the Eskimo word for twins.

1890, Murdoch:[89]

> The people who live on the extreme northwest corner of our continent are far from being an ugly or an ill-made race. Though they are not tall—a man of 5 feet 10 inches is a tall man among them—they are well proportioned, broad shouldered, and deep chested. The men, as a rule, are

particularly well "set up," like well-drilled soldiers and walk and stand with a great deal of grace and dignity.

The women do not have such good figures, but are inclined to slouchiness. They are seldom inclined to be fleshy, though their plump, round faces, along with their thick fur clothing, often give them the appearance of being fat. They generally have round, full faces, with rather high cheek bones, small, rounded noses, full lips, and small chins. Still, you now and then see a person with an oval face and aquiline nose. Many of the men are very good looking, and some of the young women are exceedingly pretty. Their complexion is a dark brunet, often with a good deal of bright color on the cheeks and especially on the lips. They sunburn very much, especially in the spring, when the glare of the sun is reflected from the snow. They have black or dark-brown eyes and abundant black hair. The women's hair is often long and silky. When they are young they have white and regular teeth, but these are worn down to stumps before middle life is reached. Cheerful and merry faces are the rule.

1890, Kelly:[90]

Personal appearance.—There are three types observable among the Arctic Eskimos of Alaska. The tall, cadaverous natives of Kangoot, Seelawik, Koovuk, and Kikiktowruk, on Kotzebue Sound, who live on fish, ptarmigans, and marmots. They always have a hungry look and habitually

wear a grin of fiendish glee at having circumvented an adverse fate. There is a tendency among these people to migrate north.

Then there is the tall, strongly knit type of the Nooatoks, a gigantic race, of a splendid physique that would be remarkable in any part of the world.

Rugged as the mountains among which they live, vigorous and courageous, they stop at nothing but the impossible to accomplish a desired end. Their food supply is the reindeer, mountain sheep, ptarmigans, and fish. There are many of the coast natives of this type, but they lack the healthy glow and the indomitable will of the Nooatoks.

The third type is the short, stumpy one, probably that of the old Eskimo before the admixture with southern tribes, now found on the Arctic coast. * * *

The Eskimos have coarse, black hair, some with a tinge of brown. Many of the coast people of both sexes are bald from scrofulous eruptions. Males have the crown of the head closely cropped, so that reindeer may not see the waving locks when the hunter creeps behind bunch grass. They have black eyes and high cheek bones. The bones of the face are better protected from the severity of the climate by a thicker covering of flesh than southern races.

Among the coast people the nose is broad and flat, with very little or no ridge between the eyes. The adult males have short

mustaches, and some of the elder ones—more noticeable in the interior—have rough, scraggy beards. Generally their beard is very scant, and most of them devote otherwise idle hours to pulling out the hairs.

1900, Nelson:[91]

The Eskimo from Bering Strait to the lower Yukon are fairly well-built people, averaging among the men about 5 feet 2 or 3 inches in height. The Yukon Eskimo and those living southward from that river to the Kuskokwim are, as a rule, shorter and more squarely built. The Kuskokwim people are darker of complexion than those to the northward, and have rounder features. The men commonly have a considerable growth of hair on their faces, becoming at times a thin beard 2 or 3 inches in length, with a well-developed mustache. No such development of beard was seen elsewhere in the territory visited.

The people in the coast region between the mouths of the Kuskokwim and the Yukon have peculiarly high cheek bones and sharp chins, which unite to give their faces a curiously pointed, triangular appearance. At the village of Kaialigamut I was impressed by the strong development of the superciliary ridge. From a point almost directly over the pupil of the eye and extending thence inward to the median line of the forehead is a strong bony ridge causing the brow to stand out sharply. From the outer edge of this the skull appears as though beveled away to the ears, giving the temporal area a considerable enlargement beyond that usually shown. This

curious development of the skull is rendered still more striking by the fact that the bridge of the nose is low, as usual among these people, so that the shelf-like projection of the brow stands out in strong relief. It is most strongly marked among the men and appears to be characteristic at this place. Elsewhere in this district it was noted only rarely here and there.

All of the people in the district about Capes Vancouver and Romanzof, and thence to the Yukon mouth, are of unusually light complexion. Some of the women have a pale, slightly yellowish color, with pink cheeks, differing but little in complexion from that of a sallow woman of Caucasian blood. This light complexion is so exceptionally striking that wherever they travel these people are readily distinguished from other Eskimo, and before I visited their territory I had learned to know them by their complexion whenever they came to St. Michael.

The people of the district just mentioned are all very short and squarely built. Inland from Cape Vancouver lies the flat marshy country about Big Lake, which is situated between the Kuskokwim and the Yukon. It is a well-populated district and its inhabitants differ from those near the coast at the capes referred to, in being taller, more slender, and having more squarely cut features. They also differ strikingly from any other Eskimo with whom I came in contact, except those on Kowak River, in having the bridge of the nose well developed and at times sufficiently

prominent to suggest the aquiline nose of our southern Indian tribes.

The Eskimo of the Diomede Islands in Bering Strait, as well as those of East Cape and Mechigme and Plover Bays on the Siberian coast, and of St. Lawrence Island are tall, strongly built people and are generally similar in their physical features. These are characterized by the unusual heaviness of the lower part of the face due to the very square and massive lower jaw, which, combined with broad, high cheek bones and flattened nose, produces a wide, flat face. These features are frequently accompanied with a low retreating forehead, producing a decidedly repulsive physiognomy. The bridge of the nose is so low and the cheek bones so heavy that a profile view will frequently show only the tip of the person's nose, the eyes and upper portion of the nose being completely hidden by the prominent outline of the cheek. Their eyes are less oblique than is common among the people living southward from the Yukon mouth. Among the people at the northwestern end of St. Lawrence Island there is a greater range of physiognomy than was noted at any other of the Asiatic localities.

The Point Hope people on the American coast have heavy jaws and well-developed superciliary ridges. At Point Barrow the men are remarkable for the irregularity of their features, amounting to a positive degree of ugliness, which is increased and rendered specially prominent by the expression

produced by the short, tightly drawn upper lip, the projecting lower lip, and the small beady eyes. The women and children of this place are in curious contrast, having rather pleasant features of the usual type.

The Eskimo from Upper Kowak and Noatak Rivers who were met at the summer camp on Hotham Inlet are notable for the fact that a considerable number of them have hook noses and nearly all have a cast of countenance very similar to that of the Yukon Tienné. They are a larger and more robustly built people than these Indians, however, and speak the Eskimo language. They wear labrets, practice the tonsure, and claim to be Eskimo. * * * Among them was seen one man having a mop of coarse curly hair, almost negroid in character. The same feature was observed in a number of men and women on the Siberian coast between East Cape and Plover Bay. This latter is undoubtedly the result of the Chukchi-Eskimo mixture, and in the case of the man seen at Hotham Inlet the same result had been brought about by the Eskimo-Indian combination. Among the Eskimo south of Bering Strait on the American coast not a single instance of this kind was observed. The age of the individuals having this curly hair renders it quite improbable that it came from an admixture of blood with foreign voyagers, since some of them must have been born at a time when vessels were extremely rare along these shores. As a further argument against this curly hair having come from white men, I may add that

I saw no trace of it among a number of people having partly Caucasian blood. As a general thing, the Eskimo of the region described, have small hands and feet and the features are oval in outline, rather flat and with slightly oblique eyes.

Children and young girls have round faces and often are very pleasant and attractive in feature, the angular race characteristics becoming prominent after the individuals approach manhood. The women age rapidly, and only a very small proportion of the people live to an advanced age.

The Malemut and the people of Kaviak Peninsula, including those of the islands in Bering Strait are tall, active, and remarkably well built. Among them it is common to see men from 5 feet 10 inches to 6 feet tall and of proportionate build. I should judge the average among them to be nearly or quite equal in height to the whites.

Among the coast Eskimos, as a rule, the legs are short and poorly developed, while the body is long with disproportionately developed dorsal and lumbar muscles, due to so much of their life being passed in the kaiak.

The Eskimo of the Big Lake district, south of the Yukon, and from the Kaviak Peninsula, as well as the Malemut about the head of Kotzebue Sound, are on the contrary very finely proportioned and athletic men who can not be equaled among the Indians of the Yukon region. * * * There were a number of half-blood children among the Eskimo,

resulting from the intercourse with people from vessels and others, who generally show their Caucasian blood by large, finely shaped, and often remarkably beautiful brown eyes. The number of these mixed bloods was not very great.

1905, Jackson:[92]

The Eskimos of Alaska are a much finer race physically than their kindred of Greenland and Labrador. In the extreme north, at Point Barrow, and along the coast of Bering Sea they are of medium size. At Point Barrow the average height of the males is 5 feet 3 inches and average weight 153 pounds; of the women, 4 feet 11 inches and weight 135 pounds. On the Nushagak River the average weight of the men is from 150 to 167 pounds. From Cape Prince of Wales to Icy Cape along the Arctic Coast and on the great inland rivers emptying into the Arctic Ocean they are a large race, many of them being 6 feet and over in height.[93] They are lighter in color and fairer than the North American Indian, have black and brown eyes, black hair, some with a tinge of brown, high cheek bones, fleshy faces, small hands and feet, and good teeth. The men have thin beards.

1916, Hawkes:[94]

The Alaskan Eskimo are a taller and more symmetrical people than their brethren of the central and eastern districts. They lack that appearance of stoutness and squatness inherent in the eastern stock, and for proportion and development of the various parts of the body they do not compare

unfavorably with Indians and whites. It is not unusual to find in an Alaskan Eskimo village several men who are 6 feet tall, with magnificent shoulders and arms and bodily strength in proportion. The usual height, however, is about 168 centimeters for men, which is some 10 centimeters above the height of the eastern Eskimo. * * * The average for women among the western Eskimo is 158 centimeters, which approximates the height of the men in the Hudson Bay region, 158 centimeters (Boas). The female type in Alaska is taller and slimmer than in the east, and the width of the face is considerably less. Eskimo women of large stature are often seen in the northern section of Alaska. The individual variation here is more conspicuous than in Labrador or Hudson Bay.

1923, Jenness:[95]

In his report on the Copper Eskimos, D. Jenness gives excellent descriptive notes on this group with references to others. These notes, too voluminous to be transcribed, may well be consulted in these connections.

FOOTNOTES:

[67] Cook, Capt. James, and Capt. James King. A Voyage to the Pacific Ocean. London, 1784, II, vol. 2, p. 300.

[68] Kotzebue, Otto von, A voyage of discovery into the South Sea and Bering Strait, 1815-1818, vol. 1, p. 209. London, 1821.

[69] Beechey, F. W., Narrative of a voyage to

the Pacific and Bering Strait. Philadelphia, 1832, pp. 474-476.

[70] Latham, Robert G., The varieties of man. London, 1850, pp. 290-292.

[71] Hooper, W. H., Ten months among the tents of the Tuski. London, 1853, pp. 223-224.

[72] Seemann, Berthold, Narrative of the voyage of H. M. S. *Herald*. London, 1853, vols. I-II. On the Anthropology of Western Eskimo Land and on the Desirability of Further Arctic Research. J. Anthrop. Soc., London, 1865, vol. III, p. 301.

[73] Richardson, Sir John, The Polar Regions. Edinburgh, 1861, p. 301.

[74] Dall, W. H., Alaska and Its Resources. Boston, 1870.

[75] Orarian, a term used by the author to distinguish the tribes of Innuit, Aleutians, and Asiatic Eskimo from the natives known under the name of Indian, in allusion to the universal coastwise distribution of the former.

[76] Bancroft, Hubert H., The Native Races of the Pacific States. Vol. I, New York, 1874. Wild Tribes, p. 45.

[77] *Color.*—"Their complexion, if divested of its usual covering of dirt, can hardly be called dark."—Seemann's Voy. *Herald*, vol. II, p. 51. "In comparison with other Americans of a white complexion."—McCulloh's Aboriginal Hist. of America, p. 20. "White complexion, not copper coloured."—Dobb's Hudson's Bay, p. 50. "Almost as white as Europeans."—Kalm's Travels, vol. II, p. 263. "Not darker than that of a Portuguese."—Lyon's Journal, p. 224. "Scarcely a shade darker than a deep brunet."—Parry's Third Voyage, p. 493. "Their complexion is light."—Dall's Alaska, p. 381.

"Eyewitnesses agree in their superior lightness of complexion over the Chinooks."—Pickering's Races of Man, U. S. Ex. Ex., IX, 28. At Coppermine River they are "of a dirty copper color; some of the women, however, are more fair and ruddy."—Hearne's Travels, p. 166. "Considerably fairer than the Indian tribes."—Simpson's Nar., p. 110. At Cape Bathurst "the complexion is swarthy, chiefly, I think, from exposure and the accumulation of dirt."—Armstrong's Nar., p. 192. "Show little of the copper color of the Red Indians."—Richardson's Pol. Reg., p. 303. "From exposure to weather they become dark after manhood."—Richardson's Nar., I, 343.

[78] *Proportions.*—"Both sexes are well proportioned, stout, muscular, and active."—Seemann's Voy. *Herald*, II, 50. "A stout, well-looking people."—Simpson's Nar., pp. 110, 114. "Below the mean of the Caucasian race."—Doctor Hayes in Historic Magazine, vol. I, p. 6. "They are thick set, have a decided tendency to obesity, and are seldom more than 5 feet in height."—Figuier's Human Race, p. 211. At Kotzebue Sound "tallest man was 5 feet 9 inches; tallest woman 5 feet 4 inches."—Beechey's Voy., I, 360. "Average height was 5 feet 4½ inches"; at the mouth of the Mackenzie they are of "middle stature, strong, and muscular."—Armstrong's Nar., 149, 192. "Low, broad set, not well made nor strong."—Hearne's Trav., p. 166. "The men were in general stout."—Franklin's Nar., I, 29. "Of a middle size, robust make, and healthy appearance."—Kotzebue's Voy., I, 209. "Men vary in height from about 5 feet to 5 feet 10 inches."—Richardson's Pol. Reg., p. 304. "Women were generally short." "Their figure inclines to squat."—Hooper's Tuski, p. 224.

[79] *Hands and feet.*—"Tous les individus qui appartiennent à la famille des Esquimaux se distinguent par la petitesse de leurs pieds et de leurs mains, et la grosseur énorme de leurs têtes."—De Pauw, Recherches Phil. I, 262. "The hands, and feet are delicately small and well formed."—Richardson's Pol. Reg., p. 304. "Small and beautifully made."—Seemann's Voy. Herald, II, 50. At Point Barrow "Their hands, notwithstanding the great amount of manual labor to which they are subject, were beautifully small and well formed, a description equally applicable to their feet."—Armstrong's Nar., p. 101.

[80] *Head.*—"The head is of good size, rather flat superiorly, but very fully developed posteriorly, evidencing a preponderance of the animal passions; the forehead was for the most part low and receding; in a few it was somewhat vertical but narrow."—Armstrong's Nar., p. 193. Their cranial characteristics "are the strongly developed coronary ridge, the obliquity of the zygoma, and its greater capacity compared with the Indian cranium. The former is essentially pyramidal, while the latter more nearly approaches a cubic shape."—Dall's Alaska, p. 376. "Greatest breadth of the face is just below the eyes, the forehead tapers upwards, ending narrowly but not acutely, and in like manner the chin is a blunt cone."—Richardson's Pol. Reg., p. 302. Doctor Gall, whose observations on the same skulls presented him for phrenological observation are published by M. Louis Choris, thus comments upon the head of a female Eskimo from Kotzebue Sound: "L'organe de l'instinct de la propagation se trouve extrêmement dévelopé pour une tête de femme." He finds the musical and intellectual organs poorly developed, while vanity and

love of children are well displayed. "En général," sagely concluded the doctor, "cette tête femme présentait une organization aussi heureuse que celle de la plupart des femmes d'Europe."—Voy. Pitt., pt. II, p. 16.

[81] *Face.*—"Large, fat, round faces, high cheek bones, small hazel eyes, eyebrows slanting like the Chinese, and wide mouths."—Beechey's Voy., I, 345. "Broad, flat faces, high cheek bones."—Doctor Hayes in Hist. Mag., I, p. 6. Their "teeth are regular, but from the nature of their food and from their practice of preparing hides by chewing, are worn down almost to the gums at an early age."—Seemann's Voy. *Herald*, II, 51. At Hudson Strait, "broad, flat, pleasing face; small and generally sore eyes; given to bleeding at the nose."—Franklin's Nar., I, 29. "Small eyes and very high cheek bones."—Kotzebue's Voy., I, 209. "La face plate, la bouche ronde, le nez petit sans être écrase, le blanc de l'oeil jaunâtre, l'iris noir et peu brillant."—De Pauw, Recherches Phil., I, 262. They have "small, wild-looking eyes, large and very foul teeth, the hair generally black, but sometimes fair, and always in extreme disorder."—Brownell's Indian Races, p. 467. "As contrasted with the other native American races, their eyes are remarkable, being narrow and more or less oblique."—Richardson's Nar., I, 343. "Expression of face intelligent and good natured. Both sexes have mostly round, flat faces, with Mongolian cast."—Hooper's Tuski, p. 223.

[82] *Hair.*—"Allowed to hang down in a club to the shoulder."—Richardson's Pol. Reg., p. 305. "Their hair is straight, black, and coarse."—Seemann's Voy. *Herald*, II, 51. A fierce expression characterized them on the

McKenzie River, which "was increased by the long, disheveled hair flowing about their shoulders."—Armstrong's Nar., p. 149.

[83] *Beard.*—"The old men had a few gray hairs on their chins, but the young ones, though grown up, were beardless."—Beechey's Voy., I, 322. "The possession of a beard is very rare, but a slight mustache is not infrequent."—Seemann's Voy. *Herald*, II, 51. "As the men grow old they have more hair on the face than red Indians."—Richardson's Nar., I, 343. "Generally an absence of beard and whiskers."—Armstrong's Nar., p. 193. "Beard is universally wanting."—Kotzebue's Voy., I, 252. "The young men have little beard, but some of the old ones have a tolerable show of long, gray hairs on the upper lip and chin."—Richardson's Pol. Reg., p. 303. "All have beards."—Bell's Geography, V, 294. Kirby affirms that in Alaska "many of them have a profusion of whiskers and beard."—Smiths. Report, 1864, p. 416.

[84] Simpson, John, Observations on the Western Eskimo and the Country They Inhabit. *In* A Selection of Papers on Arctic Geography and Ethnology, Pres. by the Roy. Geogr. Soc., London, 1875, pp. 238-246.

[85] Dall, W. H., Tribes of the Extreme Northwest. Contribution to North American Ethnology, I, Washington, 1877.

[86] Hooper, C. L., Report of cruise of the revenue steamer *Corwin*, 1881. Washington, 1884, p. 101.

[87] Ray, P. H., Ethnographic sketch of the natives. Report of the International Polar Expedition to Point Barrow, Alaska. Washington, 1885.

[88] Murdoch, J., Ethnological results of the

Point Barrow expedition. Ninth Ann. Rept. Bur. Ethn., 1887-88, pp. 33-39, Washington, 1892.

[89] Murdoch, J., Dress and physique of the Point Barrow Eskimos. Popul. Sci. Month., Dec., 1890, 222-223.

[90] Kelly, J. W., Arctic Eskimos in Alaska and Siberia. Revised and edited by Sheldon Jackson. Bull. No. 3, Soc. Alaskan Nat. Hist. and Ethnol., Sitka, 1890, p. 15.

[91] Nelson, Edward W., The Eskimo about Bering Strait. Eighteenth Ann. Rept. Bur. Amer. Ethn., Washington, 1900, pp. 26-29.

[92] Jackson, Sheldon, Our barbarous Eskimos in northern Alaska. The Metropol. Mag., Vol. XXII, New York, June, 1905, pp. 257-271.

[93] Either a bad misprint or bad error.—A. H.

[94] Hawkes, Ernest William, Skeletal measurements and observations of the Point Barrow Eskimo, with comparisons with other Eskimo groups. Am. Anthrop., n. s. XVIII, No. 2, pp. 206-207, Lancaster, 1916.

[95] Jenness, D., Physical characteristics of the Copper Eskimos. Rept. Canad. Arct. Exp. 1913-1918. Ottawa, 1923, p. 38.

Older Anthropometric Data on the Western Eskimo

STATURE AND OTHER MEASUREMENTS ON THE LIVING

The earliest actual measurements of the living among the western Eskimo are those given in Captain Beechey's Narrative (1832, p. 226), where we read

that of the Eskimo of Cape Thompson (north of Kotzebue Sound) "the tallest man was 5 feet 9 inches (175.3 centimeters), the tallest woman 5 feet 4 inches (162.6 centimeters) in height." As seen before, Beechey also stated that the stature of the Eskimo increases from the east to the west.

In 1881-82, Lieutenant Ray collects and in 1885 reports evidently careful measurements of 51 men and 30 women from the villages of Uglaamie, at Cape Smythe, now Barrow, and Nuwuk, on Point Barrow.[96] An abstract of the data shows as follows:

> Average height: Male, 5 feet 3½ inches (161.3 centimeters); female, 4 feet 11¾ inches (151.8 centimeters).
> Average weight: Male, 153⅜ pounds; female, 135⅔ pounds.
> Tallest male: 5 feet 8¾ inches (174.6 centimeters).
> Tallest female: 5 feet 3 inches (160 centimeters).
> Shortest male: 4 feet 11 inches (149.9 centimeters).
> Shortest female: 4 feet ½ inch (123.2 centimeters).
> Weight: Male, 126 to 204 pounds; female, 106 to 172 pounds.

In 1892, in connection with the preparation of the anthropological exhibits for the World Exposition at Chicago, an extensive effort was made under the direction of Frederick W. Putnam and Franz Boas to secure, by the help of a group of specially instructed students, physical data on many tribes of the American aborigines, and this included a contingent of the western Eskimo. An abstract of the results was

reported by Boas in 1895.[97] The locality where the Eskimo were measured is not given, but it was most likely Nome or St. Michael Island. Thirty-four men gave the high (for the Eskimo) average of 165.8 centimeters, an unstated number of women an equally elevated average of 155.1 centimeters. No details are given. There is also given the mean and distribution of the cephalic index on 114 living western Eskimo of both sexes. (On chart, p. 395, the number is 141.) The mean index was 79.2. There are again, as under Stature, no details as to locality, and none could be obtained from the author.

In 1901 Deniker, in his Races of Man (p. 580), reports the stature of 85 Eskimo of Alaska, doubtless males, as 163 centimeters. There are no details, no references, and I have not been able to trace the source of the measurement.

During the years 1897-1899 A. J. Stone made an extended journey along a portion of the upper Yukon and through parts of northwestern Alaska and the Mackenzie River basin, for the American Museum of Natural History. On this journey he made some measurements of Indian and Eskimo, and these were published in 1901 by Franz Boas.[98] The Eskimo measured were the "Nunatagmiut" (11 males, 5 females), of the Noatak River, Alaska, and the "Koukpagmiut," (12 males, 6 females), east of the mouth of the Mackenzie. The Noataks, who alone interest us more closely here, gave the relatively high (for Eskimo) stature of 167.9 centimeters in the men and 155.6 centimeters in the women. The number of subjects is small and there may possibly have been some unconscious selection; yet it is clear that in this group there are numerous fairly tall individuals.

Stone's Data on the Noatak River Eskimo

Males (11)	
Females (5)	
Stature	
	167.9
	155.6
Stretch of arms	
	173.0
	159.2
Height of shoulder	
	139.7
	128.4
Length of arm	
	73.9
	66.0
Height sitting	
	86.8
	81.8
Width of shoulders	
	38.0
	34.2
Length of head	
	18.9
	18.1
Width of head	
	15.45
	14.26
Width of face	
	15.57
	14.46
Height of face	
	12.84

	11.98
Height of nose	
	5.63
	5.3
Width of nose	
	3.76
	3.34
Index of stretch of arms	
	103.1
	102.4
Index of arm	
	42.6
Index of height sitting	
	52.6
	52.4
Index of width of shoulders	
	22.6
	22
Cephalic index	
	81.6
	78.8

In addition, Doctor Jenness, in 1913, measured 13 adult male Point Hope Eskimo for stature, head length, and head breadth.[99] He obtained the following records:

Stature
Head length
Head breadth
Cephalic index
160.5

19.7
15.1
76.6
168.5
19.6
14.7
75.0
167.3
19.4
14.5
74.7
162.9
21.0
14.6
69.5
162.4
19.2
14.5
75.5
167.8
19.5
14.9
76.4
170.2
18.8
14.7
78.2
170.4
18.8
14.8
78.7
168.3

	19.4
	15.3
	78.8
	174.3
	18.6
	15.1
	81.1
	158.3
	18.7
	15.4
	82.3
	168.2
	19.2
	16.3
	84.9
	167.3
	18.7
	15.9
	85.0
Means[100]	
	168.2
	19.28
	15.06
	78.1

Doctor Jenness[101] also gives useful data on the stature and cephalic index of living Eskimo from other localities which, with the addition of the sources and a slightly different arrangement, are here reproduced:

	Stature
Place	

Men		Women	
Cases	Stature	Cases	Stature
Smith Sound (Steensby)			
		8	157.4
		10	145.4
S. W. Greenland (Hansen)			
		21	157.6
		24	151.8
Labrador (Duckworth and Pain)			
		11	157.7
		10	149.7
Smith Sound (Hrdlička)[102]			
		3	157.7
S. E. Greenland (Hansen)			
		22	160.4
		23	152.9
Point Barrow (Ray)			

	51
	161.5
	28
	153.6
Hudson Bay (South Island and Aivilik)	
(S. I. 35, Tocher; A. 9, Boas)	
	44
	162.0
	12
	151.8
Mackenzie Delta (Jenness)	
	4
	162.2
N. E. Greenland (Hansen)	
	31
	164.7
	15
	155.1
Coronation Gulf (Jenness)	
	82
	164.8
	42
	156.4
Iglulik, Hudson Bay (Parry)	
	20
	166.0
	20
	153.7
Point Hope (Jenness)	
	13
	166.5

Mackenzie Delta (Stone)	
	12
	167.5
	6
	151.5
Noatak River (Stone)	
	11
	167.9
	5
	155.5

Cephalic Index[103]

Place	
Men	
Women	
Cases	
Stature	
Cases	
Stature	
Mackenzie Delta (Stone)	
	12
	73.9
Mackenzie Delta (Jenness)	
	4
	76.1
	6
	75.2
Southeast Greenland (Hansen)	
	22
	75.7

	23
	75.0
Labrador (Duckworth and Pain)	
	11
	77.0
	10
	74.5
Hudson Bay (Tocher and Boas)	
	35
	77.2
Coronation Gulf (Jenness)	
	82
	77.6
	42
	76.6
Northeast Greenland (Hansen)	
	31
	77.8
	15
	76.5
Smith Sound (Steensby)	
	8
	78.0
	10
	77.4
Southwest Greenland (Hansen)	
	21
	78.1
	24
	76.8
Point Hope (Jenness)	

	13
	[104]78.3
Noatak River (Stone)	
	11
	81.6
	5
	78.8

FOOTNOTES:

[96] Ray, Lieut. P. H., Report of the International Polar Expedition to Point Barrow, Alaska. Washington, 1885, p. 50.

[97] Zur Anthropologie der Nordamerikanischen Indianer. Verh. Berl. Ges. Anthrop., Sitz. Mai 18, 1895 (with Z. Ethnol. for same year).

[98] A. J. Stone's Measurements of Natives of the Northwestern Territories. Bull. Am. Mus. Nat. Hist., 1901, XIV, pp. 53-68.

[99] Physical Characteristics of the Copper Eskimo. Rep. Canad. Arch. Exped. 1913-1918, Ottawa, 1923, Introd., also p. B37.

[100] By present writer.

[101] Rep. Canad. Arct. Exped., 1913-1918, B50.

[102] Added from author's Anthropology of Central and Smith Sound Eskimo, 1910, 228; the stature of one woman was 146.7.

[103] Physical Characteristics of the Copper Eskimo. Rep. Canad. Arct. Exped., 1913-1918, Ottawa, 1923, p. B55.

[104] The totals of the measurements give *78.1*—A. H.

THE SKULL

The first western Eskimo skull collected for scientific purposes was apparently that of a female St. Lawrence Islander. It was taken from the rocks of the island by the Kotzebue party in 1817. It was reported upon phrenologically in 1822 by Gall.[105]

In 1839 Morton, in his "Crania Americana" (p. 248), gives measurements and the illustration of a western Eskimo skull from Icy Cape, collected by Dr. A. Collie, surgeon of H. M. S. *Blossom*. The principal measurements of this evidently female skull were: Length, 17.02 centimeters; breadth, 12.70; height, 12.70. Cephalic index, *74.6*.

In 1862[106] and 1863[107] Daniel Wilson reports briefly on six Tchuktchi skulls, which were probably those of Asiatic Eskimo. He says:

> My opportunities for examining Esquimaux crania have been sufficient to furnish me with very satisfactory data for forming an opinion on the true Arctic skull form. In addition to the measurements of 38 skulls, * * * I have recently compared and carefully measured six Tchuktchi [probably Asiatic coast Eskimo] skulls, in the collection of the Smithsonian Institution, exhumed from the burial place of a village called Tergnyune, on the island of Arikamcheche, at Glassnappe Harbor, west of Bering Strait, and during a recent visit to Philadelphia I enjoyed the advantage of examining, in company with Dr. J. Aitken Meigs, a series of 125 [eastern] Esquimaux crania, obtained by Doctor Hayes during his Arctic journey of 1860. The comparison between the Tchuktchi and the

> true Esquimaux skull is interesting. Without being identical, the correspondence in form is such as their languages and other affinities would suggest. Of the former, moreover, the number is too few, and the derivation of all of them from one cemetery adds to the chances of exceptional family features; but on carefully examining the Hayes collection with a view to this comparison, I found it was quite possible to select an equal number of Esquimaux crania closely corresponding to the Tchuktchi type, which indeed presents the most prominent characteristics of the former, only less strongly marked.

In Prehistoric Man, Volume II, Plate XV, this author gives also the measurements of the Icy Cape skull recorded by Morton.

The principal mean measurements of the six Tchuktchi skulls (both sexes) were: Height, 17.60 centimeters; breadth, 13.59; height, 13.77; cranial index, *77.2*.

The next measurements on western Eskimo crania are those given in 1867 by J. Barnard Davis (*Thes. cran.*). This author measured 6 skulls, 3 of which were from Port Clarence (Seward Peninsula), 2 from Kotzebue Sound, and 1 from Cape Lisburne. The measurements, regrettably, are in inches. They include the greatest glabello-occipital length, greatest breadth, height (plane of for. magn. to vertex), height of face (chin-nasion), and breadth of face (d. bizygom. max.). The cranial index of the 4 specimens identified as male averaged *75.5* (75-76), that of the 2 females *77.5* (77-78). On page 226 the author mentions also an artificially deformed skull of a Koniag; this was in all probability a wrong

identification for no such deformations are known from the island (Kodiak).

In 1868 Jeffries Wyman[108] published measurements of 5 skulls of "Tsuktshi," the same as those of Daniel Wilson, and of 5 from the Yukon River, "three of which are Mahlemuts."

The identification of the specimens was partly erroneous. The data with corrected identification are republished by Dall (q. v.) in 1877. And the same skulls figure in all future measurements.

In 1875 Topinard[109] gives the Barnard Davis measurements in metric form without, so far as the western Eskimo are concerned, any additions.

The main measurements of Barnard Davis's western Eskimo skulls, converted to metric values, follow. The sex identification in some of the specimens is doubtful.

Skull length
Breadth
Height (to vertex)
Cranial index
Port Clarence, male
17.8
13.45
-14
75.7
Do
17.8
13.45
14.2
75.7

Port Clarence, female	
	-18
	-14
	13.45
	77.5
Means of the three	
	17.86
	13.64
	13.59
	76.4
Kotzebue Sound, male	
	17.55
	13.2
	13.45
	75.4
Kotzebue Sound, female	
	17.3
	13.45
	13.7
	77.9
Means of the two (probably both females)	
	17.4
	13.35
	13.6
	76.6
Cape Lisburne, male	
	18.3
	14.2
	-14

77.8

The next records are those by George A. Otis, published in 1876 in the Check List of the Specimens in the Section of Anatomy of the United States Army Medical Museum, Washington (pp. 13-15). Aside from those on Greenland crania the author gives here the measurements of 3 presumably Eskimo skulls collected by Dall; of 2 western Eskimo skulls, no locality; and of 3 Mahlemut skulls, probably from Norton Sound (St. Michael Island). In his later (1880) catalogue,[110] page 13, Otis adds to the above three skulls from Prince William Sound, which, however, were more probably Indian; the three Mahlemuts, on the other hand, are given with the Alaskan Indians (p. 35). These data are of but little value. The Eskimo skulls are the same Smithsonian specimens that were reported upon in 1868 by Jeffries Wyman.

In 1878, Rae[111] mentions some measurements or observations on the skulls of Western Eskimo by Flower, but no records of these could be located. Rae says:

> I had the privilege of attending the series of admirable lectures so ably given by Professor Flower at the Royal College of Surgeons a few weeks ago on the "Comparative Anatomy of Man," from which I derived much useful information and on one point very considerable food for thought.
>
> I allude to the wonderful difference in form exhibited between the skulls of the Eskimos from the neighborhood of Bering Strait, and of those inhabiting Greenland, the latter being extremely dolichocephalic, whilst the former are the very opposite—

> brachycephalic, the natives of the intermediate coast, from the Coppermine River eastward, having mesocephalic heads.

In 1879 Lucien Carr, in his "Observations on the Crania from the Santa Barbara Islands, California"[112] (p. 281), gives erroneously Otis's measurements of Aleut skulls as those of "Alaskan Eskimo."

Meanwhile W. H. Dall has published (1877) his monograph on the "Tribes of the Extreme Northwest,"[113] in which he includes Wyman's and also some of Otis's data on the Eskimo (and Aleut) skulls from Alaska and Asia. The Tshuktshi are now classed as Asiatic Eskimo, the Mahlemuts as Eskimo from St. Michael Island. The total number of skulls described in the former series is 11, in the latter series 6 (of Aleuts the number of skulls measured is 27 adults and 7 children). The means of the principal measurements of the Eskimo series, both sexes together, are as follows:

Jeffries Wyman's and Otis's Measurements of Western Eskimo Crania

Crania (both sexes)	Length	Breadth	Height	Cranial index
Asiatic Eskimo	(11)	(11)	(7)	(11)

	17.8
	14.1
	13.2
	79.3
(6)	
(6)	
(6)	
(6)	

Northwest American Eskimo

	17.5
	13.2
	13.1
	75.1

There were also taken the weight, capacity, circumference, longitudinal arch, length of the frontal, parietal, and occipital, "zygomatic diameter," and in two specimens of each series the facial angle. To-day these data have but a historical value.

In 1882, Quatrefages and Hamy,[114] in their "Crania ethnica" (p. 440) give the measurements of two male Kaniagmiouts (Kodiak Indian, A. Pinart, collector) and one female Mahlemiout. The principal measurements of these skulls are as follows:

Males (2)	**Female (1)**
Skull:	
Length	
	18.6
	17.9
Breadth	

	14.2
	13.9
Height (bas.-bg.)	
	14.3
	13.2
Cranial index	
	76.34
	77.65
Nose:	
Length	
	5.9
	5.1
Breadth	
	2.3
	2.3
Nasal index	
	38.98
	45.09
Facial index, total	
	77.69
	70.37
Orbital index	
	92.68
	90.24

In 1883 Dr. Irving C. Rosse, in his "Medical and Anthropological Notes on Alaska,"[115] refers to his examination of a number of Eskimo skulls from the St. Lawrence Island brought to the Army Medical Museum.[116] There are no measurements outside of a reference to the capacity, but there are two excellent chromolithographs showing two female crania, besides a number of outline drawings.

The next data on the western Eskimo skull are in rather unsatisfactory condition. They are those of Boas. In his report on the "Anthropologie der nordamerikanischen Indianer,"[117] Doctor Boas mentions the cranial index of the Alaska Eskimo to average *77*; and on page 397 he reports the same index as secured on 37 "Alaska Eskimo" skulls, apparently of both sexes. The only note relating to these figures is found on page 393, where it is stated that these results proceed from measurements that had been made for the author at the Peabody Museum, Cambridge, the American Museum, New York, the Academy of Sciences, Philadelphia, and the United States Army Medical Museum, Washington; and that he utilized also the measurements of Barnard Davis and Otis. On 22 of the above western Eskimo skulls there is also given the length-height index of *76.6*. There is no information as to either sex or locality. There are no other measurements.

Deniker (1901) and later Martin (1914) repeat the data given by Boas.

In 1890 Tarenetzky[118] publishes measurements and observations on four Koniag (Kodiak) skulls and one Oglemute (Aglegmute, Alaska Peninsula). The main measurements (pp. 70-71) are:

Koneage[119]
Koneage
Koneage
Koneage
Means[120] **of the four from Kodiak Island**
Aglegm-jute (Alaska Peninsula)

Skull:

Length	
	17.1
	16.4
	17.2
	16.8
	16.88
	19.0
Breadth	
	13.8
	15.7
	15.8
	14.4
	14.93
	13.7
Height	
	13.1
	14.4
	14.0
	13.2
	13.68
	14.1
Cranial index	
	80.7
	95.7
	91.8
	85.7
	88.4
	72.1
Nose:	
Length	
	4.7

	5.3
	5.7
	5.9
	5.40
	5.8
Breadth	
	2.4
	2.5
	2.6
	2.3
	2.45
	2.3
Nasal index	
	51.0
	47.1
	46.6
	39.0
	45.4
	39.6
Orbital index	
	87.5
	97.6
	92.7
	80.9
	89.7
	88.1

In 1900 Sergi[121] reports on four Kodiak skulls that he examined in Paris. Two of these are probably Aleut (or Indian). The cranial indices were, respectively, *75.8*, *78.3*, *88*, and *88.2*.

In 1916 E. W. Hawkes presented a thesis on the

"Skeletal Measurements and Observations on the Point Barrow Eskimo, with Comparisons from other Eskimo Groups."[122] The number of skulls measured was 27, of which 14 were identified as adult males, 5 adult females, 6 adolescents, and 2 infants. In addition there are measurements by Ralph Linton of other skeletal parts than the skull of three skeletons.

The measurements, though the first taken by this author, have evidently been taken in a painstaking manner and according to modern methods, and are therefore of some value. An abstract of those on the adults follows:

Principal Measurements of Point Barrow Crania, by Hawkes

	Males (14)	Females (5)
Vault:		
Length		
	18.91	
	17.86	
Breadth		
	13.73	
	13.58	
Basion-bregma height		
	13.86	
	13.30	
Cranial index		
	72.65	
	76.06	
Height-length index		
	73.24	
	74.45	

Height-breadth index	
	100.68
	98.01
Face:	
Diam. bizygom. max	
	14.10
	13.40
BF:BH proportion	
	102.6
	98.7
(6)	
(3)	
Chin-nasion height	
	13.15
	11.60
(14)	
(5)	
Alveolar point-nasion	
	7.42
	6.80
Facial index, total	
	92.13
	52.48
Facial index, upper	
	86.20
	54.05
Nose:	
Height	
	5.66
	5.24
Breadth	

	2.30
	2.18
Index	
	40.69
	41.62
Orbits:	
Height	
	3.76
	3.59
Breadth	
	4.13
	4.05
Index	
	91.3
	88.5
Dental arch:	
Length	
	5.31
	6.27
Breadth	
	4.96
	6.06
Index	
	93.4
	96.7

In 1923 Cameron[123] published the following data on six western Eskimo skulls from Port Clarence, collected by the Canadian Arctic Expedition:

Post Clarence (Seward Peninsula) Eskimo Crania

Vault	
Nose	
Length	
Breadth	
Height	
Cranial index	
Length	
Breadth	
Nasal index	
Orbital index	
Males:	
	18.9
	13.9
	14.1
	73.5
	5.9
	2.5
	42.4
	86.4
	18.7
	14.3
	13.7
	76.5
	5.3
	2.5
	47.2
	85.7
	18.8
	13.25

14.2
70.2
6.0
2.2
36.7
86.4
17.8
13.0
13.3
73.4
88.9
19.2
13.7
71.4

Mean: 18.68

13.63
13.82
72.97
5.73
2.40
41.9
86.9

Female: 17.85

13.1
12.8
73.1

The last contribution to the craniology of the western Eskimo before the present report are the data embodied in my "Catalogue of Human Crania in the United States National Museum Collections,"

published in 1924.[124] These data are embodied in those of the present report.

For ready survey the old records on western Eskimo crania are given in the following table. A sex distinction in the earlier reports was mostly impracticable or remained doubtful.

Previous Measurements of Western Eskimo Skulls

Vault	
Nose	
Length	
Breadth	
Height	
Cranial index	
Length	
Breadth	
Nasal index	
Orbital index	
	1
Icy Cape, ♀ (Morton, 1839)	
	17.02
	12.70
	12.70
	74.6
	6
Asiatic Eskimo ("Tschuktchi"): mean (Daniel Wilson, 1862)	
	17.60
	13.59
	13.77

	77.2
	3
Port Clarence (Barnard Davis, 1867)	
	17.86
	13.64
	13.59
	76.4
	2
Kotzebue Sound, ♀ (Barnard Davis, 1867)	
	17.40
	13.35
	13.60
	76.6
	11
Asiatic Eskimo (Wyman and Otis, 1868-1876)	
	17.80
	14.10
	13.20
	79.3
	6
N. W. Amer. Eskimo (St. Michael Island) (Wyman and Otis, 1868-1876)	
	17.50
	13.20
	13.10
	75.1
	2
Kodiak Island, ♂ (Quatrefages and Hamy, 1882)	
	18.60

	14.20
	14.30
	76.35
	5.9
	2.3
	39
	1
Kodiak, ♀ (Quatrefages and Hamy, 1882)	
	17.90
	13.90
	13.20
	77.65
	5.1
	2.3
	45.1
(37 western Eskimo)[125] (Boas, 1895)	
	(*77*)
	4
Kodiak Island, ♀[126] (Tarenetzky, 1900)	
	16.88
	14.93
	13.68
	88.4
	5.4
	2.45
	45.4
	89.7
	4
Kodiak Island,[127] (Sergi, 1900)	
	2:*77.1*

2:88.1
14
Point Barrow, ♂ (Hawkes, 1916)
18.91
13.73
13.86
72.65
5.66
2.30
40.7
91.3
5
Point Barrow, ♀ (Hawkes, 1916)
17.86
13.58
13.30
76.1
5.24
2.18
41.6
88.5
5
Port Clarence, ♂ (Cameron, 1923)
18.68
13.63
13.82
73
5.73
2.40
41.9
86.9

	1
Port Clarence, ♀ (Cameron, 1923)	
	17.85
	13.10
	12.80
	73.1

FOOTNOTES:

[105] Voyage pittoresque autour du Monde, by Louis Choris, Paris, 1822, pp. 15, 16.

[106] Wilson, Daniel, Prehistoric man. Two vols. Lond., 1862; II, pl. 15; 3d ed., 1876, II, 192, 15.

[107] Wilson, Daniel, Physical ethnology. Smithsonian Report for 1862, Washington, 1863, pp. 261-262. The measurements of the Tchuktchi are given in the Prehistoric Man, vol. II, Table 16.

[108] Observations on Crania. Proc. Bost. Soc. Nat. Hist., XI, 440-462. Boston, 1868.

[109] Topinard, P., Mesures craniometriques des Esquimaux. Rev. d'Anthrop., 1873, II, 499-522.

[110] List of the specimens in the Anatomical Section of the Army Medical Museum. Washington, 1880.

[111] Rae, John, Eskimo skulls. J. Anthrop. Inst. Gr. Brit, London, 1878, VII, 142.

[112] Rep. U. S. Geogr. Surv. W. of 100 Merid., vol. VII.

[113] U. S. Geog. and Geol. Surv. Rocky Mt. Reg. Contributions to North American Ethnology, I. Washington, 1877, p. 63 et seq.

[114] Quatrefages, A. de, and Hamy, E. T., Crania ethnica. Paris, 1882, 438, 440.

[115] Cruise of the *Corwin* in 1881. Washington, 1883, p. 38.

[116] Now in the Division of Physical Anthropology of the U. S. National Museum.

[117] 1895, Verh. Berliner, Ges. Anthrop. p. 367 et seq.

[118] Tarenetzky, Al., Beitrüge zur Craniologie der Ainos auf Sachalin. Mem. Acad. imp. Sc. St. Pétersb., 1890, XXXVII, No. 13, 1-55.

[119] Most if not all the Kodiak skulls are doubtless females, the Oglemute a male. Quite probably also the Kodiak skulls are those of Aleuts and not of Eskimo.

[120] By present author.

[121] Sergi, G., Crani Esquimesi. Atti della società Romana di antropologia, Roma, 1900, VII, 2, 93-102.

[122] Am. Anthrop., 1916, XVIII, 203-244.

[123] Cameron, John, Osteology of the western and central Eskimo. Rep. Canad. Arctic Exp., 1913-1918. Ottawa, 1923. With a report on the teeth by S. G. Ritchie and J. S. Bagnall. Table and means by the present writer.

[124] No. 1: The Eskimo, Alaska and Related Indians, Northeastern Asiatics. Proc. U. S. Nat. Mus., 1924, LXIII; sep., 51 pp.

[125] No details; series comprises specimens measured by Wyman, Otis, and Barnard Davis.

[126] Probably Aleuts, not Eskimo.

[127] Not the same with those of Tarenetzky; two probably Aleut.

Present Data on the Western Eskimo

THE LIVING

Barring the Aleutian and Pribilof Islands in the south and the Chukchee territory in the west, the Bering Sea is wholly the sea of the Eskimo, the Indians occupying the inland but reaching nowhere to the coast. There is doubtless much of significance in this remarkable distribution. It is now quite certain that the Eskimo has not been pressed out by the Indian; there are as a rule no traces of him farther inland than where he has been within historic times. On the other hand no Indian remnants or remains are known from any part of the coasts or islands within the Eskimo region; though the study of the older sites in these regions has barely as yet begun, besides which (see Narrative) it is a serious question whether really old sites could now be located in these regions at all even if they had once existed. At all events the Eskimo appears from all indications to be the latest comer, and judging from his remains his occupancy here is not geologically ancient; it is one to be counted, apparently, in many hundreds of years rather than in thousands. The Aleuts in the south are, as I have pointed out in the Catalogue (No. 1, 1924, p. 39), not Eskimo but Indians, related to the general Alaska Indian type; and the Pribilof Islands appear never to have been occupied until fairly recently, when a good number of Aleuts, mostly mixed bloods, have been transported and established there in the interest of the seal fisheries.

MEASUREMENTS OF LIVING WESTERN ESKIMO

Thanks to Moore, Collins, and Stewart, all of the

National Museum, instructed by me and working with the same instruments, we now have several small to fair series of measurements on the living western Eskimo of both sexes. They are tabulated below. They are the first made on these groups and will be of much interest both in general and in connection with the measurements made on the skulls and bones of most of the same people. The main points shown are as follows:

Stature.—The stature of the males ranges from markedly to moderately submedium. There is a considerable similarity. Only the Yukon group and that of Togiak reach near or slightly above medium, the general human medium for males approaching 165 centimeters. The female stature on the St. Lawrence Island averages 12 centimeters less than that of the males, which is about the difference found in most other peoples. At Hooper Bay, and especially at the Nunivak Island, the difference is less, indicating either that the males are slightly stunted or that the growth of the females is somewhat favored.

Height sitting.—The height-sitting-stature index ranges from slightly to quite notably higher than it is in other races, indicating a tendency toward a relatively long trunk and somewhat short limbs. A study of the long bones shows that this is due especially, if not wholly, to the relative shortness of the tibia; and the subdevelopment of this bone may, it seems, be ascribed to a great deal of squatting both at home during the long winters and in the canoes. The male Eskimo show more difference from other males in this respect than the Eskimo females show from other females.[128]

Arm span.—Relatively to the stature the length of the

arms in the Eskimo males is shorter than it is in other racial groups, though there appears to be some inequality in this respect. This shortness would be especially marked if we compared the arm span with the height sitting. It is due essentially to a shortness of the distal half of the upper limbs. The males once more show this disproportion more as compared to other males than the females compared with others of their sex. (See comp. data in Old Americans.) This may be connected in some way with the male Eskimo work and habits; or it may be an expression of a correlative subdevelopment with that of the lower limbs. It is a good point for further study.

The head.—The head, especially when taken in relation to the stature, is of good size, particularly on the Nunivak Island and on the Yukon. This agrees with what is known of the Eskimo head, skull, and brain elsewhere.

The size of the Eskimo head—which is not caused by a thick skull—will best be appreciated by contrasting it with that of civilized whites. In whites in general the mean head diameter or cephalic module ranges in males from approximately 15.70 to 16.40; in the male western Eskimo groups the range is 15.87 to 16.08, and 16.11 in the group at Marshall on the Yukon. The percentage relation of the module to stature in 12 groups of male whites, including the old Americans, averages *9.31* to *10.11*; in the male Eskimo groups it is from *9.57* to *9.94*. In females, the cephalic module is 15.57 in the old Americans, 15.36 to 15.68 in the Eskimo; the relation of the module to stature in the former being *9.59*, in the latter *10.15* to *10.25*.

In the western Eskimo woman the head dimensions are particularly favorable. In the old American

whites the mean head diameter in the female is to that of the male on the average as *95* to 100; in the two main groups of the western Eskimo it is as *96.1* and *96.7* to 100. Nothing is known as to the cause of this apparently favorable status of the Eskimo woman; it is another interesting point for further inquiry.

In shape, the head of the western Eskimo is highly mesocephalic to moderately brachycephalic and of only fair height, and it seldom approaches the scaphoid or dome-shaped. It is not the narrow, high, keeled skull of the northeastern and often the northern Eskimo. The physiognomy, the characteristics of the body, and the mentality and behavior, are in general typical Eskimo; but the form of the vault is substantially different. It is a form which approaches on one side that of the northwesternmost Indian, and on the other that of the northeastern and Mongoloid Asiatics. More must be said about this when we come to consider the skull.

The forehead.—Anthropometric studies have shown repeatedly[129] that the height of the forehead is not a safe gauge of intelligence, as commonly believed, but is controlled by the variable height of the hair line. Thus the common full-blood American Negro laborer and servant show a slightly higher forehead than the educated old American whites.

Something of a similar nature is found in the Eskimo. As seen in the following table, in the males the western Eskimo forehead is absolutely, and especially relatively to stature, higher than it is in the whites. In the females the absolute height in the two races is identical, but relatively to stature the Eskimo again shows a clear though somewhat lesser

advantage. The condition is apparently not due to the size of the head, for this is not greater than in the whites, in the males; while in the females, where the Eskimo shows a slightly larger head than the white in relation to stature, the forehead fails to correspond.

Dimensions of Forehead

	Western Eskimo		Old Americans	
	Male	Female	Male	Female
	cm.	*cm.*	*cm.*	*cm.*
Height, nasion to hair line	6.86	6.45	6.59	6.45
Percentage relation to stature	*4.23*	*4.23*	*3.78*	*3.80*
Breadth: Diameter frontal minimum	10.58	10.54	10.59	

	10.12
Percentage relation of diameter frontal minimum to breadth of face	
	71.1
	73.7
	76.4
	77.8
Forehead index $\frac{(H \times 100)}{(B)}$	
	64.8
	61.2
	63.7
	62.1

With the lower breadth of the forehead, conditions are also interesting. The absolute figures for the two races show a reversal. The height of the forehead is larger in the Eskimo than in the white males, equal in the females; the lower frontal breadth is equal in the males but larger in the Eskimo than in the white female. Proportionately to stature, which is so much lower in the Eskimo, both sexes of the latter show an advantage in the dimension over the white.

The percental relation of the breadth of the forehead to that of the face reflects the excess of the latter in the Eskimo, particularly the male. There is evidently not a full direct correlation between the two dimensions. Yet relatively to its height the face is broader in the females than in the males (see below), which is doubtless not without influence on the lower breadth of the forehead in the former.

To summarize, the western Eskimo forehead exceeds in area that of the American whites, in both sexes,

and that particularly in relation to stature. As to the individual measurements, the male Eskimo forehead as contrasted with that of the white is especially high, the female especially broad.

To which should be added that in the Eskimo the spheno-temporal region is often remarkably full, almost bulging, so that, contrary to what may be observed in the Negro, the frontal maximum diameter is also probably larger than in the whites, all of which doubtless has significance, even though this is not yet fully understood.

The face.—The principal measurements and relations are given below. They show a face large and especially broad. Moreover, relatively to its height the face is especially broad in the Eskimo female, in connection doubtless with the well-known excess of the work (in softening leather, etc.) of her jaws, with consequent development of the muscles of mastication, which in turn broaden the zygoma.

Dimensions of the Face

	Western Eskimo		Old Americans	
	Male	Female	Male	Female
Height, menton-nasion	12.67	11.64	12.15	11.09
Females to males (M = 100)				

	91.9
	91.3
Diameter bizygomatic maximum	
	14.88
	14.30
	13.87
	12.99
Females to males (M = 100)	
	96.1
	93.6
Facial index, anatomic	
	85.2
	81.4
	87.6
	85.4
Facial module (or mean diameter), anatomic	
	13.77
	12.97
	13.01
	12.04
Female to male (M = 100)	
	94.2
	92.5
Percentage relation of female and male to stature	
	8.49
	8.50
	7.46
	7.44

The great size of the Eskimo face is especially apparent in the relations of the mean diameter of the face to stature; it is in this respect no less than 12 per

cent in excess of that of the whites in the males and 12.5 per cent in the females.[130]

Lower facial breadth.—Due to the great development of the masseter muscles and the consequent frequent lesser or greater eversion of the angles of the lower jaw, the bigonial diameter in the Eskimo is very large, particularly when taken in relation to stature, and in such relation it looms especially large in the females. Compared with the old American whites, the bigonial breadth in its relation to stature is higher in the Eskimo males by 15.5 per cent, in the Eskimo females by 17.7 per cent. And measurements of Eskimo lower jaws in general show that this breadth in the western contingents is not exceptional.

Lower Facial Breadth

Western Eskimo (St. Lawrence Island)	
Old Americans	
Males	
Females	
Males	
Females	
Diameter bigonial	
11.78	
11.18	
10.63	
9.84	
Female vs. male	
94.9	
92.6	
Percentage relation to stature	
7.21	
7.39	
6.09	
6.08	
Percentage relation to breadth of face	
80	
79.5	
76.7	
75.8	

The nose.—The nose of the western Eskimo promises to be of much importance in the study of Eskimo origins in general. Nowhere in this region is it like the nose of the northern or northeastern groups. It is

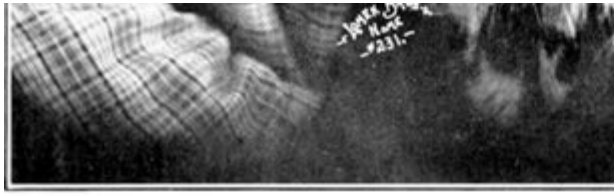
decidedly broader. Its breadth is intermediary between that of the Alaska and other Indians and that of the northern and northeastern Eskimo, connecting with both, and these characteristics are so generalized throughout western Alaska and the Bering Sea islands that they can not possibly be attributed to Indian or other admixture. Nor can this relatively broad nose of the western Eskimo be well attributed to environmental effects, i. e., to a broadening of a formerly narrow nose through climatic conditions. There do not appear to be any such conditions. The only rational explanation seems to be that this is the more original condition of the Eskimo nose, and that the northern and northeastern narrowness is a later derivation. More may be said on this point when we come to consider the skeletal remains.



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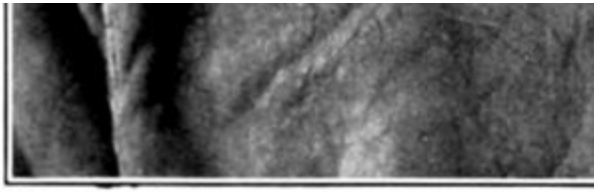


The Long and Broad-faced

(Photo by Lomen

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***a*, Broad-faced and low-vaulted Eskimo, St. Lawrence**

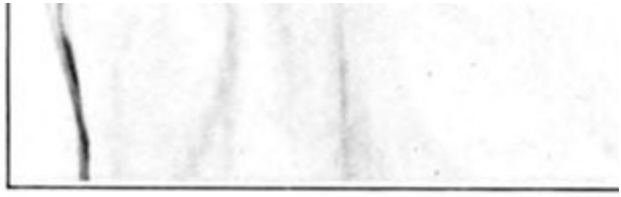




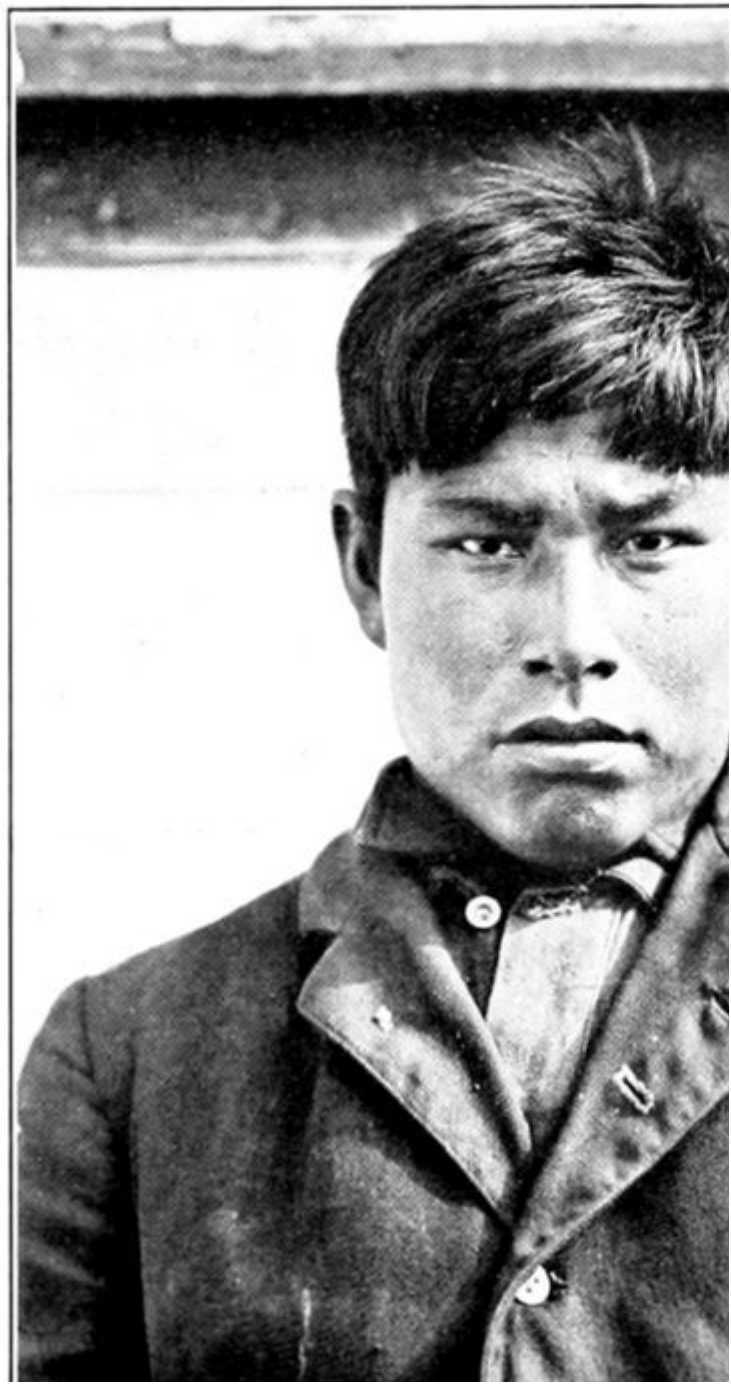
***b*, Broad-faced type, St. Lawrence Island. (F**

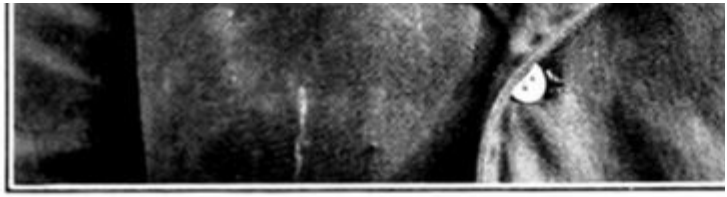
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***a*, A young man from Seward P**

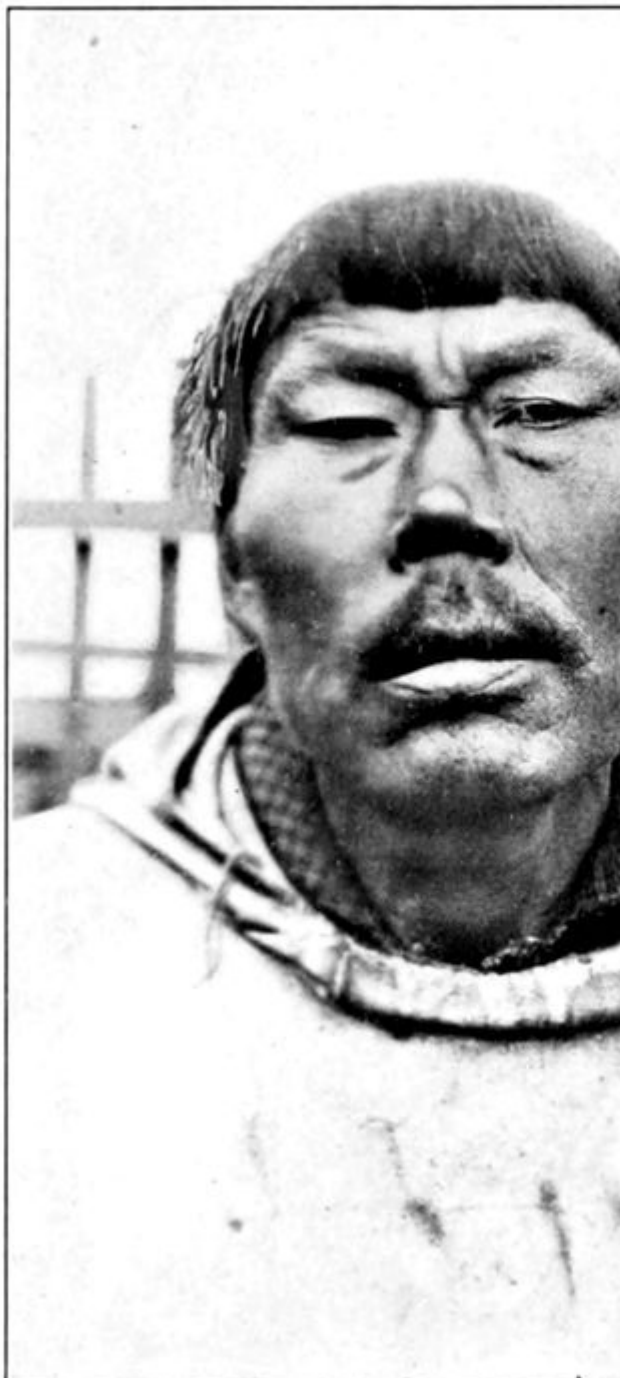


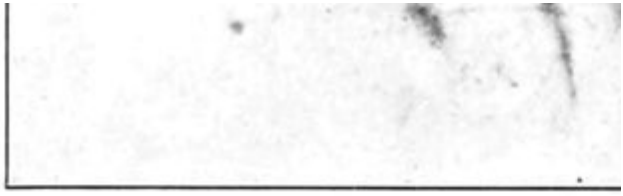


***b*, A boy from St. Lawrence**

The Long-faced Type

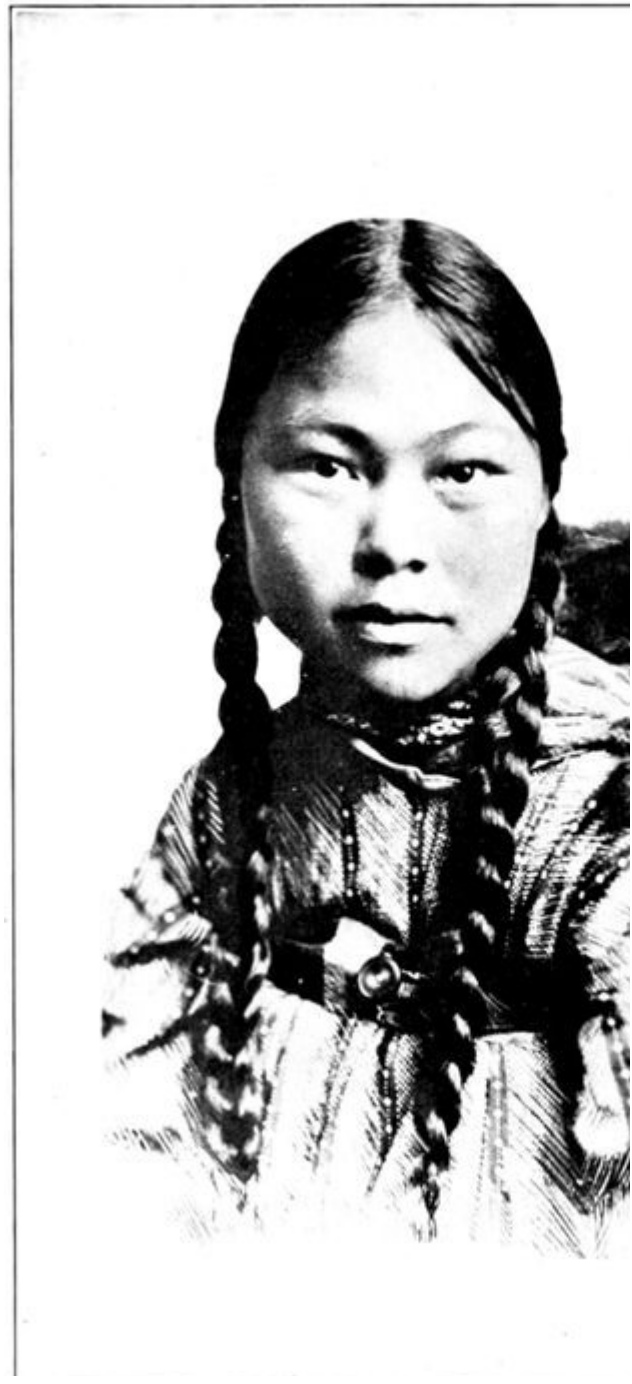
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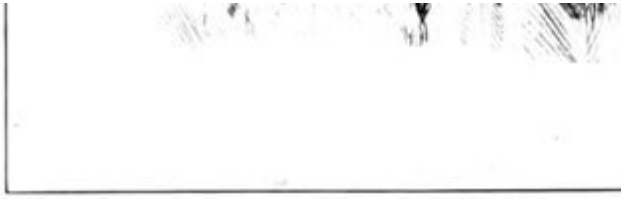




A "Hypereskimo," King Island. Excessiv

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXTI





Eskimo "Madonna" and Child, Northern

(Photo by Lomen Bros

The Eskimo nose is also high, which goes with the height of the whole face; that in turn evidently is attributable to more work and demand—in brief, more mastication. The nose, face, lower jaw, and other parts of the Eskimo anatomy offer rare opportunities for studies in the heredity of acquired characters.

Nose Measurements

American whites	
Western Eskimo	
Old Americans and immigrants	
Old Americans	
Males	
Females	
Males	
Females	
(13 groups)	
(6 groups)	
Height	
	4.95-5.4
	4.94
	5.47-6.03
	5.03
Breadth	

	3.45-3.6
	3.25
	3.82-3.93
	3.61
Index	
	62.5-73
	66
	63.7-71.9
	71.9

The mouth.—The western Eskimo mouth is large. It is considerably larger (wider) than in the old American whites, though these are of much higher stature. In relation to stature the width of the western Eskimo mouth exceeds that in the white old Americans by 13 per cent in the males and by nearly 14 per cent in the females, but there is a close relation with that of a large group of Indians. The details follow:

Mouth Width

Western Eskimo (Nunivak and St. Lawrence Islands)
16 tribes of Indians of the Southwest and northern Mexico.
Old American whites.
Males
Females
Males
Females
Males
Females

Width	
	5.73
	5.44
	5.85
	5.49
	5.37
	4.95
Females versus males	
	94.9
	93.8
	92.3
Percentage relation to stature	
	3.53
	3.57
	3.50
	3.55
	3.07
	3.08

The ears.—The ears of the western Eskimo are large. They are especially long. They exceed in both size and relative length those of whites, but are in both respects much more like those of the American Indian. The excess in length, both in the Eskimo and the Indian, is especially marked when this measurement is taken in relation to stature.

Relatively to its length, the ear of the female Eskimo in all our groups is somewhat narrow, giving a lower index. This is not observed in the available whites and Indians.

None of the series below are affected seriously by the age factor; though with an organ so much influenced by age as the ear the ideal way would be to compare

only groups of the same age.

Ears		
Western Eskimo		
Miscellaneous North American Indian		
Old American whites (Labor Ser.)		
Males		
Females		
Males		
Females		
Males		
Females		
Height of left ear		
		7.05
		6.61
		7.25
		6.95
		6.69
		6.10
Breadth of left ear		
		3.82
		3.49
		3.90
		3.70
		3.79
		3.47
Ear index		
		54.2
		52.8

	53.2
	53.6
	56.7
	56.9
Percentage relation of ear length to stature	
	4.34
	4.33
	4.25
	4.35
	3.84
	3.68

Western Eskimo groups	
Whites in general	
Height of left ear	
6.71- 7.40	6.49-6.73
6.20- 6.69	
Breadth of left ear	
3.72- 4.04	3.45-3.57
3.58- 3.79	
Ear index	
53.3 -58.9	*52.3 -53.1*
56 -58.6	

The chest.—The best measurements of the chest, experience has shown, are the antero-posterior and lateral diameters at the nipple height in the males and at the corresponding level of the upper border of the fourth costal cartilages in the females. They give not merely the individual dimensions but also their relation, which is of much ontogenic as well as other interest, and their mean gives the chest module

which in relation to the stature is anthropologically as well as individually (medically) important.

The table following gives the chest measurements in the western Eskimo, in a large group of Indians (my older data), and in the old American whites as well as others.

The Eskimo chest is large. In the males, in addition, it is very deep. Compared to that of the white old Americans it is markedly deeper in the males and broader in the females, notwithstanding the fact that the Americans are much taller. It is even larger, besides being relatively deeper in the males and somewhat broader in the females, than it is in many tribes of the Indian. Only tall and bulky Indians such as the Sioux show a chest that is absolutely somewhat larger, but in relation to stature, with which the dimensions of the chest stand in close correlation,[131] the Eskimo prevails even in this instance. This excess in chest development in the Eskimo must be ascribed in the main to his occupations and exertions, particularly again, it would seem, in connection with the canoe.

Chest Measurements

Western Eskimo, Nunivak Island
16 tribes of southwestern and New Mexico Indians
Old Americans
Males
Females
Males
Females

Males	
Females	
Stature	
	161.8
	153.1
	167.3
	-155.
	174.3
	161.8
Breadth	
	29.97
	28.63
	29.89
	28.21
	29.76
	26.62
Depth	
	24.63
	-22.
	22.77
	21.91
	21.70
	20.03
Index	
	82.2
	76.8
	76.15
	77.66
	72.9
	75.3
Module	

	27.30
	25.32
	26.33
	25.06
	25.73
	23.32
Module vs. stature	
	16.87
	16.53
	15.74
	16.17
	14.75
	14.41

4 other groups of western Eskimo, males	
72 Sioux Indians, males	
12 other groups of white males	
Stature	
	-160.6-166.
	-174.
	163.4-171.6
Breadth	
	-29.6-30.
	31.92
	-25.9-28.
Depth	
	-23.-24.75
	-26.

	20.9-22.6
Index	
	76.7-83.3
	81.4
	72.9-81.5
Module	
	26.97
	28.96
	23.4-25.7
Module vs. stature	
	16.56
	16.64
	14.22-14.84

The hand.—The hand of the Eskimo is small, both absolutely and relatively to stature. But it is rather broad relative to its length, giving a high index. The index is higher than that of any of the groups available for comparison, white or Indian, excepting a few groups of immigrant whites, laborers.

Hand
Western Eskimo, (group means)
16 tribes of southwestern and Mexican Indians
Old Americans
12 groups of immigrant whites
Males
Females

Males	
Females	
Males	
Females	
Males	
Left hand:	
Length	
	17.35-18.42
	16.60-16.85
	18.53
	17.20
	19.28
	17.34
Breadth	
	8.60-8.90
	7.78-8.20
	8.51
	7.71
	9.18
	7.87
Percentage relation of hand length to stature	
	10.96
	10.94
	11.07
	11.13
	11.05
	10.70
	-11.-11.3
Western	

Eskimo	
Southwestern and Mexican Indians	
Sioux	
Old American whites	
12 other groups of whites	
Males	
Females	
Males	
Females	
Males	
Females	
Males	
Females	
Males	
Females	
Hand index	
	49.5
	47.5
	45.9
	44.8
	47.6
	47.6
	45.4
	47.6-50.3

72 Sioux males: *11.40*.

The foot.—The foot of the western Eskimo, like his hand, is both absolutely and relatively to stature rather short, but it is broad, giving a high breadth-length index. Its actual breadth perceptibly exceeds that of the much taller old American whites, though not reaching that of any of the immigrant laborers.

Contrary to what was seen in the case of the hand, the relative proportions of the Eskimo foot, as expressed by the index, are almost identical with those of the southwestern and Mexican Indians. The Sioux foot is relatively longer, and so is that of whites except southern Italians, who, though their foot as a whole is larger, give the same index as the Eskimo.

Foot			
Western Eskimo			
16 tribes of southwestern and Mexican Indians			
Old Americans			
12 groups of immigrant whites			
Males			
Females			
Males			
Females			
Males			
Females			
Males			

Left foot:

Length	
	24.23
	22.13
	25.42
	23.30
	26.12
	23.33
Breadth	
	9.72
	8.70
	10.15
	9.07
	9.49
	8.36
Percentage relation foot length-stature	
	14.94
	14.51
	15.19
	15.08
	14.97
	14.42
15.36-15.73	

Western Eskimo
Southwestern and Mexican Indians
Sioux
Old American whites
12 other groups of whites

Males	
Females	
Males	
Females	
Males	
Females	
Males	
Females	
Males	
Females	
Foot index	
	40.1
	39.3
	39.9
	38.9
	37.1
	36.3
	35.8
	37.9-40.1

72 Sioux males: *15.40*.

Girth of the calf.—The western Eskimo, like the American Indians, are characterized by a rather slender calf. The size of the calf correlates in a large measure with stature. Reducing our measurements to calf girth-stature ratios, these are seen to be much alike in the three racial groups used for comparison, namely the Eskimo, the Indian, and the old American white. But this is deceptive. The correlation of size of calf with stature is not uniform (see "Old Americans," p. 348) for all stature groups; as the scale in stature

descends the calf is relatively stouter. If we take white Americans of approximately the same stature with the Eskimo here considered, there appears a higher ratio, showing that stature for stature the girth of the calf of the Eskimo is smaller, notwithstanding his generally more ample supply of adipose tissue. Once more his relation is closer with the Indian. The Eskimo and the Indian women are especially much alike, while the white women make a marked exception—their calfs (as well as thighs) have more fat than is found in those of their Eskimo and Indian sisters.

Measurements of the Leg

	Western Eskimo	**Southwestern and Mexican Indians (16 tribes)**	**Old white Americans**
	Male		
	Female		
	Male		
	Female		
	Male		
	Female		
Maximum girth of left calf			
	33.6		
	31.4		
	34.1		
	32		
	36.1		

	35.5
Percentage relation to stature	
	20.7
	20.6
	20.52
	20.54
	20.3
	21.95
Percentage relation to stature in those approaching the Eskimo stature	
	21.6
	22.3
Females v. males (M = 100)	
	93.5
	93.9
	98.3

FOOTNOTES:

[128] For comparative data on these and other proportions see writer's Old Americans, Baltimore, 1925; also Topinard's and Martin's textbooks.

[129] See Old Americans; also the writer's The natives of Kharga Oasis, Egypt, Smiths. Misc. Coll., Washington, 1912; Anthropology of the Chippewa, Holmes Anniv. Vol., Washington, 1916; and Measurements of the Negro, Am. J. Phys. Anthrop., 1928, XII, No. 1.

[130] A word of slight caution is due here. In all these cases the proper way would be to compare the Eskimo with whites of same mean stature. But we have no such whites available. As it is the comparisons must be taken merely

as approximations, but they are so close approximations that the substance of the conclusions is probably correct.

[131] The chest dimensions correlate with stature, respectively the trunk height, and the breadth correlates with the depth; but both are influenced by function.

Physiological Observations

Due to various difficulties which do not exist to that extent elsewhere, the physiological observations on the Eskimo are neither as numerous or extended as would be desirable; yet there are some data of value. They extend to the pulse, respiration, temperature, and dynamometric tests of hand pressure. They were made mainly on St. Lawrence and Nunivak Islands, by Moore, Collins, and Stewart. They quite agree, especially after elimination of some records that are clearly erroneous or abnormal. The tests should be extended with even more rigid precautions in future work among the Eskimo.

The results are given below. They were all made in the summer season and on healthy subjects, yet there were numerous indications of temporary disorders, pathological or functional. Even after a careful elimination of the obvious cases of such disorders not a few minor irregularities have doubtless remained, so that the data can not be taken for more than fairly close approximations to the normal.

The data show remarkably low pulse, respiration rate and temperature close to those of whites, with a submedium hand pressure. (For comparative data see "Old Americans.") The low pulse is also characteristic in the Indian, as I have repeatedly pointed out before

(see especially my "Physiological and Medical Observations among the Indians," etc., Bull. 34, Bur. Amer. Ethn., Washington, 1908).

The dynamometric tests agree also better with those on the Indians than with those on whites; they are valid only as to the hands, and they embody not only the strength of the muscles but also that of the conscious impulse behind them. The age factor, of importance, does not here enter materially into the case.

Pulse, Respiration, Temperature, and Strength
ST. LAWRENCE ISLAND ESKIMO
MALES—ALL

Pulse[132]	(63)
Respiration[133]	(54)
Temperature[134]	(61)
Strength (Collins dynamometer)	(60)
Pressure right hand	(60)
Pressure left hand	62.1
	20.1
	98.64
	34.36
	28.75
	(40-78)
	(15-25)

(97.6-99.4)
(19.5-45.5)
(19.5-44)
(47)
(47)
(47)
(57)
(57)
[135]61.3
[135]20.4
[135]98.84
[135]34.34
[135]29.78
FEMALES—SUSPICIOUS CASES ELIMINATED
(25)
(25)
(25)
(47)
(47)
72.4
20
99.13
20.13
16.81
(54-84)
(15-23)
(98.4-99.9)
(14.5-29)
(12-22.5)
NUNIVAK ISLAND ESKIMO

Pulse [132]
Respiration[133]
Temperature[134]
Males
(6)
(6)
(6)
63.2
18.2
98.05
(52-68)
(16-21)
(97.8-98.4)

The details of these six records were:

Age (year)	
Time of day	
Pulse (p. m.)	
Respiration	
Temperature	
	40
	4.40
	60
	21
	98.1
	33
	2
	66

	18
	97.8
	19
	2.30
	68
	18
	98.2
	45
	1.25
	68
	18
	98.4
	40
	1.30
	64
	(14)
	97.8

In connection with the pressure tests in the two hands, some interesting comparisons are possible between the Eskimo here dealt with and the old white Americans. As all the tests were made with the same instrument and method the results inspire confidence. It is in details of this nature that the anthropologist finds again and again the most striking proofs of the basal unity of the living races and their necessarily common origin somewhere in the past.

Pressure Force in the Hands in the Western Eskimo and Old White Americans

Western Eskimo
Old Americans

	Male
	Female
	Male
	Female
Pressure:	
	Kg.
	Kg.
	Kg.
	Kg.
Right hand	
	34.36
	20.13
	41.8
	23.3
Left hand	
	28.75
	16.81
	36.1
	19.4
Percentage relation of left to right	
	83.7
	83.5
	86.4
	83.6
Percentage relation of female to male (M = 100)	
Right hand	
	55.8
	55.5
Left hand	
	53.7
	53.7

FOOTNOTES:

[132] Sitting, at rest, no signs of any health disorder.

[133] Sitting, at rest.

[134] Sitting, at rest, sub lingua.

[135] Subjects where all three determinations were not possible and the most suspicious ones (abnormally above or below the mean) eliminated.

Summary of Observations on the Living Western Eskimo[136]

These Eskimo are generally of submedium stature, occasionally reaching medium. The distal parts of their extremities are relatively short. Walk in adult males somewhat awkward.

In head form they are highly mesocephalic to moderately brachycephalic; the height of the head averages about medium. The head is of good size, especially when taken in relation to stature. The forehead is above medium in both height and breadth.

The face is large in all dimensions, generally full and rather flat. In men it not seldom approaches a square form. The lower jaw region is largely developed, the angles of the lower jaw are broad to protruding.

The nose is of fair breadth, with bridge somewhat narrow above and on the whole only moderately high. The mouth is large, lips medium to somewhat above. The ears are long. Beard spare on sides of face, mostly sparse on chin; mustache sparse and

often limited to tufts above the corners of the mouth. Expression generally good-natured, smiling.

The chest is large, in females broad, in males especially deep. There is but a mild lumbar curve and no steatopygy. The lower limbs in females are less stout and shapely than they are in whites. The hands and feet are small, but, particularly the foot, relatively broad.

Temperature and respiration approach those in normal whites, though they appear frequently to be slightly higher; pulse normally is slow.

Dynamometric tests of strength (pressure, both hands) give somewhat lower records than in whites.

FOOTNOTES:

[136] Incorporated in this are writer's own observations.

Remarks

The most noteworthy and important result of these studies on the living western Eskimo is the evidence, coming to light again and again, of their fundamental somatic relations to the Indian. These relations are too numerous and weighty to be accidental. Nor can they be ascribed to mixture with the Indian in such far-away groups as the St. Lawrence Islanders, who so long as known have never had any direct or even indirect contact with Indians. These relations in dimensions and relative proportions of the body, and in physiological characteristics such as the slow normal pulse, are supplemented by many phases of behavior, and often

by a more or less Indianlike physiognomy. They inevitably lead to the conclusion that the Eskimo and the Indian are in the root members of the same family. They are two digits of the same hand, separate and diverging, yet at base joined to and derived from the same source. And this source, according to many indications, is the paleo-asiatic, "mongoloid," stem of northern Asia. The western Eskimo shows to be nearer this source than his more northern and northeastern relatives, indicating either that he is a later comer, or, which is more probable, that he has changed less in the south than in the north. It may be possible to say something more on this subject after the skeletal remains have been considered.





Young Woman, Northern Bering Sea R

(Photo by Lomen Bros.)

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Young Women, Full-blood Eskimos,

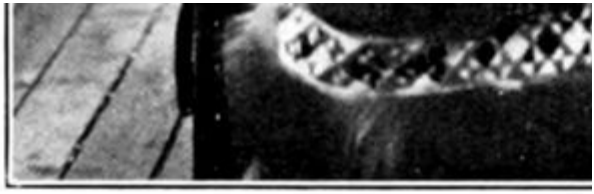
(Photo by Lomen Bro

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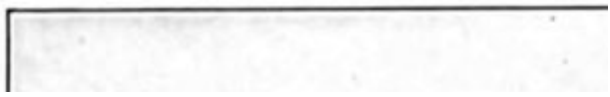
***a*, Eskimo woman, Kevalina. (Photo on**



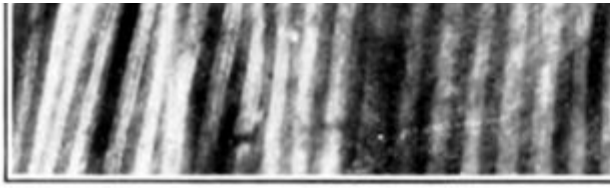


***b*, The body build of an adult Eskir**

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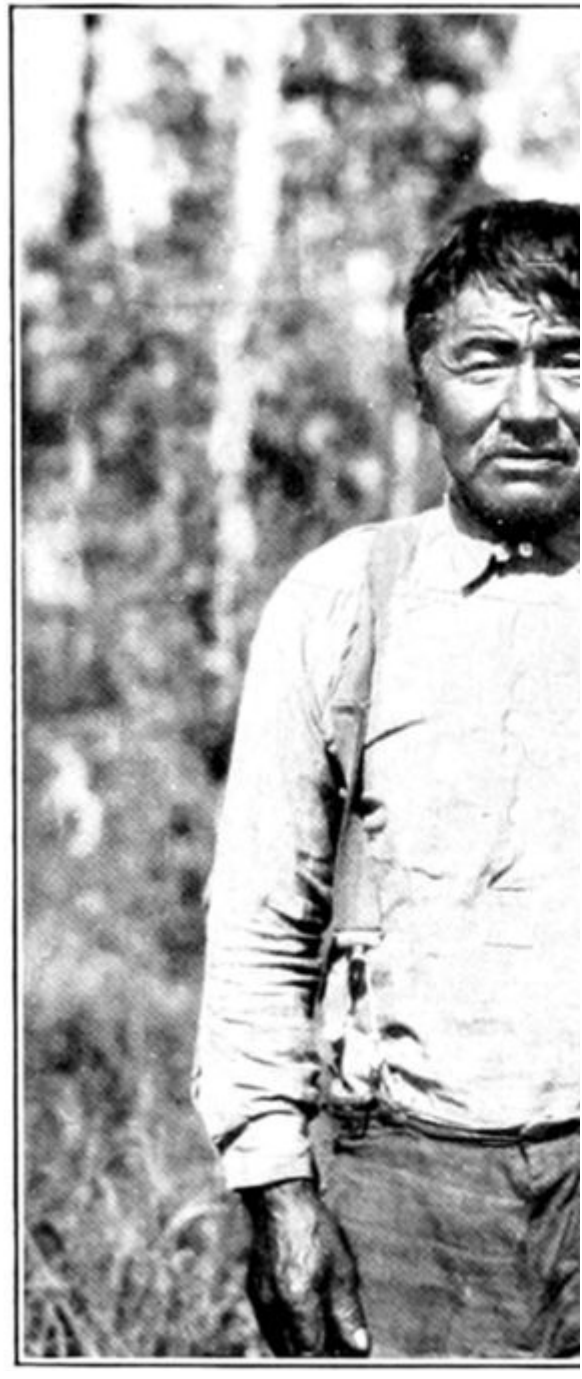


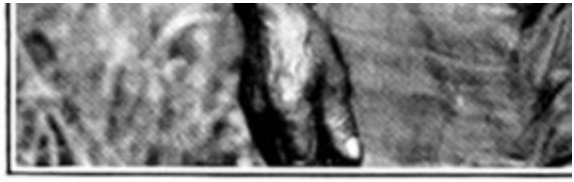


Elderly Woman, St. La

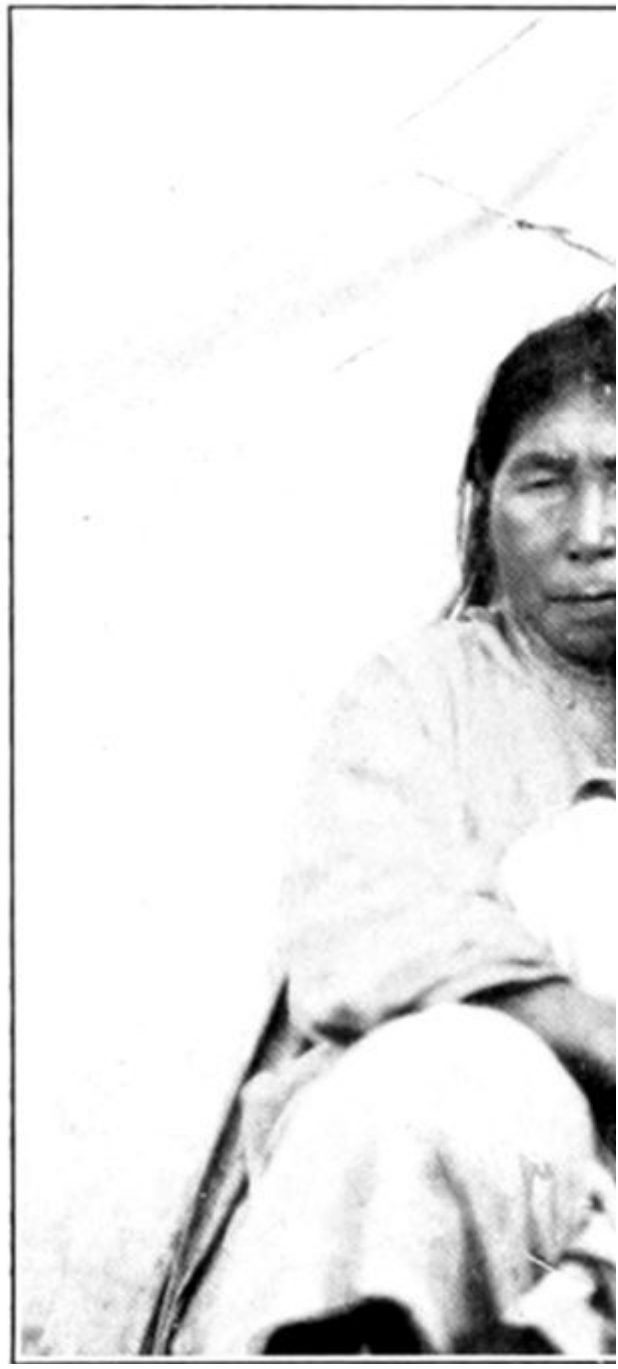
(Photos by R. D. Moore,

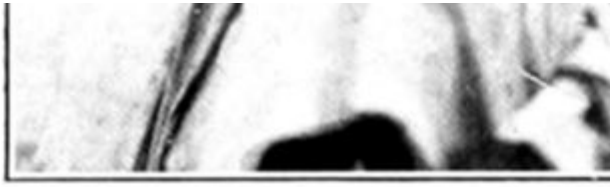
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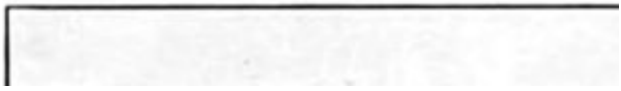
***a*, Yukon Eskimo, below**

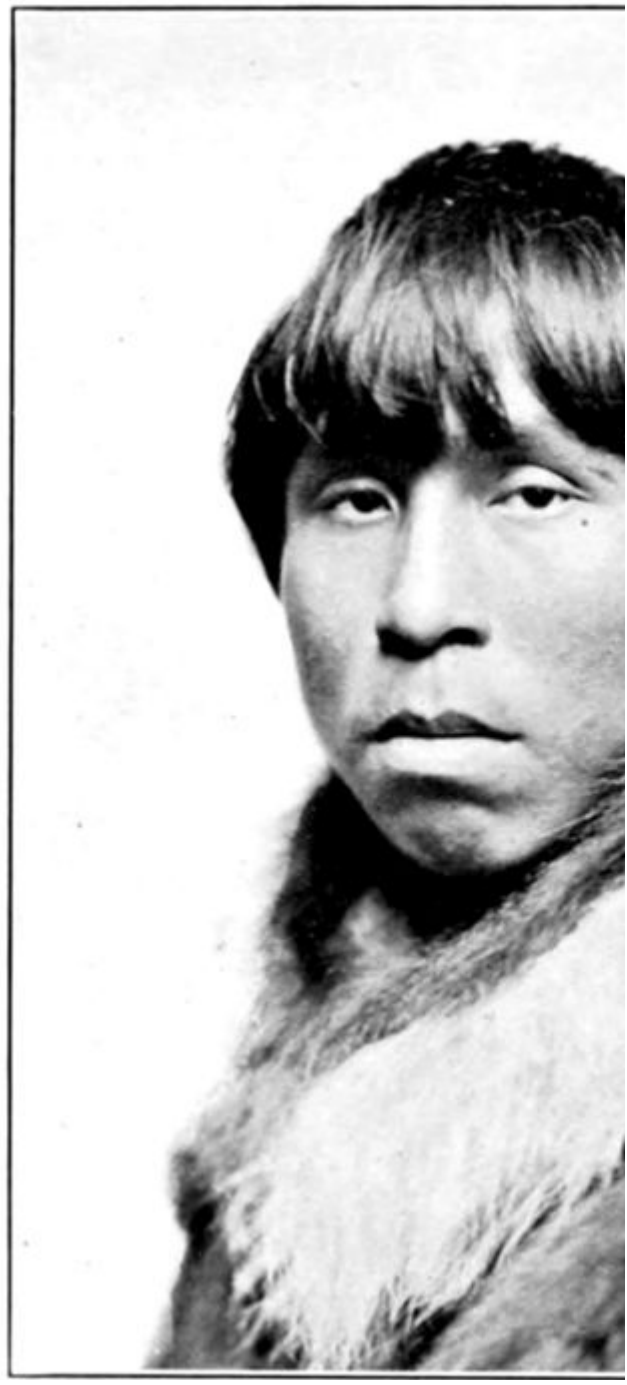




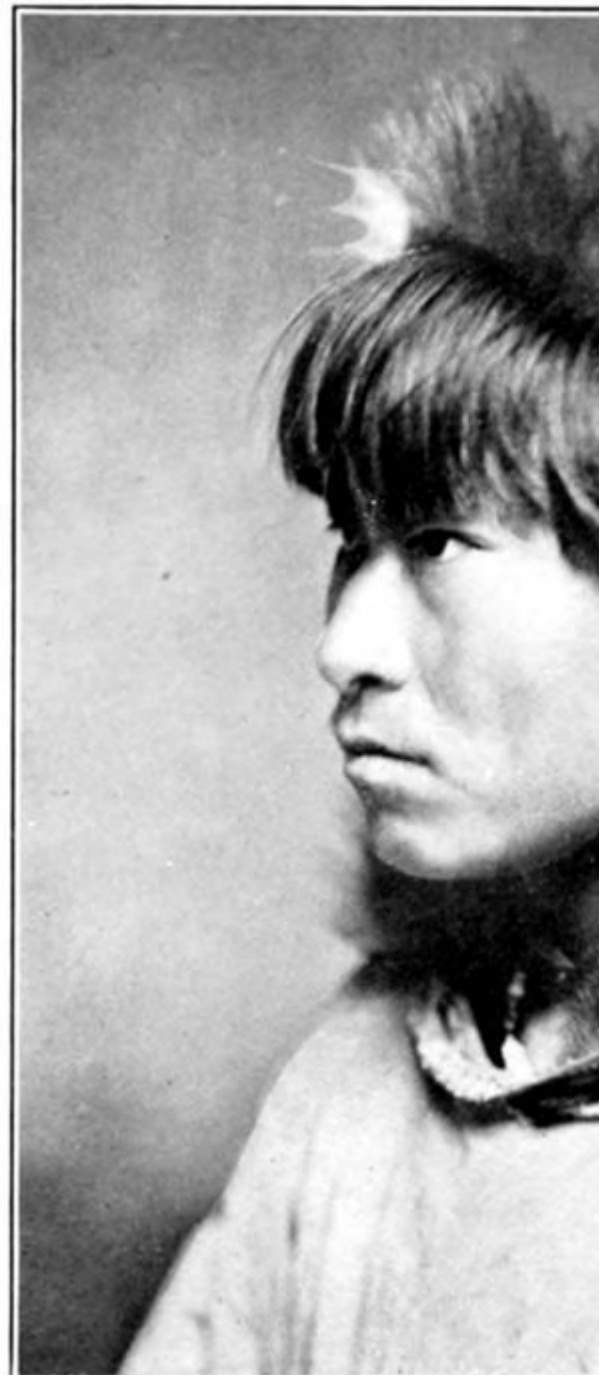
***b*, Norton Sound Eskimo wom**

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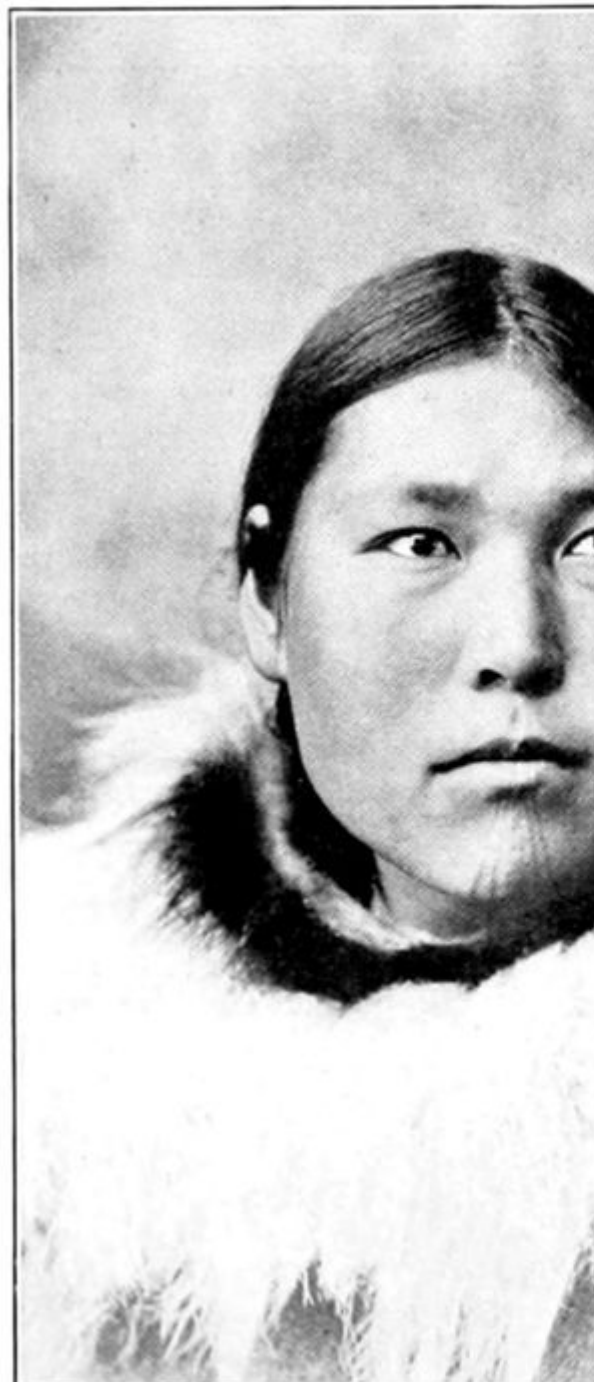


Eskimo, Indianlike; Northe

(Photos by Lom

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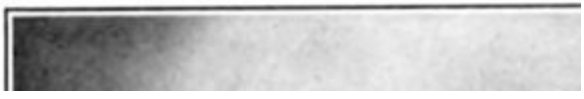




Eskimo, Indianlike; Northern

(Photos by Lome

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Eskimo, Indianlike; Nort

(Photos by L

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIXTH AN
54





Eskimo, Indianlike; Northern Bering Sea

(Photo by Lomen Bros.)

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Eskimo, Indianlike; Northern Bering Sea

(Photo by Lomen Bros.)

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Eskimo, Indianlike; Arctic Regi

(Photo by Lomen Bros.)

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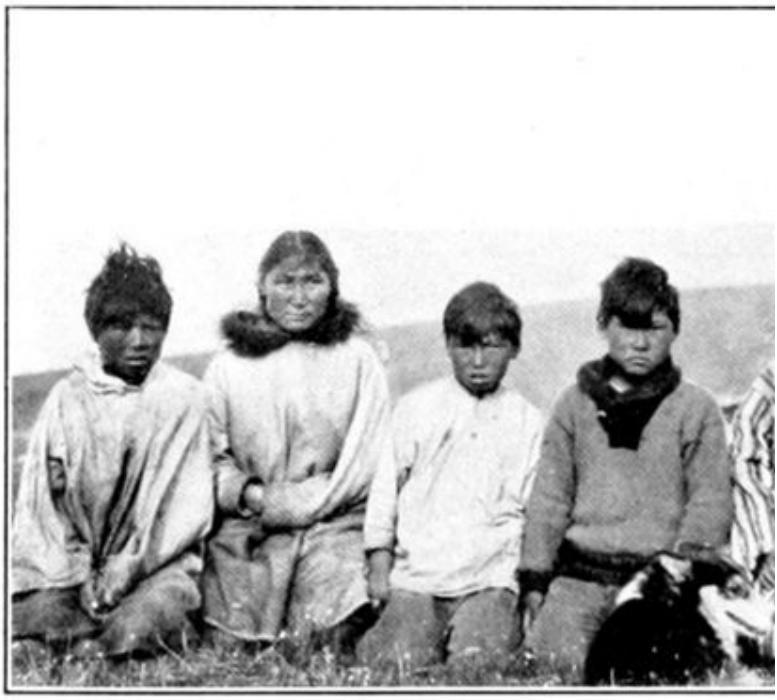
Siberian Eskimo and Child, Indian

BUREAU OF AMERICAN ETHNOLOGY FORTY-SIX





***a*, Mrs. Sage, Kevalina. Fine Indian type. Born on Notak. 1926.)**



***b*, Eskimo family, Indianlike; near Bar**

Western Eskimo: Measurements on the Living
[Measurements by Collins and Stewart, except as noted]

Males—Locality
Females—Locality
Kulukak

Togiak	
Tanunuk (Nelson Island)	
Nunivak Island	
Hooper Bay	
Marshall, Lower Yukon	
St. Lawrence Island	
Kanakanak, Bristol Bay	
Nunivak Island	
Hooper Bay	
St. Lawrence Island	
Date of record	
	(1927)
	(1927)
	(1927)
	(1927)
	(1927)
	(1927)
	(1912)
	(1927)
	(1927)
	(1927)
	(1912)
Subjects measured	
	(8)
	(4)
	(4)
	(19)
	(20)
	[137](6)
	[138](63)

	[139](10)	
	(24)	
	(2)	
	[138](48)	
Age		
Adult.		
Adult.		
Adult.		
Adult.		
Adult.		
Adult.		
Adult.		
Near adult.		
Adult.		
Adult.		
Adult.		
Stature		
		160.6
		166
		162.7
		161.8
		162.5
		163.8
		163.3
		147.8
		153.1
		153
		151.35
Height sitting		
		86
		89.75
		90.62

	88.86
	89.48
	90.22
	88.4
	(83.08)
	84.36
	83.80
	84.07
Height-sitting-stature index	
	53.55
	53.95
	55.69
	55.70
	55.06
	55.08
	54.13
	(*56.21*)
	55.10
	54.77
	55.55
Arm span vs. stature	
	+2.8
	+6.7
	+5.5
	+2.7
	+.7
	+5.1
	+.6
	+1.5
	-.7
(?)	

	-.7
Head:	
Length	
	19.06
	18.95
	19.37
	19.70
	19.13
	19.05
	19.33
	18.10
	18.85
	18.85
	18.56
Breadth	
	15.56
	15.70
	15.37
	15.48
	15.57
	15.85
	15.40
	15.26
	15
	15.30
	14.77
Height[140]	
	12.98
	13.02
	12.90

	13.07
	13.11
	13.43
	13.23
	13.01
	12.81
	12.90
	12.76
Cephalic module	
	15.87
	15.89
	15.88
	16.08
	15.94
	16.11
	15.99
	15.46
	15.55
	15.68
	15.36
Cephalic index	
	81.7
	82.9
	79.4
	78.6
	81.3
	83.3
	79.7
	84.3
	79.6
	81.2
	79.6

Mean height index	
	75
	75.2
	74.3
	74.3
	75.6
	77
	76.2
	79
	79
	75.5
	76.6
Face:	
Menton-crinion	
	19.70
	20.05
	19.70
	19.23
	19.41
	19.85
	20.01
	18.73
	18.45
	18
	18.03
Menton-nasion	
	12.89
	12.87
	12.58
	12.74

	12.47
	12.78
	12.68
	(11.79)
	12.11
	11.50
	11.31
Diameter bizygomatic maximum	
	14.74
	15.27
	14.95
	14.99
	14.97
	14.85
	14.73
	(13.95)
	14.31
	14.55
	14.03
Physiognomic facial index	
	72.3
	76.2
	75.9
	78.2
	77.1
	74.8
	73.6
	(*62.9*)
	77.6
	80.8
	77.8
Anatomical facial index	

	87.4
	84.2
	85.7
	85
	83.3
	86.1
	86.7
	84.6
	84.6
	79
	80.6
Height of forehead (nasion-hair line)	
	6.81
	7.18
	7.12
	6.49
	6.94
	7.07
	7.33
	6.94
	6.34
	6.50
	6.72
Breadth of forehead (diameter front—minimum)	
	10.26
	10.75
	10.65
	10.54
	10.35
	10.38
	10.94

	10.62
	10.38
	10.65
	10.58
Diameter bigonial	
	11.78
	11.18
Nose:	
Height	
	5.65
	6.03
	5.57
	5.58
	5.48
	5.42
	5.47
	(5.02)
	5.17
	4.89
Breadth	
	3.88
	3.82
	3.85
	3.89
	3.89
	3.60
	3.93
	(3.35)
	3.59

	3.63
Nasal index	
	68.7
	63.7
	69.1
	69.8
	71
	66.4
	71.9
	66.7
	69.4
	74.4
Mouth: Breadth	
	5.64
	5.82
	5.70
	5.87
	5.74
	5.70
	5.60
	(4.81)
	5.56
	5.32
Ear (left):	
Height	
	6.71
	7.17
	7.18
	7.05
	6.79

	6.52
	7.40
	(5.99)
	6.49
	6.60
	6.73
Breadth	
	3.76
	3.82
	3.72
	3.91
	3.69
	3.38
	4.04
	(3.49)
	3.45
	3.45
	3.57
Ear index	
	56.4
	53.3
	58.9
	55.5
	54.3
	51.9
	54.6
	(*58.3*)
	53.1
	52.3
	53
Chest:	

Breadth	
	29.58
	29.65
	29.70
	29.97
	29.96
	(27.43)
	28.63
Depth	
	24.10
	24.35
	24.75
	24.63
	23
	(19.39)
	22
Chest index	
	81.5
	82.1
	83.3
	82.2
	76.7
	[141](*70.7*)
	76.8
Hand (left):	
Length	
	17.35
	17.87

	17.55
	18.42
	17.61
	18.12
	17.94
	(15.90)
	16.62
	16.85
	16.60
Breadth	
	8.68
	8.60
	8.90
	8.81
	8.76
	8.70
	8.63
	(7.53)
	7.82
	8.20
	7.78
Hand index	
	52.9
	48.1
	50.7
	47.8
	49.7
	48
	48
	47.4
	47.1
	48.7

	46.7
Foot (left):	
Length	
	24.82
	24.05
	24.31
	23.88
	24.07
	(22.08)
	22.27
	22.15
	21.98
Breadth	
	9.88
	9.90
	9.81
	9.40
	9.61
	(8.55)
	8.85
	8.65
	8.59
Foot index	
	37.8
	41.2
	40.4
	39.4
	39.9
	(*38.7*)

	40.6
	39.1
	39.1
Leg: Circumference, maximum	
	32.62
	34.42
	33.56
	33.64
	(32.39)
	32.12
	29.70
	32.33

FOOTNOTES:

[137] Measurements by Collins.

[138] Measurements by R. D. Moore.

[139] Oldest girls of an orphanage.

[140] From the base line of the 2 meatus; this and all other measurements, including those of 1912, were taken by Hrdlička's methods and with his instruments. (See his "Anthropometry," Wistar Institute, Philadelphia, 1920.)

[141] Subadult in chest.

Present Data on the Skull and other Skeletal Remains of the Western Eskimo

THE SKULL

Until recently collections of skeletal remains of the

western Eskimo were confined largely to skulls. The material in our own institutions comprised a small collection of Mahlemut (St. Michael Island) and "Chukchee" (Asiatic Eskimo) crania made in the early sixties by W. H. Dall; a larger series of crania gathered in 1881 on St. Michael and St. Lawrence Islands by E. W. Nelson; 28 skulls with 3 skeletons brought in 1898 by E. A. McIlheny from Point Barrow; a valuable lot of skulls from Indian Point, Siberia, with a few from St. Lawrence Island, collected by W. Bogoras; and some scattered specimens by other explorers. To this were added in 1912 an important collection of skulls, with a few skeletons, made by Riley D. Moore, at that time my aide, on St. Lawrence Island; an important lot of crania gathered a few years later by V. Stefánsson at Point Barrow; and a third large and highly interesting lot, this time of both skulls and skeletons, collected near Barrow for the University Museum at Philadelphia in 1917-1919 by W. B. Van Valin. But none of the later material was described excepting the McIlheny collection which, in 1916, was reported upon by E. W. Hawkes.[142]

During the survey which is the subject of this report a special effort was made to collect all the older skeletal material along the Bering Sea and Arctic coasts that could be reached, and the result was the bringing back of some 450 crania, nearly 50 with skeletons, and many separate parts of the skeleton; nearly all of the specimens proceeding from localities thus far not represented in the collections. To which were added in 1927 nearly 200 skulls with a good number of skeletons gathered by H. B. Collins, jr., assistant curator in the Department of Anthropology, United States National Museum, and my aide, T. D. Stewart, on Nunivak Island and along the west coast

of Alaska from Bristol Bay to near the Yukon delta. [143]

We thus have now a relatively vast amount of skeletal material on the western Eskimo; it is essentially a virginal material; it is well identified as to locality; and the specimens are mostly in very good condition.

Aside from Hawkes's thesis, nothing of note had been published on these collections until 1924, when the first number of my Catalogue of Human Crania in the United States National Museum Collections appeared, which includes the principal measurements on 290 skulls of the western Eskimo. Since then, in view of the growing importance of the subject, I have remeasured every specimen reported before; have measured personally all the new collections; and thanks to the kindness of those in charge have been enabled to extend the measurements to all the collections of Eskimo crania, both from Alaska and elsewhere, that were preserved up to the spring of 1928 at the National Museum at Ottawa, the American Museum of Natural History of New York, and the Wistar Institute of Philadelphia, which now contains the University Museum collections. The total records reach now to 1,283 adult skulls from practically all important parts of the total Eskimo area, besides a considerable quantity of other bones of the skeleton. The main results of the work will be given here, the detailed measurements being reserved for another number of the Catalogue.

To save repetitions and possible confusion and to show more clearly the status of the southwestern and midwestern Eskimo, the entire cranial material will be dealt with in this section, and previous records on

the northeastern and a few other groups of the Eskimo will not be drawn upon to preserve the advantage of dealing with data obtained by the same methods, instruments, and observer.

In presenting the records it is found expedient, both on geographical and anthropological grounds, to make but three groupings. The first of these comprises the Eskimo from their southernmost limit to Norton Sound and the Bering Sea islands; the second group takes in Seward Peninsula (or the larger part of it) and the Arctic coast to Point Barrow; while the third embraces all the Eskimo east of Point Barrow. The first of these three groups is remarkably homogeneous, the second and third show each some exceptional units. It may be said at once that the dialectic subdivisions of Dall, Nelson, and others, in a large majority of cases are not found to be accompanied by corresponding physical differences, so that in a somatological classification they become submerged.

FOOTNOTES:

[142] Skeletal Measurements and Observations of the Point Barrow Eskimo, Amer. Anthrop., n. s. XVIII, pp. 203-244, Lancaster, 1916.

[143] In 1928 Mr. Collins brought another important accession to these collections.

SKULL SIZE

The external size of the skull is best expressed by the cranial module or mean of the three principal diameters; the internal size, respectively the volume of the brain, by the "cranial capacity."

The module among the southwestern and midwestern Eskimo averages 15.44 centimeters in the males and 14.77 centimeters in the females. For people of submedium stature these are good dimensions. Fifty-two male and 40 female skulls of the much taller Sioux (writer's unpublished data) give the modules of only 15.25 and 14.27 centimeters; while 6 male and 9 female Munsee Indians, also tall,[144] give practically the same values as these Eskimos, namely 15.48 centimeters for the males and 14.75 centimeters for the females.

Not all the western groups, however, give equally favorable proportions. In general, the coast people below Norton Sound, and especially below the Yukon, give, so far as the males are concerned, the lowest values. It is interesting to note that it is precisely these people who among the western Eskimo are reputed to be about the lowest also in culture. The Togiak and near-by Kulukak males showed, as seen before, also about the smallest head in the living. The St. Lawrence Island males stand just about the middle, but the females of this island, as, interestingly, also in the living, show markedly less favorably. The Nunivak skulls, as with the living, are somewhat above the average, while in the small Pilot Station (Yukon) group, just as in the near-by contingent of Marshall among the living, the males have the largest heads in this western territory. The lower Yukon Eskimo were also shown, it may be recalled, to be of a higher stature than the majority of the coast people. It is a group that deserves further attention.

The module of the female skull does not evidently stand always in harmony with that of the male. The most striking example of this is shown, as already

mentioned, by the St. Lawrence Island females, both skulls and the living. The females of this isolated island are also unduly short, but their small head is not entirely due to the defective stature. There must exist on this island, it would seem, some conditions that are disadvantageous to the female. In the small groups, such as that from the Little Diomede, the disharmonies are doubtless partly due to small numbers of specimens, but there may also be other factors, such as the bringing in of women from other places.[145]

Taking the mean of all the groups equalizes conditions, and it is seen that the module in both sexes is almost identical with that of the more northern groups, to Point Barrow. But the north Arctic and northeastern groups give a cranial module that in both sexes is somewhat higher, though their stature, according to the available data (Deniker, Boas, Duckworth, Steensby, Thalbitzer), is not superior.

A very remarkable showing is that of the percentage relation of the female to male skull size in the three large groupings. In the first two it is identical, in the third it differs less than could confidently be expected among the closest relatives. Another remarkable fact is that this important relation is found to be much like that in the Eskimo in various groups of Indians; thus it was *96* in the Indians of Arkansas and Louisiana,[3] *95.5* in the Munsee of New Jersey,[146] and *96.4* in the Indian skulls of California.[147] But it is only *93.6* in the Sioux (52 male, 40 female skulls) and differs more or less also in other tribes and peoples. A comprehensive study of this relation, with due respect to age, will some day well repay the effort.

Eskimo: Cranial Module
(L + B + H)
3

MALES IN ASCENDING ORDER
Southwestern and midwestern

	Males	**Females**
	(5)	(7)
Togiak		
	15.21	14.73
	(4)	(6)
Mumtrak		
	15.22	14.68
	(3)	(2)
Southwestern Alaska		
	15.25	14.90
	(9)	(4)
Hooper Bay		
	15.30	14.68
	(8)	(6)
St. Michael Island		

15.30
14.72
(5)
(7)

Little Diomede Island

15.33
15.09
(14)
(20)

Pastolik and Yukon Delta

15.34
14.83
(145)
(128)

St. Lawrence Island

15.42
14.27
(4)
(2)

Golovnin Bay to Cape Nome

15.52
14.65
(46)
(70)

Nunivak Island

15.53
14.90
(13)
(16)

Indian Point (Siberia)

15.54

	14.88
	(3)
	(2)
Chukchee	
	15.56
	15.05
	(4)
	(1)
Port Clarence	
	15.57
	(14.57)
	(9)
	(16)
Nelson Island	
	15.59
	14.64
	(3)
	(3)
Pilot Station, Yukon	
	15.91
	15
	(275)
	(290)
General averages, approximately	
	15.44
	14.77
Females vs. males (M = 100)	
	95.7
	Northwestern
	(2)
	(1)

Kotzebue Sound

15.05
(14.67)
(12)
(8)

Shishmaref

15.19
14.71
(132)
(84)

Point Hope

15.37
14.72
(47)
(52)

Point Barrow

15.45
14.75
(35)
(34)

Barrow and vicinity

15.46
14.66
(27)
(24)

Old Igloos near Barrow

15.52
14.72
(19)
(14)

Wales

15.66
14.86
(274)
(217)

General averages, approximately

15.39
14.73

Females vs. males (M = 100)

95.7

Northern and northeastern

(49)
(52)

Greenland

15.51
14.72
(5)
(2)

Hudson Bay and vicinity

15.55
14.57
(16)
(17)

Baffin Land and vicinity

15.55
15.04
(6)
(10)

Northern Arctic

15.63
14.85
(9)

	(6)
Southampton Island	
	15.65
	15.18
	(7)
	(2)
Smith Sound	
	15.81
	15.15
	(92)
	(89)
General averages, approximately	
	15.62
	14.92
Females vs. males (M = 100)	
	95.5

FOOTNOTES:

[144] Bull. 62, Bur. Amer. Ethn., p. 22, Nos. 326-313.

[145] More or less danger in such cases as these lies in erroneous sexing of the skulls. Due to experience, care, and especially to the relatively numerous accompanying bones or skeletons, this danger in the present series has been reduced to the minimum.

[146] Bull. 62, Bur. Amer. Ethn., p. 23.

[147] Cat. Crania, U. S. Nat. Mus., No. 2.

MODULE AND CAPACITY

A comparison of considerable interest is also that of the cranial module or mean diameter, to the capacity of the same skulls. This comparison reveals an important sex factor.[148] Relatively to the module, the capacity is very appreciably smaller in the female than it is in the male. This is a universal condition to which, so far as known, there are occasional individual but no group exceptions. It appears very clearly in the Eskimo. In 283 western male Eskimo skulls in which we have so far measured the capacity,[149] the module averages 15.38 centimeters, the capacity 1,490 cubic centimeters; while in 382 female skulls thus far gauged the former averages 14.82 centimeters, the latter 1,337 cubic centimeters. The percentage relation of the capacity to the module, the numbers taken as a whole, is *96.8* in the males but only *90.2* in the females. This means that relatively to the external size of the skull the female Eskimo brain is 6.66 per cent smaller. Similar sex disproportion exists in other American groups as well as elsewhere. Some day when suitable data accumulate it will be of much interest to study this condition on a wider scale.

FOOTNOTES:

[148] See writer's "Relation of the Size of the Head and Skull to Capacity in the Two Sexes," Am. J. Phys. Anthrop., 1925, VIII, No. 3.

[149] All measured de novo by my aide, T. D. Stewart; for procedure see my "Anthropometry."

ADDITIONAL REMARKS ON CRANIAL MODULE

Before we leave this subject, it may be well to point

out two noteworthy facts apparent from the data on the northwestern and northeastern groups. The first is that the figures on both sexes from Barrow and Point Barrow are very nearly the same, suggesting strongly the identity of the people of the two settlements; and the Point Hope group is in close relation. The second fact is the curious identity of the old Igloo group, 8 miles southwest of Barrow, with the Greenlanders. The import of this will be seen later.

SKULL SHAPE

Utilizing the materials of the Otis and Barnard Davis Catalogues and with measurements taken for him on additional specimens in several of our museums, Boas, in 1895 (Verh. Berl. anthrop. Ges., 398), as already mentioned, reported the cranial index of 37 "western Eskimo" skulls of both sexes (without giving localities or details) as *77*. He also reports in the same place (p. 391) the cephalic index of 61 probably male living "Alaska Eskimo," again without locality, as *79.2*. These rather high indices and the relatively elevated stature (61 subjects, 165.8 centimeters) lead him to believe (p. 376) that both are probably due to an admixture with the Alaskan Indian, though the report contains no measurements of the latter.

The data that it is now possible to present may perhaps throw a new light on the matter. As was already seen in part from the data on the living, the head resp. the skull tends to relative shortness and broadness throughout the southwestern, midwestern, and Bering Sea region (excepting parts of the Seward Peninsula). Important groups in this region, particularly those on some of the islands, had little or

no contact with the Indian. The cranial index in most of the groups of the southwestern and midwestern Eskimo equals or even exceeds that of the Indian. And Eskimo groups with a relatively elevated cranial index are met with even in the far north, as at Point Hope, Hudson Bay, and Smith Sound.[150] Finally, the shorter and broader head connects with that of the Asiatic Eskimo and that of the Chukchee, as well as other northeastern Asiatics.[151]

The records now available show the highest cranial indices to occur on the coast between Bristol Bay and the Yukon and on lower Yukon itself, while the lowest indices of the midwest area, though still mesocranic, occur in the aggregate of Nunivak Island and the mouths of the Yukon. Another geographical as well as somatological aggregate is that of the people of the St. Lawrence and Diomede Islands and of Indian Point, Siberia, the cranial index in these three localities being identical.

Eskimo: Cranial Index
Mean of both sexes
(Male + Female index)
2
on 1,281 adult skulls.
IN DESCENDING ORDER
Southwestern and midwestern

	(11)	
Togiak		
		80.1
	(13)	
Hooper Bay		
		79.7
	(10)	

Mumtrak
79.6
(6)
Pilot Station, Lower Yukon
79.3
(5)
Chukchee (Siberia)
78.6
(26)
Nelson Island
78
(6)
Southwestern Alaska
77.7
(32)
Indian Point (Siberia)
77.4
(12)
Little Diomede Island
77.4
(299)
St. Lawrence Island
77.2
(5)
Port Clarence
76.6
(34)
Pastolik and Yukon Delta
76.1
(14)

St. Michael Island	
	75.7
(116)	
Nunivak Island	
	75.6
Northwestern	
(222)	
Point Hope	
	76.0
(3)	
Kotzebue Sound and Kobuk River	
	75.4
(22)	
Shishmaref	
	74.5
(101)	
Point Barrow	
	74.1
(73)	
Barrow	
	73.5
(33)	
Wales	
	73.5
(7)	
Golovnin Bay	
[152]	72.6
(52)	
Igloos, southwest of Barrow	
	69.7

Northern and northeastern

(7)	
Hudson Bay and vicinity	
	76.3
(9)	
Smith Sound	
	76.2
(15)	
Southampton Island	
	74.8
(15)	
Northern Arctic	
	73.6
(33)	
Baffin Land and vicinity	
	73.2
(101)	
Greenland	
	71.9

The Seward Peninsula shows sudden differences. There are a few localities along its southern coast where the cranial type belongs apparently to the Bering Sea and southern area. One site at Port Clarence was one of these. But already at Golovnin Bay, which is not far from Norton Sound and St. Michael Island, and according to the evidence of the most recent collections (Collins 1928), also at Sledge Island, there is a sudden appearance of marked dolichocrany, which is repeated at Wales, on the western extremity of the peninsula, approached at Shishmaref, the main Eskimo settlement on its northern shore, and, judging from some fragmentary

material seen at the eastern end of the Salt Lake, also in the interior. The cause of this distinctive feature in the Seward Peninsula is for the present elusive. The little known territory urgently needs a thorough exploration.

The distribution of the cranial index farther north along the western coast shows several points of interest. The first is the exceptional position of Point Hope, one of the oldest and most populous settlements in these regions, which by its cranial index seems to connect with the Bering Sea groups. The second is the closeness, once more, of Barrow and Point Barrow. The third and greatest is the presence, in a small cluster of old igloos 8 miles down the coast from Barrow, of a group of people that finds no counterpart in its cranial index and, as will be seen later, also in some other characteristics, in the entire western region; in fact, in the whole Eskimo territory outside of Greenland. As noted before, the size of the head in this group is also closest to that of Greenland. These peculiar facts indicate a problem that will call for separate consideration.

The northern and northeastern groups, with the exception of the mesocranic Hudson Bay and Smith Sound contingents, and the very dolichocranic Greenlanders, show dolichocrany much the same as that of Barrow and Point Barrow.

FOOTNOTES:

[150] Compare writer's "An Eskimo Brain," Amer. Anthrop. n. s., vol. III, pp. 454-500, New York, 1901; and his "Contribution to the Anthropology of Central and Smith Sound

Eskimo," Anthrop. Papers, Amer. Mus. Nat. Hist., V, pt. 2, New York, 1910.

[151] Compare, besides present data, measurements by Bogoras in his report on "The Chukchee," Mem. Am. Mus. Nat. Hist., 1904-9, XI, 33; 148 male and 49 female adults gave him the mean stature of 162.2 and -152, the mean cephalic index of *82* and *81.8*.

[152] Including 4 female skulls collected by Collins in 1928 and received too late for general inclusion into these series.

HEIGHT OF THE SKULL

This is a measurement of much value, both alone and as a supplement to the cranial index, for skulls with the same index may be high or low and thus really of a radically distinct type.

The height of the vault is best studied in its relation to the other cranial dimensions, particularly to the mean of the length and breadth, with both of which it correlates. But in the Eskimo it is also of interest to compare the height with the breadth of the skull alone. The former relation is known as the mean height index and the latter as the height-breadth index. Both mean the percentage value of the basion-bregma height as compared to the other dimensions.

The mean height index

$$\frac{H}{\text{(Mean of } L + B)}$$

advocated independently by the writer since 1916 (Bull. 62, Bur. Amer. Ethn., p. 116), is proving of much value in differentiation of types and has already become a permanent feature in all writers' work on the skull. There is a corresponding index

also on the living.

In the American Indian the averages of the index range from approximately 76 to 90. (See Catalogue of Crania, U. S. Nat. Mus., Nos. I and II.) Where the series of specimens are sufficiently large the index does not differ materially in the two sexes. Indices below 80 may be regarded as low, those between 80 and 84 as medium, and those above 84 as high.[153]

The southwestern and midwestern Eskimo skulls show mean height indices that may be characterized as moderate to slightly above medium. In general the broader and shorter skulls show lower indices, approaching thus in all the characters of the vault the Mongolian skulls of Asia. (Compare Catalogue Crania, U. S. Nat. Mus., No. I.) The Indian Point, St. Lawrence Island, and Little Diomede Island skulls are again, as with the cranial index, very close together, strengthening the evidence that the three constitute the same group of people. (Pls. 59, 60.)

The northwestern Eskimo and most of those of the northeast have relatively high vault. Barrow and Point Barrow are once more almost the same. The Point Hope group shows a high vault, though also rather broad. The somewhat broad Hudson Bay crania are but moderately high, like those of the southwestern Eskimo. The northern Arctic skulls give smaller height than would be expected with their type; the Southampton Island specimens give higher. The old Igloo group from near Barrow stands again close to Greenland; its skull is even a trace narrower and higher, standing in both respects at the limits of the Eskimo. The whole, as with the cranial index, shows evidently a rich field of evolutionary conditions.

Eskimo: Cranial Mean Height Index
(H-Floor-Line of Aud. Meatus to Bg × 100)
Mean of L + B

MEAN OF BOTH SEXES IN ASCENDING ORDER
Southwestern and midwestern

	(11)	
Togiak		
		81.8
	(25)	
Nelson Island		
		82.1
	(6)	
Southwest Alaska		
		82.3
	(6)	
Pilot Station, Yukon		
		82.3
	(10)	
Mumtrak		
		82.5
	(13)	
Hooper Bay		
		82.7
	(116)	
Nunivak Island		
		83.3
	(5)	
Chukchee		
		83.3
	(34)	

Pastolik and Yukon Delta

83.4

(4)

Port Clarence

83.4

(29)

Indian Point (Siberia)

83.8

(279)

St. Lawrence Island

84.1

(12)

Little Diomede Island

84.5

(14)

St. Michael Island

85.1

Northwestern

(69)

Barrow

83.8

(99)

Point Barrow

84.1

(2)

Kotzebue Sound and Kobuk River

84.4

(20)

Shishmaref

84.5

(33)
Wales
85.0
(216)
Point Hope
85.7
(4)
Golovnin Bay—Cape Nome
85.9
(51)
Igloos, southwest of Barrow
86.3

Northern and northeastern

(7)
Hudson Bay and vicinity
82.2
(15)
Northern Arctic
82.7
(33)
Baffin Land and vicinity
84.4
(9)
Smith Sound
85.1
(101)
Greenland
85.1
(15)
Southampton Island

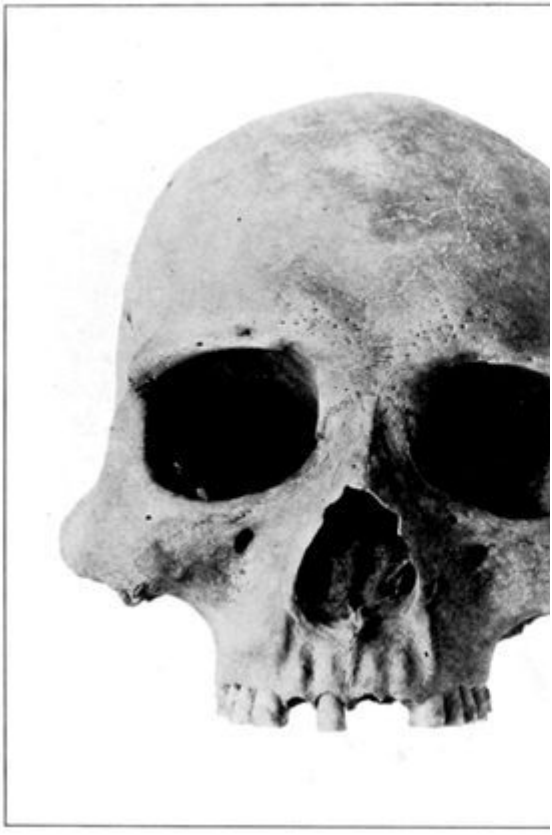
85.5

The height-breadth index

$$\frac{(H \times 100)}{(B)}$$

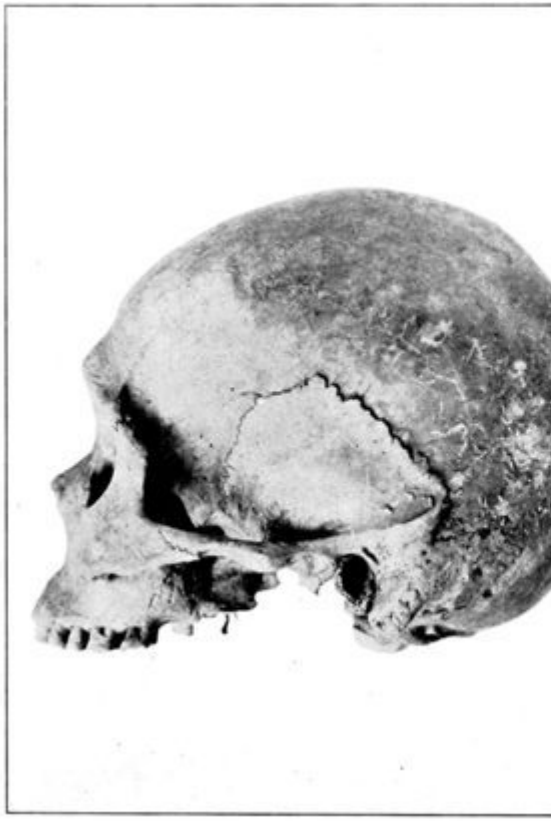
of the Eskimo skull shows in substance the same conditions as did the mean height index, but while less informative or dependable on one side, on the other it accentuates the relative narrowness of the skull in some of the groups.

BUREAU OF AMERICAN ETHN



Skulls From Old Burials, Poi

BUREAU OF AMERICAN ETHN



Skulls From Old Burials, Poi

Eskimo: Height-Breadth Index of the Skull
MEAN OF BOTH SEXES IN ASCENDING ORDER
Southwestern and midwestern

(12)

Togiak

91.9

(6)

Pilot Station, Lower Yukon
92.8
(10)
Mumtrak
93.1
(5)
Chukchee
93.1
(13)
Hooper Bay
93.2
(25)
Nelson Island
93.7
(5)
Yukon Delta
94.7
(5)
Southwest Alaska
95.2
(12)
Little Diomede Island
96.3
(279)
St. Lawrence Island
96.5
(116)
Nunivak Island
96.7
(31)

Indian Point (Siberia)

96.7

(29)

Pastolik

96.8

(6)

Cape Nome and Port Clarence

97.0

(14)

St. Michael Island

98.2

Northwestern

(99)

Point Barrow

98.7

(69)

Barrow

98.8

(20)

Shishmaref

98.9

(216)

Point Hope

99.2

(3)

Kotzebue Sound and Kobuk River

99.6

(33)

Wales

100.3

(51)
Igloos, southwest of Barrow
105.0

Northern and eastern

(7)
Hudson Bay and vicinity
95.3

(16)
North Arctic
97.8

(9)
Smith Sound
98.3

(15)
Southampton Island
99.8

(33)
Baffin Land and vicinity
99.9

(101)
Greenland
101.8

FOOTNOTES:

[153] These subdivisions are somewhat arbitrary and may, as data accumulate and are better understood, be found to need some modification.

THE FACE

The facial dimensions of the Eskimo skull offer a number of points of unusual interest. The face is absolutely and especially relatively to stature very large in all measurements. It is particularly high between the upper alveolar point and nasion.

The large size of the Eskimo face will best be appreciated from a few figures.

Facial Dimensions of the Western and Other Eskimo Crania Compared With Those of the Siouan and Algonquian Tribes

Southwestern and midwestern Eskimo	
Eskimo in general	
Siouan tribes	
Algonquian tribes	
Mean of 14 groups (male)	
10 groups (female)	
27 groups (male)	
22 groups (female)	
12 groups (male)	
15 groups (female)	
Total height (ment.-nas.)	
	12.60
	(11.63)
	12.52
	(11.59)
	12.26
	12.11
Upper height (alv. pt.-nas.)	
	7.87
	(7.29)

7.79
(7.21)
7.52
7.35

Diameter bizyg. max.

14.25
(13.27)
14.26
(13.22)
14.16
13.89

Module of upper face

$$\frac{(\text{U. H.} + \text{B})}{2}$$

11.06
(10.28)
11.03
(10.22)
10.84
10.62

So far as known there are no larger faces among the Indians than those of the Sioux, yet they remain very perceptibly, in all three measurements, behind the Eskimo. No face as large as that of the Eskimo is known, in fact, from anywhere else in the world. In whites the mean diameter of the largest faces (see data in Martin's Lehrbuch Anthrop., 789-791) does not exceed 10.36 centimeters. The above showing assumes especial weight when it is recalled that both the Siouan and the Algonquian tribes are among the tallest there are on the American Continent. The cause of the large size of the Eskimo face can only be the excessive use of the jaws; no other reason even

suggests itself. But the character may already be more or less hereditary. It furnishes another attractive subject for further investigation.

With its large dimensions the face of the Eskimo skull presents generally also large orbits, large molars, submedium prominence and breadth of the nasal bridge, shallow suborbital (canine) fossae, large dental arch above medium teeth, and a large and stout lower jaw with broad not seldom more or less everted angles, giving the whole a characteristic appearance. With partial exception of the orbits and the nose, which are subject also to other factors, all these features of the Eskimo face are explainable as strengthenings resulting from the increased function of mastication.

The main dimensions of the cranial face in the three large groupings of the Eskimo are given in the next table.

Western and Other Eskimo: Facial Dimensions in the Skull

Males
Females
Mentonnasion
Alveolar point-nasion
Diameter bizygomatic maximum
Cranial facial index
Mentonnasion
Alveolar point-nasion
Diameter bizygomatic maximum
Cranial facial index
Total

Upper
Total
Upper
Groups
(9)
(14)
(14)
(8)
(14)
(8)
(10)
(10)
(8)
(10)
Southwestern and midwestern
12.60
7.87
14.25
88.2
55.3
11.63
7.29
13.27
87.7
54.9
Groups
(5)
(7)
(7)
(5)
(7)

	(2)	
	(7)	
	(7)	
	(2)	
	(7)	
Northwestern		
		12.58
		7.73
		14.23
		88.3
		54.4
		11.55
		7.19
		13.18
		88.2
		54.6
Groups		
	(5)	
	(6)	
	(6)	
	(5)	
	(5)	
	(3)	
	(5)	
	(5)	
	(3)	
	(5)	
North Arctic and northeastern		
		12.22
		7.69
		14.32
		85.9

	53.7
	11.61
	7.13
	13.15
	85.7
	54.2

These data show a number of interesting conditions. The height of the upper face (alveolar point-nasion) is greatest in the southwestern and midwestern groups, is slightly lower in the northwesterners, and still further slightly lower in the north Arctic and the northeast. On the other hand the facial breadth is slightly higher in the north and east, and that although the vault has become mostly decidedly narrower.

These facts are shown best by the upper facial index, which in the males descends quite perceptibly in the west from the south to the north and in the Arctic from the west to the east. In the females there is a parallel gradual diminution in the upper facial height from the south to the north and then east, but the facial breadth diminishes very slightly also instead of increasing, as a result of which the upper facial index shows only minor differences; yet these differences are in the same direction as those in the males.

These matters are involved with a number of factors —the stature, the breadth of the vault, and the development and direct influence of the temporal muscles, besides hereditary conditions. Their proper study will necessitate even more—in fact, much more—material than is now at our disposal.

The following table gives the distribution of the upper cranial facial index in the various groups. Of

the two indices that of the whole face, including the lower jaw, is the less valuable; first, because the jaw is often absent; second, because it is influenced by the height of the lower jaw, which does not correlate perfectly with the upper; and third, on account of the wear of the teeth, which in such people as the Eskimo is very common and diminishes more or less the total height of the face. Its averages in the three main groupings have already been given. Its figures are not very exceptional.

Eskimo Skulls: Facial Index, Upper
MEAN OF BOTH SEXES IN ASCENDING ORDER
Southwestern and Midwestern

(6)	
Pilot Station, Lower Yukon	53.6
(5)	
Cape Nome and Port Clarence	54.0
(10)	
Hooper Bay	54.4
(9)	
Mumtrak	54.5
(93)	
Nunivak Island	54.6
(262)	
St. Lawrence Island	54.9

(8)

Togiak and vicinity

55.0

(24)

Indian Point (Siberia)

55.1

(23)

Nelson Island

55.2

(4)

Southwestern Alaska

55.4

(10)

St. Michael Island

55.5

(25)

Pastolik

55.7

(4)

Chukchee

55.8

(11)

Little Diomede Island

56.0

Northwestern

(190)

Point Hope

52.8

(2)

Kotzebue

53.7

(17)

Shishmaref

54.1

(42)

Igloos north of Barrow

54.1

(41)

Barrow

54.8

(75)

Point Barrow

55.2

(31)

Wales

55.4

Northern and northeastern

(9)

Smith South

51.7

(14)

Southampton Island

52.3

(23)

Baffin Land and vicinity

53.8

(90)

Greenland

54.1

(7)

Hudson Bay and vicinity

54.3

(11)

Northern Arctic

56.6

The upper facial index of the Eskimo skull is high, though there is considerable group variation. The reason is the height of the upper face, for which the accompanying considerable expansion of the zygomatic arches does not fully compensate. In the white groups this index ranges from approximately *50* to *54*; it averages *52.9* in 15 Algonquian and *53.1* in 12 Siouan tribes. The means in the large Eskimo groupings are from a little below *54* to a little over *55*. Its regional differences have already been mentioned. Sex differences in the index are very small. There are a number of points of significant agreement, the foremost of which is once more that in the case of Barrow and Point Barrow, and especially that of the Old Igloos near Barrow and Greenland.

THE NOSE

Equally as engaging as the whole face of the Eskimo skull is the cranial nose. Our data throw much light on this feature also.

Where the dimensions of the whole face are altered by some cause the nose can not remain unaffected. This is especially true of its height, which correlates directly and closely with that of the face proper; the correlation of the breadth of the nose with that of the face is weaker and more irregular, but not absent where not counteracted by other factors. Accordingly

with the high Eskimo upper face there is found also a high nose, both being the highest known to anthropometry. But the nasal breadth, instead of responding to the considerable facial breadth, has become smaller, until in some of the Eskimo groups it is the smallest of all known human groups. There is plainly another potent factor in action here. This factor could conceivably be connected simply with the above-average growth of the facial bones; but if this were so then individuals with smaller development of these bones ought to have broader noses, and vice versa. This point can readily be tested. Taking the largest and best cranial series, that of St. Lawrence Island, and selecting the skulls with the smallest and the largest faces, the facts come out as follows:

	Smallest development of face	**Largest development of face**
	Face height (upper)	
	Face breadth	
	Breadth of nasal aperture	
	Face height	
	Face breadth	
	Breadth of nasal aperture	
10 males		
		7.52
		13.64
		2.37
		8.46
		14.79
		2.49
10 females		

	6.81
	12.56
	2.37
	7.54
	14.02
	2.40

Percentage relation of breadth of nose to mean diameter of face:

Male	
	22.4
	21.4
Female	
	24.5
	22.2

The above data show that while the narrow nose in the Eskimo is to some extent affected by the large development in these people of the facial bones, yet there must be also other factors.

But if not wholly connected with the development of the facial bones, then some of the causes of the narrow nose in the Eskimo must either be inherited from far back or must be due to influences outside the face itself.

Pushing the character far back would be no explanation of its original cause, but it may be shown that such a procedure would not be justified. In the following important table are given the now available data on the breadth of the nasal aperture of the Eskimo, group by group and area by area, and these data show that narrow nose is by no means universal in this family. The nasal aperture is

broader in the southwest and midwest than in the northwest, and broader in the latter region than in the Arctic north, and the northeast. In general it is seen that the farther northward and northeastward the narrower the nose, until it reaches beyond that of all other human groups; while in the west and southwest it gradually approaches until it reaches the nasal breadth of the Indian. And that this latter condition is not due to Indian admixture is shown by the fact that among the broadest noses are those of the Eskimo in Siberia and those on the St. Lawrence Island, where there was no known contact with the Indian, while the narrower noses are along the midwestern coast, where Indian admixture might have been possible.

Eskimo: Breadth of the Nasal Aperture
BOTH SEXES TAKEN TOGETHER IN DESCENDING ORDER
Southwestern and midwestern

(5)	Southwestern Alaska	2.50
(31)	Indian Point (Siberia)	2.48
(5)	Chukchee	2.47
(6)	Pilot Station, Lower Yukon	2.45
(280)	St. Lawrence Island	

2.42

(29)

Pastolik

2.41

(13)

Hooper Bay

2.39

(10)

Mumtrak

2.38

(6)

Cape Nome and Port Clarence

2.38

(23)

Nelson Island

2.37

(9)

Togiak and vicinity

2.36

(4)

Yukon Delta

2.34

(107)

Nunivak Island

2.33

(11)

Little Diomede Island

2.32

(13)

St. Michael Island

2.21

Northwestern

(3)

Kotzebue

2.41

(34)

Wales

2.37

(20)

Shishmaref

2.36

(56)

Barrow

2.35

(211)

Point Hope

2.33

(92)

Point Barrow

2.30

(48)

Igloos, north of Barrow

2.30

Northern and northeastern

(9)

Smith Sound

2.29

(15)

Northern Arctic

2.26

	(14)
Southampton Island	
	2.25
	(29)
Baffin Land and vicinity	
	2.25
	(98)
Greenland	
	2.23
	(7)
Hudson Bay and vicinity	
	2.19

It is hardly possible, therefore, to assume that a narrow nose is an *ancient* inheritance of the Eskimo. From the facts now at hand it seems much more probable that the Eskimo nose or respiratory nasal aperture was not originally very narrow, but that it gradually acquired this character as the people extended farther north and northeastward; and there appears to be but one potent factor that could influence this development and that increases from south to north, namely, cold. A narrowing of the aperture can readily be understood as a protective development for the throat and the organs of respiration.

It is not easy to see how the bony structures respond to the effects of cold or heat, but that they do, particularly where these are aggravated by moisture, has long been appreciated, and shown fairly conclusively through studies on the nasal index by Thomson and later by Thomson and Buxton.[154] An even more satisfactory study would have been that of

the nasal breadth alone. Perhaps the normal variation with the elimination of the less fit are the main agencies.

The next two tables show other interesting conditions. The first of these, seen best from the more general data, are the relations of the nasal dimensions and index in the two sexes. The females in all the three large groupings have a higher nasal index than the males. This is a general condition among the Indians as well as in other races. It is usually due to a relative shortness of the female nose. This condition is very plain in the Eskimo. The female nose is actually narrower than the male, due to correlation with shorter stature and lesser facial breadth, yet the index is higher. The reason can most simply be shown by comparing the general mean nasal breadth and height in the two sexes. The breadth in the female is approximately 96.2 per cent of that in the male; the height is only 92.7 per cent.

Nasal Dimensions in Western and Other Eskimo Crania

Area								
Males			Females					
Height	Breadth	Index	Height	Breadth	Index			
Groups								
(14)								

	(14)
	(14)
	(10)
	(10)
	(10)
Southwestern and Midwestern	
	5.46
	2.42
	44.3
	5.06
	2.32
	45.8
Groups	
	(7)
	(7)
	(7)
	(6)
	(6)
	(6)
Northwestern	
	5.42
	2.37
	43.7
	5.06
	2.30
	45.4
Groups	
	(6)
	(6)
	(6)
	(5)

(5)	
(5)	
Northern Arctic and northeastern	
	5.38
	2.28
	42.4
	4.95
	2.18
	44.0

Detailed group data on the nasal index show that this ranges from *47.7* on the Yukon to *41.8* in the northernmost contingent of the Eskimo at Smith Sound. The Kotzebue group that shows even a higher index than on the Yukon is too small to have much weight. Barrow and Point Barrow are once more nearly the same, as are the Old Igloos and Greenland; and there are some other interesting relations.

Eskimo Skulls: Nasal Index
BOTH SEXES TAKEN TOGETHER IN DESCENDING ORDER
Southwestern and midwestern

(6)	
Pilot Station, Lower Yukon	
	47.7
(5)	
Southwestern Alaska	
	47.5
(31)	
Indian Point (Siberia)	
	46.5
(13)	

Hooper Bay
46.2
(6)
Cape Nome and Port Clarence
46.0
(280)
St. Lawrence Island
45.8
(5)
Chukchee
45.6
(10)
Mumtrak
45.2
(107)
Nunivak Island
45.1
(9)
Togiak and vicinity
45.0
(29)
Pastolik
44.9
(23)
Nelson Island
44.6
(11)
Little Diomede Island
44.5
(13)

St. Michael Island

42.9

(4)

Yukon Delta

42.7

Northwestern

(3)

Kotzebue

49.0

(20)

Shishmaref

46.0

(34)

Wales

45.3

(211)

Point Hope

44.9

(56)

Barrow and vicinity

44.0

(48)

Igloos north of Barrow

44.0

(92)

Point Barrow

43.5

Northern and northeastern

(7)

Hudson Bay and vicinity

	44.6
(15)	
North Arctic	
	44.1
(29)	
Baffin Land and vicinity	
	43.8
(98)	
Greenland	
	43.6
(14)	
Southampton Island	
	43.0
(9)	
Smith Sound	
	41.8

FOOTNOTES:

[154] Thomson, Arthur, The correlation of isotherms with variations in the nasal index. Proc. Seventeenth Intern. Cong. Med., London, 1913, Sec. I, Anatomy and Embryology, pt. II, 89; Thomson, Arthur, and Buxton, L. H. D., Man's nasal index in relation to certain climatic conditions, Journ. Roy. Anthrop. Inst., LIII, 92-122, London, 1923. Additional references in these publications; also in the latter an extensive list of data on nasal index in many parts of the world.

THE ORBITS

In many American groups the orbits are notoriously variable, yet their mean dimensions and index are of value.

The Eskimo orbits have long been known for their ample proportions. Their mean height and breadth are larger than those of any other known people and the excess is especially apparent when proportioned to stature. Taking the family as a whole, the mean height of the two orbits in males averages approximately 3.64 centimeters, the mean breadth 4.03 centimeters; while the males of 23 Algonquian tribes give for the same items 3.42 and 3.93, and those of 12 Siouan tribes 3.58 and 3.96 centimeters.

The general averages for the female Eskimo approach for orbital height 3.52 centimeters, for breadth 3.89 centimeters, dimensions which also surpass those in the females of any other known human group.

These large dimensions of the Eskimo orbit are, however, on closer examination into the matter, found not to be racial characters except in a secondary way. They are the direct consequence of the high and broad face. The correlation of the orbital height and breadth with the height and breadth of the face are shown by the following figures. These figures indicate also some additional details of interest.

Eskimo Orbits: Right and Left

MALES

Height
Breadth
Index
Right

	Left
	Right
	Left
	Right
	Left
	(145)
	(145)
	(145)
St. Lawrence Island	
	3.67
	3.68
	4.05
	4.01
	90.7
	91.8
	(41)
	(41)
	(41)
Nunivak Island	
	3.59
	3.59
	4.05
	4.—
	88.7
	89.7
	(120)
	(120)
	(120)
Point Hope	
	3.63
	3.63

	4.05
	4.01
	89.6
	90.5
	(46)
	(46)
	(46)
Greenland	
	3.64
	3.65
	4.02
	3.96
	90.6
	92.1
	FEMALES
	(128)
	(128)
	(128)
St. Lawrence Island	
	3.62
	3.60
	3.92
	3.89
	91.7
	92.6
	(58)
	(58)
	(58)
Nunivak Island	
	3.50
	3.52

	3.88
	3.84
	90.2
	91.6
	(70)
	(70)
	(70)
Point Hope	
	3.54
	3.54
	3.91
	3.88
	90.5
	91.4
	(45)
	(45)
	(45)
Greenland	
	3.55
	3.56
	3.86
	3.83
	91.9
	92.9

The general orbital index of the Eskimo is close to *90* in the males, *90.5* in the females. Such orbits are classed as also *relatively* high or *megaseme*, a character in which they resemble many of the American Indians. Thus the male crania of the Siouan tribes give the practically identical general index of *90.5*.

The slightly higher index in the females is the rule to which there are but few exceptions, and those in individual groups where the numbers of specimens may not be sufficient. The same tendency is observable in the Indians, and appears in fact to be panhuman. It is due to slightly lesser relative height as compared to the breadth of the orbit in the males, which condition is due in all probability to the greater development in the males of the frontal sinuses and supraorbital arches.

Eskimo Crania: Dimensions of the Orbits in Relation to Those of the Face
ORBITAL HEIGHT VERSUS UPPER FACIAL HEIGHT

Males		
(10) **Lowest faces (7.2-7.4)**		
(10) **Average faces (7.8)**		
(10) **Highest faces (8.4-9)**		
Face	**Orbits**	
Face	**Orbits**	
Face	**Orbits**	
7.37	3.62	
7.80	3.65	
8.55	3.78	
Females		
(10) **Lowest faces (6.4-6.8)**		
(10) **Average faces (7.3)**		
(14) **Highest faces (7.8-8.4)**		

Face
Orbits
Face
Orbits
Face
Orbits
6.69
3.54
7.30
3.56
7.89
3.67
PERCENTAGE RELATIONS OF ORBITS TO FACE
49.1
46.8
44.2
53
48.7
46.6
ORBITAL BREADTH VERSUS FACIAL BREADTH
Males
(10) **Narrowest faces (13.4 and below)**
(17) **Average faces (14.2)**
(10) **Broadest faces (14.9 and above)**
Face
Orbits

Face
Orbits
Face
Orbits
13.30
3.96
14.20
4.01
15.11
4.17
Females
(10) **Narrowest faces (12.7 and below)**
(14) **Average faces (13.3)**
(10) **Broadest faces (13.9 and above)**
Face
Orbits
Face
Orbits
Face
Orbits
12.57
3.74
13.30
3.88
14.09
3.98
PERCENTAGE RELATIONS OF ORBITS TO FACE

29.8
28.4
28.2
29.8
29.2
27.6

Individual variation in the orbital index of the Eskimo is extensive, reaching from slightly below *80* to well over *100*. It extends more or less over the whole Eskimo area, without conveying definite indication anywhere of either a mixture or of a special evolutionary tendency. Yet it occasions group differences that eventually might prove evolutionary, though they may merely represent the next or higher order of variability, namely, that of groups within a family.

Orbital Dimensions and Index in Eskimo Skulls

Area
Males
Females
Mean height
Mean breadth
Mean index
Mean height
Mean breadth

	Mean index	
	(13)	
	(13)	
	(13)	
	(13)	
	(13)	
	(13)	
South and Midwestern		
		3.63
		4.01
		90.6
		3.56
		3.87
		92.1
	(6)	
	(6)	
	(6)	
	(6)	
	(6)	
	(6)	
Northwestern		
		3.62
		4.02
		90.1
		3.51
		3.92
		89.7
	(5)	
	(5)	
	(5)	

(5)	
(5)	
(5)	
Northern Arctic and northeastern	
	3.65
	4.07
	89.5
	3.54
	3.91
	90.6

The group differences in the orbital index of the Eskimo skull are shown in the next table. They elude a satisfactory explanation, unless recourse is had to the above suggested theory of normal group variability within a family. They have about the same range in the three large areas, which would seem to support this theory.

Group relations are indicated in the cases of Pastolik-Yukon Delta-St. Michael Island; Point Barrow-Barrow; and Old Igloos-Greenland.

Eskimo Skulls: Mean Index of the Orbits
BOTH SEXES TAKEN TOGETHER IN ASCENDING ORDER

Southwestern and midwestern

(10)	
Mumtrak	
	88.4
(11)	
Little Diomede Island	
	89.4
(6)	

Cape Nome and Port Clarence
89.7
(101)
Nunivak Island
90.1
(31)
Indian Point (Siberia)
90.3
(5)
Chukchee
90.6
(6)
Pilot Station, Lower Yukon
91.0
(5)
Southwest Alaska
91.4
(271)
St. Lawrence Island
91.7
(24)
Nelson Island
91.9
(13)
Hooper Bay
92.5
(29)
Pastolik
93.2
(7)

Togiak

93.3

(4)

Yukon Delta

93.8

(13)

St. Michael Island

94.4

Northwestern

(3)

Kotzebue

86.1

(20)

Shishmaref

88.9

(34)

Wales

89.4

(85)

Point Barrow

90.3

(200)

Point Hope

90.4

(53)

Barrow

91.1

(43)

Igloos north of Barrow

91.1

Northern and northeastern

(9)	
Smith Sound	87.6
(13)	
Southampton Island	88.4
(28)	
Baffin Land and vicinity	90.0
(16)	
Northern Arctic	91.0
(94)	
Greenland	91.6
(7)	
Hudson Bay and vicinity	92.3

THE UPPER ALVEOLAR ARCH

The dental arches correlate with function (use), with stature, with the dimensions of the face, and with those of the teeth. The western as well as other Eskimo show arches that are about equal in absolute dimensions to those of our taller Indians, such as the Munsee, Arkansas, and Louisiana;[155] but relatively to stature the Eskimo arch is decidedly larger.

The upper dental arch index

$$\frac{L \times 100}{}$$

$$\frac{B}{}$$

, now being used in preference to the unwieldy "uranic index"

$$\frac{B \times 100}{L}$$

of Turner, is rather high, showing that the arch is relatively, as well as absolutely, broad. The same index in the Munsee averaged in the males *82.8*, in the females *82.7*; in the Arkansas and Louisiana mound skulls *84.4* in the males and *85.1* in the females. Data are needed here for more extensive comparisons.

Eskimo Crania: Alveolar Arch

Males	
Females	
External length	
External breadth	
Module (mean diameter)	
Index $\frac{L \times 100}{B}$	
External length	
External breadth	
Module (mean diameter)	
Index $\frac{L \times 100}{B}$	

11 groups:

Southwestern and Midwestern

	5.56
	6.66
	6.11
	83.5
	5.34
	6.38
	5.86
	83.8
6 groups:	
Northwestern	
	5.63
	6.61
	6.12
	85.1
	5.38
	6.31
	5.85
	85.2
5 groups:	
Northern Arctic and northeastern	
	5.68
	6.75
	6.21
	84.2
	5.37
	6.28
	5.83
	85.6

Eskimo Skulls: Length-Breadth Index of the Upper Alveolar Arch
BOTH SEXES TAKEN TOGETHER IN ASCENDING ORDER
Southwestern and Midwestern

Pilot Station, Lower Yukon	(5)	79.4
Togiak and vicinity	(8)	80.5
Chukchee	(4)	81.1
Hooper Bay	(12)	81.7
Mumtrak	(9)	81.7
Little Diomede Island	(9)	82.2
St. Lawrence Island	(234)	83.0
St. Michael Island	(10)	84.3
Pastolik	(22)	

	84.4
(90)	
Nunivak Island	
	84.4
(4)	
Southwest Alaska	
	84.7
(5)	
Cape Nome and Port Clarence	
	84.9
(22)	
Indian Point (Siberia)	
	85.0
(22)	
Nelson Island	
	85.5
Northwestern	
(39)	
Igloos north of Barrow	
	84.1
(14)	
Shishmaref	
	84.4
(171)	
Point Hope	
	84.6
(31)	
Wales	
	84.9
(38)	

Barrow	
	85.8
(66)	
Point Barrow	
	87.1
Northern and northeastern	
(9)	
Smith Sound	
	82.7
(13)	
Southampton Island	
	83.7
(7)	
Hudson Bay and vicinity	
	84.4
(23)	
Baffin Land and vicinity	
	85.7
(89)	
Greenland	
	85.9
(10)	
Northern Arctic	
	86.5

Sex differences in the index are small, nevertheless the females tend to show a slightly higher index, due to relatively slightly smaller breadth of the arch.

The size of the arch and its index differ but little over the three main areas of the Eskimo territory, yet there are slight differences. They appear plainly in

the following table. Notwithstanding the fact that on the whole the southwestern and midwestern groups are somewhat taller than those of the far north and northeast, the largest palate, in the males at least, is found in the latter area.

In the southwest and midwest the upper alveolar arch is relatively (as well as absolutely, barring one group) somewhat broad and short. This may be in correlation with the broader head in this area, just as the absolutely slightly longer palates over the rest of the Eskimo territory and particularly (in males) in the northeast may correlate with the longer heads in those regions. This point may be tested on our splendid material from St. Lawrence Island. Taking the broadest and the narrowest skulls from this locality, the following data are obtained for the proportions of the upper dental arch:

Eskimo Crania: Dental Arch and Form of Skull
ST. LAWRENCE ISLAND MATERIAL

	Males	**Females**
	Narrowest skulls (C. I. 70.7-73.5)	**Broadest skulls (80.6-83.1)**
	Narrowest skulls (70.3-74.2)	**Broadest skulls (80.9-83.8)**
Length		
	5.68	
	5.58	
	5.52	

5.20
Breadth
6.83
6.77
6.66
6.36
Index
83.2
82.4
82.9
82.7
Mean diameter
6.26
6.18
6.09
5.78
Mean cranial diameter (cranial module) of same skulls
15.61
15.49
14.97
14.73
Percentage relation of mean dental arch diameter to the mean diameter of the skull
40.1
39.8
40.7
39.2
Length of same skulls
19.21
18.10
18.35

	17.25
Percentage relation of length of dental arch to that of skull	
	29.5
	30.8
	30.1
	30.1

The above figures show several conditions. The first is that the arch is quite distinctly larger in the narrow than in the broad skulls in both sexes. The second fact is that the skull (vault) itself is slightly larger in the narrow-headed. The third is that the length of the arch is somewhat greater in the narrow and long skulls than it is in the broad and shorter, relatively to the skull size. The fourth is that there appears a close correlation, more particularly in the females, between the length of the arch and that of the skull.

FOOTNOTES:

[155] See Bull. 62, Bur. Am. Ethn., and writer's Report on an Additional Collection of Skeletal Remains from Arkansas and Louisiana, published with Clarence B. Moore's report on the Antiquities of the Ouachita Valley, Philadelphia, 1909.

THE BASION-NASION DIAMETER

The anterior basal length (basion-nasion) is a measurement of importance, though its full meaning in anthropology is not yet entirely clear. From data quoted by Martin (Lehrb., 715-716) it appears to average in whites up to 10.3 centimeters in males

and up to 10.1 centimeters in females, and is known to correlate closely with the length of the vault. Secondarily it also correlates with stature.

Data on American Indians are not yet generally available, though in preparation. The Munsee skulls gave the writer for the diameter the means of 10.27 for the males and 10.02 for the females; the mound skulls from Arkansas and Louisiana gave 10.45 for the males and 9.77 for the females.

An abstract of the data on the Eskimo skulls is given in the next table. The values for the measurement are rather high, especially for such short people. The percentage relation of the measurement to the length of the skull appears also to be high. Manouvrier (1882, quoted in Martin, Lehrb., 716) found this relation in French skulls to be *53.6* in the males and *54.7* in the females.

Eskimo Crania: Basion-Nasion Length

Groups of males	
Corresponding groups of females	
Basion-nasion diameter	
Its percentage relation to length of skull	
Basion-nasion diameter	
Its percentage relation to length of skull	
	(13)
	(13)
	(13)
	(13)
Southwestern and Midwestern	

		10.38
		56.4
		9.85
		55.7
	(6)	
	(6)	
	(6)	
	(6)	
Northwestern		
		10.58
		56.4
		10.06
		56.3
	(5)	
	(5)	
	(5)	
	(5)	
Northern Arctic and northeastern		
		10.65
		56.2
		10.06
		55.4

The female measurement to that of the male, in the Eskimo, is as *94.9* to 100. As a similar relation of the cranial modules in the two sexes is close to *95.7*, the anterior basal length would seem to be at a little disadvantage in the female Eskimo skull.

The same condition is seen also when the basion-nasion diameter is compared with the length of the skull. In the males, notwithstanding the fact that the length of the vault is increased through the development of the frontal sinuses and not

infrequently also through that of the occipital ridges, the percentage relation of the basion-nasion to the maximum total length of the vault is approximately *56.3*, in the females but *55.8*. It seems therefore safe to say that in the Eskimo, in general, that part of the brain anterior to the foramen magnum is relatively somewhat better developed in the males than in the females.

But to this there are some exceptions. Thus it may be seen in the general table which follows that in the northwestern groups conditions in this respect are equalized; and in the succeeding detailed table it will be noted that while the males exceed the females in this particular in 14 of the groups, in 5 groups conditions are equal (or within one decimal), and in 5 the female percentage exceeds slightly that in the males. In the numerically best represented groups conditions are nearly equal, with the males nevertheless slightly favored.

Eskimo Skulls: Basion-Nasion Length and Its Relation to Length of Skull
SEXES SEPARATELY IN ASCENDING ORDER

Males	
Females	
B-N. **BN × 100** **Skull l**	
B-N. **BN × 100** **Skull l**	
Southwestern and Midwestern	
	(4)
	(7)

Little Diomede Island	
	10.18
	56.2
	9.91
	54.9
	(3)
	(2)
Chukchee	
	10.20
	54.8
	10.00
	54.8
	(3)
	(3)
Pilot Station (Yukon)	
	10.27
	54.3
	9.97
	56
	(9)
	(4)
Hooper Bay	
	10.29
	57.6
	9.70
	55.7
	(4)
	(6)
Mumtrak	
	10.32
	57

	9.52
	55.1
	(146)
	(133)
St. Lawrence Island	
	10.36
	56.3
	9.93
	56.1
	(3)
Yukon Delta	
	10.37
	55.8
	(11)
	(18)
Pastolik	
	10.41
	56.5
	9.98
	56.3
	(8)
	(6)
St. Michael Island	
	10.44
	57.3
	9.98
	56.3
	(9)
	(15)
Nelson Island	

	10.46
	55.8
	9.73
	55.9
	(3)
	(7)
Togiak	
	10.47
	57.2
	9.56
	55.7
	(3)
	(2)
Southwestern Alaska	
	10.47
	57.6
	9.80
	54.8
	(15)
	(16)
Indian Point and Puotin	
	10.54
	56.5
	9.97
	56.5
	(46)
	(69)
Nunivak Island	
	10.55
	56.1
	10.02

	56
	Northwestern
	(2)
Kotzebue	
	10.45
	57.3
	(133)
	(82)
Point Hope	
	10.48
	57
	10.00
	56.9
	(12)
	(8)
Shishmaref	
	10.50
	56.8
	10.20
	57.5
	(47)
	(52)
Point Barrow	
	10.54
	56.2
	9.94
	55.5
	(35)
	(34)
Barrow	

	10.61 *55.9*
	10.01 *56.3*
	(19) (15)
Wales	
	10.64 *56.7*
	10.01 *55.5*
	(27) (24)
Igloos north of Barrow	
	10.70 *55.6*
	10.18 *56.2*
Northern and northeastern	
	(16) (17)
Baffin Land and vicinity	
	10.51 *55.6*
	10.11 *55.2*
	(5) (2)
Hudson Bay and vicinity	
	10.60 *56.4*

	9.75
	55.6
	(48)
	(52)
Greenland	
	10.60
	55.9
	10.13
	56.2
	(5)
	(10)
Northern Arctic	
	10.68
	56.1
	10.07
	55.3
	(7)
Smith Sound	
	10.70
	56.4
	(9)
	(5)
Southampton Island	
	10.83
	57.3
	10.34
	56.9

An interesting point is that in the north and northeast, where the skulls are longest, there is evidently a slightly greater relative development of

the occipital portion of the vault, or slightly lesser development of the frontal portion.

Some additional points of interest appear when the basion-nasion: skull-length index, taken collectively for the two sexes, is compared in the different groups. All these comparisons suffer, naturally, from unevenness and often insufficiency of the numbers of specimens, yet some of the results are very harmonious with those brought out repeatedly by other data. Thus the St. Lawrence material stands once more close to the medium of the southwestern and midwestern groups; Barrow and Point Barrow are almost identical; and so are the Old Igloos from near Barrow and Greenland. The St. Michael islanders show very favorably in the midwest, the Shishmarefs in the northwest and the Southampton islanders in the northeast.

Eskimo Skulls: Basion-Nasion Line in Relation to Skull Length

$$\frac{BN \times 100}{SL}$$

BOTH SEXES TOGETHER IN ASCENDING ORDER

Southwestern and midwestern

(5)		
Chukchee		54.8
(6)		
Pilot Station, Lower Yukon		55.2
(11)		
Little Diomede Island		55.6

(24)
Nelson Island
55.9
(115)
Nunivak Island
56.0
(10)
Mumtrak
56.1
(279)
St. Lawrence Island
56.2
(5)
Southwestern Alaska
56.2
(29)
Pastolik
56.4
(10)
Togiak
56.5
(31)
Indian Point and vicinity (Siberia)
56.5
(13)
Hooper Bay
56.6
(14)
St. Michael Island
56.8

Northwestern

(51)

Igloos southwest of Barrow

55.9

(99)

Point Barrow

55.9

(69)

Barrow

56.1

(34)

Wales

56.1

(215)

Point Hope

57.0

(20)

Shishmaref

57.1

Northern and northeastern

(33)

Baffin Land and vicinity

55.4

(10)

Northern Arctic

55.7

(7)

Hudson Bay and vicinity

56.0

(100)

Greenland

56.1

(7)

Smith Sound (male)

56.4

(14)

Southampton Island

57.1

The next table gives the percentage relations of the basion-nasion diameter to the mean diameter of the skull. The correlation of the two is even closer than in the case of the skull length, and the grouping, while in the main alike, seems in general even more in harmony with that in previous comparisons. The St. Lawrence Island females are very exceptional, as was also apparent in other connections. The unusual smallness of their skull (compare section on Cranial module) is evidently due to a poor development of its posterior half.

Eskimo Crania: Percentage Relation of the Basion-Nasion Diameter to Mean Cranial Diameter (Cranial Module)

$$\frac{BN \times 100}{CM}$$

BOTH SEXES TOGETHER IN ASCENDING ORDER

Southwestern and Midwestern

Pilot Station, Yukon

65.6

Chukchee

66.0

Little Diomede Island

	66.1
Hooper Bay	
	66.4
Nelson Island	
	66.7
Togiak	
	66.9
Southwest Alaska	
	67.3
Indian Point, Siberia	
	67.4
Mumtrak	
	67.4
Nunivak Island	
	67.6
Pastolik	
	67.6
St. Michael Island	
	68.0
St. Lawrence Island:	
Male	
	67.2
Female	
	(69.6)
Northwestern	
Wales	
	67.7
Point Barrow	
	67.8
Point Hope	
	68.1
Barrow	

	68.4
Old Igloos	
	69.0
Shishmaref	
	69.2
Northern Arctic and northeastern	
Baffin Land	
	67.4
Hudson Bay	
	67.6
Smith Sound (male)	
	67.6
North Arctic	
	68.1
Greenland	
	68.5
Southampton Island	
	68.7

PROGNATHISM

Since better understood, the subject of facial prognathism has lost much of its allure in anthropology; yet the matter is not wholly without interest.

Facial protrusion is as a rule secondary to and largely caused by alveolar protrusion, which in turn is caused by the size and shape of the dental arch; and the dental arch is generally proportional to the size of the teeth. The form of the arch is, however, quite influential. With the teeth identical in size a narrow arch will be more, a broad arch less protruding, and a narrow arch with small teeth may protrude more

than a broad one with larger teeth. Another influence is that of the height of the upper face, the same arch protruding more in a low face than in a high one. And still another factor is the incline of the front teeth, though this affects merely the appearance of prognathism and not its measurements.

There are different ways of measuring facial prognathism, and with sufficient care all may be effective; I prefer, for practical reasons, linear measurements from the basion, which, together with the facial and subnasal heights, give triangles that can readily be reconstructed on paper and allow a direct measurement of both the facial and the alveolar angle. The three needed diameters from basion are taken, the first to the "prealveolar point," or the *most anterior* point on the upper dental arch above the incisors; the second to the "subnasal point," or the point on the left (for convenience) of the nasal aperture, where the outer part of its border passes into that which belongs to the subnasal portion of the maxilla (the point where the subnasal slant begins); and the third to nasion. The facial height is that from the alveolar point (*lowest* point of the upper alveolar border in the median line) to nasion; while for the subnasal height, which can not be measured directly, I utilize the difference between the facial and nasal heights, which is very close to the needed dimension.

The important basion-nasion diameter has already been considered. That to the subnasal point needs no comment. That to the prealveolar point shows in the western and other Eskimo as follows:

Eskimo Crania: Basion-Prealveolar Point Diameter
All Eskimo

Males:
Mean diameter
centimeters
10.54
Mean relation to length of skull
per cent
56.3
Females:
Diameter
centimeters
9.99
Relation
per cent
55.8

MALES

A = Basion prealveolar point diameter
B = Its relation to length of skull

Southwestern and midwestern											
Northwestern											
Northern Arctics and northeastern											
A											
B											
A											
B											
A											
B											
10.38											
56.4											
10.58											
56.4											
10.65											

56.2
Mean skull lengths
18.41
18.75
18.96
FEMALES
9.85
55.7
10.06
56.3
10.06
55.4
Mean skull lengths
17.69
17.86
18.15

As in other details, so here there is a remarkable similarity between the skulls from the three large areas, pointing both to the unity of the people and to absence of heterogeneous admixtures. As the skull length increases so does the basi-alveolar line, but the relative proportions of the two remain very nearly the same.

The relative value of the basi-alveolar length in the males, compared to the length of the skull, is in general about 0.5 per cent higher than it is in the females. This is just about the excess of the relative proportion of the length of the male dental arch when compared to the same skull dimension. The general mean skull length in the Eskimo male approximates 18.705, in female 17.899 centimeters; the mean length of the arch is, in the male, close to 5.625, in the female 5.365 centimeters; and the

percentage relation of the latter to the former is *30.6* in the males, *30* in the females. The relatively slightly greater basi-alveolar length in the males is evidently, therefore, at least partly due to the relatively longer male dental arch, which in turn is doubtless due to the somewhat larger teeth in the males.[156]

Notwithstanding the just discussed slight sex difference in the Eskimo, the facial angle, i. e., the angle between the basi-alveolar line and the line nasion-alveolar point, is equal in the two sexes. This equalization is due largely, if not wholly, to the effect in the males of the relatively longer basio-nasion diameter (v. a.), while the alveolar angle, or that between the basi-alveolar and the subnasal lines, is in general by about 1 per cent lower in the females (males, 56°; females, 55°), indicating a slightly greater slant of the subnasal region in the female, which can only be due to a relatively slightly shorter in this sex of the basion-subnasal point diameter. As a matter of fact, the percentage relation of this diameter to the length of the skull amounts in the males to *56.3*, in the females to but *55.6*.

Compared to that in the Indians, the facial angle in the Eskimo skulls shows close affinities. Its value (69°) is very nearly the same as in the mound skulls from Arkansas and Louisiana (males 70.7°, females 69°). In other Indians it ranges from close to 68° to 71.5°. In the Munsee it reached 73.5°. In whites, according to Rivet's data,[157] it ranges from about 72° to 75°; in a group of negroes it was 68.5°. In American and other negro crania measured by me[158] it ranged from 67° to 70.5°, in Melanesians from 66° to 68°, in Australians from 67° to 69°.

The *alveolar angle* is more variable. It shows

considerable individual, sex, and group differences. It averages slightly to moderately higher, which means a more open angle or less slant in the males than in the females. In the Eskimo as a whole it was seen to be approximately 56° in the males, 55° in the females; in the Munsee Indians (Bull. 62, Bur. Amer. Ethn.) it was males 59°, females 57°; in the Arkansas and Louisiana skulls (J. Ac. Sci., Phila., 1909, XIV) it averaged males 55°, females 52°. In my catalogue material it shows a group variation of 46.5° to 55.5° in the negro, 47.5° to 52.5° in the Australians, 46.5° to 50.5° in the Melanesians. In the whites it generally exceeds 60°.

Differences in facial and alveolar protrusion among the Eskimo according to area are small, yet they are not wholly absent. The figures below show that in the southwesterners and midwesterners, where the skull is more rounded, the prognathism is smallest; and that toward the north and northeast, where the skull is narrower and the palate (dental arch) tends to become longer, prognathism increases. The "Old Igloo" group shows once more such affinity with the Greenlanders that it is placed with the third subdivision.

Eskimo Skulls: Facial and Alveolar Angle with Principal Areas

Males
Females
South- and midwest
Northwest
North and northeast
South- and midwest
Northwest

	North and northeast
Groups	
	(13)
	(5)
	(6)
	(13)
	(5)
	(6)
Facial angle	
	68
	69
	70
	67.5
	69
	70
Alveolar angle	
	55
	56
	55
	54
	55
	54.5

Individual group differences in the facial and alveolar angle are moderate, yet evidently not negligible. (See next table.) The most prognathic, especially in the subnasal region, are the skulls from Nelson Island. A marked alveolar slant is also present in the Pilot Station Yukon group, and in Greenland. The least prognathic are the St. Michael Islanders, the Point Hope people, and those from Southampton Island. St. Lawrence stands once more near the middle of the southwesterners and midwesterners,

and there are to be seen the principal old relations.

The main points shown by the above conditions are the group variability, particularly in the southwest and midwest; the tendency, on the whole, toward a slightly greater prognathy, both facial and alveolar, in this same area; and the evidence that the alveolar slant has some individuality.

Eskimo Skulls: Group Conditions in Facial and Alveolar Angle[159]

South and Midwest	
	Facial angle
	Alveolar angle
	(20)
Nelson Island	
	66.3
	51.5
	(4)
Southwest Alaska	
	66.8
	54.5
	(4)
Chukchee	
	66.8
	57.0
	(21)
Indian Point	
	67.0
	56.5
	(8)
Togiak	
	67.0

	54.0
	(242)
St. Lawrence Island	
	67.8
	55.3
	(86)
Nunivak Island	
	67.8
	56.5
	(23)
Pastolik	
	68.3
	54.8
	(10)
Hooper Bay	
	68.3
	55.3
	(10)
Little Diomede Island	
	68.5
	57.5
	(9)
Mumtrak	
	68.8
	55.3
	(5)
Pilot Station, Yukon	
	68.8
	52.0
	(10)

St. Michael Island

70.0

56.8

Northwest

(11)

Sledge Island

69.5

54.9

(31)

Wales

67.8

56.0

(17)

Shishmaref

68.3

55.8

(73)

Point Barrow

69.5

56.0

(43)

Barrow

69.8

56.8

(181)

Point Hope

70.5

56.5

North and northeast

(11)

North Arctic

	68.5
	54.5
	(24)
Baffin Land	
	70.0
	55.0
	(87)
Greenland	
	69.8
	53.8
	(35)
Old Igloos near Barrow	
	70.3
	55.8
	(7)
Hudson Bay	
	70.3
	56.8
	(12)
Southampton Island	
	71
	55

ESKIMO CRANIA
Southwestern and Western Alaska, Bering Sea Islands, and Asiatic Coast
MALES

Prince William Sound
Kodiak Island
Unalaska Peninsula
Nushagak Bay and Kanakanak

Togiak	
Mumtrak	
Nunivak Island	
Nelson Island Tanunok Village	
Hooper Bay	
Lower Yukon and delta	
Pilot Station, lower Yukon	
Kotlik and Pastolik	
St. Michael Island	
St. Lawrence Island	
Little Diomede Island	
Northeastern Asia	
Indian Point (E. Cape)	
Puotin (NW. of E. Cape)	
Chukchi (in or near Bering Strait)	

Vault:

(1)
(1)
(1)
(1)
(4)
(4)
(46)
(9)
(9)
(3)
(3)
(11)
(8)

	(153)	
	(5)	
	(14)	
	(2)	
	(3)	
Length		
		18.1
		18.6
		17.8
		17.4
		18.30
		18.10
		18.81
		18.73
		17.86
		18.57
		18.90
		18.44
		18.23
		18.40
		18.12
		18.59
		18.95
		18.63
	(1)	
	(1)	
	(1)	
	(1)	
	(4)	
	(4)	
	(46)	

	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(153)	
	(5)	
	(14)	
	(2)	
	(3)	
Breadth		
		13.8
		14.4
		14.1
		14.4
		14.20
		14.20
		14.09
		14.44
		14.43
		14.13
		15.07
		13.90
		13.84
		14.19
		14.28
		14.32
		14.45
		14.67
	(1)	

	(1)	
	(1)	
	(1)	
	(4)	
	(4)	
	(46)	
	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(145)	
	(5)	
	(13)	
	(2)	
	(3)	
Height		
		12.8
		14
		13.6
		13.4
		13.25
		13.35
		13.69
		13.60
		13.60
		13.67
		13.77
		13.60
		13.83
		13.68

		13.60
		13.68
		14.30
		13.37
	(1)	
	(1)	
	(1)	
	(1)	
	(4)	
	(4)	
	(46)	
	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(145)	
	(5)	
	(13)	
	(2)	
	(3)	
Cranial Module		
		14.90
		15.67
		15.17
		15.07
		15.25
		15.22
		15.53
		15.59

		15.30
		15.46
		15.91
		15.31
		15.30
		15.42
		15.33
		15.54
		15.90
		15.56
	(1)	
	(1)	
	(1)	
	(3)	
	(4)	
	(46)	
	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(142)	
	(5)	
	(3)	
Capacity		
		1,380
		1,485
		1,440
		1,447
		1,465

		1,504
		1,556
		1,519
		1,490
		1,660
		1,486
		1,461
		1,462
		1,470
		1,490
	(*1*)	
	(*1*)	
	(*1*)	
	(*1*)	
	(*4*)	
	(*4*)	
	(*46*)	
	(*9*)	
	(*9*)	
	(*3*)	
	(*3*)	
	(*11*)	
	(*8*)	
		(*153*)
	(*5*)	
	(*14*)	
	(*2*)	
	(*3*)	
Cranial Index		
		76.2
		77.4

		79.2
		82.3
		77.6
		78.5
		75
		77.2
		80.8
		76.1
		79.7
		75.4
		75.9
		77.1
		78.8
		77
		76.3
		78.7
	(*1*)	
	(*1*)	
	(*1*)	
	(*1*)	
	(*4*)	
	(*4*)	
	(*46*)	
	(*9*)	
	(*9*)	
	(*3*)	
	(*3*)	
	(*11*)	
	(*8*)	
		(*145*)
	(*5*)	

	(*13*)	
	(*2*)	
	(*3*)	
Mean height Index		
		80.3
		84.8
		85.3
		84.3
		81.6
		82.7
		83.2
		82
		84.2
		83.6
		81.6
		84.1
		86.2
		84
		83.9
		83
		85.6
		80.3
	(*1*)	
	(*1*)	
	(*1*)	
	(*1*)	
	(*4*)	
	(*4*)	
	(*46*)	
	(*9*)	
	(*9*)	

	(*3*)	
	(*3*)	
	(*11*)	
	(*8*)	
		(*145*)
	(*5*)	
	(*13*)	
	(*2*)	
	(*3*)	
Height-breadth index		
		90.7
		97.2
		96.4
		93
		93.3
		94
		97.1
		94.2
		94.2
		96.7
		91.4
		97.8
		99.9
		96.4
		95.2
		95.2
		98.9
		91.1
Face:		
	(1)	
	(1)	

	(2)	
	(3)	
	(24)	
	(7)	
	(7)	
	(3)	
	(7)	
	(2)	
	(24)	
Menton-nasion		
		11.8
		12.6
		12.90
		12.17
		12.95
		13
		12.44
		12.40
		12.67
		12.20
		12.70
	(1)	
	(1)	
	(1)	
	(3)	
	(3)	
	(43)	
	(9)	
	(8)	
	(3)	

	(2)	
	(9)	
	(7)	
	(139)	
	(5)	
	(10)	
	(2)	
	(2)	
Nasion-upper alveolar point		
		7.5
		7.8
		7.6
		8
		7.60
		7.83
		8.19
		7.69
		7.87
		7.85
		7.78
		7.86
		7.82
		7.58
		7.91
		8.05
		8.10
	(1)	
	(1)	
	(1)	
	(1)	
	(3)	

	(4)
	(45)
	(9)
	(9)
	(3)
	(3)
	(9)
	(8)
	(148)
	(5)
	(14)
	(2)
	(3)
Diameter-bizygomatic maximum	
	13.4
	14.8
	14.1
	14.6
	14.07
	13.90
	14.32
	14.44
	14.17
	14.30
	14.97
	14.13
	13.99
	14.20
	13.52
	14.37
	14.65
	14.53

	(*1*)	
	(*1*)	
	(*2*)	
	(*3*)	
	(*24*)	
	(*7*)	
	(*7*)	
	(*2*)	
	(*7*)	
	(*2*)	
	(*24*)	
Facial Index, total		
		79.7
		86.3
		95.6
		88.8
		90.3
		90.5
		87.4
		82.4
		90.1
		87.8
		88.8
	(*1*)	
	(*1*)	
	(*1*)	
	(*3*)	
	(*3*)	
	(*43*)	

	(*9*)
	(*8*)
	(*3*)
	(*2*)
	(*9*)
	(*7*)
	(*13*)
	(*5*)
	(*10*)
	(*2*)
	(*2*)
Facial Index, upper	
	56
	49.3
	52.1
	56.9
	55.5
	54.6
	56.7
	54.1
	55
	52.2
	55
	56.4
	55.1
	56.1
	55.7
	55
	55.7
Basio-facial:	
	(1)

		(1)
		(3)
		(1)
		(3)
		(42)
		(7)
		(8)
		(3)
		(2)
		(7)
		(7)
		(131)
		(4)
		(8)
		(2)
		(2)
Basion alveolar point		
		11
		10.5
		10.43
		10
		10.43
		10.65
		10.61
		10.25
		10.20
		10.35
		10.40
		10.21
		10.43
		10.25

		10.40
		10.95
		10.50
	(1)	
	(1)	
	(1)	
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	(3)	
	(4)	
	(44)	
	(9)	
	(9)	
	(3)	
	(3)	
	(10)	
	(8)	
	(143)	
	(4)	
	(13)	
	(2)	
	(3)	
Basion-subnasal point		
		9.4
		9.4
		9
		8.6
		9.37
		9.12
		9.51
		9.28
		9.12

		9.20
		9.07
		9.17
		9.04
		9.26
		9.12
		9.35
		9.80
		9.10
	(1)	
	(1)	
	(1)	
	(1)	
	(3)	
	(4)	
	(46)	
	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(145)	
	(4)	
	(13)	
	(2)	
	(3)	
Basion-nasion		
		10.4
		10.8
		10.2

		9.9
		10.47
		10.32
		10.55
		10.46
		10.29
		10.37
		10.27
		10.41
		10.44
		10.36
		10.18
		10.48
		10.90
		10.20
	(*1*)	
	(*1*)	
	(*1*)	
	(*4*)	
	(*3*)	
	(*41*)	
	(*7*)	
	(*8*)	
	(*3*)	
	(*2*)	
	(*7*)	
	(*7*)	
		(*131*)
	(*4*)	
	(*8*)	
	(*2*)	

	(2)	
Facial angle		
		65.5
		72
		67.5
		68
		69
		68
		66
		68
		69
		70.5
		69
		69
		67.5
		68
		67
		68
		66
	(1)	
	(1)	
	(1)	
	(4)	
	(3)	
	(41)	
	(7)	
	(8)	
	(3)	
	(2)	
	(7)	
	(7)	

		(*131*)
	(*4*)	
	(*8*)	
	(*2*)	
	(*2*)	
Alveolar angle		
		48.5
		56.5
		49
		56.5
		55
		58
		53
		55.5
		59.5
		53
		56
		56.5
		56.5
		55.5
		57
		58
		57.5
Orbits:		
	(1)	
	(1)	
	(1)	
	(1)	
	(3)	
	(4)	
	(42)	

	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(145)	
	(5)	
	(14)	
	(2)	
	(3)	
Mean height		
		3.47
		3.55
		3.62
		3.67
		3.64
		3.45
		3.59
		3.75
		3.66
		3.76
		3.57
		3.67
		3.74
		3.68
		3.45
		3.80
		3.60
		3.66
	(1)	

	(1)	
	(1)	
	(1)	
	(3)	
	(4)	
	(42)	
	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(145)	
	(5)	
	(14)	
	(2)	
	(3)	
Mean breadth		
		3.85
		4.07
		4
		3.9
		3.95
		4.09
		4.02
		4.08
		3.92
		3.94
		4.07
		3.98
		4.04
		4.03

		3.88
		4.10
		4.25
		4.01
	(*1*)	
	(*1*)	
	(*1*)	
	(*1*)	
	(*3*)	
	(*4*)	
	(*42*)	
	(*9*)	
	(*9*)	
	(*3*)	
	(*3*)	
	(*11*)	
	(*8*)	
		(*145*)
	(*5*)	
	(*14*)	
	(*2*)	
	(*3*)	
Mean index		
		90.2
		87.1
		90.7
		94.2
		92.2
		84.3
		89.2
		92

		93.4
		95.5
		87.7
		92.3
		93.3
		91.2
		89.1
		92.7
		84.7
		91.1
Nose:		
	(1)	
	(1)	
	(1)	
	(1)	
	(3)	
	(4)	
	(44)	
	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(148)	
	(5)	
	(14)	
	(2)	
	(3)	
Height		
		4.9
		5.1

		5.4
		5.3
		5.57
		5.49
		5.35
		5.59
		5.41
		5.45
		5.37
		5.44
		5.36
		5.42
		5.30
		5.57
		5.47
		5.63
	(1)	
	(1)	
	(1)	
	(1)	
	(3)	
	(4)	
	(44)	
	(9)	
	(9)	
	(3)	
	(3)	
	(11)	
	(8)	
	(148)	
	(5)	

	(14)	
	(2)	
	(3)	
Breadth		
		2.4
		2.45
		2.45
		2.45
		2.35
		2.54
		2.35
		2.41
		2.43
		2.23
		2.57
		2.51
		2.26
		2.45
		2.36
		2.55
		2.50
		2.30
	(*1*)	
	(*1*)	
	(*1*)	
	(*1*)	
	(*3*)	
	(*4*)	
	(*44*)	
	(*9*)	
	(*9*)	

(*3*)
(*3*)
(*11*)
(*8*)
(*148*)
(*5*)
(*14*)
(*2*)
(*3*)

Index

49
48
45.4
46.2
42.2
46.3
43.8
43
44.9
41
47.8
46.2
42.1
45.2
44.6
45.7
45.7
40.8

Upper alveolar arch:

(1)
(1)

	(1)	
	(3)	
	(3)	
	(44)	
	(8)	
	(8)	
	(3)	
	(2)	
	(7)	
	(7)	
	(121)	
	(5)	
	(8)	
	(2)	
	(2)	
Length		
		5.9
		5.6
		5.5
		5.60
		5.40
		5.66
		5.73
		5.46
		5.40
		5.70
		5.57
		5.44
		5.63
		5.38
		5.57

		5.70
		5.95
	(1)	
	(1)	
	(1)	
	(3)	
	(3)	
	(44)	
	(8)	
	(8)	
	(3)	
	(2)	
	(7)	
	(7)	
	(121)	
	(5)	
	(8)	
	(2)	
	(2)	
Breadth		
		6.9
		6.8
		6.6
		6.43
		6.63
		6.79
		6.68
		6.65
		6.63
		7.40
		6.70

		6.63
		6.79
		6.46
		6.66
		6.60
		7.15
	(*1*)	
	(*1*)	
	(*1*)	
	(*3*)	
	(*3*)	
	(*44*)	
	(*8*)	
	(*8*)	
	(*3*)	
	(*2*)	
	(*7*)	
	(*7*)	
		(*121*)
	(*5*)	
	(*8*)	
	(*2*)	
	(*2*)	

Index

	87
	82.4
	83.3
	87
	81.4
	83.4
	85.8

		82.1
		81.4
		77
		83.4
		82.1
		82.9
		83.3
		83.6
		86.4
		83.2
	(1)	
	(1)	
	(2)	
	(4)	
	(28)	
	(8)	
	(8)	
	(3)	
	(11)	
	(2)	
	(26)	
	(2)	
Lower jaw: Height at symphysis		
		3.3
		4
		3.8
		3.55
		4
		3.91
		3.63

	3.63
	3.75
	3.65
	3.62
	3.90

ESKIMO CRANIA—Continued
Seward Peninsula to Point Barrow and Eastward to Greenland
MALES

Golovnin Bay
Cape Nome
Sledge Island
Port Clarence
Wales
Shishmaref
Kotzebue
Point Hope
Barrow and vicinity
Old Igloos, southwest of Barrow
Point Barrow
Northern Arctic
Melville Peninsula
Southampton Island
Hudson Bay and Ungava Bay
Baffin Land, northern Devon, and vicinity
Smith Sound
Greenland

Vault:

	(3)	
	(1)	
	(5)	
	(4)	
	(19)	
	(13)	
	(2)	
	(131)	
	(37)	
	(27)	
	(49)	
	(5)	
	(1)	
	(9)	
	(5)	
	(16)	
	(7)	
	(49)	
Length		
		19.23
		18
		19.16
		18.88
		18.75
		18.49
		18.25
		18.40
		18.90
		19.25
		18.74
		19.04
		19.6

		18.91
		18.78
		18.91
		18.96
		8.97
	(3)	
	(1)	
	(5)	
	(4)	
	(19)	
	(13)	
	(2)	
	(131)	
	(37)	
	(27)	
	(49)	
	(5)	
	(1)	
	(9)	
	(5)	
	(16)	
	(7)	
	(49)	
Breadth		
		13.67
		13.5
		13.72
		13.78
		13.64
		13.65
		13.50

		13.86
		13.73
		13.30
		13.84
		14.08
		13.7
		14.03
		14.10
		13.83
		14.37
		13.61
	(3)	
	(1)	
	(5)	
	(3)	
	(19)	
	(12)	
	(2)	
	(128)	
	(35)	
	(27)	
	(47)	
	(5)	
	(1)	
	(9)	
	(5)	
	(16)	
	(7)	
	(49)	
Height		
		14.13

		13.6
		14.02
		13.90
		13.92
		13.48
		13.40
		13.90
		13.78
		14.02
		13.78
		13.76
		13.6
		14.01
		13.76
		13.87
		14.06
		13.95
	(3)	
	(1)	
	(5)	
	(3)	
	(19)	
	(12)	
	(2)	
	(128)	
	(35)	
	(27)	
	(47)	
	(5)	
	(1)	
	(9)	

	(5)	
	(16)	
	(7)	
	(49)	
Cranial Module		
		15.68
		15.03
		15.63
		15.57
		15.66
		15.19
		15.05
		15.39
		15.46
		15.52
		15.44
		15.63
		15.63
		15.65
		15.55
		15.55
		15.81
		15.51
	(3)	
	(1)	
	(5)	
	(18)	
	(11)	
	(2)	
	(126)	
	(5)	

	(9)	
	(1)	
	(7)	
	(42)	
Capacity		
		1,483
		1,325
		1,498
		1,474
		1,395
		1,398
		1,474
		1,324
		1,563
		1,450
		1,566
		1,518
	(3)	
	(1)	
	(5)	
	(4)	
	(19)	
	(13)	
	(2)	
		(131)
	(37)	
	(27)	
	(49)	
	(5)	
	(1)	

	(*9*)	
	(*5*)	
	(*16*)	
	(*7*)	
	(*49*)	
Cranial Index		
		71.1
		75
		71.6
		73
		72.8
		73.8
		74
		75.3
		72.6
		69.1
		73.9
		74
		70
		74.2
		75.1
		73.1
		75.8
		71.8
	(*3*)	
	(*1*)	
	(*5*)	
	(*3*)	
	(*19*)	
	(*12*)	
	(*2*)	

		(*128*)
	(*35*)	
	(*27*)	
	(*47*)	
	(*5*)	
	(*1*)	
	(*9*)	
	(*5*)	
	(*16*)	
	(*7*)	
	(*49*)	
Mean height Index		
		85.9
		86.1
		85.3
		84.8
		85.9
		84
		84.4
		86.2
		84.6
		86.2
		84.7
*83.*1		
		81.7
		85.1
		83.7
		84.9
		84.4
		85.7
	(*3*)	

	(*1*)	
	(*5*)	
	(*3*)	
	(*19*)	
	(*12*)	
	(*2*)	
		(*128*)
	(*35*)	
	(*27*)	
	(*47*)	
	(*5*)	
	(*1*)	
	(*9*)	
	(*5*)	
	(*16*)	
	(*7*)	
	(*49*)	
Height-breadth index		
		103.4
		100.7
		102.2
		99
	102	
	98.8	
		99.3
		100.3
		99.6
		105.5
		99.6
		97.7
		99.3
		99.8

		97.6
		100.5
		97.8
		102.5
Face:		
	(3)	
	(1)	
	(4)	
	(1)	
	(12)	
	(6)	
	(1)	
	(4)	
	(16)	
	(2)	
	(1)	
	(1)	
	(6)	
	(4)	
	(6)	
	(6)	
	(12)	
Menton-nasion		
		12.67
		12.6
		12.73
		13
		12.74
		12.30
		(11.8)
		12.40

		12.39
		13.10
		14
		12.8
		12.63
		12.18
		12.27
		12.13
		12.38
	(3)	
	(1)	
	(5)	
	(3)	
	(16)	
	(10)	
	(1)	
	(118)	
	(21)	
	(261)	
	(37)	
	(5)	
	(1)	
	(9)	
	(5)	
	(12)	
	(7)	
	(46)	
Nasion-upper alveolar point		
		7.97
		8
		7.83

		7.73
		7.81
		7.60
		(7.3)
		7.52
		7.89
		7.71
		7.86
		8.02
		8
		7.67
		7.56
		7.61
		7.64
		7.61
	(3)	
	(1)	
	(5)	
	(3)	
	(18)	
	(10)	
	(2)	
	(124)	
	(26)	
	(26)	
	(44)	
	(5)	
	(9)	
	(5)	
	(16)	
	(7)	

	(47)
Diameter-bizygomatic maximum	
	14.37
	14.3
	14.20
	14.17
	14.16
	14.20
	(13.85)
	14.31
	14.34
	14.16
	14.26
	14.44
	14.48
	14.06
	14.22
	14.69
	14.05
	(*3*)
	(*1*)
	(*4*)
	(*1*)
	(*12*)
	(*6*)
	(*1*)
	(*4*)
	(*16*)
	(*2*)
	(*1*)
	(*6*)

	(*4*)	
	(*6*)	
	(*6*)	
	(*12*)	
Facial Index, total		
		88.2
		88.1
		89.3
		89.7
		90
		87.2
		88.1
		6.7
		86.9
		90.7
		94.6
		87.2
		87
		85.9
		82.4
		87.1
	(*3*)	
	(*1*)	
	(*5*)	
	(*3*)	
	(*16*)	
	(*10*)	
	(*1*)	
		(*114*)
	(*20*)	
	(*24*)	

	(*36*)	
	(*5*)	
	(*9*)	
	(*5*)	
	(*12*)	
	(*7*)	
	(*45*)	
Facial Index, upper		
		55.5
		55.9
		55.2
		54.6
		55.2
		53.6
		54.5
		52.5
		55
		54.5
		55.1
		55.5
		53
		53.8
		53.7
		52
54.1		
Basio-facial:		
	(2)	
	(1)	
	(5)	
	(3)	
	(17)	

	(10)	
	(1)	
	(105)	
	(21)	
	(20)	
	(36)	
	(5)	
	(8)	
	(5)	
	(12)	
	(7)	
	(42)	
Basion-alveolar point		
		10.4
		10.9
		10.62
		10.87
		10.55
		10.60
		10.7
		10.31
		10.39
		10.45
		10.39
		10.46
		10.76
		10.58
		10.41
		10.26
		10.54
	(3)	

	(1)
	(5)
	(3)
	(18)
	(11)
	(2)
	(123)
	(28)
	(27)
	(45)
	(5)
	(9)
	(5)
	(16)
	(7)
	(47)
Basion-subnasal point	
	9.57
	9.9
	9.58
	9.63
	9.43
	9.44
	(9.20)
	9.28
	9.31
	9.33
	9.23
	9.20
	9.52
	9.52

		9.24
		9.39
		9.32
	(3)	
	(1)	
	(5)	
	(3)	
	(19)	
	(12)	
	(2)	
	(128)	
	(35)	
	(27)	
	(47)	
	(5)	
	(9)	
	(5)	
	(16)	
	(7)	
	(48)	
Basion-nasion		
		10.87
		10.8
		10.88
		10.77
		10.64
		10.50
		(10.45)
		10.49
		10.61
		10.70

		10.54
		10.68
		10.83
		10.60
		10.51
		10.70
		10.60
	(*2*)	
	(*1*)	
	(*5*)	
	(*8*)	
	(*16*)	
	(*10*)	
	(*1*)	
		(*105*)
	(*36*)	
	(*5*)	
	(*9*)	
	(*5*)	
	(*7*)	
	(*42*)	
Facial angle		
		69.5
		67.5
		70
		68
		68.5
		68.5
		68.5
		70

		69
		69
		69
		69.5
		71.4
		70
	(*2*)	
	(*1*)	
	(*5*)	
	(*8*)	
	(*16*)	
	(*10*)	
	(*1*)	
		(*105*)
	(*36*)	
	(*5*)	
	(*9*)	
	(*5*)	
	(*7*)	
	(*42*)	
Alveolar angle		
		60.5
		59
		57
		53.5
		57
		56
		54
		57
		56

		55
		53
		59
		57.7
		56
Orbits:		
	(3)	
	(1)	
	(5)	
	(3)	
	(19)	
	(11)	
	(2)	
	(118)	
	(28)	
	(25)	
	(43)	
	(5)	
	(1)	
	(9)	
	(5)	
	(15)	
	(7)	
	(47)	
Mean height		
		3.66
		3.42
		3.64
		3.62
		3.67
		3.60

		3.48
		3.63
		3.60
		3.62
		3.61
		3.82
		3.9
		3.67
		3.58
		3.56
		3.54
		3.64
	(3)	
	(1)	
	(5)	
	(3)	
	(19)	
	(11)	
	(2)	
	(118)	
	(28)	
	(25)	
	(43)	
	(5)	
	(1)	
	(9)	
	(5)	
	(15)	
	(7)	
	(47)	
Mean breadth		

		4.20
		4.05
		4.03
		4.03
		4.09
		3.98
		4.05
		4.03
		4.04
		3.97
		4.02
		4.22
		4.3
		4.06
		3.97
		3.98
		4.11
		3.99
	(*3*)	
	(*1*)	
	(*5*)	
	(*3*)	
	(*19*)	
	(*11*)	
	(*2*)	
		(*118*)
	(*28*)	
	(*25*)	
	(*43*)	
	(*5*)	
	(*1*)	

	(*9*)	
	(*5*)	
	(*15*)	
	(*7*)	
	(*47*)	
Mean index		
		87.1
		84.6
		90.3
		89.9
		89.8
		90.4
		85.9
		90.1
		89.2
		91.3
		89.9
		90.5
		90.7
		90.3
		90
		88.8
		86.7
		91.4
Nose:		
	(3)	
	(1)	
	(5)	
	(3)	
	(19)	
	(11)	
	(2)	

	(126)	
	(29)	
	(27)	
	(46)	
	(5)	
	(1)	
	(9)	
	(5)	
	(16)	
	(7)	
	(48)	
Height		
		5.57
		5.7
		5.59
		5.37
		5.39
		5.35 (4.95)
		5.36
		5.52
		5.45
		5.48
		5.44
		5.4
		5.43
		5.14
		5.32
		5.73
		5.24
	(3)	
	(1)	

	(5)
	(3)
	(19)
	(11)
	(2)
	(126)
	(29)
	(27)
	(46)
	(5)
	(1)
	(9)
	(5)
	(16)
	(7)
	(48)
Breadth	
	2.35
	2.55
	2.35
	2.35
	2.41
	2.39
	2.22
	2.39
	2.39
	2.37
	2.31
	2.32
	2.45
	2.30
	2.23

2.31
2.27
2.27
(*3*)
(*1*)
(*5*)
(*3*)
(*19*)
(*11*)
(*2*)
(*126*)
(*29*)
(*27*)
(*46*)
(*5*)
(*1*)
(*9*)
(*5*)
(*16*)
(*7*)
(*48*)
Index
42.2
44.7
42
43.8
44.8
44.6
44.9
44.6
43.4

	43.6
	42.2
	42.6
	45
	42.3
	45.3
	43.4
	39.7
	43.3
Upper alveolar arch:	
(3)	
(1)	
(5)	
(3)	
(17)	
(9)	
(1)	
(99)	
(15)	
(23)	
(33)	
(4)	
(9)	
(5)	
(11)	
(7)	
(44)	
Length	
	6.13
	6.1
	5.70

		5.90
		5.69
		5.74
		5.5
		5.55
		5.59
		5.57
		5.63
		5.80
		5.84
		5.78
		5.63
		5.50
		5.63
	(3)	
	(1)	
	(5)	
	(3)	
	(17)	
	(9)	
	(1)	
	(99)	
	(15)	
	(23)	
	(33)	
	(4)	
	(9)	
	(5)	
	(11)	
	(7)	
	(44)	

Breadth		
		7
		6.9
		6.83
		6.80
		6.76
		6.79
		5.8
		6.54
		6.45
		6.68
		6.47
		6.70
		6.94
		6.72
		6.72
		6.74
		6.63
	(*3*)	
	(*1*)	
	(*5*)	
	(*3*)	
	(*17*)	
	(*9*)	
	(*1*)	
	(*99*)	
	(*15*)	
	(*23*)	
	(*33*)	
	(*4*)	
	(*9*)	

(*5*)
(*11*)
(*7*)
(*44*)

Index

87.6
88.4
83.5
86.8
84.2
84.6
94.8
84.9
86.6
83.4
86.9
86.6
84.2
86
83.8
81.6
85

(3)
(1)
(4)
(1)
(16)
(7)
(1)
(4)
(2)

	(22)
	(2)
	(1)
	(6)
	(4)
	(7)
	(6)
	(16)
Lower jaw: Height at symphysis	
	4
	3.85
	3.61
	4.2
	3.91
	3.78
	3.8
	3.82
	3.95
	3.72
	3.9
	4.2
	3.67
	3.56
	3.83
	3.52
	3.76

ESKIMO CRANIA—Continued
Western, Northern, and Eastern Eskimo
FEMALES

Unalaska Peninsula

Togiak	
Mumtrak	
Nunivak Island	
Nelson Island	
Hooper Bay	
Yukon Delta (Kashunok) and lower Yukon	
Pilot Station, lower Yukon	
Kotlik and Pastolik	
St. Michael Island	
St. Lawrence Island	
Little Diomede Island	
Northeastern Asia	
Indian Point	
Chukchee	
Vault:	
	(2)
	(7)
	(6)
	(70)
	(17)
	(4)
	(2)
	(3)
	(18)
	(6)
	(140)
	(7)
	(16)

	(2)	
Length		
		17.90
		17.17
		17.27
		17.89
		17.42
		17.42
		18.7
		17.8
		17.72
		17.72
		17.69
		18.04
		17.64
		18.25
	(2)	
	(7)	
	(6)	
	(70)	
	(17)	
	(4)	
	(2)	
	(3)	
	(18)	
	(6)	
	(140)	
	(7)	
	(16)	
	(2)	
Breadth		

		13.70
		14.17
		13.92
		13.65
		13.71
		13.70
		13.95
		14
		13.62
		13.38
		13.60
		13.71
		13.74
		14.30
	(2)	
	(7)	
	(6)	
	(70)	
	(16)	
	(4)	
	(2)	
	(3)	
	(18)	
	(6)	
	(128)	
	(7)	
	(16)	
	(2)	
Height		
		13.10
		12.86

		12.85
		13.15
		12.78
		12.62
		13
		13.20
		13.04
		13.07
		13.21
		13.50
		13.25
		13.60
	(2)	
	(7)	
	(6)	
	(70)	
	(16)	
	(4)	
	(2)	
	(3)	
	(18)	
	(6)	
	(128)	
	(7)	
	(16)	
	(2)	
Cranial Module		
		14.90
		14.73
		14.68
		14.90

		14.64
		14.68
		(15.22)
		15
		14.81
		14.72
		14.87
		15.09
		14.88
		15.38
	(2)	
	(6)	
	(4)	
	(66)	
	(14)	
	(4)	
	(3)	
	(18)	
	(6)	
	(120)	
	(6)	
	(2)	
Capacity		
		1,352
		1,375
		1,376
		1,353
		1,334
		1,246
		1,442
		1,359

		1,293
		1,335
		1,359
		1,512
	(*2*)	
	(*7*)	
	(*6*)	
	(*70*)	
	(*17*)	
	(*4*)	
	(*2*)	
	(*3*)	
	(*18*)	
	(*6*)	
		(*140*)
	(*7*)	
	(*16*)	
	(*2*)	
Cranial Index		
		76.5
		82.7
		80.6
		76.3
		78.7
		78.6
		74.6
		78.7
		76.8
		75.5
		77.4
		76

		77.9
		78.4
	(*2*)	
	(*7*)	
	(*6*)	
	(*70*)	
	(*16*)	
	(*4*)	
	(*2*)	
	(*3*)	
	(*18*)	
	(*6*)	
		(*128*)
	(*7*)	
	(*16*)	
	(*2*)	
Mean height Index		
		82.9
		82
		82.4
		83.4
		82.1
		81.1
		(*79.2*)
		83
		83.2
		84
		84.2
		85
		84.5
		83.6

(*2*)	
(*7*)	
(*6*)	
(*70*)	
(*16*)	
(*4*)	
(*2*)	
(*3*)	
(*18*)	
(*6*)	
	(*128*)
(*7*)	
(*16*)	
(*2*)	
Height-breadth index	
	95.6
	90.7
	92.3
	96.4
	93.2
	92.2
	(*92.8*)
	94.3
	95.8
	97.6
	96.5
	98.4
	96.4
	95.1
Face:	
(2)	

	(4)	
	(27)	
	(10)	
	(2)	
	(2)	
	(15)	
	(3)	
	(23)	
	(1)	
Menton-nasion		
		12.1
		11.3
		11.62
		11.62
		11.80
		11.90
		11.82
		11.5
		11.49
		11.40
	(2)	
	(4)	
	(6)	
	(52)	
	(14)	
	(2)	
	(3)	
	(16)	
	(3)	
	(120)	

(6)	
(13)	
(2)	
Nasion-upper alveolar point	
	7.80
	7.30
	7.05
	7.27
	7.18
	7.30
	7.40
	7.49
	7.13
	7.29
	7.38
	7.41
	7.40
(2)	
(4)	
(6)	
(63)	
(15)	
(4)	
(1)	
(3)	
(16)	
(5)	
(128)	
(7)	
(14)	
(2)	

Diameter-bizygomatic maximum		
		13.40
		13.12
		13.1
		13.27
		13.37
		13.37
		13.9
		13.47
		13.26
		13.12
		13.31
		13.09
		13.34
		13.25
	(*2*)	
	(*4*)	
	(*26*)	
	(*10*)	
	(*2*)	
	(*2*)	
	(*15*)	
	(*3*)	
	(*23*)	
	(*1*)	
Facial Index, total		
		93.1
		84.8
		88.2
		87
		88.4

		89.1
		89
		88.2
		86.9
		85.7
	(*2*)	
	(*4*)	
	(*6*)	
	(*51*)	
	(*14*)	
	(*2*)	
	(*3*)	
	(*16*)	
	(*3*)	
		(*120*)
	(*6*)	
	(*12*)	
	(*2*)	
Facial Index, upper		
		58.2
		55.6
		53.6
		54.8
		53.6
		54.7
		55
		56.5
		54.7
		54.8
		56
		55

		55.9
Basio-facial:		
	(2)	
	(4)	
	(6)	
	(45)	
	(14)	
	(2)	
	(3)	
	(16)	
	(3)	
	(111)	
	(6)	
	(13)	
	(2)	
Basion-alveolar point		
		10.05
		9.78
		9.53
		10.17
		10.06
		9.60
		10.17
		10.09
		9.77
		10.04
		9.73
		10.14
		10.10
	(2)	
	(4)	

	(6)	
	(60)	
	(15)	
	(4)	
	(1)	
	(3)	
	(18)	
	(6)	
	(119)	
	(6)	
	(15)	
	(2)	
Basion-subnasal point		
		8.80
		8.55
		8.50
		8.97
		8.76
		8.55
		8.9
		8.80
		8.86
		8.80
		8.88
		8.78
		8.95
		9.05
	(2)	
	(7)	
	(6)	
	(69)	

	(15)	
	(4)	
	(1)	
	(3)	
	(18)	
	(6)	
	(128)	
	(7)	
	(16)	
	(2)	
Basion-nasion		
		9.80
		9.56
		9.52
		10.02
		9.73
		9.70
		10.2
		9.97
		9.98
		9.98
		9.93
		9.91
		9.97
		10
	(*2*)	
	(*4*)	
	(*6*)	
	(*45*)	
	(*13*)	
	(*2*)	

	(*3*)	
	(*16*)	
	(*3*)	
		(*111*)
	(*6*)	
	(*13*)	
	(*2*)	
Facial angle		
		65.5
		66
		68.5
		67.5
		66.5
		68.5
		67
		67.5
		71
		68
		69
		67
		67.5
	(*2*)	
	(*4*)	
	(*6*)	
	(*45*)	
	(*13*)	
	(*2*)	
	(*3*)	
	(*16*)	
	(*3*)	
		(*111*)

	(*6*)	
	(*13*)	
	(*2*)	
Alveolar angle		
		54.5
		51.5
		55.5
		55
		50
		55
		51
		53.5
		57
		54
		59.5
		54
		56.5
Orbits:		
	(2)	
	(3)	
	(6)	
	(59)	
	(15)	
	(4)	
	(1)	
	(3)	
	(18)	
	(5)	
	(121)	
	(6)	
	(15)	

	(2)	
Mean height		
		3.65
		3.59
		3.53
		3.51
		3.50
		3.56
		3.5
		3.54
		3.62
		3.61
		3.60
		3.60
		3.59
		3.41
	(2)	
	(3)	
	(6)	
	(59)	
	(15)	
	(4)	
	(1)	
	(3)	
	(18)	
	(5)	
	(121)	
	(6)	
	(15)	
	(2)	
Mean breadth		

		3.92
		3.85
		3.81
		3.86
		3.81
		3.89
		3.8
		3.89
		3.86
		3.78
		3.91
		4.01
		3.90
		3.79
	(*2*)	
	(*3*)	
	(*6*)	
	(*59*)	
	(*15*)	
	(*4*)	
	(*1*)	
	(*3*)	
	(*18*)	
	(*5*)	
		(*121*)
	(*6*)	
	(*15*)	
	(*2*)	
Mean index		
		93
		93.5

		92.6
		91
		91.8
		91.7
		92.1
		91
		94.1
		95.5
		92.1
		89.7
		91.9
		90.1
Nose:		
	(2)	
	(5)	
	(6)	
	(63)	
	(14)	
	(4)	
	(1)	
	(3)	
	(18)	
	(5)	
	(127)	
	(6)	
	(15)	
	(2)	
Height		
		5.32
		5.06
		5.03
		4.99

		5.06
		4.95
		5.5
		5
		5.19
		4.95
		5.13
		5.15
		5.16
		5.20
	(2)	
	(5)	
	(6)	
	(63)	
	(14)	
	(4)	
	(1)	
	(3)	
	(18)	
	(5)	
	(127)	
	(6)	
	(15)	
	(2)	
Breadth		
		2.58
		2.32
		2.23
		2.32
		2.34
		2.35

		2.45
		2.33
		2.31
		2.17
		2.39
		2.28
		2.45
		2.65
	(*2*)	
	(*5*)	
	(*6*)	
	(*63*)	
	(*14*)	
	(*4*)	
	(*1*)	
	(*3*)	
	(*18*)	
	(*5*)	
		(*127*)
	(*6*)	
	(*15*)	
	(*2*)	

Index

	47.5
	45.8
	44.2
	46.4
	46.3
	47.5
	44.5
	46.7

		44.5
		43.8
		46.6
		44.4
		47.4
		50.5
Upper alveolar arch:		
	(2)	
	(4)	
	(6)	
	(46)	
	(14)	
	(2)	
	(3)	
	(15)	
	(3)	
	(109)	
	(4)	
	(12)	
	(2)	
Length		
		5.55
		5.18
		5.03
		5.39
		5.39
		5.25
		5.40
		5.45
		5.40
		5.37

		5.30
		5.44
		5.45
	(2)	
	(4)	
	(6)	
	(46)	
	(14)	
	(2)	
	(3)	
	(15)	
	(3)	
	(109)	
	(4)	
	(12)	
	(2)	
Breadth		
		6.55
		6.40
		6.13
		6.31
		6.32
		6.45
		6.60
		6.38
		6.23
		6.46
		6.52
		6.40
		6.90
	(*2*)	

(*4*)
(*6*)
(*46*)
(*14*)
(*4*)
(*3*)
(*15*)
(*3*)
(*109*)
(*4*)
(*12*)
(*2*)

Index

84.7
80.9
82.1
84.4
85.3
81.4
81.8
85.4
86.6
83.0
81.2
85
79

(2)
(3)
(32)
(11)
(4)

	(2)
	(17)
	(4)
	(25)
	(1)
Lower jaw: Height at symphysis	
	3.50
	3.30
	3.48
	3.40
	3.40
	3.67
	3.56
	3.39
	3.18
	3.2

ESKIMO CRANIA—Continued
Western, Northern, and Eastern Eskimo—Continued
FEMALES

Seward Peninsula
Port Clarence
Wales
Shishmaref
Kotzebue Sound and Kobuk River
Point Hope
Barrow and vicinity
Old Igloos north of Barrow
Point Barrow

Northern Arctic
Southampton Island
Hudson Bay and vicinity
Baffin Land, North Devon and vicinity
Smith Sound
Greenland
Golovnin Bay
Cape Nome
Sledge Island

Vault:

(4)
(2)
(9)
(3)
(15)
(10)
(1)
(92)
(36)
(25)
(52)
(10)
(6)
(2)
(17)
(2)
(52)

Length

	17.92
	17.70

		18.13
		17.63
		18.05
		17.73
		17.2
		17.5 7
		17.77
		18.11
		17.91
		18.21
		18.17
		17.55
		18.33
		18
		18.04
	(4)	
	(2)	
	(9)	
	(3)	
	(15)	
	(10)	
	(1)	
	(92)	
	(36)	
	(25)	
	(52)	
	(10)	
	(6)	
	(2)	
	(17)	
	(2)	

	(52)	
Breadth		
		13.22
		13.25
		13.50
		13.50
		13.35
		13.29
		13.4
		13.43
		13.23
		12.72
		13.32
		13.36
		13.70
		13.60
		13.44
		13.80
		12.98
	(4)	
	(2)	
	(9)	
	(3)	
	(15)	
	(9)	
	(1)	
	(89)	
	(34)	
	(24)	
	(52)	
	(10)	

	(6)	
	(2)	
	(17)	
	(2)	
	(52)	
Height		
		13.20
		13
		13.22
		12.90
		13.21
		13.16
		13.4
		13.20
		12.97
		13.21
		13.03
		12.99
		13.69
		12.55
		13.34
		13.65
		13.12
	(4)	
	(2)	
	(9)	
	(3)	
	(15)	
	(9)	
	(1)	
	(89)	

	(34)	
	(24)	
	(52)	
	(10)	
	(6)	
	(2)	
	(17)	
	(2)	
	(52)	
Cranial Module		
		14.78
		14.65
		14.95
		14.68
		14.87
		14.72
		14.67
		14.72
		14.66
		14.72
		14.75
		14.85
		15.18
		14.57
		15.04
		15.15
		14.72
	(4)	
	(2)	
	(8)	
	(1)	

	(15)	
	(6)	
	(89)	
	(3)	
	(6)	
	(1)	
	(43)	
Capacity		
		1,345
		1,290
		1,374
		1,285
		1,359
		1,239
		1,316
		1,235
		1,443
		1,510
		1,324
	(4)	
	(2)	
	(9)	
	(3)	
	(15)	
	(10)	
	(1)	
	(92)	
	(36)	
	(*25*)	
	(*52*)	

	(*10*)	
	(*6*)	
	(*2*)	
	(*17*)	
	(*2*)	
	(*52*)	
Cranial Index		
		73.8
		74.8
		74.5
		76.6
		73.9
		75
		77.9
		76.4
		74.5
		70.2
		74.4
		73.4
		75.4
		77.5
		73.3
		76.7
		72
	(*4*)	
	(*2*)	
	(*9*)	
	(*3*)	
	(*15*)	
	(*9*)	
	(*1*)	

	(*89*)	
	(*34*)	
	(*24*)	
	(*52*)	
	(*10*)	
	(*6*)	
	(*2*)	
	(*17*)	
	(*2*)	
	(*52*)	
Mean height Index		
		84.8
		83.9
		83.6
		82.9
		84
		84.9
		87.6
		85.2
		82.9
		86.4
		83.4
		82.3
		85.9
		80.6
		84
		85.8
		84.6
	(*4*)	
	(*2*)	
	(*9*)	

	(*3*)
	(*15*)
	(*9*)
	(*1*)
	(*89*)
	(*34*)
	(*24*)
	(*52*)
	(*10*)
	(*6*)
	(*2*)
	(*17*)
	(*2*)
	(*52*)
Height-breadth index	
	99.8
	98.1
	97.9
	95.5
	99
	98.9
	100
	98.2
	98.1
	104.6
	97.8
	97.2
	99.9
	92.3
	99.3
	98.9
	101

Face:		
	(3)	
	(3)	
	(11)	
	(1)	
	(1)	
	(2)	
	(15)	
	(1)	
	(3)	
	(5)	
	(2)	
	(5)	
Menton-nasion		
		12.03
		11.93
		11.85
		12
		11.9
		12.05
		11.21
		12.7
		11.7
		11.60
		11.20
		11.52
	(3)	
	(1)	
	(7)	
	(1)	

(16)	
(9)	
(1)	
(78)	
(22)	
(18)	
(40)	
(7)	
(5)	
(2)	
(12)	
(2)	
(45)	
Nasion-upper alveolar point	
	7.40
	7.3
	7.30
	6.7
	7.39
	7.20
	7.1
	7.06
	7.18
	7.01
	7.22
	7.43
	7.14
	6.95
	7.10
	6.80
	7.05

	(4)	
	(2)	
	(7)	
	(1)	
	(1)	
	(8)	
	(1)	
	(84)	
	(23)	
	(24)	
	(46)	
	(7)	
	(5)	
	(2)	
	(14)	
	(2)	
	(50)	
Diameter-bizygomatic maximum		
		13.2 5
		13.15
		13.26
		13.1
		13.29
		13.21
		13.4
		13.32
		13.16
		13.08
		13.06
		12.96
		13.82
		12.65

		13.27
		13.20
		13.03
	(*3*)	
	(*3*)	
	(*1*)	
	(*1*)	
	(*1*)	
	(*2*)	
	(*15*)	
	(*3*)	
	(*5*)	
	(*2*)	
	(*5*)	
Facial Index, total		
		90.9
		90.9
		89.6
		91.6
		88.5
		88.3
		86.8
		84.8
		86.6
		84.9
		85.7
	(*3*)	
	(*1*)	
	(*7*)	
	(*1*)	

	(*1*)
	(*8*)
	(*1*)
	(*77*)
	(*21*)
	(*18*)
	(*39*)
	(*6*)
	(*5*)
	(*2*)
	(*11*)
	(*2*)
	(*45*)
Facial Index, upper	
	55.8
	55.7
	55.1
	51.1
	55.6
	54.7
	53
	53.1
	54.7
	53.8
	55.3
	57.8
	51.7
	54.9
	53.9
	51.5
	54.1
Basio-facial:	

		(3)
		(1)
		(6)
		(1)
		(15)
		(8)
		(1)
		(76)
		(22)
		(15)
		(37)
		(6)
		(4)
		(2)
		(12)
		(2)
		(45)
Basion-alveolar point		
		10.27
		10.3
		10.25
		9.8
		10.24
		10.38
		9.2
		9.72
		9.85
		10.13
		9.77
		10.03
		10.02

		9.4
		10.13
		9.35
		10.09
	(4)	
	(2)	
	(7)	
	(2)	
	(16)	
	(8)	
	(1)	
	(83)	
	(27)	
	(21)	
	(46)	
	(10)	
	(4)	
	(2)	
	(13)	
	(2)	
	(50)	
Basion-subnasal point		
		9
		8.85
		9.16
		8.8
		9.04
		9.25
		7.9
		8.72
		8.86

		9.12
		8.73
		8.85
		9.02
		8.35
		9.05
		8.35
		8.94
	(4)	
	(2)	
	(8)	
	(3)	
	(16)	
	(9)	
	(1)	
	(89)	
	(34)	
	(24)	
	(52)	
	(10)	
	(5)	
	(2)	
	(17)	
	(2)	
	(52)	
Basion-nasion		
		10.10
		10.05
		10.29
		9.93
		10.01

		10.16
		9.5
		9.89
		10.01
		10.18
		9.94
		10.07
		10.34
		9.75
		10.11
		9.65
		10.13
	(*1*)	
	(*6*)	
	(*1*)	
	(*15*)	
	(*8*)	
	(*75*)	
	(*37*)	
	(*6*)	
	(*2*)	
	(*45*)	
Facial angle		
		67
		69
		66
		67
		68
		70
		69

		68
		71.5
		70
	(*1*)	
	(*6*)	
	(*1*)	
	(*15*)	
	(*8*)	
	(*75*)	
	(*37*)	
	(*6*)	
	(*2*)	
	(*45*)	
Alveolar angle		
		54
		53
		41.5
		55
		55.5
		56.5
		55
		54
		54.5
		54
Orbits:		
	(4)	
	(2)	
	(7)	
	(2)	

	(16)	
	(10)	
	(1)	
	(83)	
	(25)	
	(18)	
	(42)	
	(10)	
	(5)	
	(2)	
	(13)	
	(2)	
	(47)	
Mean height		
		3.57
		3.52
		3.58
		3.55
		3.52
		3.43
		3.30
		3.54
		3.61
		3.47
		3.55
		3.50
		3.64
		(3.60)
		3.53
		3.51
		3.55

	(4)	
	(2)	
	(7)	
	(2)	
	(16)	
	(10)	
	(1)	
	(83)	
	(25)	
	(18)	
	(42)	
	(10)	
	(5)	
	(2)	
	(13)	
	(2)	
	(47)	
Mean breadth		
		3.86
		3.92
		3.98
		3.95
		3.94
		3.90
		3.82
		3.90
		3.88
		4.01
		3.90
		3.83
		4.05
		(3.80)

		3.88
		3.96
		3.85
	(4)	
	(2)	
	(7)	
	(2)	
	(16)	
	(10)	
	(1)	
	(83)	
	(25)	
	(*18*)	
	(*42*)	
	(*10*)	
	(*4*)	
	(*2*)	
	(*13*)	
	(*2*)	
	(*47*)	
Mean index		
		92.5
		89.8
		90
		89.4
		89.3
		88.1
		86.3
		90.8
		93
		91

		90.7
		91.4
		86.6
		(*94.7*)
		91.3
		88.6
		92.4
Nose:		
	(4)	
	(2)	
	(7)	
	(1)	
	(16)	
	(10)	
	(86)	
	(27)	
	(21)	
	(46)	
	(9)	
	(5)	
	(2)	
	(13)	
	(2)	
	(50)	
Height		
		5.20
		5.02
		5.10
		4.9
		5.08
		4.93

		4.9
		5.04
		5.19
		5.02
		5.11
		4.83
		5.06
		4.90
		4.98
		5.30
		4.99
	(4)	
	(2)	
	(7)	
	(1)	
	(16)	
	(10)	
	(1)	
	(86)	
	(27)	
	(21)	
	(46)	
	(9)	
	(5)	
	(2)	
	(13)	
	(2)	
	(50)	
Breadth		
		2.32
		2.50

		2.26
		2.3
		2.32
		2.33
		2.6
		2.28
		2.32
		2.23
		2.29
		2.14
		2.21
		2.15
		2.20
		2.32
		2.20
	(*4*)	
	(*2*)	
	(*7*)	
	(*1*)	
	(*16*)	
	(*10*)	
	(*1*)	
	(*86*)	
	(*27*)	
	(*21*)	
	(*46*)	
	(*9*)	
	(*5*)	
	(*2*)	
	(*13*)	
	(*2*)	

	(*50*)
Index	
	44.6
	49.8
	44.3
	46.9
	45.7
	47.3
	53.1
	45.3
	44.7
	44.4
	44.9
	44.4
	43.7
	43.9
	44.3
	43.9
	44
Upper alveolar arch:	
	(3)
	(1)
	(6)
	(1)
	(15)
	(6)
	(73)
	(23)
	(16)
	(33)
	(6)

	(4)	
	(2)	
	(12)	
	(2)	
	(45)	
Length		
		5.77
		5.5
		5.61
		5.3
		5.61
		5.67
		5.5
		5.21
		5.22
		5.34
		5.25
		5.38
		5.50
		4.85
		5.44
		5.20
		5.35
	(3)	
	(1)	
	(6)	
	(1)	
	(15)	
	(6)	
	(1)	
	(73)	

	(23)	
	(16)	
	(33)	
	(6)	
	(4)	
	(2)	
	(12)	
	(2)	
	(45)	
Breadth		
		6.73
		6.4
		6.46
		6.6
		6.57
		6.67
		6.4
		6.19
		6.13
		6.29
		6.01
		6.22
		6.60
		5.85
		6.22
		6.20
		6.16
	(*3*)	
	(*1*)	
	(*6*)	
	(*11*)	

(*15*)
(*6*)
(*1*)
(*73*)
(*23*)
(*16*)
(*33*)
(*6*)
(*4*)
(*2*)
(*12*)
(*2*)
(*45*)

Index

85.7
85.9
86.8
80.3
85.3
85
85.9
84.3
85.1
84.9
87.4
86.5
83.3
82.9
87.6
83.9
86.8

	(3)
	(1)
	(4)
	(14)
	(1)
	(1)
	(3)
	(3)
	(17)
	(1)
	(2)
	(2)
	(5)
	(2)
	(13)
Lower jaw: Height at symphysis	
	3.73
	3.7
	3.60
	3.56
	3.8
	3.9
	3.38
	3.27
	3.38
	3.7
	3.20
	3.15
	3.46
	3.42
	3.40

FOOTNOTES:

[156] Compare writer's Variation in the dimensions of lower molars in man and anthropoid apes, Am. J. Phys. Anthrop., VI, 423-438, Washington, 1923.

[157] Rivet, P., Recherches sur le prognathisme. L'Anthropologie, XX, pp. 35, 175; Paris, 1909. XXI, pp. 505, 637, 1910.

[158] Cat. Crania, U. S. Nat. Mus., etc., No. 3. Washington, 1928, 88, 105, 139.

[159] Lower angles mean higher, higher angles lower facial or alveolar protrusion.

SKULLS OF ESKIMO CHILDREN

A special effort in our work has been made to secure well-preserved skulls of children. As elsewhere, so among the Eskimo, more children die than adults, but conditions are not favorable for the preservation of their skeletal remains. Most of the bones are done away with or damaged by animals (foxes, dogs, mice, etc.), while others decay, so that generally nothing remains of the youngest subjects and but a few bones and a rare skull of the older children. The total number of such skulls in our collection now reaches 25. They are all of children of more than 2 but mostly less than 6 years old, and are all normal specimens. The principal measurements of their vault —a study of the face is a subject apart and needing more material—are given in the following tables.

Crania of Eskimo Children

Catalogue No.
Collector
Locality
Deformation
Vault
Cranial index

		Mean height Index	Height-breadth index	Basion-nasion	Basion-nasion diameter vs. length of skull	Length	Breadth	Height
						U.S.N.M.		
332563								
A. Hrdlička								
Pastolik								
								16.4
								13.1
								79.9
332566								
	do							
	do							
								15.6
								13
								82.8
332564								
	do							

	do	
		16.6
		13.8
		12
		83.1
		79
		87
		8.4
		50.6
339037		
Collins and Stewart		
Togiak		
		16.5
		13.4
		12.2
		81.2
		81.6
		91
		9.2
		55.8
339087		
	do	
Nelson Island		
		16.1
		13.5
		12.8
		83.8
		86.5
		94.8
		9.2
		57.1

339088		
	do	
	do	
		16.2
		13.6
		11.6
		84
		77.9
		85.3
		7.8
		48.1
339056		
	do	
Mumtrak		
		16.3
		13.8
		12.8
		84.7
		85
		92.7
		8.9
		54.6
339063		
	do	
	do	
		15.7
		14
		12.2
		89.2
		82.2
		87.1

		8.6
		54.8
339113		
	do	
Hooper Bay		
		16.2
		13.8
		85.2
	(9)	
	(9)	
	(6)	
	(9)	
	(6)	
	(6)	
	(6)	
	(6)	
Total		
		144.6
		122
		73.6
		52.1
Average		
		16.07
		13.56
		12.27
		84.4
		82.5

		89.6
		8.68
		54
SOUTHWESTERN AND MIDWESTERN ESKIMO		
339172		
H. B. Collins, jr., and T. D. Stewart		
Nunivak Island		
		16.9
		12.6
		12
		74.6
		81.4
		95.2
		9.1
		53.8
339153		
	do	
	do	
		17.4
		13.4
		12.4
		77
		80.5
		92.5
		9.2
		52.9
339198		
	do	
	do	
		16.6
		12.8

		12.7
		77.1
		86.4
		99.2
		8.6
		51.8
339222		
H. B. Collins, jr., and T. D. Stewart.		
Nunivak Island		
		16.8
		13.4
		12.2
		79.8
		80.8
		91
		9
		53.6
339197		
	do	
	do	
		17
		13.6
		12.4
		80
		81
		91.2
		9.1
		53.5
339199		
	do	
	do	

		16.1
		13.3
		82.6
339152		
	do	
	do	
		17
		14.5
		12.6
		85.3
		80
		86.9
		8.7
		51.2
	(7)	
	(7)	
	(6)	
	(7)	
	(6)	
	(6)	
	(6)	
	(6)	
Total		
		117.8
		93.6
		74.3
		53.7

Average		
		16.83
		13.37
		12.38
		79.5
		81.6
		92.5
		8.95
		52.8
279569		
R. D. Moore		
St. Lawrence Island		
		17.6
		13.4
		12.2
		76.1
		78.7
		91
		9.3
		52.8
279568		
	do	
	do	
		17.1
		13.2
		12.8
		77.2
		84.5
		97

		9.3
		54.4
279495		
	do	
	do	
		16.8
		13.1
		12.6
		78
		84.3
		96.2
		9.1
		54.2
279479		
	do	
	do	
		16.8
		13.2
		12.8
		78.6
		85.3
		97
		9
		53.6
279462		
	do	
	do	
		16.2
		13
		12.8
		80.3

		87.7
		98.5
		9.2
		56.8
279421		
	do	
	do	
		16.4
		13.4
		12.1
		81.7
		81.2
		90.3
		8.4
		51.2
279448		
	do	
	do	
		16.4
		13.5
		82.3
279591		
	do	
	do	
		14.7
		12.4
		84.3
279443		
	do	
	do	

	16.4
	13.9
	12.4
	84.8
	81.8
	89.2
	8.6
	52.4
(9)	
(9)	
(7)	
(9)	
(7)	
(7)	
(7)	
(7)	
Total	
	146.4
	119.1
	87.7
	62.9
Average	
	16.27
	13.23
	12.53
	81.4
	84.1

	94.1
	8.99
	54.5

A. M. N. H.

	99-4106
G. Comer Southampton Island	
	17.4
	13.3
	12.8
	76.4
	83.4
	96.2
	8.8
	50.6
	4657
do Hudson Bay	
	16.9
	13.2
	12.2
	78.1
	81.1
	92.4
	9.1
	53.8
	7690
Capt. Bartlett Etah, Smith Sound	

	16.6
	13.4
	12.7
	80.7
	84.7
	94.8
	9.2
	55.4

Principal Cranial Indices in Children Compared With Those in Adults

Cranial index	
Mean height index	
Height-breadth index	
BN-skull length index	
Percentage relation of dimensions of the vault in adults and children (adults = 100)	
Length	
Breadth	
Height	
Basion-nasion diameter	
South western and Midwestern Eskimo[160]	
Children	
	84.4
	82.5
	89.6
	54
	90.1
	96.7
	93.2

	86.5
Adults (both sexes)	
	79.3
	82.3
	93
	56
Nunivak Island	
Children	
	79.5
	81.6
	92.5
	52.8
	91.7
	96.4
	92.3
	87.1
Adults (both sexes)	
	75.6
	83.3
	96.7
	56
St. Lawrence Island	
Children	
	81.4
	84.1
	94.1
	54.5
	90.2
	95.2
	93.2
	88.6
Adults (both sexes)	

	77.3
	84.1
	96.5
	56.2
All	
Children	
	81.8
	82.7
	92.1
	53.8
	90.8
	96.1
	92.9
	87.4
Adults	
	77.4
	83.2
	95.4
	56.1

The main interest centers in the comparison of the relative proportions of these skulls with those of the adults from the same localities. These comparisons, given in the smaller table, are of considerable interest.

The cranial index is considerably higher in the children. On analysis this is found to be due almost wholly to a greater relative breadth of the child's skull. During later growth the Eskimo cranium advances materially more in length than in breadth. A further expansion in breadth is evidently hindered by some factor outside of the bones themselves, for nothing appears in these that could constitute such a

hindrance. And the only evident outside factor capable of producing such an effect are the strong pads of the temporal muscles.

The mean height index

$$\frac{H \times 100}{\text{mean of } L + B}$$

remains much the same in the children and adults, indicating that the relative increase during growth in skull length compensates for the lagging increase in breadth, while the proportion of the height to the mean of the length and breadth remains fairly stable.

The much greater growth in length than in breadth of the Eskimo skull from childhood onward is shown even better in the second part of the table by a direct comparison of the mean dimensions. The length of the adult skull is by over 9 per cent, the breadth by less than 4 per cent, greater than that in childhood in the same groups.

The adult Eskimo skull has also grown very perceptibly more in height than in breadth, though somewhat less so than in length. The result is a notably higher height-breadth index in the adult. Compared to that in childhood the adult Eskimo skull is therefore relatively markedly longer, higher, and narrower.

These facts are probably of more significance than might seem at first glance; for it is precisely by the same characters, carried still further, that some of the Eskimo differ from others. Let us compare two of our largest and best groups, those of St. Lawrence Island and Greenland:

Number of skulls (both sexes)
Skull length

	Breadth	
	Height	
St. Lawrence Island		
	(293)	
		18.05
		13.90
		13.45
Greenland		
	(101)	
		18.51
		13.30
		13.54

The Greenland skull is longer, narrower, and somewhat higher. The differences are less than those between a child and an adult western Eskimo, but of the same nature. This apparently speaks strongly for the development of the Greenland type of Eskimo cranium from the western. On the other hand, the type of skull shown by the Eskimo child approaches much more closely than that of the Eskimo adult to the type of the skull of the Mongol.

The above are mere observations, not theories, and they carry a strong indication that mostly we are still floundering only on the borders of true anthropology, embracing all phases of life and development, which, if mastered, would give us with beautiful definition many now vainly sought or barely glimpsed solutions.

A highly interesting feature is the relatively great development in the Eskimo, between childhood and the adult stage, of the anterior half of the skull or basion-nasion dimension. This augments, it is seen, by even 3.4 per cent more than the length. This

growth must involve some additional factor to those inherent in the bones themselves and in the attached musculature, and this can only be, it seems, the development of the anterior half of the brain. Evidently this portion of the brain between childhood and adult life grows in the Eskimo more rapidly than that behind the vertical plane corresponding to the basion. It is a very suggestive condition calling for further study, and thus far almost entirely wanting in comparative data on other human as well as subhuman groups.

FOOTNOTES:

[160] Same group for adults as for children.

THE LOWER JAW

The lower jaw of the Eskimo deserves a thorough separate study. For this purpose, however, more jaws in good condition are needed from various localities, and particularly more jaws accompanying their skulls. As it is, a large majority of the crania are without the lower jaw, or the alveolar processes of the latter have become so affected in life through age and loss of teeth that their value is diminished or lost. Still another serious difficulty is that the measuring of the lower jaw is difficult and has not as yet been regulated by general agreement, so that there is much individualism of procedures with limited possibilities of comparison.

One of the principal measurements taken on the available Eskimo mandibles was the symphyseal height. This is taken by the sliding calipers and is the height from the lower alveolar point (highest point of the normal alveolar septum between the middle lower incisors) to the lowest point on the inferior border of the chin in the median line.[161] The results are given in the following tables.

Eskīmo Lower Jaw: Height at Symphysis

Male
Female
Southwestern and midwestern

Northwestern	
Northern and eastern	
Southwestern and midwestern	
Northwestern	
Northern and eastern	
Groups (main)	
	(9)
	(5)
	(5)
	(9)
	(5)
	(5)
Specimens	
	(116)
	(143)
	(40)
	(121)
	(134)
	(25)
Average	
	3.75
	3.76
	3.67
	3.38
	3.34
	3.39
General mean in western Eskimo	
	3.76
	3.36
Percental relation of female to male (M = 100)	
	89.4

Males, 19 groups (399 jaws)
Females, 19 groups (280 jaws)
General mean for all Eskimo (approximate)
3.73
3.37
Percental relation of female to the male
90.4
General mean of total facial height
12.47
11.60
Percental relation of height of jaw to total facial height
30
29
General mean of upper facial height
7.76
7.20
Percental relation of height of jaw to upper facial height
48
47

Just what these figures mean will best be shown by a table of comparisons.[162] All these are my own measurements.

Lower Jaw of Various Races: Height at Symphysis

Male
Female
Female versus

	male (M = 100)	
	(399)	
	(280)	
Eskimo (all)		
		3.73
		3.37
		90.4
North American Indians:		
	(36)	
	(26)	
Sioux		
		3.60
		3.22
		89.4
	(52)	
	(50)	
Arkansas		
		3.66
		3.24
		88.5
	(29)	
	(21)	
Florida		
		3.69
		3.38
		91.4
	(9)	
	(6)	
Munsee		

		3.70
		3.40
		91.9
	(15)	
	(14)	
Louisiana		
		3.72
		3.29
		88.4
	(44)	
	(30)	
Kentucky		
		3.49
		3.18
		91.1
	(50)	
	(30)	
U. S. whites (miscellaneous)		
		3.29
		2.87
		87.2
	(41)	
	(8)	
Negro, full-blood, African and American		
		3.54
		3.14
		[163]*88.7*
	(261)	
	(191)	
Australians		

	3.44
	3.07
	89.2

The table shows the Eskimo jaw to be absolutely the highest at the symphysis of all those available for comparison, with the female nearly the highest.[164] Relatively to stature it exceeds decidedly all the groups, the Indians that come nearest matching it in the absolute measurement being all much taller than the Eskimo. And the female Eskimo jaw is relatively high compared with that of the male, being exceeded in this respect only in three of the Indian groups, in two of which, however, the showing is due wholly and in one partly to a lesser height of the male jaw. The relative excess of the female jaw in this respect seems particularly marked in the northern and northeastern groups, though it must remain subject to corroboration by further material.

The white, Negro, and Australian data have an interest of their own.

FOOTNOTES:

[161] Should there be a decided notch in the middle, as happens in rare specimens, it is rational to take the measurement to the side of the notch.

[162] From my Phys. Anthr. of the Lenape, etc., the Anthropology of Florida, and the Catalogue of Crania.

[163] Approximately.

[164] Rudolf Virchow, as far back as 1870, in studying some mandibles of the Greenland Eskimo, found that the height of the body in the middle (3.5 centimeters) was greater than

that of the lower jaws of any other racial group available to him for comparison. Archiv. für Anthrop., IV, p. 77, Braunschweig, 1870.

Strength of the Jaw

The Eskimo jaw is generally stout. Barring rare exceptions there is nothing slender about it. The body, moreover, is frequently strengthened by more or less marked overgrowths of bone lingually below the alveoli and above the mylohyoid ridge. These neoformations will be discussed later.

The strength of the mandible may be measured directly in various locations on the body. Due to the peculiar build of the body, however, and especially to its variations, these measurements are by no means simple and wholly satisfactory. It is hardly necessary in this connection to review the various attempted methods, none of which has become standardized. As a result of experience I prefer since many years to measure the thickness of the body of the jaw at the second molars, and that in such a way that either the molars, if the measurement is taken from above, or the lower border of the jaw if it is taken from below, lies midway between the two branches of the sliding calipers with which the measurement is taken. The two methods (from above or below) give results that are nearly alike. In some cases the one and in others the other is the easier, but wherever the teeth are lost the measurement from below is perhaps preferable. The records obtained on the lower jaws of the western Eskimo and other racial groups are given in the next table.

Thickness of the Body of the Lower Jaw at the Second Molars in the Western Eskimo and Other

Groups
Male
Female
Female versus male (M = 100)
Right side
Left side
Right side
Left side
(240)
(243)
Western Eskimo
millimeters
16.2
16.3
15.1
15.1
92.9
(29)
(28)
Florida Indians
do
16.6
15.5
93.4
(21)
(16)
Louisiana Indians
do
16.3
15.3

	93.9
	(58)
	(47)
Arkansas Indians	
	do
	15.2
	14.7
	96.7
	(40)
	(22)
Kentucky Indians	
	do
	14.7
	14.2
	96.6
	(50)
	(20)
American whites (misc.)	
	do
	14.5
	12.8
	88.3

The figures show that the Eskimo jaw is very stout. It is exceeded in thickness only by the jaws of Florida, which in general are the thickest in America, and in males is about equaled, in females very slightly exceeded by those of the prehistoric Indians of Louisiana, who belong to the same Gulf type with the Indians of Florida. The old Arkansas Indians, though closely related to those of Louisiana, show a very perceptibly more slender jaw, particularly in the

males; while in an old Kentucky tribe (Green River, C. B. Moore, collector) the jaws are still less strong. The lower jaws of the American whites (dissecting-room material) are slightly less stout than even those of the Indians of Kentucky in the males, and much less so in the females. The interesting sex differences are shown well in the last column of the above table.

Breadth of the Rami

Still another character that reflects the strength of the lower jaw is the breadth of the rami. The most practicable measurement of this is the breadth minimum at the constriction of the ascending branches. A great breadth of the rami is very striking, as is well known, in the Heidelberg jaw, and the Eskimo have long been known for a marked tendency in the same direction. The measurements of the lower jaws of the western Eskimo show as follows:

Lower Jaws of the Western Eskimo and Other Racial Groups: Breadth Minimum of the Ascending Branches

Male
Female
Female versus male (M = 100)
Right
Left
Right
Left

	(243)	
	(240)	
	(237)	
	(228)	
Western Eskimo		
	centimeters	
		3.99
		4.03
		3.68
		3.70
		92
	(20)	
	(20)	
	(13)	
	(13)	
Florida Indians		
	do	
		3.82
		3.85
		3.39
		3.34
		87.7
	(21)	
	(19)	
	(19)	
	(16)	
Louisiana Indians		
	do	
		3.72
		3.72
		3.29

		3.27
		88.2
	(62)	
	(60)	
	(58)	
	(61)	
Arkansas Indians		
	do	
		3.47
		3.47
		3.24
		3.23
		93.2
	(42)	
	(40)	
	(30)	
	(29)	
Kentucky Indians		
	do	
		3.44
		3.44
		3.18
		3.21
		92.9
	(50)	
	(50)	
	(20)	
	(20)	
United States whites (miscellaneous)		
	centimeters	
		3.17

	3.14
	2.89
	2.82
	90.5

The Eskimo jaws, and particularly that of the female (relatively to other females), have the broadest rami. Otherwise the series range themselves in the same order as under the measurement of the stoutness of the body.

Other Dimensions

Four other measurements were taken on the jaws, namely the length of the body (on each side); the height of the two rami; the bigonial diameter; and the body-ramus angle. The results of the first three may conveniently be grouped into one table.

Additional Measurements on the Lower Jaw

MALE

Length of body, each side[165]	
Length of body as a whole[166]	
Height of ramus[167]	
Diameter bigonial[168]	
Right	(236)
Left	(236)
Right	(100)
Left	(132)

	(131)
	(201)
Western Eskimo	
	10.28
	10.28
	8.03
	6.45
	6.38
	11.42
	(24)
	(18)
	(22)
Florida Indian	
	8.45
	6.72
	10.75
	(19)
	(15)
	(17)
Louisiana Indian	
	8.44
	7
	10.67
	(62)
	(52)
	(57)
Arkansas Indian	
	7.88
	6.52
	10.49

	(42)
	(37)
	(38)
Kentucky Indian	
	7.45
	6.48
	10.48
	(50)
	(50)
	(50)
U. S. whites (miscellaneous)	
	7.57
	6.53
	10.11
FEMALE	
	(230)
	(228)
	(100)
	(134)
	(128)
	(199)
Western Eskimo	
	9.61
	9.60
	7.47
	5.61
	5.57
	10.57
	(19)
	(18)
	(17)

Florida Indian	
7.72	
6.02	
9.70	
(16)	
(15)	
(15)	
Louisiana Indian	
7.38	
5.77	
9.90	
(57)	
(52)	
(56)	
Arkansas Indian	
7.46	
5.85	
9.58	
(30)	
(25)	
(30)	
Kentucky Indian	
7.12	
5.64	
9.45	
(20)	
(20)	
(20)	
U. S. whites (miscellaneous)	
7.02	

	5.87
	9.12

Females to Males (M = 100)

Length each side	Length as a whole	Height of rami	Diameter bigonial
Western Eskimo			
			93.4
			93.0
			87.3
			92.6
Florida Indian			
			91.4
			89.6
			90.2
Louisiana Indian			
			87.4
			82.4
			92.8
Arkansas Indian			
			94.6
			89.7
			91.3
Kentucky Indian			
			95.6
			87.0
			90.2
U. S. whites (miscellaneous)			

	92.7
	89.9
	90.2

The Eskimo lower jaw, which, as seen before, is characterized by a high and stout body and the broadest rami, shows further that these rami are remarkably low, and that the bigonial spread is extraordinarily broad. The length of the body, on the other hand, is not very exceptional, being perceptibly exceeded in some of the Indians.

FOOTNOTES:

[165] Sliding calipers: Separate measurement of each half of the body, from the lowest point on the posterior border of each ramus not affected by the angle to a point of corresponding height on the line of the symphysis. The anterior point may, in consequence of a lower or higher location of the posterior point, range from the chin to above the middle of the symphysis, but the results are much alike. The measurement leaves much to be desired, but is the best possible if the two halves of the body are to be measured separately.

[166] The length of the whole jaw is measured on Broca's mandibular goniometer, by laying the jaw firmly on the board, applying the movable plane to both rami, and recording the distance of the most anterior point of the chin from the base of the oblique plane. This measurement is easier than the previous, though on account of the variation in the angles and the lower part of the posterior border of the rami it is also not fully satisfactory, and it does not show the

differences in the two halves of the body.

[167] Sliding calipers: One branch applied so that it touches the highest points on both the condyle and the coronoid, while the other is applied to the lowest point of the ramus anterior to the angle, if the bone here is prominent; if receding, the branch of the compass is applied to the midpoint on the lower border of the ramus.

[168] Sliding calipers: Maximum external diameter at the angles; the maximum points may, exceptionally, be either anterior to or a little above the angle proper.

The Angle

The angle between the body and the ramus of the lower jaw is known to differ with the age and sex as well as individually. Not seldom it differs also, and that sometimes quite appreciably, on the two sides. Racial differences are as yet uncertain.

The angle, especially in some specimens, is not easy to measure, and the position of the jaw may make a difference of several degrees. Numerous trials have shown that the proper way is to measure the angle on the two sides separately, and to so place the jaw in each case that there is no interference with the measurement by either the posterior or the anterior enlarged end of the condyle.

Leaving out jaws in which extensive loss of teeth has in all probability resulted in changes in the angle, the western Eskimo material gives the following data:

Western Eskimo: Angle of the Lower Jaw

Male

	Female	
	(224)	
	(217)	
Right side		
		119.6°
		124.5°
	(218)	
	(207)	
Left side		
		119.5°
		124.3°

In the male Munsee Indians the angle was 118°; in those of Arkansas and Louisiana, 118.5°; in those of Peru (Martin, Lehrb., 884), 119°. In the whites, males, the average angle approximates 122°; in the Negro, 121° (Topinard, Martin).

The angle in the female in the Eskimo is to that of the male as 104 to 100; in the Arkansas and Louisiana series it was 103. In the whites the proportion seems to be a little higher.

There are evidently, if we exclude the whites in whom the shortness of the jaw conduces probably to a wider angle, no marked racial differences, but the subject needs a more thorough study on large series of sexually well-identified specimens, carefully selected as to age.

The average angle on the right differs in the Eskimo but very slightly from that on the left, though individually there are frequent unequalities.

Résumé

The Eskimo lower jaw differs substantially in many respects from that in other races, particularly from that of the whites. It is characterized by a high and stout body; by broad but low rami; and by excessive breadth at the angles. The body-ramus angle is moderate. To which may be added that the chin is generally of but moderate prominence, and that the bone at the angles in males is occasionally markedly everted.

Mandibular Hyperostoses

These hypertrophies or hyperostoses are rarely met with also in the jaws of the Indian and other people. They are symmetric and characteristic, though often more or less irregular. They generally extend from the vicinity of the lateral incisors or the canines backward, forming when more developed a marked bulge on each side opposite the bicuspids, which gives the inner contour of the jaw when looked at from above a peculiar elephantine appearance. They may occur in the form of smooth, oblong, somewhat fusiform swellings, or as a continuous more or less uneven ridge, or may be represented by from one to four or five more or less rounded or flattened hard "buttons" or tumorlike elevations. In development they range from slight to very marked.

These hyperostoses have been reported by various observers (Danielli, Søren Hansen, Rudolf Virchow, Welcker, Duckworth & Pain, Oetteking, Hrdlička, Hawkes). They received due attention by Fürst and Hansen in their "Crania Groenlandica" (p. 178). They have been given the convenient, though both etiologically and morphologically inaccurate, name of "mandibular torus"; I think mandibular hyperostoses or simply welts would be better. Fürst

and Hansen found them, taking all grades of development, in 182, or 85 per cent, of 215 lower jaws of Greenland Eskimo; in 28 jaws, or 13 per cent, they were pronounced, the remainder being slight to medium. A special examination of 62 lower jaws of children and 710 lower jaws of adult western Eskimo (with a small number from Greenland) gives the following record:

Lingual Mandibular Hyperostoses in the Western Eskimo

	None or indistinguishable	Slight to moderate	Medium	Pronounced
CHILDREN [62 mandibles, completion of milk dentition to eruption of second permanent molar]				
Specimens	47	[169]10	[170]5	
Per cent	*75.8*	*16.1*	*8.1*	
ADULTS [Both sexes. 710 mandibles]				
Specimens	215	356	114	

	25
Per cent	
	30.3
	50.1
	16.1
	3.5

ADULTS
[Sexes separately. M. 350; F. 360 mandibles]

Males	
Females	
Males	
Females	
Males	
Females	
Males	
Females	
Specimens	
	71
	144
	193
	163
	67
	47
	19
	6
Per cent	
	20.3
	40.0
	55.1
	45.3

19.1
13.1
5.4
1.7

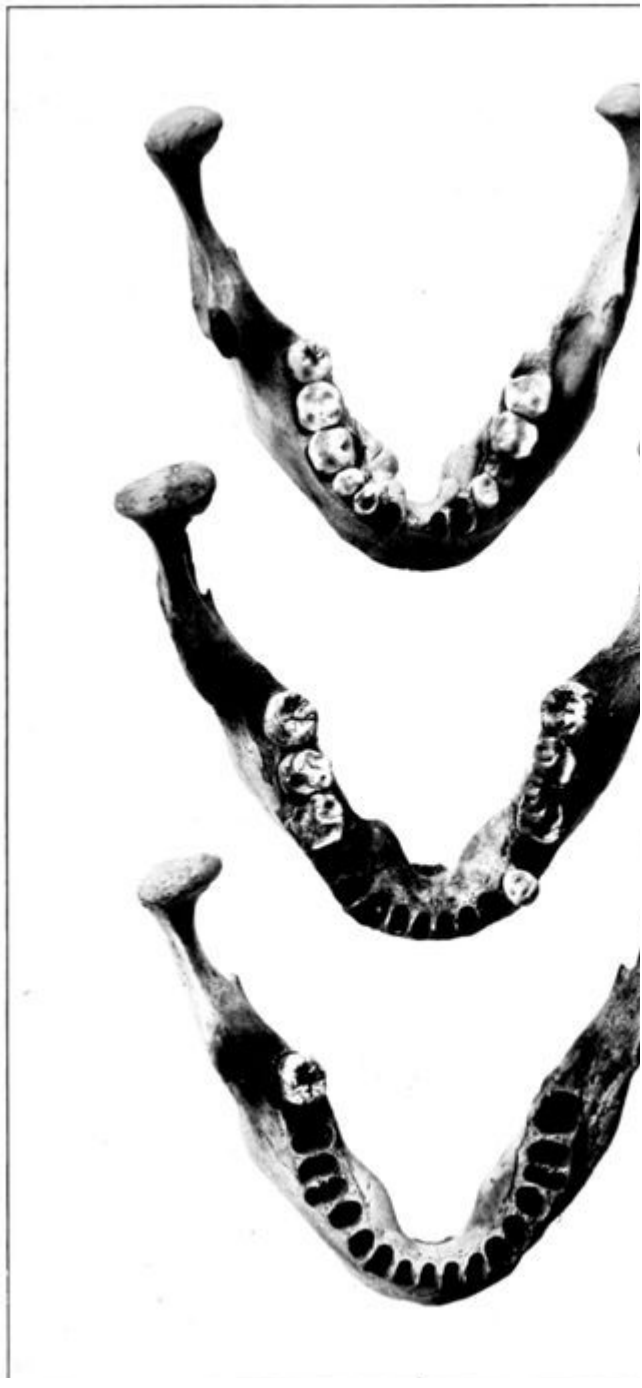
The significance of these hyperostoses is not yet quite clear. Danielli, who in 1884 reported them[171] in the Ostiaks, Lapps, a Kirghiz, a Peruvian Indian, and four white skulls, offered no explanation. For Søren Hansen,[172] who first suggested the resemblance of these formations to the torus palatinus, "the significance of this feature, which also occurs in other Arctic races not directly related to the Eskimos, is not clear." R. Virchow,[173] who reports "wulstigen und knolligen Hyperostosen" on both the upper and lower jaws of a Vancouver Island Indian, restricts himself to a brief mention of the condition with a suggestion as to its causation (see later). Welcker[174] found them in the skulls of a German (Schiller?), Lett, and a Chinese, but has nothing to say as to their meaning. Duckworth and Pain[175] report the "thickening" in 10 out of 32 Eskimo jaws, but do not discuss the causation; and the same applies to Oetteking,[176] who reported on a series of Eskimo from Labrador. In 1909 Gorjanovič-Kramberger[177] somewhat indirectly notes the condition, without a true appreciation of its meaning.

In 1910 I had the opportunity to report on the mandibular hyperostoses in a rare collection of crania and lower jaws of the central and Smith Sound Eskimo.[178] Of 25 lower jaws of adults and 5 of children, 18, or 72 per cent, of the former and 2 of the latter showed distinct to marked lingual hyperostoses, while in the remaining cases the feature was either doubtful (absorption of the

alveolar process) or absent. Two of the five children showed the peculiarity in a well-marked degree. A critical consideration of the condition leads me to the conclusion that it is not pathological, and my remarks were worded (p. 211) as follows: "A marked and general feature is a pronounced bony reinforcement of the alveolar arch extending above the mylohyoid line from the canines or first bicuspids to or near the last molars. This physiological hyperostosis presents more or less irregular surface and is undoubtedly of functional origin, the result of extraordinary pressure along the line of teeth most concerned in chewing; yet its occurrence in infant skulls indicates that at least to some extent the feature is already hereditary in these Eskimo."

In 1912, Kajava[179] reported lingual hyperostotic thickenings on the lower jaws of 68 adult Lapps, and found the condition in frequent association with pronounced wear of the teeth. In 1915, finally, Fürst and C.C. Hansen, in their great volume on "Crania Groenlandica," approach this question much more thoroughly. They, as also Kajava, did not know of the writer's report of 1910. They found the "torus" (p. 181), "also in the mandibles of some various Siberian races in a not insignificant percentage * * * and also not infrequently among European races, especially in the Laplanders (30 to 35 per cent)." They also report the presence of the condition "in a Chinaman," and saw indications of a good development of it in 17 per cent of 164 middle ages to prehistoric, and in 12 per cent of later Scandinavian lower jaws. Their interesting comments on its possible causation, though at one point seemingly not harmonizing, are as follows (p. 180): "The possibility is not precluded that we have here a formation which, even though it has at first arisen and been acquired through

mechanical causes, has in the end become a racial character, albeit a variable one." And page 181: "There seems to be no doubt whatever that it is a formation connected with Arctic races or Arctic conditions of life; and, accordingly, it can not safely be assumed to be a racial character, however difficult it is to regard it as a formation only acquired individually."





Western Eskimo and Aleut (middle) Lower Jaws, Showi
(U.S.N.M.)

With both the previously published and the present data, I believe the subject of these bony formations may now be approached with some hope of definite conclusions.

These hyperostoses give no indication of being pathological. They are formed largely, if not entirely, by compact bone tissues of evidently normal construction. They never show a trace of attending inflammation or of ulceration or of breaking down. They resemble occasionally the osteomae of the vault of the skull, and more distantly the osteomae of the auditory meatus, but in those cases where the bony swelling is uniform and in many others they show to be of quite a different category. (Pl. 61.)

As a rule these bony protuberances in the Eskimo are not connected with evidence of pyorrhoea, root abscesses, or any other pathological condition of the teeth, for those conditions are practically absent in the older Eskimo skulls; therefore they can not be ascribed to any irritation due to such conditions, and the Eskimo have no habits that could possibly be imagined as favoring, through mechanical irritation, the development of these bony swellings. Wear of the teeth, which has been thought to stand possibly in a causative relation to these developments, is common in many races and even in animals (primates, etc.), without being accompanied by any such formations.

The development of such overgrowths is not wholly limited, as already indicated from the cases reported

by Danielli (1884) and Virchow (1889), to the lower jaw, but somewhat similar growths may also be observed, though much more rarely, both lingually and on the outer border of the alveolar process of the upper jaw in the molar region. When present in the latter position they interfere with the measurement of the external breadth of the dental arch.

But, if neither pathological themselves nor due to any pathological or mechanical irritation, then these hyperostoses can only be, it would seem, of a physiological, ontogenic nature; and if so, then they must be brought about through a definite need and for a definite purpose or function.

These views are supported by their marked symmetry, which is very apparent even where they are irregular; by the fact that in general they are not found in the weakest jaws (weak individuals), or again in the largest and stoutest mandibles (jaws that are strong enough, as it is); and by the history of their development.

Our rather extensive present data on children show that these formations are absent in infancy. They begin to develop in older childhood, in adolescence, or even during the earlier adult life; they stop developing at different stages in different individuals, and they never lead to any deformity of the body of the mandible.

These overgrowths are further seen to be more common and to more frequently reach a pronounced development in the males than in the females.

What is the effect of these hyperostoses? They strengthen the dental arch. With them the arch is stronger; without them it would be weaker. The view is therefore justified that they augment the

effectiveness of the dental arch; which is just what is needed or would be useful in such people as the Eskimo where the demands on the jaws exceed in general those in any other people.

All these appear to be facts of incontrovertible nature; but if so then we are led to practically the same conclusion that I have reached in the study of the central and Smith Sound Eskimo, which is that the lingual mandibular hyperostoses are physiological formations, developed in answer to the needs of the alveolar portions of the lower jaw. They could be termed synergetic hyperostoses.

The process of the development of these strengthening deposits of bone is probably still largely individual; yet the tendency toward such developments appears to be already hereditary in the Eskimo, as indicated by their beginning here and there in childhood. But their absence in nearly one-third of the Eskimo mandibles, their marked differences of occurrence and development in the two sexes, and their occasional presence in the jaws of various other peoples, including even the whites, speak against the notion of these hyperostoses being as yet true racial features.

Taking everything into consideration, the writer is more than ever convinced that the lingual hyperostoses of the normal lower (as well as the upper) jaw, in the Eskimo as elsewhere, are physiological, ontogenic developments, whose object and function is the strengthening of the lower alveolar process in its lateral portions. Only when excessively developed, which is very rare, they may, mechanically, perhaps cause discomfort and thereby approach a pathological condition.

FOOTNOTES:

[169] None in the younger children.

[170] All in older children or adolescents.

[171] Danielli, J., Arch. p. l'antrop. e l'etnol., 1884, XIV.

[172] Meddel. om. Grønl., 1887, No. 17.

[173] Beitr. Kraniol. d. Insul. w. Küste Amer., 1889, 398.

[174] Arch. Anthrop., 1902, XXVII, 70.

[175] J. Anthr. Inst., 1900, XXX, 134.

[176] Abh. und Ber. Zool. und Anthr. Mus., Dresden, 1908, XII.

[177] Sitzber. preuss. Ak. Wiss., LI-LIII.

[178] Anthrop. Pap's. Am. Mus. Nat. Hist., V, pt. II.

[179] Verh. Ges. Finn. Zahnärzte, 1912, IX.

Main References

Danielli,[180] 1884: "Saw the condition in lower jaws of 1 Swede, 1 Italian, 1 Terra di Lavoro jaw, 1 Slovene, 1 Hungarian, 1 Kirghis, 1 ancient Peruvian."

Found hyperostoses in 9 out of 14 Ostiak lower jaws.

Material: Young 2, adult 6, old 6.

Hyperostoses in young 1, adult 3, old 5.

Mantegazza, at his request, examined some Ostiak and Eskimo skulls in Berlin and found the hyperostoses in 2 Ostiak lower jaws (slight) and in 1 Eskimo skull from Greenland (marked).

Found also smaller hyperostoses in the upper jaw

ventrally to the molars ("situate quasi sempre dalla parte interna in corrispondenza dei molari"):

Skulls: 2 Italians, 1 Hungarian, 7 Norwegians, 2 Lapps, 5 Ostiaks.

Plate shows 8 lower jaws, 1 with slight, 7 with marked hyperostoses (1 symphyseal swellings, 3 tumorlike).

Refrains from interpretation (could not reach conclusion).

Virchow,[181] 1889, page 392: In upper jaws of three Santa Barbara skulls: "An den Alveolarrändern der weiblichen Schädel Nr. 3-6 von S. Barbara besteht eine höchst eigenthümliche und seltene, knollige Hyperostosis s. Osteosclerosis alveolaris, wie ich sie in gleicher Stärke früher nur bei Eskimos gesehen hatte. Ein leichter Ansatz dazu zeigt sich auch bei dem männlichen Schädel Nr. 4 von S. Cruz. Es dürfte dieser Zustand, der mit tiefer Abnutzung der Zähne zusammenfält, durch besonders reizende Nahrung bedingt sein."

Vancouver Island skulls: "dagegen sehen wir dieselbe alveolare Hyperostose, die wir bei den Leuten von S. Barbara und weiterhin bei Eskimos kennen gelernt haben."

Virchow,[182] 1892: "Der Alveolarrand gleichfalls mit hyperostotischen Wülsten besetzt, jedoch mehr an der inneren Seite, besonders stark in der Gegend per Prümolares und Canini, weniger stark in der Gegend der Incisici."

Welcker,[183] 1902: "Exostosen der Alveolarränder. Von erheblicher Beweiskraft können Eigenthümlichkeiten und Abnormitäten des Knochengewebes under der Knochenoberfläche

werden, wenn dieselben, bei an sich grosser Seltenheit ihres Vorkommens, an einem Oberschädel und Unterkiefer zugleich vorkommen.

"So fand ich am Unterkiefer der Gypsabgüsse des sogenannten Schillerschädels sehr merkwürdige, bis dahin nirgends erwähnte, erbsenförmige Exostosen an den Alveolen der Eck- und Schneidezähne. Ganz ähnliche, wenn auch etwas flächere Exostosen zeigen die Alveolen eben derselben Zähne des Oberschädels, und es beweist dieses seltene Vorkommen bei dem Zutreffen aller übrigen Zeichen das Zusammengehören beider Stücke mit hoher Sicherheit.

"In einer etwas anderen Form, in der dieselben einen geschlossenen, exostotischen Saum bilden, fand ich Alveolarexostosen bei einem Lettenschädel (G. Gandras, 47 J., Halle Nr. 52). Hier sind die Alveolarränder der Schneide-und Eckzähne mit flachen, am Oberkiefer streifenförmigen (senkrecht gestellten), am Unterkiefer mehr rundlichen Exostosen besetzt, so dass der sonst papierdünne Zahnflächenrand beider Kiefer in einen, die Zahnhälse begrenzenden wulst-förmigen Saum umgewandelt ist. Der gleiche Charakter dieser nicht häufigen Abnormität an beiden Kiefern giebt die vollste Ueberzeugung der Zusammengehörigkeit.

"In schwächerem Grade zeigt diesen Zustand ein Chinesenschädel der Halle'schen Sammlung (Lie Assie)."

Fürst,[184] 1908: "Wir haben hier auf diese interessante anatomische Bildung aufmerksam machen wollen, die, wenn nicht konstant, doch in sehr hohem Prozentsatze und in bestimmter charakteristischer Form bei den Eskimos auftritt und

in verschiedenen Variationen auf dem Unterkiefer anderer Rassen, speziell nordischer oder arktischer, vorkommt.—Wir wollen später eine ausführlichere Beschreibung über den Torus mandibularis mitteilen."

Gorjanovič-Kramberger,[185] 1909: "Durch die Ausbiegung der seitlichen Kieferflächen würde ferner die Druckrichtung der M und P eine gegen die innere Kieferwandung gerichtete. Als direkte Folge dieses Druckes hat man die starke Ausladung der entsprechenden lingualen Kieferseiten im Bereiche der P und M anzusehen, die da eine auffallende Einengung des inneren Unterkieferraumes bewerkstelligte."

Hrdlička (A.), 1910. See text.

Hansen,[186] 1914: "The lower jaws attached to the skulls are powerfully formed, high, and, above all, very thick, their inner surface being markedly protruding, rounded, and without any special prominence of linea mylohyoidea. This peculiarity, which is common enough, among the Eskimo and certain Siberian tribes, but is otherwise exceedingly rare, must be regarded as a hyperostosis of the same nature as the so-called torus palatinus. It is a partly pathological formation due to a peculiar mode of life rather than a true morphological mark of race."

Fürst, C. M., and Hansen, C. C., 1915. See text.

Cameron,[187] 1923: "In some instances the bony thickening was excessive. For example, in mandible XIV H-8 the inward bulging of the bone was so marked that the transverse distance between the inner surfaces of the body opposite the first molars was reduced to 21.5 millimeters. This jaw had therefore an extraordinary appearance when viewed

from below. (See fig. 5.) The writer would regard these bulgings as bone buttresses built up by nature to resist the excessive strain thrown upon the alveoli of the molar teeth. He exhibited the mandibles to Prof. H. E. Friesell, dean of the dental faculty, University of Pittsburgh, and this authority concurred in the opinion expressed above." A disagreement with this view is expressed by S. G. Ritchie, pages 64c-65c, same publication.

FOOTNOTES:

[180] Danielli, Jacopo, Iperostosi in mandibole umano specialmente di Ostiacchi, ed anche in mascellari superiore. Archivio per l'antropologia e l'etnologia, 1884, XIV, 333-346.

[181] Virchow, E., in Beiträge zur Craniologie der Insulaner von der Westküste Nordamerikas. Zeitschr. f. Ethnol. Verhandl., 1889, XXI, 395, 401.

[182] Virchow, R., Crania Ethnica Americana. Berlin, 1892, Tafel XXIII. A "long-head" male adult of Koskimo, Vancouver Island.

[183] Welcker, H., Die Zugehörigkeit eines Unterkiefers zu einem bestimmten Schädel, nebst Untersuchungen über sehr auffällige, durch Auftrocknung und Wiederanfeuchtung bedingte Gröben und Formveränderungen des Knochens. Arch. f. Anthropol., 1902, XXVII, 70.

[184] Fürst, Carl M., Demonstration des Torus mandibularis bei den Askimos und anderen Rassen. Verhandlungen der Anatomischen Gesellschaft in Berlin, 1908, Ergänzhft z. Anatom. Anz., 1908, XXXII, 295-296.

[185] Gorjanovič-Kramberger, K., Der

Unterkiefer der Eskimos (Grönländer) als Träger primitiver Merkmale. Sitzungsberichte der königlich preussischen Akademie der Wissenschaften, 1909, LI.

[186] Hansen, Søren, Contributions to the anthropology of the East Greenlanders. Meddelelser om Grønland, Copenhagen, 1914, XXXIX, 169.

[187] Cameron, John, The Copper Eskimos. Report of the Canadian Arctic Expedition, 1913-1918. Ottawa, 1923, XII, c. 55.

SKELETAL PARTS OTHER THAN THE SKULL

The skeletal parts of the western Eskimo, outside of the skull, are but little known. The only records are those on two skeletons (one male, one female) from Point Barrow by Hawkes,[188] and those on a few bones from Port Clarence by Cameron.[189] The data on the skeletal parts of the northern and eastern Eskimo are only slightly richer, being for the most part fragmentary and scattered.[190] Nor has the time arrived yet for a comprehensive study of such material, for notwithstanding the relative abundance in crania and the more resistant individual skeletal parts, the securing of anywhere near complete skeletons is very difficult. Nevertheless there is now a good number of the long bones of the western Eskimo in the possession of the National Museum and the main data on these, all secured personally by the writer, will be given. They must for the present remain essentially as so many figures without adequate discussion and comparisons. Nevertheless a few facts appear so plainly that they may well be pointed out before concluding this section.

FOOTNOTES:

[188] Amer. Anthrop., 1916, LVIII, 240-243.

[189] Rep. Canad. Arct. Exp., 1913-1918, Pt.

C, 1923, 56-57.

[190] Mainly by Turner (London, 1886); Duckworth (Cambridge, 1904); Hrdlička (New York, 1910); Cameron (Ottawa, 1913-1918); also a series of incidental references and comparisons.

Western Eskimo: the Long Bones

Bones of both sides taken together
Males
Females
Southwestern and midwestern groups[191]
Seward Peninsula[192]
Point Hope
Seward Peninsula and northwestern Eskimo in general[193]
Southwestern and midwestern groups
Seward Peninsula
Point Hope
Seward Peninsula and northwestern Eskimo in general

Humeri:

(143)
(261)
(67)
(100)
(136)
(26)
(55)
(83)

Length maximum	
	30.69
	31.42
	31.07
	31.17
	28.40
	28.75
	28.83
	28.83
At middle—	
Diameter maximum	
	2.40
	2.46
	2.46
	2.46
	2.10
	2.14
	2.16
	2.15
Diameter minimum	
	1.80
	1.81
	1.86
	1.85
	1.54
	1.59
	1.63
	1.62
Index at middle	
	75.1

		73.8
		75.8
		75.1
		73.2
		74.4
		75.4
		75.1
Radii:		
	(98)	
	(20)	
	(15)	
	(37)	
	(109)	
	(16)	
	(8)	
	(24)	
Length maximum		
		22.90
		23.63
		23.44
		23.50
		20.50
		21.26
		[194](21.58)
		21.25
Radio-humeral index (approximate)		
		74.5
		75.2
		75.4
		75.4
		72.2
		74

		(*74.8*)
		74
Femora:		
	(195)	
	(44)	
	(10)	
	(60)	
	(132)	
	(26)	
	(31)	
Length, bicond.		
		42.50
		43.20
		(44.06)
		43.46
		39.36
		40.12
		40.44
Humero-femoral index (approximate)		
		72.2
		72.7
		[195](*70.5*)
		71.7
		72.2
		71.7
		71.3
At middle—		
Diameter antero-posterior		
		3.08
		3.17

	(3.33)
	3.21
	2.69
	2.85
	2.88
Diameter lateral	
	2.70
	2.72
	(2.68)
	2.72
	2.46
	2.55
	2.56
Index at middle	
	87.6
	85.8
	(*80.4*)
	84.8
	91.5
	89.6
	88.9
At upper flattening—	
Diameter maximum	
	3.35
	3.34
	(3.27)
	3.32
	3.02
	3.04
	3.06

	Diameter minimum	
		2.51
		2.57
		(2.58)
		2.59
		2.26
		2.37
		2.40
	Index at upper flattening	
		75
		77
	(*79*)	
		78.1
		74.5
		78
		78.4
Tibiae:		
	(141)	
	(35)	
	(41)	
	(79)	
	(147)	
	(18)	
	(17)	
	(36)	
	Length (in position)	
		33.86
		34.52
		36.40
		35.52
		31.32

	31.90
	32.90
	32.50
Tibio-femoral index (approximate)	
	79.7
	79.9
	[194](*82.6*)
	81.7
	79.6
	79.5
	80.4
At middle—	
Diameter antero-posterior	
	3.12
	3.13
	3.26
	3.19
	2.71
	2.71
	2.80
	2.75
Diameter lateral	
	2.12
	2.12
	2.20
	2.16
	1.89
	1.93
	1.92
	1.92

Index at middle
67.9
67.7
67.4
67.8
69.9
71.3
68.8
70

The first fact shown by the preceding figures is the slightly greater length of all the long bones in the midwestern and northwestern groups as compared with those of the Bering Sea (midwestern and southwestern). This means naturally that the people of the Seward Peninsula and northward average somewhat taller in stature.

The second evident fact is that the people of the Seward Peninsula and the more northern groups (so far as represented in these collections) show a slightly greater stature of all the bones than the groups farther south, showing that they were both a somewhat taller and somewhat sturdier people.

The next fact of importance is the remarkable agreement in some respects in the relative proportions of the main skeletal parts between the people of the more southern and the more northern groups. The males are more regular in this respect than the females. The relative proportions of the humerus and again the tibia at their middle are identical in the males of the southwestern and midwestern groups and those farther northward; and the radio-humeral, humero-femoral, and tibio-femoral indices are all very closely related. Why

there should be less agreement in these respects among the females it is difficult to say; in all probability the series of specimens are not sufficiently large.

The next table presents data and some racial comparisons. Here the western Eskimo are taken as a unit. They are seen to considerably resemble the Yukon Indians, but somewhat less so other Indians in the radio-humeral and tibio-femoral indices, and they resemble all the Indians in the relative proportions of the femur at its middle. In other respects there are somewhat more marked differences, especially between the western Eskimo and the Indians in general. Some irregularities in the Yukon series may be due to insufficiency of numbers.

When compared with the bones of the whites and the negroes the Eskimo and Indians separate themselves in many respects as a distinct group, while the white and the negro bones are particularly distinct through the greater relative thickness of the humerus and tibia at their middle, and of the femur at its upper flattening; in other words the Eskimo as well as the Indians are more platybrachic, platymeric and platycnemic than the whites or the negroes.

The basic relation of the Eskimo to the Indian bones is quite evident; though the Eskimo, when compared to Indians outside of Alaska, show a relatively shorter radius and tibia, indicating the already discussed relative shortness of the forearm and leg.

FOOTNOTES:

[191] Principally Hooper Bay, Nunivak Island, Pastolik, and St. Lawrence Island.

[192] Mainly Shishmaref, Wales and Golovnin

Bay.

[193] Including Point Hope.

[194] Number of radii insufficient.

[195] Number of femora insufficient.

Western Eskimo, Long Bones: Comparative Data

MALES	
Humerus: Index of shaft at the middle (all groups)	
Radio-humeral index	
Femur	
Humero-femoral index	
Tibia: Index of shaft at middle	
Tibio-femoral index	
Index of shaft at middle	
Index of shaft at upper flattening	
	[196](243)
	(135)
	(255)
	(255)
	(243)
	(220)
	(220)
Western Eskimo	
	75.1
	75
	86.2
	76.5
	72

	67.9
	80.7
	(10)
	(10)
	(14)
	(14)
	(10)
	(14)
	(14)
Yukon Indians	
	70
	75.7
	87.1
	70.7
	74.5
	66
	81.5
	(448)
	(370)
	(902)
	(902)
	(378)
	(1259)
	(324)
Other Indians	
	73.3
	77.7
	87.3
	74
	72.5
	66.1

	84.4
	(1930)
	(1052)
	(207)
	(836)
	(800)
	(1400)
	(1216)
United States whites (miscellaneous)	
	83
	73.6
	97
	83
	72.5
	71.1
	82.1
	(112)
	(74)
	[197](14)
	(48)
	(50)
	(63)
	(68)
United States negroes	
	84.1
	77.3
	(91.2)
	86.8
	71.6
	73.9
	84.9

FEMALES	
	(213)
	(133)
	(153)
	(153)
	(153)
	(183)
	(183)
Western Eskimo	
	74.1
	73.1
	90.2
	76.5
	71.8
	70
	80
	(348)
	(200)
	(327)
	(248)
	(200)
	(910)
	(384)
Other Indians	
	70.1
	76.6
	91.8
	70
	72.5
	70
	84.3

	(770)
	(424)
	(100)
	(192)
	(290)
	(600)
	(520)
United States whites (miscellaneous)	
	79.3
	72.7
	97
	77.7
	71.6
	71.9
	81.5
	(52)
	(34)
	[197](17)
	(48)
	(52)
	(44)
	(48)
United States negroes	
	79.2
	77.2
	(100)
	81.1
	70.2
	75.9
	83.7

FOOTNOTES:

[196] Bones of both sides.

[197] Numbers insufficient.

Long Bones in Eskimo and Stature

One of the most desirable of possibilities in the anthropometry of any people, but particularly in groups now extinct, is a correct estimation of their stature. For this purpose the most useful aid has been found in the long bones, and various essays have been made by Manouvrier, Rollet, Topinard, Pearson, and others[198] at preparing tables or arriving at methods that would enable the student to promptly and satisfactorily obtain the stature as it was in life from the length of the long bones. But all these essays were based on observations on white people, and it has always been recognized that they could not with equal confidence be applied to other racial groups. They would in all probability be especially inapplicable to the Eskimo with his relatively short forearms and legs; yet the possibility of estimating the stature in many localities of the Eskimo territory, where no living remain, would be of real value. Fortunately for this purpose there are now some data on hand which make this possible.

In 1910, in my Contributions to the Anthropology of the Central and Smith Sound Eskimo, I was able to report both the stature and the length of the long bones in two normally developed adult males and one adult female from Smith Sound. To this it is now possible to add larger though less direct data from the group of St. Lawrence Island. We have the stature of many of the living from this place and also the

measurements of numerous long bones from the dead of the same group. The relations of the two are given below, together with corresponding data from Smith Sound. There is in general such a striking agreement in the relative proportions that the latter may, it would seem, be used henceforth for stature estimates also in other parts of the Eskimo region.

FOOTNOTES:

[198] See section on Estimation of Stature from Parts of the Skeleton, in author's Anthropometry, Wistar Inst., Philadelphia, 1920.

Length of Principal Long Bones, and Stature in the Living, on the St. Lawrence Island

Male																			
Female																			
(63) Mean stature: 163.3																			
(48) Mean stature: 151.3																			
Mean dimensions																			
Percental relation to stature (S = 100)																			
Mean dimensions																			
Percental relation to stature (S = 100)																			

	(49)
Humerus	
	30.41
	18.6
	27.77
	18.3
	(23)
	(35)
Radius	
	23.03
	14.1
	20.77
	13.7
	(100)
	(38)
Femur	
	32.54
	27.8
	38.12
	25.1
	(58)
	(50)
Tibia	
	34.16
	20.9
	31.13
	20.5

Long Bones vs. Stature in Eskimo of Smith Sound[199]

Male	
Female	
a	
b	
Stature	
	155.0
	164.0
	146.7
Humerus:	
Mean length (of the two)	
	28.95
	29.0
	26.55
Percental relation to stature	
	18.7
	17.7
	18.1
Radius:	
Mean length	
	21.3
	23.2
	19.85
Percental relation to stature	
	13.7
	14.1
	13.5
Femur:	
Mean length	
	39.1
	42.1

	38.55
Percental relation to stature	
	25.2
	25.7
	26.3
Tibia:	
Mean length	
	30.25
	34.45
	30.9
Percental relation to stature	
	19.5
	21.0
	21.1

FOOTNOTES:

[199] Hrdlička, A., Contribution to the anthropology of central and Smith Sound Eskimo. Anthrop. Pap. Am. Mus. Nat. Hist., V, pt. 2, 280. New York, 1910.

A STRANGE GROUP OF ESKIMO NEAR POINT BARROW

In 1917-1919, in the course of the John Wanamaker Expedition for the University Museum, Philadelphia, W. B. Van Valin, with the help of Charles Brower, the well-known local trader and collector, excavated near Barrow a group of six tumuli, which proved in the opinion of Van Valin to be so many old igloos, containing plentiful cultural as well as skeletal material. The collections eventually reached the museum, but due to lack of facilities they were in the main never unpacked.

I heard of this material first from Mr. Brower, with whom I sailed in 1926 from Barrow southward, and later with Dr. J. Alden Mason I saw the collection still in the original boxes, at the University Museum. In April of this year the skeletal remains were transferred to the Wistar Institute, Philadelphia, and after their transfer I obtained the permission of Dr. Milton J. Greenman, director of the Wistar Institute, to examine the material, which was of importance to him in connection with his own collections from Barrow and southward. A due acknowledgment for the privilege is hereby rendered to both Doctor Greenman and Doctor Mason.

The study proved one of unexpected and uncommon interest. The material was found to consist of two separate lots. The first of these consisted of a

considerable number of brown colored, more or less complete skeletons with skulls, proceeding from the "igloos"; while the second lot comprised a series of whitened isolated skulls, without other skeletal parts and mostly even without the component lower jaws, gathered on the tundra near Barrow. At first sight, also, the skulls of the two groups were seen to present important differences.

The "igloo" crania, while plainly pure Eskimo, proved to be of a decidedly exceptional nature for this location. The skulls, in brief, were not of the general western Eskimo type, but reminded at once strongly of the skulls from Greenland and Labrador. And they were exceptionally uniform, showing that they belonged to a definite and distinct Eskimo group.

After writing of this to Doctor Mason, he kindly sent me a copy of the notes and observations on the discovery of the material by W. B. Van Valin, who was in charge of the excavation. The detailed notes will soon be published by Doctor Mason. The main information they convey is as follows:

The excavations by Van Valin date from 1918-19. They were made in six large "heaps," approximately 8 miles southwest of Barrow and about 1,000 yards back from the beach on the tundra. Two of the heaps were on the northern and four on the southern side of a ravine or draw formed by a drain flowing from inland to the sea. The Eskimo at Barrow knew nothing about these remains or their people.

Each of the heaps inclosed what in the excavator's opinion was an "igloo" made of driftwood and earth; and all contained evidently undisturbed human skeletons. The total number of bodies of all ages was counted as 83, and they ranged from infants to old people. There were many bird and other skins (for

covers and clothing), and numerous utensils. The hair on the bodies was in general "black as a raven." Most of the bodies lay on "beds" of moss or "ground willows," or rough-hewn boards. There was no indication of any violence or sudden death. The bodies at places were in three levels, one above the other; but there was but moderate uniformity in the orientation of the bodies. There were found with the burials no traces of dogs (though there were some sled runners), and no metal, glass, pipes, labrets, nets, soapstone lamps or dog harness; but there were bows and arrows, bolas, and ordinary pottery. The cultural objects, Doctor Mason wrote me, resemble in a smaller measure those of the older Bering Sea, to a larger extent those of the old northern or "Thule" culture. There were some jadeite axes, indicating a direct or indirect contact with Kotzebue Sound and the Kobuk River.

Some of the bearskin coverings were "as bright and silvery" as the day the bear was killed (Van Valin); and the frozen bodies were evidently in a state of preservation approaching that of natural mummies.

Notwithstanding indications to the contrary, Van Valin reached the opinion that these remains were not those of regular burials, though offering no other definite hypothesis.

Desiring additional information about this highly interesting find, I wrote to Mr. Brower, who assisted at the excavations, and received the following answer:

> These mounds are from 5 to 8 miles south of the Barrow village (Utkiavik). The largest that were opened were the farthest south, and seemed more like raised lumps on the land than ruins. No doubt that is the reason

no one had bothered them.

The Eskimo have no traditions of these people. In fact they did not even suspect the mounds contained human remains until Mr. Van Valin started to investigate them.

While Van Valin thought they might be houses, I have always thought they were burial mounds, as there seemed no family to have been together at the time of death as often has happened. When whole families have died from some epidemic, then the man and wife are together under their sleeping skins. In these mounds each party was wrapped separate, either in polar bear or musk ox skins; none were wrapped in deer skins. If male, all his hunting implements were at his side, and if a female her working tools were with her, as scrapers, dishes of wood, and stone knives. The men had their bows, arrows, spears, and often a heavy club, for what purpose unless used in fighting I could not make out. At the head of each person was a small receptacle, made of whalebone, and in it or alongside was a long wing bone that had been used as a drinking tube. In some cases there seemed to be the remains of food in the platters, but that was impossible to identify. Most of the bodies were laid on the ground, a few had the remains of scrub willow under them, while only in two or three cases had there been driftwood planks under the bodies; these were crudely hewn with their old stone adzes.

There seems to have been some sort of

driftwood houses over these bodies at some time, but they decayed and have fallen on the remains, which were in some cases embedded in the ice. Often before the frame had broken down earth must have accumulated and covered the bodies. In these cases the flesh has the consistency of a fine meal. While with those in the ice in some cases part of the flesh still remained. In both cases when exposed to the air they rapidly disintegrated, leaving nothing except the bones. By measurements they must have been a larger race than the present people.

When your letter reached here I at once started making inquiries as to what mounds were still intact; and I find that as far as known only two of the larger ones have not been opened. The Eskimo have been opening the mounds ever since they were found, taking from them all the hunting implements and other material and selling them aboard the ships for curios. It seems a shame that all this should be lost to science, and if no one takes an interest in these places in a year or two they will all be gone.

I have again made inquiries as to what the present Eskimo think of these people, but they tell me they have no tradition regarding them and that they do not know if they were their ancestors or not. In fact, they are ignorant of where they came from or when they died.

To date I do not know of any whaling implement being found with these old people, neither is any of the framework of

> these mounds made from the bones of whales. In some of the implements ivory has been used. The mounds farthest from the shore were about 400 yards, those that remain are closer to the beach. Some of the smaller ones are on the banks of small streams but never very far from shore. Undoubtedly, however, they were at one time considerably farther from the sea, but the sea is every year claiming some of this land, especially where the banks are high along the beach. There the beach is narrow and during a gale the waves wash out the land at its base. This is about all that I can tell you of these people. All credit for finding these mounds belongs to Van Valin.
>
> Yours truly,
>
> CHAS. D. BROWER.

The material.—The collection as received at the Wistar Institute was notable for its general dark color, enhanced in many of the specimens by dark to black remains of the tissues. There was no mineralization and but little bone decay, though the bones were somewhat brittle.

There is a scarcity of children and adolescents; there are in fact only two skulls of subjects less than 20 years of age in the collection.

The skulls and bones that remain show no violence.

The remains show a complete freedom from syphilis or other constitutional disease; the only pathological condition present in some of the bones being arthritis. This speaks strongly for their preceding the contact with whites. The surface series, though smaller, shows three syphilitic skulls. An additional

fact of interest is the absence in both the igloo and the surface series of all marks of scurvy. Such marks are fairly common farther southward. Finally, none of the skulls are deformed, either in life or posthumously.

Anthropological Observations and Measurements on the Collections

Age.—The first observations made on the igloo material were those as to the individual ages of the bodies. Such observations are necessarily rough, yet within sufficiently broad limits fairly reliable. The criteria are principally the condition of the teeth and that of the sutures. The possible error in such estimates is, experience has shown, as a rule well within 10 years in the older and within 5 years in the young adults or subadults.

One of the objects of these observations on the "igloo" material was to get some further light on whether the remains were those of a group that perished of an epidemic, famine, or some other sudden agency, or whether they represented just burials. The age distribution of the dead would differ considerably in the two cases.

Estimated Ages at Death

IGLOO MATERIAL
20 to 25
30 to 40
45 to 55
Above 55
Per cent
Per cent

	Per cent
	Per cent
Males (27)	
	11
	15
	41
	33
Females (25)	
	16
	24
	44
	16
Mean, both sexes	
	13.5
	19
	42.5
	25
SURFACE SERIES	
Males (21)	
	5
	48
	48
Females (14)	
	29
	36
	36
Mean, both sexes	
	11.5
	17
	43
	29.5

The above table shows the data obtained, with those on the surface material from the same collection and known to be that of ordinary burials.

The results do not agree with the composition of the living population but are apparently near to what might be expected in burials. Taking the sexes apart, the series from the surface shows a somewhat more favorable condition for the men, but worse for the women. Taking the materials, however, regardless of sex, the proportions of ages in the earlier igloos and in the late surface burials are practically identical. This points strongly against the idea of the igloo remains being those of people who either died there of starvation, of an epidemic, of being smothered, or of some other sudden affliction, and to their having been just ordinary burials.

To arrive at something still more definite, if possible, I appealed on the one hand to the United States Census and on the other to Doctor Dublin of the Metropolitan Life Insurance Co., New York, for data as to the distribution of ages among the dead, using the same age-categories as in the case of the "igloo" material. The data furnished by Miss E. Foudray through Dr. Wm. H. Davis, Chief Statistician of the Bureau of the Census, are particularly to the point. They are as follows:

Per Cent Age Distribution of Indian Population in Alaska Aged 20 Years and Over, According to the Census of 1900

20 to 24
25 to 44
45 to 54
55 and over

Males	
	17.8
	54.2
	15.9
	12.1
Females	
	19.4
	53.3
	15.9
	11.4
Both sexes	
	18.6
	53.7
	15.9
	11.8

Per Cent Age Distribution at Death (Estimated) of Indian Population of Alaska in 1900, Who, Had They Lived, Would Have Appeared in the Census of 1910 at Ages 20 Years and Over

20 to 24
25 to 44
45 to 54
55 and over
Males
13.2
43.9
21.3
21.6
Females
11.9
47.0

	19.5
	21.6
Both sexes	
	12.6
	45.4
	20.4
	21.6

There is a remarkable agreement of these figures with those obtained on both the Igloo and the Barrow surface burial material, except that for the two middle age series the figures are reversed. This may mean an error in the two respective estimates on the Indians, or it may mean that for these two ages the conditions among the Eskimo concerned were better than they were in 1900 among the Alaska Indians.

All the above, together with the details on the orderly treatment of the bodies, and the absence of such conditions as were encountered in the dead villages on St. Lawrence Island (Hooper, Nelson), inclines one to the conclusion that the Igloo remains, however exceptional the method for the Eskimo, were just burials.

Physical Characteristics

The skull.—The most noteworthy feature about the Igloo remains is the marked distinctiveness of the skull. This strikes the observer at the first sight of the specimens, and the impression is only strengthened by detail examination. The skulls are very narrow, long, and high. They differ plainly from anything except occasional individual specimens, either about Barrow or along the rest of the west coast of Alaska,

with the possible exception of a few groups of Seward Peninsula. They recall strongly the crania of Labrador and south Greenland. It is the Labrador-Greenland type throughout, men, women, and even the two children. It is a group outside of the range of local variation. It is a strange Eskimo group, either developed here in former times as it developed in Greenland and Labrador, and possibly the Seward Peninsula, or one that had come here from places where such type had already been realized.

The following data (the individual measurements will appear in a later number of the Catalogue of Crania) show the differences between the Igloo and the surface material, the latter both of the Van Valin and of the author's collections, and the valuable Stefánsson material, now at the American Museum, from Point Barrow. They need but little comment. They show clearly on one hand the wholly Eskimo nature of the Igloo skulls, and on the other their distinctness from those of the later burials, both of Barrow and Point Barrow. The vault especially is characteristic—narrow, long, high, more or less keel-shaped. The face in general is much more alike in the three groups; nevertheless its absolute height and breadth in the Igloo series are slightly smaller than in the other two, and there are minor differences in the orbits and the palate.

Eskimo Crania, Barrow and Vicinity

Old Igloos
Surface burials, Barrow
Surface burials, Point Barrow
Males (27)
Females

(25)	
Males (37)	
Females (36)	
Males (49)	
Females (52)	
Vault:	
Length maximum	
	19.25
	18.11
	18.90
	17.77
	18.74
	17.91
Breadth maximum	
	13.30
	12.72
	13.73
	13.23
	13.84
	13.32
Basion-bregma height	
	14.02
	13.21
	13.78
	12.97
	13.78
	13.08

Cranial index	
	69.1
	70.2
	72.6
	74.5
	73.9
	74.4
Height-breadth index	
	105.5
	104.6
	99.6
	98.1
	99.6
	97.8
Mean height index	
	86.2
	86.4
	84.6
	82.9
	84.7
	83.4
Cranial module	
	15.52
	14.72
	15.46
	14.66
	15.44
	14.75
Face:	
Height: menton- nasion	
	12.4

	11.21
Height: upper alveolar point-nasion	
	7.7
	7.01
	7.89
	7.18
	7.86
	7.22
Breadth: Diameter bizygomatic maximum	
	14.2
	13.08
	14.34
	13.16
	14.26
	13.06
Facial index, total	
	86.9
	86.8
Facial index, upper	
	54.5
	53.8
	55
	54.7
	55.1
	55.3
Basion-nasion	
	10.70
	10.18
	10.61
	10.01

	10.54
	9.94
Basion-subnasal point	
	9.33
	9.12
	9.31
	8.86
	9.23
	8.73
Basion-upper alveolar point	
	10.45
	10.13
	10.39
	9.85
	10.39
	9.77
Lower jaw: Height at symphysis	
	3.72
	3.38
	3.95
	3.27
	3.9
Orbits:	
Mean height	
	3.62
	3.47
	3.60
	3.61
	3.61
	3.55
Mean breadth	

	3.97
	4.01
	4.04
	3.88
	4.02
	3.90
Mean index	
	91.3
	91
	89.2
	93
	89.9
	90.7
Nose:	
Height	
	5.45
	5.02
	5.52
	5.19
	5.48
	5.11
Breadth	
	2.37
	2.23
	2.39
	2.32
	2.31
	2.29
Index	
	43.6
	44.4

	43.4
	44.7
	42.2
	44.9
Alveolar arch:	
Length	
	5.57
	5.34
	5.59
	5.22
	5.63
	5.25
Breadth	
	6.68
	6.29
	6.45
	6.13
	6.47
	6.01
Index	
	83.4
	84.9
	86.6
	85.1
	86.9
	87.4

Let us now contrast the Igloo skulls with those of southern Greenland from the collection of the United States National Museum.[200] The size of the series is such that they are nicely comparable. And to the two is added a small recent series (A. H., 1926, and

Collins, 1928), from Golovnin Bay and Sledge Island (Seward Peninsula).

Main Measurements of the Barrow "Igloo" and of Greenland Eskimo Crania

	Males			Females		
	Golovnin Bay and Sledge Island			Golovnin Bay and Sledge Island		
	Igloos			Igloos		
	Greenland			Greenland		
Number of specimens	(8)					
	(27)					
	(49)					
	(13)					
	(25)					
	(52)					
Vault:						
Length						
			19.20			
			19.25			
			18.97			
			18.03			
			18.11			
			18.04			
Breadth						
			13.70			

	13.30
	13.61
	13.36
	12.72
	12.98
Height	
	14.08
	14.02
	13.95
	13.21
	13.21
	13.12
Cranial index	
	71.3
	69.1
	71.8
	74.1
	70.2
	72
Height-breadth index	
	102.8
	105.5
	102.5
	97.9
	104.6
	101
Mean height index	
	85.6
	86.2
	85.7
	84.2
	86.4

	84.6
Module	
	15.66
	15.52
	15.51
	14.87
	14.72
	14.72
Face:	
Menton-nasion height	
	12.70
	12.39
	12.38
	11.98
	11.21
	11.52
Alveolar point-nasion height	
	7.90
	7.71
	7.61
	7.35
	7.01
	7.05
Breadth	
	14.29
	14.16
	14.05
	13.25
	13.08
	13.03
Facial index, total	

	88.9
	86.9
	87.1
	90.4
	86.8
	85.7
Facial index, upper	
	55.3
	54.5
	54.1
	55.4
	53.8
	54.1
Orbits:	
Mean height	
	3.65
	3.62
	3.64
	3.58
	3.47
	3.55
Mean breadth	
	4.11
	3.97
	3.99
	3.92
	4.01
	3.85
Mean index	
	88.8
	91.3

	91.4
	91.2
	91
	92.4
Nose:	
Height	
	5.58
	5.45
	5.24
	5.15
	5.02
	4.99
Breadth	
	2.35
	2.37
	2.27
	2.29
	2.23
	2.20
Index	
	42.1
	43.6
	43.3
	44.5
	44.4
	44

A comparison of the Igloo and Greenland series shows striking similarities; hardly any two geographically separate groups originating from a single source could reasonably be expected to come nearer. The Igloo skulls are even narrower in the

vault than the Greenlanders, which means so much farther away from the southwestern, midwestern, and Asiatic Eskimo; and offer a few other differences, but all these are of small moment, not affecting the essential relations of the two groups.

A comparison of the Igloo and Greenland series with the material from Golovnin Bay and Sledge Island shows also numerous similarities but with them some rather material differences. The differences are especially marked in the females, whose characteristics approach more those of the midwestern Eskimo, which suggests that an important proportion of them may have been derived from the latter. However, even the males tend to differ. Both sexes show absolutely a somewhat broader skull than that of the northerners; in both sexes the skull, as seen from the cranial module, is slightly larger in the Seward Peninsula series than in either of the other groups; but the principal differences are seen in the face, which in the Seward Peninsula group is perceptibly larger and especially higher than it is in either the Igloo or the Greenland series. The orbits also in the southerners are larger and the nose is slightly higher.

On the whole it may be said that the resemblance of the Igloo crania to those of Greenland is closer than that to either or both of the series of Golovnin Bay and Sledge Island. This suggests the possibility that a similar though not quite the same differentiation in the skull may have taken place both in the Seward Peninsula and in the far north; though the possibility of a derivation of any one of the three groups from any of the others can not be discarded. So far as the skull is concerned a definite solution of the identity of the Igloo material would have to be, it would

seem, postponed to the future.

The used data on the Greenland Eskimo skulls agree closely with those of Fürst and Hansen (Crania Groenlandica, fol., 1915), and also with the much fewer and scattered records of Virchow, Davis, Duckworth, Oetteking, Pittard, etc.,[201] on Eskimo skulls from Labrador.

Stature and strength.—The bones of the skeleton of the Igloo series show the people to have been of good height and of above medium Eskimo robustness. The principal measurements are given below, together with the corresponding ones on the western and the Yukon Eskimo. The material is not all that could be wished for, either in numbers or representation, but it will suffice for rough comparisons. Regrettably nothing for comparison is available as yet from Greenland or other parts of the far northeast where we meet with long, narrow, and high skulls.

The Long Bones of the Igloo People and Other Eskimo Bones of the Two Sides Together

Males
Females
Igloo
Seward Peninsula and northwestern Eskimo
Yukon Eskimo
Igloo
Seward Peninsula and northwestern Eskimo
Yukon Eskimo

Humerus:

(35)

	(100)	
	(16)	
	(27)	
	(83)	
	(16)	
Length-maximum		
		31.17
		31.17
		32.10
		28.41
		28.82
		28.31
At middle:		
Diameter, major		
		2.47
		2.46
		2.33
		2.11
		2.15
		2.07
Diameter, minor		
		1.86
		1.85
		1.80
		1.60
		1.62
		1.51
Index		
		75.2
		75.1
		78.2

		76.1
		75.1
		73.2
Radius:		
	(31)	
	(37)	
	(16)	
	(17)	
	(24)	
	(16)	
Length, maximum		
		23.53
		23.50
		23.44
		20.98
		21.35
		20.18
Radio-humeral index		
		75.5
		75.4
		73
		73.8
		74
		71.3
Femur:		
	(33)	
	(60)	
	(22)	
	(25)	
	(31)	
	(27)	
Length, bicondylar		

	43.86
	43.46
	43.78
	40.31
	40.44
	41.11
Humero-femoral index	
	71.1
	71.7
	73
	70.5
	71.3
	69
At middle:	
Diameter, antero-posterior	
	3.37
	3.21
	3.05
	2.88
	2.88
	2.74
Diameter, lateral	
	2.90
	2.72
	2.67
	2.51
	2.56
	2.44
Index	
	86.1
	84.8

	87.6
	87.3
	88.9
	88.8
At upper flattening:	
Diameter, maximum	
	3.51
	3.32
	3.31
	3.09
	3.06
	3.02
Diameter, minimum	
	2.71
	2.59
	2.57
	2.30
	2.40
	2.27
Index	
	77.2
	78.1
	77.4
	74.4
	78.4
	75.4
Tibia:	
(29)	
(79)	
(22)	
(24)	

(36)	
(27)	
Length in position	
	35.60
	35.52
	35.14
	31.94
	32.50
	32.01
Tibio-femoral index	
	81.2
	81.7
	80.3
	79.2
	80.4
	79.8
At middle:	
Diameter, antero-posterior	
	3.26
	3.19
	3.16
	2.80
	2.75
	2.61
Diameter, lateral	
	2.20
	2.16
	2.15
	1.87
	1.92
	1.90

Index

	67.5
	67.8
	68.3
	66.7
	70
	72.8

The above table shows some remarkable and interesting conditions.

The first of the most apparent facts is that the type of the Yukon Eskimo stands well apart from both of the other series in a number of essentials, showing that it is not very nearly related and that it may be left out of consideration.

On the other hand the long bones from the Seward Peninsula and the northwest coast, especially those of the males, show very closely to those of the Igloo group. The male bones of the two series are almost identical, except that the Igloo bones are somewhat stronger.

Such close resemblances can hardly be fortuitous. They speak strongly for the basic identity of the old Igloo people with those of at least parts of the Seward Peninsula and parts of the northwest coast. If we take the bones from the Seward Peninsula alone (see p. 314) it is found that these resemblances still hold.

The evidence thus shown constitutes a strong indication that the old Igloo group may be inherently related to that part of the Eskimo population of Seward Peninsula which shows the long and narrow skull; but the data offer no light on the questions as to whether the Igloo group may have been derived

from that of the Seward Peninsula or vice versa, and on the true relation of either or both of these to the Eskimo of Baffin Land, Greenland, and Labrador.

To definitely decide the problem of the Igloo group there are needed data on the long bones of the northeasterners; in the second place it is highly desirable to know how large and how ancient was the group of the narrow-headed people on the Seward Peninsula and Sledge Island; and in the third place it is important that the cultural history of the two groups be known as thoroughly as possible. All of which are tasks for the future.

The possibility of a development of the Igloo cranial type on the northwest coast itself can not be denied, in view of the facts that all its characteristics are within the ranges of normal individual variations on that coast, and that similar developments have evidently been realized elsewhere. But in such a case it would be logical to expect, locally or not far away, some ancestry of the group, and the group would not probably be limited to a little spot and a few scores of persons. Had the group developed incidentally from a physically exceptional family, it could not be expected to have been anywhere nearly as uniform as the group under consideration. The high degree of uniformity of the Igloo contingent speaks for a well accomplished differentiation; and as there is no other trace of this in the conditions near Barrow, and there are no ruins denoting a long occupation, the evidence is against a local development and for an immigration of the group. A coming of a small-sized contingent from the Seward Peninsula would be easy; its coming from Greenland or Labrador or Baffin Land would surely be difficult, but not impossible to the Eskimo, who is known to have

been a traveler.

Whatever may be the eventual solution of the Igloo problem, it is plain that the presence of that group near Barrow, together with the presence of evidently closely related groups in a part of the Seward Peninsula and again in the far east of the Eskimo region, offers much food for thought and investigation. The most plausible possibility would seem to be a relatively late (within the present millennium) coming of a physically already well differentiated small group, from either the south or the east, with a relatively short settlement at the Barrow site, some local multiplication in numbers, and then extinction partly through disease, partly perhaps through absorption into a stronger and newer contingent derived from the western people.

FOOTNOTES:

[200] The measurements of this series have been published by the writer in the first part of the Catalogue of Human Crania in the U. S. National Museum (Proc. U.S.N.M., 1924, LXIII, art. 12, p. 26), but as a few errors crept in, the whole series was remeasured by the writer.

[201] For more exact references see writer's Contribution to the Anthropology of Central and Smith Sound Eskimo, Anthrop. Papers Am. Mus. Nat. Hist., N. Y., 1910, V, pt. 2; and the bibliography at the end of this volume.

ORIGIN AND ANTIQUITY OF THE ESKIMO

All anthropological research on the Eskimo has naturally one ultimate object, which is the clearing up of the problems of the origin and antiquity of this highly interesting human strain; and it may well be asked what further light on these problems has been shed by the studies here dealt with. To show this with a proper perspective it will be requisite to briefly review the previous ideas on these problems.

Origin of the Name "Eskimo"

According to Charlevoix (Nouv. France, III, 178), the term "Eskimo" is a corruption of the Abenaki Indian Esquimantsic or the Ojibway Ashkimeg, both terms meaning "those who eat raw flesh." In the words of Captain Hooper,[202] "Neither the origin nor meaning of the name 'Esquimaux,' or Eskimo, as it is now spelled, is known. According to Doctor Rink, the name 'Esquimaux' was first given to the inhabitants of Southern Labrador as a term of derision by the inhabitants of Northern Labrador, and means raw-fish eater. Dall says the appellation 'Eskimo' is derived from a word indicating a sorcerer or shaman in the language of the northern tribes."

For Brinton,[203] as for Charlevoix, the term "Eskimo" is derived from the Algonkin "Eskimantick," "eaters of

raw flesh." According to Chamberlain,[204] Sir John Richardson (Arctic Searching Exp., p. 203) attempts to derive it from the French words ceux qui miaux (miaulent), referring to their clamorous outcries on the approach of a ship. Petitot (Chambers Encyc., Ed. 1880, IV, p. 165, article Esquimaux) says that at the present day the Crees, of Lake Athabasca, call them Wis-Kimowok (from Wiyas flesh, aski raw, and mowew to eat), and also Ayiskimiwok (i. e., those who act in secret). In Labrador the English sometimes call the Eskimo "Huskies" (loc. cit., p. ix. 7. Chambers Encyc., article Esquimaux. See Hind. Trav. in Int. of Labr., loc. cit., and Petitot loc. cit., p. ix.) and Suckemos (Richardson, Arctic Searching Expedition, p. 202) and Dall (Proc. Am. Ass. Adv. Sci., 1869, p. 266) says that in Alaska the Tinneh Indians call them "Uskeeme" (sorcerers).

The Eskimo call themselves "Innuit," said to be the plural of in-nu, the man, hence "the people"; the same being as a rule the meaning of the name by which the various tribes of the Indian call themselves.

On the Asiatic coast the Eskimo is known as the "Yuit," "Onkilon," "Chouklouks," or "Namollo"; while in the east appears the name "Karalit."

None of this has thrown any light on the origin of the Eskimo.

FOOTNOTES:

[202] Hooper, C. L., Cruise of the U. S. revenue steamer *Corwin*, 1881. Washington, 1884, p. 99.

[203] Brinton, D. C., Myths of the New World, 1868, p. 23. New York.

[204] Chamberlain, A. F., The Eskimo race and language. Proc. Canadian Inst., 3d ser., vol. VI, pp. 267-268. Toronto, 1889.

Opinions By Former and Living Students

Origin in Asia.—Many opinions on the origin of the Eskimo have been expressed by different authors. Among the earliest of these were those of missionaries, such as Crantz (1779), and of the early explorers, such as Steller, v. Wrangell, Lütke and others. They were based on the general aspect of the Eskimo, particularly that of his physiognomy; and seeing that in many features he resembled most the mongoloid peoples of Asia they attached him to these, which meant the conclusion that he was of Asiatic derivation. Quite soon, however, there began to appear also the opinions of students of man. The first of these was that of Blumenbach, as expressed in his Inaugural Thesis of 1781. In this thesis, more particularly its second edition, he classifies the Eskimo expressly as a part of the Caucasian or white race. But after obtaining an Eskimo skull and an Eskimo body he changes his opinion and in 1795-1806 he comes out with a definite classification of the Eskimo as a member of the Mongolians; and a similar conclusion, with its implied or expressed consequence of a migration from Asia to America, has been reached since, mainly on somatological but also in part on linguistic and cultural bases, by a large number of authors, including Lawrence, Morton, Pickering, Latham, Flower, Peschel, Topinard, Brinton, Virchow (1877), Quatrefages and Hamy (1882), Thalbitzer, Bogoras and numerous others. With all of this, the conception of the Asiatic origin of the Eskimo has not passed the status of a

strong probability, lacking a final conclusive demonstration.

A chronological list of the more noteworthy individual statements is given at the end of this section.

Origin in America.—Since the earlier parts of the nineteenth century the opinion began to be expressed that the Eskimo is not of Asiatic but of American origin. Already in 1847 Prichard tells us that there are those who "consider them as belonging to the American family," and he plainly favors this conception.

Between 1873 and 1890 the American origin of the Eskimo is repeatedly asserted by Rink, who for 16 winters and 22 summers lived with the eastern Eskimo, first as a scientific explorer and later as royal inspector or governor of the southern Danish settlements in Greenland (preface by R. Brown to Rink's Tales and Traditions, 1875). In this opinion, briefly, the Eskimo were derived from the inland Indian tribes of Alaska; without referring to the origin of the Indian.

Rink's authoritative opinion was followed or paralleled by Daniel Wilson (1876), Grote, Krause, Ray, Keane, Brown, and others. In 1887 Chamberlain expresses the somewhat startling additional theory that it was not the Eskimo who was derived from the Mongolians but the Mongolians from the Eskimo or their American ancestors. And in 1901-1910 Boas comes to the conclusion that the Eskimo probably originated from the inland tribes (Indian?) in the Hudson Bay region.

An interesting case in these connections is that of Rudolf Virchow. In 1877 (see details at the end of

this section) he expresses the belief in the Eskimo coming from Asia; in 1878 he seems to be uncertain; and in 1885 he comes out in support of the opinion that the original home of the Eskimo may have been in the western part of the Hudson Bay region. Among later students of the problem, Steensby[205] and Birket-Smith[206] incline on cultural grounds to this hypothesis.

Wissler, not explicit as to the Eskimo in 1917 (The American Indian), in 1918 (Archæology of the Polar Eskimo) finds, after Steensby, the most acceptable theory of the Eskimo origin to be that "they expanded from a parent group in the Arctic Archipelago"; but in 1922, in the second edition of his The American Indian, he repeats word for word his opinion of 1917, which appears to favor an Asiatic derivation.

Origin in Europe—Identity with Upper Palaeolithic man. —About the sixties of last century growing discoveries in France of implements, etc., of later palaeolithic man brought about a realization that not a few of these implements and other objects, particularly those of the Magdalenian period, resembled like implements and objects of the Eskimo; from which, together with the considerations of the similarities of fauna (reindeer, musk-ox, etc.), and of climate, there was but a step to a more or less definite identification of the Magdalenians and Solutreans with the Eskimo. In 1870 Pruner-Bey[207] claims a similarity between Solutrean and Eskimo skulls. In 1883 these views received the influential support of De Mortillet (see details). In 1889 the theory receives strong support from the characteristics of the Chancelade (Magdalenian) skeleton which Testut declares are in

many respects almost identical with those of the Eskimo. And within the next few years the notion is upheld by Hamy and Hervé. It remains sympathetic as late as 1913 to Marcellin Boule, and finds most recent champions in Morin and Sollas.

However, there were also many who opposed the effort at a direct connection of the upper palaeolithic man of Europe and the Eskimo. Among these were Geikie, Flower, Rae, Daniel Wilson, Robert Brown, Déchelette, Laloy. At present the theory is supported mainly by Morin and Sollas, opposed by Steensby, Burkitt, Keith, MacCurdy, and others; while most students of the Eskimo ignore the question.

Other hypotheses.—Besides the preceding ideas which attribute the origin of the Eskimo to Asia, or America, or old Europe, there were also others that failed to receive a wider support; and there were authors and students who remained undecided or were too cautious to definitely formulate their beliefs. Some of the former as well as the latter deserve brief mention.

Gallatin, in 1836, mainly on linguistic grounds, recognizes the fundamental relation of the Eskimo and the Indian and seems inclined to the American origin of the former, but makes no clear statement to that effect. For Meigs (1857), who probably followed an earlier opinion, the Eskimo came "from the islands of the Polar Sea." C. C. Abbott (1876) saw Eskimo in the early inhabitants of the Delaware Valley. To Grote (1875, 1877), the Eskimo were "the existing representatives of the man of the American glacial epoch"; they were modified Pliocene men. Nordenskiöld (1885) follows closely Meigs and Grote; the Eskimo may be "the true autochthones of the Polar regions," having inhabited them from

before the glacial age, during more genial climate. Keane (1886) believed the Eskimo developed from the Aleuts. For De Quatrefages (1887), man originated in the Tertiary in northern Asia, spread from there, and some of his contingents may have reached America and been the ancestors of the Eskimo; the western tribes of the latter being a mixture of the Eskimo with Asiatic brachycephals. Nansen (1893) avoids a discussion of the origin of the Eskimo; and the same caution is observable more or less in most modern writers.

The following chart of the more noteworthy opinions regarding the origin of the Eskimo will show at a glance the diversity of the views and their lack of conclusiveness.

FOOTNOTES:

[205] Contr. Ethn. and Anthropogeog. Polar Eskimos, Med. om Grönl., XXXIV, Copenhagen, 1910; also, Origin of the Eskimo culture, *ibid.*, 1916, 204-218.

[206] Internat. Congr. Americanists, New York, 1928.

[207] In Ferry, H. de, Le Maconnais préhistorique, etc., 1 vol, Macon, 1870, with a section by Pruner-Bey.

Theories as to the Origin of the Eskimo

Asiatic:

Steller 1743

Cranz

1779
Blumenbach
1795
Lawrence
1822
Von Wrangell
1839
Morton
1839
McDonald
1841
Latham
1850
Pickering
1854
Wilson
1863
Rae
1865, 1877-78, 1886
Markham
1865, 1875
Whymper
1869
Peschel
1876
Kuhl
1876
Petitot
1876
Topinard
1877
Virchow

	1877
Dall	
	1877
Palmer	
	1879
Henry	
	1879
Dawson	
	1880
Quatrefages	
	1882, 1887
Elliot	
	1886
Flower	
	1886
Brown	
	1888
Ratzel	
	1897
Hrdlička	
	1910, 1924
Thalbitzer	
	1914
Fürst and Hansen	
	1915
Wissler	
	1917
Mathiassen	
	1921
Bogoras	
	1924, 1927

American:

Prichard 1847

Rink 1873, 1888

Holmes 1873

Wilson 1876

Grote 1877

Krause 1883

Ray 1885

Virchow 1885

Keane 1886, 1887

Brown 1888

Murdoch 1888

Chamberlain 1889

Quatrefages 1889

Boas 1907, 1910

Wissler 1917

European or connected with Europe:

Lartet and Christy
1864
Dawkins
1866
Hervé
1870
Abbott
1876
De Mortillet
1883
Testut
1889
Boule
1913
Sollas
1924, 1927

Opposed to Europe:
Brown.
Burkitt.
Déchelette.
Flower.
Geikie.
Keith.
Laloy.
MacCurdy.
Rae.
Steensby.
Wilson.
Hrdlička (1910).

Miscellaneous and indefinite:
Gallatin

1836

Richardson

1852

Meigs

1857

Grote

1875

Abbott

1876

Nordenskiöld

1885

Keane

1886

Quatrefages

1887

Nansen

1893

Tarenetzky

1900

Nadaillac

1902

Jenness

1928

ASIATICS

Steller, 1743:[208] Several references which indicate that Steller regarded the Eskimo as related to the northeastern Asiatics.

Cranz, 1779:[209] Points out the resemblances of the Eskimo (and their product) to the Kalmuks, Yakuts, Tungus, and Kamchadales, and derives them from

northeastern Asia (forced by other peoples through Tartary to the farthest northeast of Asia and then to America).

Blumenbach, 1781:[210] The first of the five varieties of mankind "and the largest, which is also the primeval one, embraces the whole of Europe, including the Lapps, * * * and lastly, in America, the Greenlanders and the Esquimaux, for I see in these people a wonderful difference from the other inhabitants of America; and, unless I am altogether deceived, I think they must be derived from the Finns."

But in his "Beiträge zur Naturgeschichte," 2d ed., Göttingen, 1806, Blumenbach classes both the Lapps and the Eskimo with the Mongolians (Anthr. Treatises of Blumenbach, Lond., 1865, p. 304): "The remaining Asiatics, except the Malays, with the Lapps in Europe, and the Esquimaux in the north of America, from Bering Strait to Labrador and Greenland. They are for the most part of a wheaten yellow, with scanty, straight, black hair, and have flat faces with laterally projecting cheek bones, and narrowly slit eyelids."

Von Wrangell, 1839:[211] "* * * ihre sclavische Abhängigkeit von den Rennthier-Tschuktschen beweist, dass die letztern spätere Einwanderer und Eroberer des Landes sind, welches sie jetzt inne haben."

Lawrence, 1822:[212] "The Mongolian variety * * * includes the numerous more or less rude, and in great part nomadic tribes, which occupy central and northern Asia; * * * and the tribes of Eskimaux

extending over the northern parts of America, from Bering Strait to the extremity of Greenland. * * *

"The Eskimaux are formed on the Mongolian model, although they inhabit countries so different from the abodes of the original tribes of central Asia."

Latham, 1850:[213] "Our only choice lies between the doctrine that makes the American nations to have originated from one or more separate pairs of progenitors, and the doctrine that either Bering Strait or the line of islands between Kamskatka and the Peninsula of Alaska, was the highway between the two worlds—from Asia to America, or vice versa. * * * Against America, and in favor of Asia being the birthplace of the human race—its unity being assumed—I know many valid reasons. * * * Physically, the Eskimo is a Mongol and Asiatic. Philologically, he is American."

1851:[214] "Just as the Eskimo graduate in the American Indian, so do they pass into the populations of northeastern Asia—language being the instrument which the present writer has more especially employed in their affiliation. From the Peninsula of Alaska to the Aleutian chain of islands, and from the Aleutian chain to Kamskatka is the probable course of the migration from Asia to America—traced backwards, i. e., from the goal to the starting point, from the circumference to the center."

Pickering, 1854:[215] "The Arctic Regions seem exclusively possessed by the Mongolian race."

Wilson, 1863:[216] "The same mode of comparison which confirms the ethnical affinities between the Esquimaux and their insular or Asiatic congeners, reveals, in some respects, analogies rather than contrast between the dolichocephalic Indian crania and those of the hyperborean race."

Markham, 1856:[217] "The interesting question now arises—whence came these Greenland Esquimaux, these Innuit, or men, as they call themselves, and as I think they ought to be called by us? They are not descendants of the Skroellings of the opposite American coast, as has already been seen. It is clear that they can not have come from the eastward, over the ocean which intervenes between Lapland and Greenland, for no Esquimaux traces have ever been found on Spitzbergen, Iceland, or Jan Mayen. We look at them and see at once that they have no kinship with the red race of America; but a glance suffices to convince us of their relationship with the northern tribes of Siberia. It is in Asia, then, that we must seek their origin."

Whymper, 1869:[218] "That the coast natives of northern Alaska are but Americanized Tchuktchis from Asia, I myself have no doubt."

Peschel, 1876:[219] "The identity of their language with that of the Namollo, their skill on the sea, their domestication of the dog, their use of the sledge, the Mongolian type of their faces, their capability for higher civilization, are sufficient reasons for answering the question, whether a migration took place from Asia to America or conversely from America to Asia, in favor of the former alternative; yet such a migration from Asia by way of Bering Strait must have occurred at a much later period than the first colonization of the New World from the Old one * * *.

"It is not likely that the Eskimo spread from America to Asia, because of all Americans they have preserved the greatest resemblance in racial characters to the Mongolian nations of the Old World, and in historical times their migrations have always taken place in an easterly direction."

Kuhl, 1876:[220] "Bilden so die Eskimo in der Sprache das Bindeglied zwischen America und Asien, so ist dies noch viel mehr der Fall in Bezug auf ihren Typus: dieser stimmt bei den Polarvölkern diesseits und jenseits der Beringsstrasse 'zum Verwechseln' überein, wie denn auch ein beständiger Verkehr hinüber und herüber stattfindet. Hierin liegt der unwiderstehliche Beweis, dass diese Polarvölker wenigstens von einer Herkunft sind und dass eine Einwanderung von einem Continente in das andere hier stattgefunden hat. Haben wir nun die Wahl, entweder die Eskimo aus Asien nach America, oder die Tschuktschen, die dort auf der Asiatischen Seite

wohnen, aus America einwandern zu lassen—wofür sich auch Stimmen erhoben haben—so werden wir keinen Augenblick zweifelhaft sein: eine spätere Rückwanderung eines einzelnen Stammes in das Land der Väter wäre immerhin denkbar; aber wer über die Tschuktschen hinweg die Sache in's Grosse sieht, kann für die Urzeit nur eine Einwanderung von Asien nach America, nicht umgekehrt, annehmen, und hierfür finden wir ausser den allgemeinen Gründen, welche uns der Verlauf unserer Untersuchungen nahe gebracht, noch zwei besondere Beweise bei den Eskimo: einmal können wir die Spur ihrer Wanderungen historisch verfolgen, und diese wären nach Osten gerichtet, sodass sie Grönland, mit dem heute ihr Name so eng verbunden ist, zuletzt erreichten (S. 209); sodann haben die Eskimo allein unter den Americanischen Stämmen das Mongolische Gepräge ganz unversehrt bewahrt—dies bliebe unerklärlich, wenn sie Americanische Autochthonen wären * * * Einen deutlichen Hinweis auf die Urheimath Asien enthalten auch die Wanderungen der Stämme durch das Americanische Continent, soweit wir dieselben verfolgen können."

Dall, 1877:[221] "I see, therefore, no reason for disputing the hypothesis that America was peopled from Asia originally, and that there were successive waves of emigration.

"The northern route was clearly by way of Bering Strait; * * * Linguistically, no ultimate distinction can be drawn between the American Innuit and the American Indian. * * * I shall assume, what is also assumed by Mr. Markham, that the original

progenitors of the Innuit were in a very primitive, low, and barbarous condition. * * *

"I assume, then, that the larger part of North America may have been peopled by way of Bering Strait. * * * I believe that this emigration was vastly more ancient than Mr. Markham supposes, and that it took place before the present characteristics of races and tribes of North American savages were developed. * * *

"My own impression agrees with that of Doctor Rink that the Innuit were once inhabitants of the interior of America; that they were forced to the west and north by the pressure of tribes of Indians from the south; that they spread into the Aleutian region and northwest coast generally, and possibly simultaneously to the north; that their journeying was originally tentative, and that they finally settled in those regions which afforded them subsistence, perhaps after passing through the greater portion of Arctic America, leaving their traces as they went in many places unfit for permanent settlement; that after the more inviting regions were occupied, the pressure from Indians and still unsatisfied tribes of their own stock, induced still further emigration, and finally peopled Greenland and the shores of northeastern Siberia; but that these latter movements were, on the whole, much more modern, and more local than the original exodus, and took place after the race characteristics and language were tolerably well matured. * * *

"I conclude that at present the Asiatic Innuit range from Koliuchin Bay to the eastward and south to Anadyr Gulf. * * *

"To the reflux of the great wave of emigration, which no doubt took place at a very early period, we may

owe the numerous deserted huts reported by all explorers on the north coasts of Asia, as far east as the mouth of the Indigirka. At one time, I thought the migration to Asia had taken place within a few centuries, but subsequent study and reflection has convinced me that this could not have been the case. No doubt successive parties crossed at different times, and some of these may have been comparatively modern."

Rae, 1878:[222] "All the Eskimos with whom I have communicated on the subject, state that they originally came very long ago from the west, or setting sun, and that in doing so they crossed a sea separating the two great lands.

"That these people (the Eskimos) have been driven from their own country in the northern parts of Asia by some unknown pressure of circumstances, and obliged to extend themselves along the whole northern coast line of America and Greenland, appears to be likely, and that the route followed after crossing Bering Strait was of necessity along the coast eastward, being hemmed in by hostile Indians on the south, and driven forward by pressure from the west * * *.

"Such were my opinions 12 years ago, and their correctness has been rather confirmed than otherwise, by all that we have since learned. * * *"

1887:[223] "Professor Flower said that his

investigation into the physical characteristics of the Eskimos led him to agree entirely with Doctor Rae's conclusions derived from other sources. He looked upon the Eskimos as a branch of the North Asiatic Mongols (of which the Japanese may be taken as a familiar example), who in their wandering across the American continent in the eastward direction, isolated almost as perfectly as an island population would be, hemmed in on one side by the eternal polar ice, and on the other by hostile tribes of American Indians, with whom they rarely, if ever, mingled, have gradually developed special modifications of the Mongolian type, which increase in intensity from west to east, and are seen in their greatest perfection in the inhabitants of Greenland.
* * *

"Doctor Rae also thinks that the Eskimos came from across Bering Strait from Asia. Their traditions and many other things point in that direction, and they are in no way related to the ancient cave men of Europe."

Dawson, 1880:[224] Eskimo: "On the eastern side of the continent these poor people have always been separated by a marked line from their Indian neighbors on the south, and have been regarded by them with the most bitter hostility. On the west, however, they pass into the Eastern Siberians, on the one hand, and into the West-coast Indians, on the other, both by language and physical characters. They and the northern tribes at least of West-coast Indians, belong in all probability to a wave of population spreading from Bering Strait."

Quatrefages et Hamy; 1882:[225] "Les Esquimaux ou Eskimos, qui se nomment eux-mêmes Innuits, constituent dans la série mongolique un groupe exceptionnel, qui diffère à maints égards de ceux qui viennent de passer sous nos yeux, mais dont l'origine asiatique n'est plus aujourd'hui contestée et dont les affinités occidentales frappent de plus en plus les observateurs spéciaux."

Brown, 1888:[226] "It is only when we come to the region beginning at Cape Shelagskii and extending to the East Cape of Siberia that we find any traces of them. This tract is now held by the coast Tchukchi, but it was not always their home, for they expelled from this dreary stretch the Onkilon or Eskimo race who took refuge in or near less attractive quarters between the East Cape and Anadyrskii Bay."

Ratzel, 1897:[227] "If we ask whence they came, Asia seems most obvious, since between the American and Asiatic coasts of Bering Straits, intercourse has always been ventured upon even in the rudest skin-boats. * * *

"Ethnographic indications also point predominantly to the west. * * *

"But we have an equal right to suppose a migration from America into Asia."

Thalbitzer, 1914:[228] "I still believe (like Rink), that

the common Eskimo mother-group has at one time lived to the west at the Bering Strait, coming originally from the coasts of Siberia."

Fürst and Hansen, 1915:[229] "We are to some extent acquainted with the diffusion of the Eskimos over the earth, and know that they could not have come directly from Europe and that Greenland was populated from the west, one may naturally conclude, as has often been concluded before, that their descent is from the west, in other words from Asia, though the time at which such an immigration took place and the racial type which they then possessed must remain still more hypothetical than immigration itself."

Mathiassen, 1927:[230] "We must therefore imagine that the Thule culture, with all its peculiar whaling culture, has originated somewhere in the western regions, in an Arctic area, where whales were plentiful and wood abundant, and we are involuntarily led toward the coasts of Alaska and East Siberia north of Bering Strait, the regions to which we have time after time had to turn in order to find parallels to types from the Central Eskimo finds. There all the conditions have been present for the originating of such a culture, and from there it has spread eastward right to Greenland, seeking everywhere to adapt itself to the local geographical conditions. And it can hardly have been a culture wave alone; it must have been a migration. The

similarities between east and west are in many directions so detailed that it is difficult to explain them without assuming an actual migration of people from the one place to the other."

Jochelson, 1928:[231] "In discussing the question of former Eskimo occupation of the Siberian Arctic coast a very remote period of time is not meant, so that in this sense the assumed recent Eskimo migrations from Asia into America and vice versa do not interfere with the general theory of the Asiatic origin of the American population."

FOOTNOTES:

[208] Steller, G. W., Journal, 1743. Transl. and repr. in Bering's Voyages, Am. Geog. Soc. Research, ser. I, 2 vols., vol. II, p. 9 et seq. New York, 1922.

[209] Cranz, David, Historie von Grönland, Frankf. and Leipz., 1779, 300-301.

[210] Blumenbach, J. F., Be generis humani varietate nativa. 2d ed., Goettingen, 1781; in The anthropological treatises of J. F. Blumenbach, Anthr. Soc. Lond., 1865, p. 99, ftn. 4.

[211] Von Wrangell, in Baer and Helmersen's "Beiträge zur Kenntniss des Russischen Reiches," pp. 58-59. St. Petersburg, 1839.

[212] Lawrence, W., Lectures on physiology, zoology, and the natural history of man, pp. 511-513. London, 1822.

[213] Latham, Robert Gordon, The Natural history of the varieties of man, pp. 289-291.

London, 1850.

[214] Latham, Robert Gordon, Man and his migrations, p. 124. London, 1851.

[215] Pickering, Charles, The races of man, p. 7. London, 1854.

[216] Wilson, Daniel, Physical ethnology. Smithsonian Report for 1862, p. 262. Washington, 1863.

[217] Markham, C. R., On the origin and migrations of the Greenland Esquimaux. J. Roy. Geog. Soc., XXXV, p. 90. London, 1865.

[218] Whymper, Frederick, Travels in Alaska and on the Yukon, p. 214. New York, 1869.

[219] Peschel, Oscar, The races of man, pp. 396-97. New York, 1876.

[220] Kuhl, Dr. Joseph, Die Anfänge des Menschengeschlechts und sein einheitlicher Ursprung, pp. 315-16. Leipzig, 1876.

[221] Dall, W. H., Tribes of the extreme northwest. U. S. Geog. and Geol. Survey, I, pp. 93-105. Washington, 1877.

[222] Rae, John, Eskimo Migrations. Jour. Anthrop. Inst. Great Britain and Ireland, VII, pp. 130-131. London, 1878.

[223] Rae, John, Remarks on the Natives of British North America. Jour. Anthrop. Inst. Great Britain and Ireland, XVI, p. 200. London, 1887.

[224] Dawson, J. W., Fossil men and their modern representatives, pp. 48-49. Montreal, 1880.

[225] Quatrefages, A. de, et Hamy, E. T., Crania ethnica. Les crânes des races humaines, p. 437. Paris, 1882.

[226] Brown, Robert, The origin of the

Eskimo. The Archaeological Review, I, No. 4, pp. 238-289. London, 1888.

[227] Ratzel, Friedrich, The history of mankind, II, pp. 107-108. London, 1897.

[228] Thalbitzer, W., The Ammassalik Eskimo. Meddelelser om Grønland, vol. XXXIX, pt. 1, p. 717. Copenhagen, 1914.

[229] Fürst, Carl M., and Fr. C. C. Hansen, Crania Groenlandica, p. 228. Copenhagen, 1915.

[230] Mathiassen, Therkel, Archaeology of the central Eskimos. Report of the Fifth Thule Expedition 1921-1924, p. 184. Copenhagen, 1927.

[231] Jochelson, W., Peoples of Asiatic Russia. Am. Mus. Nat. Hist., p. 60. New York, 1928.

AMERICAN

Prichard, 1847:[232] "A question has been raised, to what department of mankind the Esquimaux belong. Some think them a race allied to the northern Asiatics, and even go so far as to connect them with the Mongolians. Others, with greater probability, consider them as belonging to the American family. All the American writers eminent for their researches in the glottology of the New World, among whom I shall mention Mr. du Ponceau and Mr. Gallatin, are unanimous in the opinion that the Esquimaux belong to the same great department of nations as the Hunting Tribes of North America."

Rink, 1890:[233] "* * * kann es wohl keinem Zweifel

unterworfen sein, dass die Eskimos den sogenannten Nordwest-Indianern an der Küste Alaskas und weiter südwärts am nächsten stehen. Es dürfte deshalb der Untersuchung werth sein, ob sie nicht auch wirklich als das äusserste nördliche Glied dieser Völkerstämme zu betrachten wären. Man hat angenommen, dass diese letzteren, dem Laufe der Flüsse folgend, vom Binnenlande zur Küste gekommen sind. Sie lernten dann, theilweise und um so mehr wohl, je weiter nach Norden sich ihren Lebensunterhalt aus dem Meere zu verschaffen. Die Eskimos endigten damit, sich ausschliesslich der Jagd auf dem Meere zu widmen, und erlangten dadurch ihre merkwürdige Fähigkeit, allen Hindernissen des arktischen Klimas Trotz bieten zu können. Betrachten wir demnach, wie man vermeintlich noch jetzt die Spuren der Veränderungen beobachten kann, denen sie nach und nach unterworfen worden sind, indem sie sich, unserer Vermuthung zufolge, nach Norden und Osten verbreiteten."

Rink, 1873:[234] "As far as can now be judged, the Eskimo appear to have been the last wave of an aboriginal American race, which has spread over the continent from more genial regions, following principally the rivers and watercourses, and continually yielding to the pressure of the tribes behind them, until at last they have peopled the seacoast. * * *

"The author explains some of the most common traditions from Greenland as simply mythical narrations of events occurring in the far northwest corner of America, thereby pointing to the great probability of that district having been the original home of the nation, in which they first assumed the peculiarities of their present culture."

Captain Pim also expressed his belief that "the Eskimo were pure American aborigines, and not of Asiatic descent."

Rink, 1875:[235] "If we suppose the physical conditions and the climate of the Eskimo regions not to have altered in any remarkable way since they were first inhabited, their inhabitants of course must originally have come from more southern latitudes, * * * it appears evident on many grounds that such a southern tribe has not been a coast people migrating along the seashore, and turning into Eskimo on passing beyond a certain latitude, but that they have more probably emerged from some interior country, following the river banks toward the shores of the polar sea, having reached which they became a coast people, and, moreover, a polar-coast people. The Eskimo most evidently representing the polar-coast people of North America, the first question which arises seems to be whether their development can be conjectured with any probability to have taken place in that part of the world. Other geographical conditions appear greatly to favor such a supposition * * *. The rivers taking their course to the sea between Alaska and the Coppermine River, seem well adapted to lead such a migrating people onward to the polar sea. * * *

"The probable identity of the 'inlanders' with the Indians has already been remarked on. When the new coast people began to spread along the Arctic shores, some bands of them may very probably have crossed Bering Strait and settled on the opposite shore, which is perhaps identical with the fabulous

country of Akilinek. On the other hand, there is very little probability that a people can have moved from interior Asia to settle on its polar seashore, at the same time turning Eskimo, and afterwards almost wholly emigrated to America.

"On comparing the Eskimo with the neighboring nations, their physical complexion certainly seems to point at an Asiatic origin; but, as far as we know, the latest investigations have also shown a transitional link to exist between the Eskimo and the other American nations, which would sufficiently indicate the possibility of a common origin from the same continent."

Rink, 1875:[236] "The author, who has traveled and resided in Greenland for 20 years, and has studied the native traditions, of which he has preserved a collection, considers the Eskimo as deserving particular attention in regard to the question how America has been originally peopled. He desires to draw the attention of ethnologists to the necessity of explaining, by means of the mysterious early history of the Eskimo, the apparently abrupt step by which these people have been changed from probably inland or riverside inhabitants into a decidedly littoral people, depending entirely on the products of the Arctic Sea; and he arrives at the conclusion that, although the question must still remain doubtful, and dependent chiefly on further investigations into the traditions of the natives occupying adjacent countries, yet, as far as can now be judged, the Eskimo appear to have been the last wave of an aboriginal American race, which has spread over the

continent from more genial regions, following principally the rivers and watercourses, and continually yielding to the pressure of the tribes behind them, until at last they have peopled the seacoast. * * *

"When we consider the existing intercourse between the inhabitants on both sides of Bering Strait, we find many circumstances to justify the conclusion that those traditions of the Greenland Eskimo refer to the origin of the Eskimo sledge dog from the training of the Arctic wolf, to the first journeys upon the frozen sea, and to intercourse between the aboriginal Eskimo and the Asiatic coast."

Rink, 1886:[237] "Grönland kann ja nur von Westen her seine eskimoische Bevölkerung empfangen haben. Dasselbe lässt sich mit Wahrscheinlichkeit auch von den nächsten Nachbarländern jenseits der Davisstrasse annehmen, und wenn wir diese Vermutung weiter erstrecken, gelangen wir zum Alaskaterritorium als der wahrscheinlichen Heimat der jetzt so weit zertreuten arktischen Volkes. Zunächst findet diese Annahme eine Bestätigung darin, dass die Eskimos hier nicht auf die Küste beschränkt, sondern auch längs der Flüsse ins Binnenland verbreitet sind, nur dass der ungeheure Fischreichtum dieser Flüsse es möglich gemacht haben kann, dass hier ursprünglich eine noch viel grössere Bevölkerung, als jetzt, sich sammelte, welche durch Auswanderung das notwendige Kontingent zur Entstehung der auf die Meeresküste beschränkten Stämme geliefert haben kann."

Wilson, 1876:[238] "Some analogies confirm the probability of a portion of the North American stock having entered the continent from Asia by Bering Strait or the Aleutian Islands; and more probably by the latter than the former. * * *

"In this direction, then, a North American germ of population may have entered the continent from Asia, diffused itself over the Northwest, and ultimately reached the valleys of the Mississippi, and penetrated to southern latitudes by a route to the east of the Rocky Mountains. Many centuries may have intervened between the first immigration and its coming in contact with races of the southern continent; and philological and other evidence indicates that if such a northwestern immigration be really demonstrable, it is one of very ancient date. But so far as I have been able to study the evidence, much of that hitherto adduced appears to point the other way. * * *

"With Asiatic Esquimaux thus distributed along the coast adjacent to the dividing sea; and the islands of the whole Aleutian group in the occupation of the same remarkable stock common to both hemispheres: The only clearly recognizable indications are those of a current of migration setting toward the continent of Asia, the full influence of which may prove to have been more comprehensive than has hitherto been imagined possible. * * *"

Grote, 1877:[239] Regards the Eskimo as the original inhabitants of North America and believes they extended down to 50° in the eastern and 60° in the western part of the continent.

Krause, 1883:[240] "Ueberblickt man nun die gegenwärtige Verbreitung der Eskimos in Asien, so wird man der Ansicht von Dall und Nordenskiöld beistimmen, dass die asiatischen Eskimo aus Amerika eingewandert sind und nicht, wie Steller, Wrangell, und andere vermutheten, zurückgebliebene Reste einer ehemals zahlreicheren, nach Amerika hinübergezogenen Bevölkerung. Immerhin würde durch die Annahme eines amerikanischen Ursprunges der jetzigen Eskimobevölkerung die Möglichkeit früherer Wanderungen in entgegengesetzter Richtung nicht ausgeschlossen sein, nur giebt die gegenwärtige Verbreitung keinen Anhalt für eine solche, und historische Beweise fählen."

Ray, 1885:[241] "Of their origin and descent we could get no trace, there being no record of events kept among them. * * *

"That they have followed the receding line of ice, which at one time capped the northern part of this continent, along the easiest lines of travel is shown in the general distribution of a similar people, speaking a similar tongue, from Greenland to Bering Strait; in so doing they followed the easiest natural lines of travel along the watercourses and the seashore, and the distribution of the race to-day marks the routes traveled. The seashore led them along the Labrador and Greenland coasts; Hudson Bay and its tributary waters carried its quota towards Boothia Land; helped by Back's Great Fish River, the Mackenzie carried them to the northwestern coast,

and down the Yukon they came to people the shores of Norton Sound and along the coast to Cape Prince of Wales. They occupied some of the coast to the south of the mouth of the Yukon, and a few drifted across Bering Strait on the ice, and their natural traits are still in marked contrast with their neighbors, the Chuckchee. They use dogs instead of deer, the natives of North America having never domesticated the reindeer, take their living from the sea, and speak a different tongue. Had the migration come from Asia it does not stand to reason that they would have abandoned the deer upon crossing the straits."

Keane, 1886:[242] "Dr. H. Rink, in the current number of the Deutsche Geographische Blätter (Bermen, 1886) * * * makes it sufficiently evident that their primeval home must be placed in the extreme northwest, on the Alaskan shores of the Bering Sea * * * the Aleutian Islanders, who are treated by Doctor Rink as a branch of the Eskimo family, but whose language diverges profoundly from, or rather shows no perceptible affinity at all to, the Eskimo. The old question respecting the ethnical affinities of the Aleutians is thus again raised, but not further discussed by our author. To say that they must be regarded as 'ein abnormer Seitenzweig,' merely avoids the difficulty, while perhaps obscuring or misstating the true relations altogether. For these islanders should possibly be regarded, not 'as abnormal offshoot,' but as the original stock from which the Eskimos themselves have diverged. * * * Doctor Rink himself advances some solid reasons for bringing the Eskimo, not from Asia at all, or at least

not in the first instance, but from the interior of the North American continent. He holds, in fact, with some other ethnologists, that they were originally inlanders, who, under pressure from the American Indians, gradually advanced along the course of the Yukon, Mackenzie, and other great rivers, to their present homes on the Bering Sea, and Frozen Ocean."

No individual or decided standpoint on the question is taken in the author's Man, Past and Present, 1920 edition.

Brown, 1881:[243] "The Eskimo are therefore an essentially American people, with a meridional range greater than that of any other race. * * *

"It is also clear that this migration has always been from west to east, as also has been that of the Indian tribes; * * *

"Did these hyperboreans come from Asia or are they evolutions, differentiations, as it were, of some of the other American races? That all of the American peoples came originally from Asia, is, I think, an hypothesis for which a great deal might be said. Unless they originated there or were autochthonic, an idea which may at once be dismissed; they could scarcely have come from anywhere else, * * * but the central question is whether the Eskimo are of a later date than the Indians or are really Indians compelled to live under less favorable conditions than the rest of their kinsfolk. The latter will, I think, be found to be the most reasonable view to adopt. * * *

"Doctor Rink seems not far from the truth when he indicates the rivers of Central Arctic America as the

region from whence the Eskimo spread northward. * * *

"It is not at all improbable that the original progenitors of the race may have been a few isolated families, members of some small Indian tribe, or the decaying remnants of a larger one. Little by little they were expelled from their hunting and fishing grounds on the original river bank until, finding no place amid the stronger tribes, they settled in a region where they were left to themselves. * * *

"It may, however, be taken as proved that the Eskimo are in no respect and never were a European people; that they are not and never were an Asiatic one, except to the small extent already described; that the handful of people settled on the Siberian shore migrated from America, and that it is very probable the Eskimo came from the interior of Arctic America, Alaska more likely than from any other part of the world."

Virchow, 1877:[244] "Ich möchte namentlich darauf aufmerksam machen, dass diejenigen, welche den nächsten Anknüpfungspunkt für die Urbevölkerung Amerika's bei den Eskimo's suchen, welche ferner die Sprache und die Formen der Eskimo's nach Asien hinein verfolgen, leicht ein petitio principii machen dürften, insofern als es wohl sein könnte, dass sie ein späteres Phänomen für ein früheres halten. Warum sollte nicht die Einwanderung der Eskimo's von Asien erst erfolgt sein, nachdem längst andere Theile des Continents ihre Bewohner erhalten hatten?"

1878:[245] "Nun ist es sehr bemerkenswerth, dass gegenüber dieser physiognomischen Aehnlichkeit der

Eskimos und der Mongolen eine absolute Differenze Zwischen ihnen in Bezug auf die Schädelkapsel existirt" (examined six living Greenland Eskimos).

1885:[246] "Verbinden wir dieses mit dem Umstande, dass die Sagen der Ungava-Eskimos stets nach Norden über die Hudson-Strasse verlegt werden, dass man im Baffin-Lande stets über die Fury- und Hecla-Strasse fort nach Süden als dem Schauplatz alter Sagen hinweist, und dass die westlichen Eskimos ebenso den Osten als das Land ihrer sagenhaften Helden und Stämme betrachten, so gewinnt die Vermuthung an Wahrscheinlichkeit, dass im Westen des Hudson-Bay-Gebietes die Heimath der weitverbreiteten Stämme zu suchen ist."

Chamberlain, 1889:[247] "In a paper read before the Institute last year (Proc. Can. Inst., 3d. ser., Vol. V., Fasc. i., October, 1887, p. 70), I advanced the view that instead of the Eskimo being derived from the Mongolians of northeastern Asia, the latter are on the contrary descended from the Eskimo, or their ancestors, who have from time immemorial inhabited the continent of America."

Boas, 1901:[248] "All these data seem to me to prove conclusively that the culture of the Alaskan Eskimo is very greatly influenced by that of the Indians of the North Pacific coast and by the Athapascan tribes of the interior. This is in accord with the observation that their physical type is not so pronounced as the eastern Eskimo type. I believe, therefore, that H.

Rink's opinion of an Alaskan origin of the Eskimo is not very probable. If pure type and culture may be considered as significant, I should say that the Eskimo west and north of Hudson Bay have retained their ancient characteristics more than any others. If their original home was in Alaska, we must add the hypothesis that their dispersion began before contact with the Indians. If their home was east of the Mackenzie, the gradual dispersion and ensuing contact with other tribes would account for all the observed phenomena. * * * On the whole, the relations of North Pacific and North Asiatic cultures are such that it seems plausible to my mind that the Alaskan Eskimo are, comparatively speaking, recent intruders, and that they at one time interrupted an earlier cultural connection between the two continents."

To which he adds in the second part of this work, [249] speaking of the Eskimo taboos: "It may perhaps be venturesome to claim that the marked development of these customs suggests a time when the Eskimo tribes were inland people who went down to the sea and gradually adopted maritime pursuits, which, however, were kept entirely apart from their inland life, although in a way this seems an attractive hypothesis."

Boas, 1910:[250] "There is little doubt that the Eskimos, whose life as sea hunters has left a deep impression upon all of their doings, must probably be classed with the same group of peoples. The much-discussed theory of the Asiatic origin of the Eskimos must be entirely abandoned. The investigations of the Jesup North Pacific Expedition, which it was my privilege to conduct, seem to show that the Eskimos must be considered as, comparatively speaking, new

arrivals in Alaska, which they reached coming from the east."

Clark Wissler, 1917.[251] Page 363: "The New World received a detachment of early Mongoloid peoples at a time when the main body had barely developed stone polishing."

Pages 361-362: "Our review of New World somatic characters revealed the essential unity of the Indian population. It is also clear that there are affinities with the Mongoloid peoples of Asia. Hence, we are justified in assuming a common ancestral group for the whole Mongoloid-Red stream of humanity. We have already outlined the reasons for assuming the pristine home of this group to be in Asia."

Page 335: "For example, the Eskimos, whose first appearance in the New World must have been in Alaska, spread only along the Arctic coast belt to its ultimate limits."

1918[252]. Page 161: "The most acceptable theory of Eskimo origin is that they expanded from a parent group in the Arctic Archipelago."

1922.[253] Pages 368, 396, 398: Identical in every word again with that of 1917.

FOOTNOTES:

[232] Prichard, James Cowles, Researches into the physical history of mankind, vol. V, p. 374. London, 1847.

[233] Rink, H., Die Verbreitung der Eskimo-Stämme. Congrès International des

Américanistes, 1888, 221-22. Berlin, 1890.

[234] Rink, H., On the descent of the Eskimo. Mém. Soc. Roy. d. Antiquaires du Nord; Journ. anthrop. Inst, II, 1873, pp. 104, 106, 108.

[235] Rink, H., Tales and traditions of the Eskimo, pp. 70, 71, 72, 73. Edinburgh and London, 1875.

[236] Rink, H., On the descent of the Eskimo. In a Selection of Papers on Arctic Geography and Ethnology, Roy. Geog. Soc., pp 230, 232. London, 1875.

[237] Rink, H., Die Ostgrönländer in ihrem Verhältnisse zu den übrigen Eskimostämmen. Deutsch Geographische Blätter, IX, p. 229. Bremen, 1886.

[238] Wilson, Daniel, Prehistoric man, pp. 343-352. London, 1876.

[239] Grote, A. R., Buff. Daily Courier, Jan. 7, 1877 (q. by. R. Virchow, Z. Ethnol., Verh., IX, 1877, p. 69).

[240] Krause, Aurel, Die Bevölkerungsverhältnisse der Tschuktschenhalbinsel. Verh. Berl. Ges. Anthrop., etc., in Z. Ethn., XV, pp. 226-27. 1883.

[241] Ray, P. H., Ethnographic Sketch of the Natives. Report of the International Polar Expedition to Point Barrow, Alaska, pt. 2, p. 37. Washington, 1885.

[242] Keane, A. H., The Eskimo. Nature, XXXV, pp. 309, 310. London, New York, 1886-87.

[243] Brown, Robert, The Origin of the Eskimo. The Archaeological Review, I, No. 4, pp. 240-250. London, 1888.

[244] Virchow, R., Anthropologie Amerika's.

Verh. Berl. Ges. Anthr., etc., Jahrg. 1877 (with Z. Ethnol., 1877, IX), pp. 154-55.

[245] —— Eskimos. Verh. Berl. Ges. Anthr., etc., 1878, pp. 185-189 (with Z. Ethnol., 1878, X), p. 186.

[246] Virchow, R., Eskimos. Verh. Berl. Ges. Anthr., etc., 1885, p. 165 (with Z. Ethnol., 1885, XVII).

[247] Chamberlain, A. F., The Eskimo Race and Language. Proc. Can. Inst., VI, p. 281. Toronto, 1889.

[248] Boas, F., Eskimo of Baffin Land and Hudson Bay. Bull. Am. Mus. Nat. Hist., XV, pp. 369-370. 1907.

[249] Ibid., XV, pt. 2, pp. 569-570. 1907.

[250] Boas, Franz, Ethnological Problems in Canada. Jour. Roy. Anthrop. Inst. Great Britain and Ireland, XL, p. 534. London, 1910.

[251] Wissler, Clark, The American Indian. New York, 1917.

[252] —— Archæology of the Polar Eskimo. Anthrop. Papers, Am. Mus. Nat. Hist., XXII, pt. 3, p. 161. New York, 1918.

[253] —— The American Indian. New York, 1922.

EUROPEAN

Dawkins, 1866:[254] "The sum of the evidence proves that man, in a hunter state, lived in the south of Gaul on reindeer, musk sheep, horses, oxen, and the like, at a time when the climate was similar to that which those animals now inhabit. To what race did he belong? In solving this the zoological evidence is of great importance. The reindeer and musk sheep now

inhabit the northern part of the American Continent and are the principal land animals that supply the Esquimaux with food. The latter of these has departed from the Asiatic Continent, leaving remains behind to prove that it shared the higher northern latitudes of Asia with the reindeer, and this latter has retreated farther and farther north during the historical period. May not the race that lived on these two animals in southern Gaul have shared also in their northern retreat, and may it not be living in company with them still? The truth of such a hypothesis as this is found by an appeal to the weapons, implements, and habits of life of the Esquimaux. The fowling spear, the harpoon, the scrapers, the marrow spoons are the same in the ice huts of Melville Sound as in the ancient dwellings of southern Gaul. In both there is the same absence of pottery; in both bones are crushed in the same way for the sake of the marrow, and accumulate in vast quantities. The very fact of human remains being found among the relics of the feast is explained by an appeal to what Captain Parry observed in the island of Igloolik. Among the vast quantities of bones of walruses and seals, and skulls of dogs and bears found in the Esquimaux camp, were numbers of human skulls lying about among the rest, which the natives tumbled into the collecting bags of the officers without the least remorse. A similar carelessness for the dead was also observed by Sir J. Ross and Captain Lyon. This presence, then, of human remains in the south of Gaul is another link binding the ancient people then living there to the Esquimaux. Their small size also is additional evidence.

"The only inference that can be drawn from these premises is that the people in question were

decidedly Esquimaux, related to them precisely in the same way as the reindeer and musk sheep of those days were to those now living in the high North American latitudes. The sole point of difference is the possession of the dog by the latter people, but in the vast lapse of time between the date of their sojourn in Europe and the present day the dog might very well have been adopted from some other superior race, or even reduced under the rule of man from some wild progenitor. By this discovery a new people is added to those which formerly dwelt in Europe. The severity of the climate in southern Gaul is proved by the northern animals above mentioned. As it became warmer musk sheep, reindeer, and Esquimaux would retreat farther and farther north until they found a resting place on the American shore of the great Arctic Sea. Possibly in the case of the Esquimaux the immigration of other and better-armed tribes might be a means of accelerating this movement."

Hamy, 1870:[255] "Il nous parait, comme à MM. de Quatrefages, Carter-Blake, Le Hon, etc., que les caractères anatomiques des races de Furfooz et de Cro-Magnon doivent leur faire prendre place dans le groupe hyperboréen."

Dawkins, 1874[256]: In 1866, Boyd Dawkins, on the basis of the resemblances between the implements of the Eskimo and those of the later prehistoric man of Europe, advances the idea that the Eskimo were

close kin to the palaeolithic man of Europe, before the scientific forum. In his Cave Hunting he says: "Palaeolithic man appeared in Europe with the arctic mammalia, lived in Europe along with them, and disappeared with them. And since his implements are of the same kind as those of the Eskimos, it may reasonably be concluded that he is represented at the present time by the Eskimos, for it is most improbable that the convergence of the ethnological and zoological evidence should be an accident."

1880:[257] "The probable identity of the cave men with the Eskimos is considerably strengthened by a consideration of some of the animals found in the caves. * * *

"All these points of connection between the cave men and the Eskimos can, in my opinion, be explained only on the hypothesis that they belong to the same race * * *."

The cave man: "From the evidence brought forward in this chapter, there is reason to believe that he is represented at the present time by the Eskimos."

Mortillet, 1889:[258] "Les Groënlandais, au point de vue paléoethnologique, présentent un très grand intérêt. Ils paraissent se relier très intimement aux hommes qui habitaient l'Europe moyenne pendant l'époque de la Madeleine. Ils seraient les descendants directs des Magdalèniens. Ils auraient successivement émigré vers le pôle, avec l'animal caractéristique de cette époque, le renne. Habitués aux froids les plus rigoureux de l'époque magdalénienne, ils se sont retirés dans les régions froides du Nord. * * *

"Comme on le voit, il y a la plus grande ressemblance, tant sous le rapport physique et moral que sous le rapport artistique et industriel entre les hommes de la Madeleine et les Groënlandais. Cette ressemblance est telle que nous pouvons en conclure que les seconds sont les descendants des premiers."

Testut, 1889:[259] "Parmi les races actuelles, celle qui me parait présenter la plus grande analogie avec l'homme de Chancelade est celle des Esquimaux qui vivent encore à l'état sauvage dans leg glaces de l'Amérique septentrionale. Ils ont, en effet, le même crâne que notre troglodyte quaternaire; leur face est constituée suivant le même type; ils ont, à peu de chose près, la même taille, le même indice palatin, le même indice nasal, le même indice orbitaire, le même degré de torsion de l'humérus, etc. * * *

"La découverte de Chancelade, en mettant en lumière une analogie frappante entre le squelette de notre troglodyte périgourdin et celui des Esquimaux actuels, apporte à cette opinion aussi séduisante que naturelle, l'appui de l'anthropologie anatomique qui, dans l'espèce, a une importance capitale. Elle lui est de tous points favorable et élève à la hauteur d'une vérité probable, je n'ose dire d'une vérité démontrée, ce qui n'était encore qu'une simple hypothèse."

Hervé, 1893:[260] "* * * * par leurs usages et par leurs moeurs, aussi bien que par leur matériel industriel et artistique, les Hyperboréens actuels (Tchouktches et Eskimaux) sont extrêmement voisins

des Troglodytes magdaléniens de l'Europe occidentale; à ce point que Hamy a pu dire 'qu'ils continuent de nos jours, dan les régions circumpolaires, l'âge du renne de France, de Belgique, de Suisse, avec ses caractéristiques zoologiques, ethnographiques, etc.' (op. cit., 366). 'Nous avons vu, d'autre part, que les plus purs d'entre eux ne diffèrent pas anatomiquement des Magdaléniens. C'est donc au rameau hyperboréen que nous sommes amenés à rattacher, au point de vue ethnique, les dernières populations de l'Europe quaternaire.'"

Boule, 1913:[261] "On sait d'ailleurs, depuis les travaux de Testut sur l'Homme de Chancelade, que les relations des Esquimaux sont avec d'autres Hommes fossiles de nos pays, mais d'un âge géologique plus récent."

Sollas, 1924:[262] The Magdalenians are represented "in part, by the Eskimo on the frozen margin of the North American Continent and as well, perhaps, by the Red Indians. * * *" Due to pressure of stronger peoples, the ancestors of the Eskimo were present to the north; "but as there was no room for expansion in that direction, it was diverted toward the only egress possible, and an outflow took place into America over Bering Strait or the Aleutian Islands. The primitive Eskimo, already accustomed to a boreal life, extended along the coast."

1927:[263] "The assemblage of characters presented

on the one hand by the Chancelade skull, and on the other by the Eskimo, are in very remarkable agreement, and that the onus of discovering a similar assemblage, but possessed by some other race, rests with those who refuse to accept what seems to me a very obvious conclusion. * * *

"Our only reason for any feeling of surprise is, not that Chancelade man should prove a close relation of the Eskimo, but that so far he is the only fossil example of his kind of which we have any certain knowledge."

FOOTNOTES:

[254] Dawkins, Boyd, In a Review of Lartet and Christy's "Cavernes du Périgord" (1864), in the Saturday Review, XXII, p. 713, 1866. [This review is not signed but is attributed to B. D.]

[255] Hamy, E. T., Précis de paléontologie humaine, p. 355. Paris, 1870.

[256] Dawkins, Boyd, Cave Hunting, p. 359. London, 1874.

[257] Dawkins, Boyd, Early Man in Britain, pp. 240, 241, 245. London, 1880.

[258] Mortillet, G. de, Les Groënlandais descendants des Magdaléniens. Bulletins de la Société d'Anthropologie, VI, pp. 868-870. Paris, 1883.

[259] Testut, L., Recherches anthropologiques sur le squelette quaternaire de Chancelade (Dordogne). Bull. Soc. d'anthrop., VIII, pp. 243-244. Lyon, Paris, 1889.

[260] Hervé, Georges, La Race des Troglodytes Magdaléniens. Rev. mens, de l'École d'anthrop., III, p. 188. Paris, 1893.

[261] Boule, Marcellin, L'Homme fossile de la Chapelle-aux-Saints, pp. 228. Paris, 1913.

[262] Sollas, W. J., Ancient hunters and their modern representatives, pp. 590, 592. New York, 1924.

[263] Sollas, W. J., The Chancelade skull. J. Roy, Anthrop. Inst., LVII, pp. 119, 121. London, 1927.

OPPOSED TO EUROPEAN

Rae, 1887:[264] "The typical Eskimo is one of the most specialized of the human race, as far as cranial and facial characters are concerned, and such scanty remains as have yet been discovered of the prehistoric inhabitants of Europe present no structural affinities with him."

Laloy, 1898:[265] "Cette théorie est absolument contredite par les faits." (That is, the theory of the identity of the Eskimo with the European upper palaeolithic man.)

Déchelette, 1908:[266] "C'est en vain qu'on a noté certains traits d'analogie de l'art et de l'industrie * * * telles analogies s'expliquent aisément par la parité des conditions de la vie matérielle."

Burkitt, 1921:[267] "Again the Magdalenians have

been correlated with the Eskimos, who inhabit today the icebound coastal lands to the north of the New World, and also the similar lands, on the other side of the straits, in the northeast corner of Asia. But the vast difference in place and in time would make any exact correlation very doubtful."

MacCurdy, 1924:[268] "If a Magdalenian type exists, it is probably best represented by the skeleton from Raymonden at Chancelade (Dordogne). One must not lose sight of the fact that the osteologic record of fossil man is even yet so fragmentary that there is grave danger of mistaking individual characters for those on which varieties or species should be based."

Keith, 1925:[269] "In the Chancelade man we are dealing with a member of a racial stock of a true European kind."

FOOTNOTES:

[264] Rae, Dr. John, Remarks on the natives of British North America. J. Roy. Anthrop. Inst. Great Britain and Ireland, XVI, pp. 200-201. London, 1887.

[265] Laloy, L'Anthr., IX, p. 586. 1898.

[266] Déchelette, J., Manuel d'Archéologie préhistorique, etc., pp. 312. Paris, 1908.

[267] Burkitt, M. C., Prehistory, p. 307. London, 1921.

[268] MacCurdy, G. G., Human Origins, V. I,

pp. 406-407. New York and London, 1924.

[269] Keith, Arthur, The Antiquity of Man, p. 86. London, 1925.

MISCELLANEOUS AND INDEFINITE

Gallatin, 1836:[270] "Whatever may have been the origin of the Eskimo, it would seem probable that the small tribe of the present sedentary Tchuktchi on the eastern extremity of Asia is a colony of western American Eskimo. The language does not extend in Asia beyond that tribe. That of their immediate neighbors, the "Reindeer," or "Wandering Tchuktchi," is totally different and belongs to the Kouriak family.

"There does not seem to be any solid foundation for the opinion of those who would ascribe to the Eskimaux an origin different from that of the other Indians of North America. The color and features are essentially the same; and the differences which may exist, particularly that in stature, may be easily accounted for by the rigor of the climate and partly, perhaps, by the nature of their food. The entire similarity of the structure and grammatical forms of their language with those of various Indian tribes, however different in their vocabularies, which will hereafter be adverted to, affords an almost conclusive proof of their belonging to the same family of mankind."

Richardson, 1852:[271] "The origin of the Eskimos has been much discussed as being the pivot on which the inquiry into the original peopling of America has been made to turn. The question has been fairly and

ably stated by Doctor Latham in his recent work On the Varieties of Man, to which I must refer the reader; and I shall merely remark that the Eskimos differ more in physical aspect from their nearest neighbors than the red races do from one another. The lineaments have a decided resemblance to the Tartar or Chinese countenance. On the other hand, their language is admitted by philologists to be similar to the other North American tongues in its grammatical structure; so that, as Doctor Latham has forcibly stated, the dissociation of the Eskimos from their neighboring nations on account of their physical dissimilarity is met by an argument for their mutual affinity, deduced from philological coincidences."

Meigs, 1857:[272] "A connected series of facts and arguments which seem to indicate that the Eskimo are an exceedingly ancient people, whose dawn was probably ushered in by a temperate climate, but whose dissolution now approaches, amidst eternal ice and snow; that the early migrations of these people have been from the north southwards, from the islands of the Polar Sea to the continent and not from the mainland to the islands; and that the present geographical area of the Eskimo may be regarded as a primary center of human distribution for the entire polar zone."

Abbott, 1876:[273] "It is fair to presume that the first human beings that dwelt along the shores of the Delaware were really the same people as the present inhabitants of Arctic America."

Grote, 1875:[274] Basing himself on certain biological reasonings, the author concludes "that the Eskimos are the existing representatives of the man of the American glacial epoch, just as the White Mountain butterfly (*Oeneis semidea*) is the living representative of a colony of the genus planted on the retiring of the ice from the valley of the White Mountains."

In a later communication[275] the author expresses the opinion that the peopling of America "was effected during the Tertiary; that the ice modified races of Pliocene man, existing in the north of Asia and America, forced them southward, and then drew them back to the locality where they had undergone their original modification. * * *

"During the process, then, which resulted in the race modification of the Eskimos, their original numbers must have been decreased by the slowly but ever increasing cold of the northern regions, until experience and physical adaptation combined brought them to a state of comparative stability as a race."

Baron Nordenskiöld[276] thought that the Eskimo might probably be the true "autochthones" of the polar regions, i. e., that they had inhabited the same previous to the glacial age, at a period when a climate prevailed here equal to that of northern Italy at present, as proved by the fossils found at Spitzbergen and Greenland. As it might be assumed that man had existed even during the Tertiary period, there was a great deal in favor of the assumption that he had lived in those parts which were most favorable to his existence. The question

was one of the highest importance, as, if it could be proved that the Eskimo descended from a race which inhabited the polar regions in the very earliest times, we should be obliged to assume that there was a northern (polar) as well as an Asiatic cradle of the human race, which would open up new fields of research, both to the philologist and the ethnologist, and probably remnants of the culture and language of the original race might be traced in the present polar inhabitants of both Europe and Asia.

Keane, 1886:[277] "The Aleutian Islanders, who are treated by Doctor Rink as a branch of the Eskimo family, but whose language diverges profoundly from, or rather shows no perceptible affinity at all to, the Eskimo. The old question respecting the ethnical affinities of the Aleutians is thus again raised, but not further discussed by our author. To say that they must be regarded as 'ein abnormer Seitenzweig,' merely avoids the difficulty, while perhaps obscuring or misstating the true relations altogether. For these islanders should possibly be regarded, not as 'an abnormal offshoot,' but as the original stock from which the Eskimo themselves have diverged."

Quatrefages, 1887:[278] From migrations of Tertiary man: Men originated in Tertiary in northern Asia; spread from here to Europe and over Asia; "D'autres aussi gagnèrent peut-être l'Amérique et ont pu être les ancêtres directs des Esquimaux,... Sans même supposer l'existence passée de la continuité des deux

continents, les hommes tertiaires ont bien pu faire ce que font les riverains actuels du détroit de Behring, qui vont chaque jour d'Asie en Amérique et reciproquement."...

"Evidemment la race esquimale est américaine. Au Groënland, au Labrador, dont personne ne lui a disputé les solitudes glacées, elle a conservé sa pureté. Elle est encore restée pure quand elle a rencontré les Peaux-Rouges proprement dits, parce que ceux-ci lui ont fait une guerre d'extermination qui ne respectait ni les femmes ni les enfants. Mais, dans le nord-ouest américain, elle s'est trouvée en rapport avec des populations d'un caractère plus doux et des croisements ont eu lieu. Or, parmi ces populations, il s'en trouve de brachycéphales. Tels sont en particulier certaines tribus, confondues à tort sous un même nom avec les vrais Koluches.... Ces tribus sont de race jaune et leur crâne ressemble si bien à celui des Toungouses que M. Hamy les a rattachées directement à cette famille mongole. Les Esquimaux se sont croisés avec elles; et ainsi ont pris naissance ces tribus, dont l'origine métisse est attestée par le mélange ou la fusion des caractères linguistiques aussi bien qu'anatomiques."

Nansen, 1893:[279] "So much alone can we declare with any assurance, that the Eskimos dwelt in comparatively recent times on the coasts around Bering Strait and Bering Sea—probably on the American side—and have thence, stage by stage, spread eastward over Arctic America to Greenland.
* * *

"The likeness between all the different tribes of

Eskimos, as well as their secluded position with respect to other peoples, and the perfection of their implements, might be taken to indicate that they are of a very old race, in which everything has stiffened into definite forms, which can now be but slowly altered. Other indications, however, seem to conflict with such a hypothesis, and render it more probable that the race was originally a small one, which did not until a comparatively late period develop to the point at which we now find it, and spread over the countries which it at present inhabits."

Tarenetzky, 1900:[280] "Die Frage ist bis jetzt noch nicht entschieden und wird wahrscheinlich auch niemals definitiv entschieden werden ob die gegenwärtig die Nordostgrenze Asiens und die Nordwestgrenze Amerikas bewohnenden Polarvölker ursprünglich aus Asien nach Amerika oder in umgekehrter Richtung zu ihren Wohnsitzen wanderten."

De Nadaillac[281] believed that the Eskimo (with some other aboriginal Americans), now savage and demoralized, have issued from races more civilized and that they could raise themselves to the old social level were it not for their struggle with inexorable climate, famines, and lately also alcoholism.

Jenness, 1928:[282] "We still believe that the Eskimos

are fundamentally a single people; that they had their origin in a homeland not yet determined; but we have learned that they reached their present condition through a series of complex changes and migrations, the outlines of which we have hardly begun to decipher."

FOOTNOTES:

[270] Gallatin, Albert, A Synopsis of the Indian Tribes of North America. Archaeologia Americana, II, pp. 13, 14. Cambridge, 1836.

[271] Richardson, Sir John, Origin of the Eskimos. The Edinburgh New Philosophical Journal, LII, p. 323. Edinburgh, 1852.

[272] Meigs, J. Aitken, The cranial characteristics of the races of men. In Indigenous Races of the Earth, by Nott, J. C., and Gliddon, George R., Philadelphia, p. 266. London, 1857.

[273] Abbott, C. C., Traces of American Autochthon. Am. Nat., p. 329. June, 1876.

[274] Grote, A. R., Effect of the Glacial Epoch Upon the Distribution of Insects in North America. Proc. Am. Ass. Adv. Sci., Detroit meeting, 1875, B, Natural History, p. 225.

[275] Grote, A. R., On the Peopling of America. Bull. Buffalo Soc. Nat. Sc., III, p. 181-185, 1877.

[276] Eskimo. Lecture before the Geogr. Soc. of Stockholm, Dec. 19, 1884; abstract in Proc. Roy. Geogr. Soc., VII, No. 6, p. 370-371. London, 1885.

[277] Keane, A. H., The Eskimo; a commentary. Nature, XXXV, p. 309. London, New York, 1886-1887.

[278] Quatrefages, A. de, Histoire Générale des Races Humaines, introduction l'Etude des Races Humaines, pp. 136, 435. Paris, 1887.

[279] Nansen, Fridtjof, Eskimo Life, pp. 6, 8. London, 1893. (Translated by William Archer.)

[280] Tarenetzky, A., Beiträge zur Skelet-und Schädelkunde der Aleuten, Konaegen, Kenai und Koljuschen. Mem. Acad. imp d. sc., ix, No. 4, p. 7. St. Petersburg, 1900.

[281] Nadaillac, M. de, Les Eskimo. L'Anthropologie, XIII, p. 104. 1902.

[282] Jenness, D., Ethnological Problems of Arctic America. Amer. Geogr. Soc. Special Publ. No. 7. New York, 1928.

DISCUSSION AND CONCLUSIONS INDICATED BY PRESENT DATA

The maze of thoughts on the origin of the Eskimo shows one fact conclusively, which is that the necessary evidence on the subject has hitherto been insufficient. From whatever side the problem has been approached, whether linguistically, culturally, from the study of myths, or even somatologically, the materials were, it is plain, more or less inadequate and there was not enough for satisfactory comparisons. The best contributions to Eskimo studies, from the oldest to the most recent, all accentuate the need for further research, and more ample collections.

Another point is that heterogeneous and wide apart as many of the opinions may seem, yet when the subject is looked upon with a larger perspective they may often perhaps be harmonized. Thus a belief in an American origin of the Eskimo need not exclude

that in the Asiatic derivation of his parental stock. Even in the case of the supposed European derivation the Eskimo are understood to have reached America through Asia; there is not one suggestion of any importance advocating the coming of the Eskimo over northwestern Europe and Iceland. Only the Meigs-Grote-Nordenskiöld theory of an ancient polar race and its descent southward appears now as beyond the bounds of what would be at least partly justifiable.

What is the contribution to the subject of the studies reported in this treatise, with its relatively great amount of somatological material? The answer is not easy.

Even the truly great and precious material at hand is not sufficient. There are important parts of the Arctic, such as the Hudson Bay region, Baffin Land, and the central region; several parts of the west coast, such as the inland waters of the Seward Peninsula and the Eskimo portions of the Selawik, Kobuk, Noatak, and Yukon Rivers; and above all the Eskimo part of northeastern Siberia, from which there are insufficient or no collections. There is, moreover, especially in this country, a great want of skeletal material from the non-Eskimo Siberian tribes, and also from the old European peoples that are of most importance for comparisons. It must be plain, therefore, that even at present no final deductions are possible. All that can be claimed for the evidence here brought forth is that it clears, or tends to settle, certain secondary problems, and that it presents indications of value for the rest of the question.

The secondary problems that may herewith be regarded as settled are as follows:

1. *Unity or plurality of the race.*—The materials at hand give no substantiation to the possibility of the Eskimo belonging to more than one basic strain of people. They range in color from tan or light reddish-yellow to medium brown; in stature from decidedly short to above the general human medium; in head from brachycephalic and low to extremely dolichocephalic, high and keel shaped; in eyes from horizontal to decidedly mongoloid; in orbits from microseme to hypermegaseme; in nose from fully mesorrhinic to extremely leptorrhinic; in physiognomy from pure "Indian" to extreme "Eskimo." Yet all through there runs, both in the living and in the skeletal remains, so much of a basic identity that no separation into any distinct original "races" is possible. At most it is permissible to speak of a few prevalent types.

2. *Relation.*—The general basic prototype of the Eskimo, according to all evidence, is so closely akin to that of the Indian that the two can not be fully separated. They appear only as the thumb and the digits of the same hand, some large old mother stock from which both gradually differentiated. This appears to be an unavoidable conclusion from the present anthropological knowledge of the two peoples.

The next unavoidable deduction is that the mother stock of both the Eskimo and the Indian can only be identified with the great yellow-brown stem of man, the home of which was in Asia, but the roots of which, as has been discussed elsewhere, were probably in ancient (later paleolithic) Europe.[283] The latter fact may explain the cultural as well as somatological resemblances between the Eskimo, as well as the Indian (for the Indian, physically at least,

has much in common with the upper Aurignacians), and the upper glacial European populations. But such an explanation can not in the light of present knowledge legitimately be extended to the assumption that either the Indian complex or the Eskimo originated as such in Europe; they could be at most but parts of the eventual more or less further differentiated Asiatic progeny of the upper paleolithic Europeans.

3. *Mixture.*—It has been assumed by Boas and others that the eastern Eskimo have become admixed with the eastern Indian and the western with the Alaskan Indian, that the physical and especially craniological differences between the eastern and western Eskimo were due to such a mixture, and that both extremes deviated from the type of the pure Eskimo, who was to be found somewhere in the central Arctic. The evidence of the present studies does not sustain such an assumption.

As shown before[284] and is seen more clearly from the present data, the western Eskimo type is also present or approached in various localities in the far north (part of Smith Sound, Southampton Island, part of the Hudson Bay coast, with probable spots in the central Arctic proper). There is no indication of any central region where the western Eskimo type would be much "purer" than elsewhere.

Individual skulls and skeletons in the west, particularly in certain spots (especially on Seward Peninsula), show the same characteristics as the most diverging skulls or skeletons in the farthest northeast.

And both in the west and in the east the most pronounced Eskimo characteristics exceed similar features in the Indian, indicating independent

development. Such characteristics involve the stature (taller in the west, shorter in the east than that of the Indian); the size of the head (everywhere averaging higher in the Eskimo); dolichocephaly, height of the head, its keel shape (all more pronounced in the eastern and now and then a western Eskimo than in any Indian group); the face, nose, orbits, and lower jaw; with the relative proportions and other characteristics of the skeleton. All these point to functional and other developments within the Eskimo groups and none suggest a large Indian admixture.

It is well known that more or less blood mixture takes place among all neighboring peoples where contact is possible, even if otherwise there be much enmity. Such enmity, often in an extreme form, existed everywhere it seems between the Eskimo and the Indian, as a result of the encroaching of the former on the latter; there are many statements to that effect. Within historic times also there are no records of any adoptions or intermarriages between the two peoples. Nevertheless where contact took place, as on the rivers and in the southwest as well as the southeast of the Eskimo territory, some blood mixture, it would seem, must have developed. The Indian neighbors show it, and it would be strange if it remained one-sided. But of a mixture extensive enough to have materially modified the type of the Eskimo in whole large regions, such as the entire Bering Sea and most of the far northeast, there is no evidence and little not only probability but even possibility. Nothing approaching such an extensive mixture is shown by the near-by Indians; and it would be most exceptional in people of this nature if a much greater proportion of the mixture was into the Eskimo.

Finally, a mixture of diverse human types, unless very old, may be expected to leave numerous physical signs of heterogeneity and disturbance, none of which is shown by either the western or eastern Eskimo. Such groups as that of the St. Lawrence Island, or that of Greenland, are among the most homogeneous human groups known. The range of variation of their characters is as a rule a strictly normal range, giving a uniform curve of distribution, which is not consistent with the notion of any relatively recent material mixture.

4. *The indications.*—The indications of the data and observations presented in this volume may be outlined as follows:

The Eskimo throughout their territory are but one and the same broad strain of people. This strain is fundamentally related to that (or those) of the American Indian. It is also uncontestably related to the yellow-brown strains of Asia.

In many respects, such as pigmentation, build of the body, physiognomy, large brain, fullness of forehead, fullness of the fronto-sphenotemporal region, largeness of face and lower jaw, height of the nose, size and characteristics of the teeth,[285] smallness of hands and feet, etc., the Eskimos are remarkably alike over their whole territory. They differ in details, such as stature, form of the head, and breadth of the nose. But the distribution of these differences is of much interest and probably significance. Higher statures, broader heads, and broader noses are found especially in the west, the latter two particularly in the Bering Sea region; low group statures, narrow heads and narrow noses reach, with few exceptions, their extremes in the northeast. Between the two extremes, however, there

is no interruption, but a gradation, with here and there an irregularity. These conditions speak not of mixture but rather of adaptation and differentiation.

They strongly suggest a moderate stream of people, rooted in Asia, of fairly broad and but moderately high head, of a good medium stature, with a mesorrhinic nose (and hence probably originally not far northern), and with many other characteristics in common, reaching America from northeasternmost Asia after the related Indians, spreading along the seacoasts as far as it could, not of choice, or choice alone, but mainly because of the blocking by the Indian of the roads toward the south and through the interior; and gradually modifying physically in adaptation to the new conditions and necessities; to climate, newer modes of life, the demands of the kayak, and above all to the results of the increased demands on the masticatory organs.

The narrowness, increased length and increased height of the Eskimo skull, without change in its size or other characteristics, may readily be understood as compensatory adaptations, the development of which was initiated and furthered by the development and mechanical effects of the muscles of mastication.

A similar conclusion has been reached in my former study on the central and Smith Sound Eskimo (1910). It has been approached or reached independently by other students of the Eskimo, notably Fürst and Hansen (1915) in their great work on the East Greenlanders. It is a conclusion of much biological importance for it involves not merely the development but also the eventual inheritance of new characters.

Former authors, it was seen, have advanced the

theories of an American origin of the Eskimo. This could only mean that he developed from the American Indian. And such a development would imply physical and hereditary changes at least as great as those indicated in the preceding paragraphs, and in less time. A differentiation commenced well back in Asia, geographically and chronologically, and advancing, to its present limits, in America would seem the more probable.

An origin of the Eskimo in Europe, during the last glacial invasion, would not only push into the hazy far past the same changes as here dealt with, but it would at the same time fail to explain the physical differences within the Eskimo group, and deny any substantial changes in him during the long time of his migration toward the American northern coasts.



Figure 29.—Probable movements of peopl

Absolute proofs of the origin of the Eskimo, as of that

of the various strains of the Indians, are hardly to be expected. Such origins are so gradual and insidious that they would escape detection even if watched for while occurring; they are noticed only after sufficient differences have developed and become established, which takes generations. The solving of racial origins must depend on sound scientific induction.

Such induction may not yet be fully possible in the case of the Eskimo. The evidence is not yet complete. But with the present and other most recent data there is enough on hand for substantial indications. The evidence shows that barring some irregularities, due possibly to later intrusions or refluxes, the farther east in the Eskimo territory the observer proceeds the more highly differentiated and divergent the Eskimo becomes, and there is a greater gap between him and his Indian neighbors, as well as other races. Proceeding from the east westward, conditions are reversed. In general the farther west we proceed the less exceptional on the whole the Eskimo becomes and the more he approximates the Indian, particularly the Indian of Alaska and the northwest coast. As this can not, in the light of present evidence, be attributed alone to mixture, it is plain that if it were possible to proceed a few steps farther in this direction the differences between the Eskimo and the Indian would fade out so that a distinction between the two would become difficult if not impossible.

The facts point, therefore, to an original identity of the source from which were derived the Indian, more particularly his latest branches, and the Eskimo, and to the identification of this source with the palaeo-Asiatic yellow-brown people of lower northern Asia. The differentiation of the Eskimo from this source

must have proceeded over a fairly long time, and probably started already it would seem on the northern coasts of Asia, where conditions were present capable of beginning to shape him into an Eskimo; to be carried on since in the Bering Sea area and especially in the Seward Peninsula and farther northward and eastward. In a larger sense the cradle of the Eskimo, therefore, while starting probably in northeast Asia, covered in reality a much vaster region, extending from northern Asia and the Bering Sea to the far American Arctic.

FOOTNOTES:

[283] Hrdlička, A., The Peopling of Asia. Proc. Am. Philos. Soc., LX, 535 et seq. 1921; and The Peopling of the Earth. Ibid., LXV, 150, et seq. 1926.

[284] Contrib. Anthrop. Central and Smith Sound Eskimo. Anthrop. Papers Am. Mus. Nat. Hist., 1910.

[285] See Amer. J. Phys. Anthrop., VI, Nos. 2 and 4. 1923.

SUMMARY

What is the substance of the results of all these new observations and studies on the western Eskimo, who is the main subject of this report? In large lines this may be outlined as follows:

1. The western Eskimo occupied, uninterrupted by other people (save in a few spots by the Aleuts), the great stretch of the Alaskan coast from Prince William Sound and parts of the Unalaska Peninsula to Point Barrow, all the islands in the Bering Sea except the Aleutians and Pribilovs, and the northern and western coasts of the Chukchi Peninsula in Asia.

They extended some distance inland along the Kuskokwim and Yukon Rivers; along the interior lakes and rivers of the Seward Peninsula; along a part of the Selawik River, most (perhaps) of the Kobuk River, and apparently along the whole Noatak River, communicating over the land with the lower Colville Basin. But no traces of original Eskimo settlements have ever been found in the true Alaska inland or along those parts of the Alaska rivers that constitute the Indian territory.

2. The present population is sparse, with many unpeopled intervals, and not highly fecund, but, except when epidemics strike, it no more diminishes; children and young people are now much in evidence, hygienic and economic conditions have improved, and the people in general are well

advanced in civilization. Their condition and morale are rather superior, in places very perceptibly so, to those of the majority of the Alaska Indians.

3. Except where there has been more contact with whites, a large percentage of these Eskimo are still full bloods. They are a sturdy, cheerful, and liberal yet shrewd lot. They intermarry and mix not inconsiderably among themselves (between villages). Some of the white traders have married Eskimo women and raised promising families. Where larger numbers of whites were or are in proximity clandestine mixture is apparent. The better educated show often decidedly good mental, mechanical, business, and artistic abilities. In the isolated localities, such as St. Lawrence Island, the people have apparently escaped the period of demoralization that so often attends the passing from the old to new conditions.

Tuberculosis and venereal diseases are present but not prevalent; rachitis seems absent. The people show much endurance, but longevity as yet is not much in evidence. Alcoholism is almost nonexistent except on occasions when drink is provided by whites.

4. The region of the western Eskimo shows a former larger population of the same people. This is attested by many "dead" villages and old sites. And this population evidently goes back some centuries at least, for some of the remains are extensive and both their depth and their contents give the impression of prolonged duration; though seemingly all thus far seen could be comprised within the Christian era.

5. No habitations or remains belonging to a distinct people (Indians) have thus far come to light anywhere within the territory of the western Eskimo;

and no trace has as yet been found of anything human that could be attributed to greater antiquity than that of the Eskimo. But the older beaches and banks where such remains might have existed have either been covered with storm-driven sands and are now perpetually frozen, or they have been "cut" away and lost; and there seems no hope for finding such remains in the interior away from the sea or streams, for such parts were never under recent geological conditions favorable for human habitation.

6. The now known remains consist of the ruins of dwellings and of accumulated refuse, the two together forming occasionally marked elevated heaps or ridges. Some of these ridges are over 18 feet deep. They contain many archeological specimens of stone, ivory, wood, and bone. The ivory in the older layers is more or less "fossilized." The upper layers of such remains usually contain some articles of white man's manufacture (copper, iron, beads); lower layers are wholly aboriginal. Indian artifacts occur in Eskimo sites only in the proximity of the Indian on the rivers.

7. The prevalent or later culture shown by the remains is fairly rich, of good to relatively rather high grade, and of considerable uniformity. There are numerous indications of extensive trade in various articles, particularly those of the Kobuk "jade."

8. On the Asiatic coast, in the northern parts of the Bering Sea, on the Seward Peninsula, in the Kotzebue region and at Point Hope, the deeper portions of the remains give examples of the higher and richer "fossil ivory culture." This is distinguished by many objects of high-class workmanship, and by curvilinear to scroll designs. The art appears to have

distinct affinities with, on one hand, deeper Asia, and on the other with the northwest coast of America and even farther south. It is not clearly separated from either the contemporaneous or the later Eskimo art, yet it is of a higher grade and delicacy and much distinctiveness. It is not yet known where this art begins geographically, what preceded it, whence it was derived, just how far it reached along the coasts, or even what was its main center. It seems best for the present to reserve to it the name of the "fossil ivory art" (rather than Jenness's too limiting "Bering Sea culture"), and to defer all conclusions concerning it to the future.

9. It seems justifiable, however, to point to the significance of what is already known. This "fossil ivory art" especially, but also the general culture of the western Eskimo, are highly developed and differentiated cultures, denoting considerable cultural background, extended duration, and conditions generally favorable to industrial and artistic developments. It has, it is already ascertained, certain affinities in Asia. If this art and the attending culture were advancing toward America, as seems most probable, then the question of cultural influences and introductions from Asia to America will have to be reopened.

10. Due to the perpetually frozen ground and the consequent necessity of surface burials, the area of the western Eskimo was, until recently, relatively rich in skeletal remains lying on the surface. It is no more so now, due to storms, beasts, missionaries, teachers, and scientific collectors. But while only a scattering remains of the surface material, there is much and that of special importance lying in the ground, mostly self-buried or assimilated by the

tundra. This material, which now and then is accompanied by interesting archeological specimens, calls for prompt attention; it will help greatly in clearing local and other problems.

Occasionally burials were made or dead bodies were left in old houses. These remains, too, may prove of special value.

11. Observations on both the living and the skeletal remains in the western Eskimo area, supplemented by those on the northern and northeastern Eskimo, are now ample enough to justify certain generalizations. These are:

a. Barring the Aleuts, who are Indian, the Eskimo throughout belong somatologically to but one family, and this family appears as a remarkably pure racial unit, somewhat admixed in the south with the Aleut, on the western rivers with the Indian, and in the east and a few spots elsewhere with recent white people.

b. Within this family there is observable a considerable cranial change, with moderate differences in nasal breadth, stature, and color, but the general characteristics of the physiognomy, and of the body and the skeleton, remain remarkably similar.

c. The changes in the skull affect mainly the vault, which, in dimensions, ranges through all the intermediary grades from moderately broad, short, and moderately high to pronouncedly narrow, long, and high, and in form from moderately convex over the top to markedly keel shaped.

The distribution of skull form is somewhat irregular, but in general the broader and shorter heads predominate in the Asiatic and the southwestern and

midwestern American portions of the Eskimo region, while the longest and narrowest heads are those of parts of the Seward Peninsula, and especially those from an isolated old settlement near Barrow with those of Greenland (exclusive of the Smith Sound), Baffin Land, and, judging from other data, also eastern Labrador. More or less transitional forms are found between the two extremes, without there being anywhere a clear line of demarcation.

The breadth of the nose, too, averages highest in the Asiatic, Bering Sea, and the more southern Eskimo of the Alaska coast, the least along the northern Arctic coast and in the northeast. The stature is highest along the western Alaska rivers and parts of the coast, least in Greenland and Labrador.

The skin, while differing within but moderate limits, is apparently lightest along parts (at least) of the northern Arctic.

12. The whole distribution of the physical characteristics among the Eskimo strongly suggests gradual changes—within the family itself; and as the long, narrow, high skull with keeled dome, occurring in a few limited localities in the west but principally in southern Greenland and neighboring territories, appears to be the farthest limit of the differentiation which finds no parallel in the neighboring or other peoples, while the form found in northeastern Asia, the Bering Sea, and southwestern Alaska is near to those of various surrounding peoples, the inevitable resulting deduction is that, in the light of our present knowledge, the origin of the Eskimo is to be looked for in the western rather than the northern Arctic or the northeastern area, and that particularly in the northern Bering Sea and the adjacent, particularly perhaps the northern, Asiatic region. The author is,

therefore, led to regard the area between 160° west and 160° east longitude and 60° to 75° north latitude as containing the primal Eskimo-genic center, and as the source of the oldest Eskimo or proto-Eskimo extensions, while the larger part of the Eskimo differentiations is in all probability American.

13. The earlier notions relating to the western Eskimo, namely, those that would attribute his physical characteristics to a large admixture with the Indian, are now untenable for the following reasons:

a. The distribution of the western Eskimo traits and measurements does not indicate any important heterogeneous mixture.

b. The groups most distant from the Indians, such as the St. Lawrence or Diomede islanders and the Asiatic Eskimo, show very nearly the same somatological characteristics as the rest of the southwestern and midwestern groups.

c. Among the western Eskimo there are no data, no traditions, and no linguistic or cultural evidence of any considerable Indian admixture.

d. The western contingents of the family do not represent a physical resultant or means of the more narrow and long-headed type with the neighboring Indians of Alaska (or elsewhere in the north), but they equal or even exceed the Indians in the principal features of the skull, face, and in other particulars.

14. The nearest physical relatives of the Eskimo are evidently some of the Chukchi, with probably some other north Asiatic groups; their nearest basic relatives in general are, according to many indications, the American Indians. The two families, Indian and Eskimo, appear much, it may be repeated,

like the thumb and fingers of one and the same hand, the hand being the large, original palaeo-Asiatic source of both. But the Eskimo are evidently a younger, smaller and still a more uniform member; which speaks strongly for their later origin, migration and internal differentiation.

15. With his numbers, purity of blood, approachability, present facilities of language, many of the young speaking good English, and other favorable conditions, the Eskimo offers to anthropology one of its best opportunities for a thorough study of an important human group, adapted to highly exceptional natural conditions. His food, mode of life, the climate, and isolation, give promise of interesting conditions of the internal organs, perhaps even blood, and of physiological as well as chemical and pathological peculiarities. This opportunity, together with the excellent and important opportunities for archeology in the Bering Sea and neighboring regions, should be utilized to the possible limit within the present generation, for the western Eskimo, on one hand, is rapidly becoming civilized, changing his food, clothing, housing, and habits; is also becoming more mixed with whites; and is most assiduously exploiting the archeological sites in his region for the sake of the income that comes to him from the ever-rising demand for beads, etc., and from "fossil" ivory.

BIBLIOGRAPHY

ABBES, H. Die Eskimos des Cumberland-Sundes. Globus, XLVI, 198-201, 213-218, Braunschweig, 1884.

ASMUSSEN, P. Die erste Entdeckung Amerikas. Globus, LVI, 337-341, Braunschweig, 1889.

BAELZ, E. Die Körperlichen Eigenschaften der Japaner. Mitt, deutsch. Gesellsch. f. Natur- und Völkerk. Ostasiens, Band III, Heft 28, 330-359, Yokohama, 1883.

BAUER, M. Beiträge zur anthropologischen Untersuchung des harten Gaumens. Inaug.-Diss. Zürich, 1904. (Aus dem Anthrop. Inst. der Univ. Zürich.)

BESSELS, E. Die Amerikanische Nordpol-Expedition. Leipzig, 1878.

—— The northernmost inhabitants of the earth. American Naturalist, XVIII, 861-882, Phila., 1884.

—— Einige Worte über die Inuit (Eskimo) des Smith-Sundes, nebst Bemerkungen über Inuit-Schädel. Arch. f. Anthrop., VIII, 107-122, Braunschweig, 1875.

BLUMENBACH, JOH. FRIEDERICH. Decas collectionis suae craniorum diversarum

gentium illustrata. III; Gottingae, 1795. IV, 1800.

BOAS, F. Über die ehemalige Verbreitung der Eskimos im arktisch-amerikanischen Archipel. Zeit. Ges. f. Erdkunde, XVIII, 118-136, Berlin, 1883.

—— Eskimo of Baffin Land and Hudson Bay. Bull. Am. Mus. Nat. Hist., XV, pts. 1-2, New York, 1901-1907.

—— Ethnological Problems in Canada. Jour. Roy. Anthrop. Inst. Gr. Brit. & Ireland, XL, 529-539, London, 1910.

—— A. J. Stone's Measurements of Natives of the Northwestern Territories. Bull. Am. Mus. Nat. Hist., XIV, 53-68, New York, 1901.

—— Physical Types of the Indians of Canada. Annual Archæol. Report, 1905, 84-88, Toronto, 1906.

—— Die Sagen der Baffin-Land-Eskimos. Zeit. Ethnol., Verhandl., XVII, 161-166, Berlin, 1885.

—— Schädelformen von Vancouver Island. Zeit. Ethnol., Verhandl., XXII, 29-31, Berlin, 1890.

—— Zur Anthropologie der nordamerikanischen Indianer, Zeitschr. f. Ethnol., Verhandl., XXVII, 366-411, Berlin, 1895.

BOGORAS, V. Rasprostranĕnie kultury nazemlĕ. Moskva, 1928.

BOGORAS, W. Early migrations of the Eskimo between Asia and America, XXI Congrès

international des Américanistes, pt. 2, 216-235, Göteborg, 1925.

BRINTON, DANIEL G. Myths of the New World. New York. 1876.

BROCA, P. Sur un crâne de fellah et sur l'usure des dents. Bull. Soc. d'Anthropol., IIIe sér., II, 342-344, Paris, 1879.

BROWN, ROBERT. The Origin of the Eskimo. The Archæol. Review, I, 237-253, London, 1888.

—— The Races of Mankind. Vol. I, London, n. d.

CHAMBERLAIN, A. F. The Eskimo Race and Language. Their Origin and Relations. Proc. Canad. Inst., XXIV (3 ser. v. 6), 261-337, Toronto, 1889.

CHARLIER, C. V. L. Grundfragen af den matematiska statistiken. Lund, 1910.

CRANZ, DAVID. History of Greenland. Vols. I-II. London, 1767. (*Same*, London, 1780; 1820.)

DALL, W. H. Alaska and its Resources. Boston, 1870.

—— Tribes of the extreme Northwest. Cont. N. Am. Ethn., I, pt. 1, Washington, 1877.

—— On the Remains of later prehistoric Man obtained from Caves in the Catherina Archipelago, Alaska Territory, and especially from the Caves of the Aleutian Islands. Smithsonian Contributions to Knowledge, vol. XXII, no. 318, 1-32, Washington, 1878.

DAVIS, B. Thesaurus craniorum. Catalogue of the skulls of the various races of man. Lond., 1867.

DAWKINS, W. BOYD. Cave Hunting. London, 1874.

—— Early Man in Britain, London, 1880.

—— Eskimo in the South of Gaul. Saturday Review. London, Dec. 8, 1866.

DAWSON, J. W. Fossil Men and their modern Representatives. London, 1880.

DÉCHELETTE, J. Manuel d'Archéologie préhistorique, etc. Paris, 1908.

DUCKWORTH, W. L. H. Morphology and Anthropology. Cambridge, 1904.

—— Studies from the Anthropological Laboratory, the Anatomy School of Cambridge. Cambridge, 1904.

—— and PAIN, B. H. A Contribution to Eskimo Craniology. Jour. Anthrop. Inst., XXX, n. s. III, 125-140, London, 1900.

ESKIMO. Lecture before the Geogr. Soc. of Stockholm, Dec. 19, 1884; abstract in Proc. Roy. Geogr. Soc., VII, No. 6, pp. 370-371, London, 1885.

FERRY, H. DE. Le Maconnais préhistorique; avec notes, additions et appendice, par A. Arcelin, & accompagne d'un supplément anthropologique par le docteur Pruner-Bey. 1 vol. avec atlas. Macon, 1870.

FLOWER, W. H. Catalogue of the specimens illustrating the osteology and dentition of vertebrated animals recent and extinct,

contained in the Museum of the Royal College of Surgeons of England. Part I. Man. London, 1879.

FORBIN, V. Origine et caractéristiques des Esquimaux. La Nature, LIV, (no. 2700), 1-5, Paris, 1926.

FRÉDÉRIC, J. Untersuchungen über die normale Obliteration der Schädelnähte. Zeit. für Morphologie und Anthropologie. IX, 373-456, Stuttgart, 1906.

FRIDOLIN, J. Burjäten- und Kalmückenschädel. Arch. f. Anthropol., XXVII, pp. 303-316, Braunschweig, 1900.

FRIZZI, E. Ein Beitrag zur Anthropologie des "Homo Alpinus Tirolensis." Inaug.-Diss. Zürich. Mitteil. Anthrop. Ges. Wien XXXIX (3 Folge B. 9), 1-65, Wien 1909.

FÜRST, CARL M. Einiges über anthropologische Winkelmessungen und über ein Instrument für Winkel- und Index-Bestimmungen. Zeit. für Morphologie und Anthropologie. IX, 331-343, 1906; X, 146, Stuttgart, 1907.

—— Index-Tabellen zum anthropometrischen Gebrauche, Jenn. 1902.

—— Observations à propos des remarques de M. G. Hervé sur un crâne de l'Ile aux Chiens décrit par Winslow (1722). Revue anthropologique, XXIII, 416-418, Paris, 1913.

—— Zur Kraniologie der schwedisehen Steinzeit. Kungl. Svenska Vetenskapsakademiens Handlingar. 1912, IL,

No. 1.

—— and FR. C. C. HANSEN. Crania Groenlandica. Copenhagen, 1915.

GERLAND, G. Zur Ethnographie des äussersten Nordostens von Asien. Zeit. Ges. für Erdkunde, XVIII, 194-222, Berlin, 1883.

GORJANOVIČ-KRAMBERGER, K. Der diluviale Mensch von Krapina in Kroatien Wies badem, 1906.

—— Die Kronen und Wurzeln der Molaren des Homo primigenius und ihre genetische Bedeutung. Korresp.-Blatt deutsch Ges., Anthrop., XXXVIII, 138-141, Braunschweig, 1907.

GRAAH, W. Undersögelses-Reise til Östkysten af Grönland. Kopenhagen, 1832.

GROTE, A. R. On the peopling of America. Bull. Buffalo Soc. Nat. Sci., III, 181-186, Buffalo, 1877.

GUÉRAULT, H. Mémoire sur les caractères différentiels de la conformation cranienne chez les Lapons et les Esquimaux. Mém. Soc. d'Anthrop. de Paris, I, 177-186, Paris, 1860. See also: Bull. Soc. d'Anthrop. Paris, I, 220-221. Paris, 1860.

HABERER, K. Schädel und Skeletteile aus Peking. Ein Beitrag zur somatischen Ethnologie der Mongolen. Jena, 1902.

HAMBRUCH, P. Beiträge zur Untersuchung über die Längskrümmung des Schädels beim Menschen. Korresp.-Blatt Deutsch. Ges. Anthrop., XXXVIII, 19-25, Braunschweig,

1907.

HANSEN, FR. C. C. De aeldste Kongegrave og Bispegrave i Roskilde Domkirke, anthropologisk-historiske Undersøgelser. Kjøbenhavn, 1914.

HANSEN, S. Bidrag til Ostgrönlaendernes Anthropologie. Medd. om Grönl., X, Kjøbenhavn, 1886.

—— Bidrag til Vestgrönlaendernes Anthropologi. Medd. om Grönl., VII, 163-248, Kjøbenhavn, 1893.

—— Bidrag til Eskimoernes Kraniologi. Medd. om Grönl., XVII, 347-356, Kjøbenhavn, 1895.

HAWKES, E. W. Skeletal Measurements and Observations of the Point Barrow Eskimo with Comparisons with other Eskimo Groups. American Anthropologist, XVIII, No. 3, pp. 203-204, Lancaster, 1916.

HENSHAW, H. W., *and* SWANTON, J. R. [Article] Eskimo. Handbook of American Indians, Bur. Amer. Ethn., Bull. 30, pt. 1, 433-437, Washington, 1907.

HERVÉ, GEORGES. Remarques sur un crâne de l'Ile aux Chiens décrit par Winslow (1722). Revue de l'École d'Anthropologie, XX, 52-59, Paris, 1910.

—— La race des troglodytes Magdaléniens. Revue de l'École d'anthropologie, III, 173-188, Paris, 1893.

HOEVEN, JAN VAN DER. Catalogus Craniorum Diversarum Gentium. Lugdunum

Batavorum 1860.

HOOPER, W. H. Ten Months among the Tents of the Tuski. London, 1853.

HRDLIČKA, A. Skeletal Remains Suggesting or Attributed to Early Man in North America. Bull. 33, Bur. Amer. Ethn., Washington, 1907.

—— Contribution to the Anthropology of Central and Smith Sound Eskimo. Anthrop. Papers Am. Mus. Nat. Hist., V. pt. 2, New York, 1910.

—— Catalogue of Human Crania. Proc. U. S. Nat. Mus., LXIII, art. 12 (no. 2480), Washington, 1924.

JACOBSEN, PHILLIP. Das Kochen der Indianer an der Nordwestküste Americas und die Abnutzung ihrer Zähne, Zeitschr. f. Ethnol., Verhandl., XXIII, 395-396, Berlin, 1891.

JENNESS, D. Ethnological Problems of Arctic America. Amer. Geogr. Soc. Special Publ. No. 7, 167-175, New York, 1928.

JOHANNSEN, W. Arvelighedslaerens Elementer. København, 1905.

—— Elemente der exakten Erblichkeitslehre mit Grundzügen der biologischen Variationsstatistik. 2te Auflage Jena, 1913.

JOCHELSON, W. Peoples of Asiatic Russia. Am. Mus. Nat. Hist., New York, 1928.

KAJAVA, YRJÖ. Die Zähne der Lappen. Anthropologische Studien. Verhandlungen der Gesellschaft Finnischer Zahnärzte IX, 1912.

KATE, H. F. C. TEN. Zur Kraniologie der Mongoloiden: Beobachtungen und Messungen. Inaug.-Diss., Berlin, 1882.

KEANE, A. H. Man: Past and Present. Cambridge, 1899. Revised ed., Cambridge, 1920.

KEITH, ARTHUR. The Antiquity of Man. 2d ed. I, London, 1925.

KING, RICHARD. On the Physical Characters of the Esquimaux. Jour. Ethnol. Soc. London, I, 45-59, Edinburgh, 1848.

KLAATSCH, H. Die Stellung des Menschen in der Primatenreihe und der Modus seiner Hervorbildung aus einer niederen Form. Korresp.-Blatt deutsch. Ges. Anthrop. XXX, 154-157, München, 1899.

—— Kranio-morphologie und Kranio-trigonometrie. Arch. f. Anthrop., XXXVI (N. F. VIII) 101-123, Braunschweig, 1909. *Vgl. auch*: Die Uhschau, Nr. 47, XII Jahrg. pp. 923-927, Frankfurt A. M., 1907.

—— Das Gesichtsskelett der Neandertalrasse und der Australier. Verhandl. anatom. Gesellsch., 22. Versamml. in Berlin, 223-273, Jena, 1908.

KLUTSCHAK, H. W. Als Eskimo unter den Eskimos. Leipzig, 1881.

KOGANEI, Y. Beiträge zur physischen Anthropologie der Aino. Tokio, 1893.

KRAUSE, AUREL. Die Bevölkerungsverhältnisse der Tschuktschenhalbinsel. Zeit. für Ethnol.,

Verhandl., XV, 224-227, Berlin, 1883.

KUHL, DR. JOSEPH. Die Anfänge des Menschengeschlechts und sein Einheitlicher Ursprung. Leipzig, 1876.

LALOY, L. [Review of] The graphic Art of the Eskimos, by W. J. Hoffman. L'Anthrop., IX, 585-587, Paris, 1898.

LATCHAM, R. E. Notes on some Ancient Chilian Skulls and other Remains. Jour. Anthrop. Inst. Gr. Brit., XXXIV (n. s. VII), 234-254, London, 1904.

LATHAM, ROBERT GORDON. The Natural History of the Varieties of Man. London, 1850.

LARTET, E., and H. CHRISTY. Cavernes du Périgord. Paris, 1864.

LEDOUBLE, A. Traité des Variations des os de la face de l'homme et leur signification au point de vue de l'Anthropologie zoologique. Paris, 1906.

LISSAUER, A. Untersuchungen über die sagittale Krümmung des Schädels. Archiv für Anthropologie, XV, suppl., 9-118, Braunschweig, 1885.

—— Zur Frage der Rassen-Verwandtschaft der Ainos. Zeit. f. Ethnol., Verhandl., XXXIII, 247-248, Berlin, 1901.

LUSCHAN, F. v. Die Konferenz von Monaco. Korresp.-Blatt der deutschen Gesellsehaft für Anthropologie, Ethnologie und Urgeschichte, XXXVII, No. 7, 53-62, Braunschweig, 1906.

—— Sammlung Baessler, Schädel von

Polynesischen Inseln. Veröffentlichungen aus dem königlichen Museum für Völkerkunde, XII, Berlin. 1907.

LÜTKE. Putěšestvie okrug světa, 1826-29. St. Petersburg, 1834.

LYON, G. F. The Private Journal of Capt. G. F. Lyon, of H. M. S. *Hecla*, during the recent Voyage of Discovery under Captain Parry. London, 1824.

MARKHAM, C. R. On the Origin and Migrations of the Greenland Esquimaux. Jour. Roy. Geog. Soc., XXXV, 87-99, London, 1865.

MARTIN, R. Altpatagonische Schädel. Vierteljahrschr. naturforsch. Gesellsch. Zürich, XLI, 496-537, 1896.

—— Die Inlandstämme der Malaiischen Halbinsel. Jena, 1905.

—— Zur physischen Anthropologie der Feuerländer. Archiv. f. Anthrop., XXII, 155-218, Braunschweig, 1894.

MATHIASSEN, THERKEL. Archaeology of the Central Eskimos. Report of the Fifth Thule Expedition, 1921-24, IV, pts. 1-2, Copenhagen, 1927.

MORANT, G. M. Studies of Palaeolithic Man. Annals of Eugenics, I, 257-276, Cambridge, 1926.

MORTILLET, G. DE. Les Groënlandais descendants des Magdaléniens. Bull. Soc. d'Anthrop. de Paris, VI, IIIe sér., 868-870, Paris, 1883.

MORTON, S. G. Crania Americana; or a comparative view of the skulls of various aboriginal nations of North and South America. Philadelphia and London, 1839.

MOLLISON, TH. Beitrag zur Kraniologie und Osteologie der Maori. Zeit. f. Morphol. u. Anthrop., XI, 529-595, Stuttgart, 1908.

MURDOCH, JOHN. [Review of] Dr. Rink's "Eskimo Tribes." The American Anthropologist, I, 125-133, Washington, 1888.

NADAILLAC, M. DE. Les Eskimos. L'Anthropologie, XIII, 94-104, Paris, 1902.

—— Les Groënlandais descendants des Magdaléniens. Bull. Soc. d'Anthrop., IIIe sér., VI, 868-870, Paris, 1883.

NELSON, E. W. The Eskimo about Bering Strait. Eighteenth Ann. Rept. Bur. Amer. Ethn., pt. 1, Washington, 1899.

NORDENSKIÖLD, A. E. Die Umseglung Asiens und Europas auf der Vego, Leipzig, 1882.

—— [Abstract of] Lecture before the Geog. Soc. of Stockholm, Feb. 20, 1885, on the culture and habits of the original Eskimo. Proc. Roy. Geog. Soc., VII, no. 6, 402-403, London, 1885.

NORDPOLARFAHRT, DIE ZWEITE DEUTSCH. In den Jahren 1869 und 1870, unter Führung des Kapitän Karl Koldewey. 2 v. Leipzig, 1874 (Vgl. auch Pansch).

OETTEKING, BR. Ein Beitrag zur Kraniologie der Eskimo. Abhandlungen und Berichte des

Königl. Zoologischen und Antropologisch-Ethnografischen Museums zu Dresden, XII, No. 3, 1908.

PACKARD, A. S. Notes on the Labrador Eskimo and their former range southward. American Naturalist, XIX, 471-481, 553-560, Phila., 1885.

PANSCH, A. Anthropologie (vgl. Nordpolarfahrt, Die zweite deutsche, etc.), 1874.

PESCHEL, OSCAR. The Races of Man and Their Geographical Distribution, London, 1876.

PETITOT, E. F. S. Monographie des Esquimaux tchiglit du Mackenzie et de l'Anderson, Paris, 1876b.

—— Vocabulaire français-Esquimau, Paris, 1876.

—— Sur l'ethnographie du nord de l'Amérique. Bull. Soc. d'Anthrop. de Paris, IIIe. Sér., III, 590-593, Paris, 1880.

PICKERING, CHARLES. The Races of Man, London, 1876.

PITTARD, EUGÈNE. Contribution à l'étude anthropologique des Esquimaux du Labrador et de la Baie d'Hudson. Bull. Soc. Neuchateloise de Géogr., XIII, 158-176, Neuchatel, 1901.

PRICHARD, JAMES C. The Natural History of Man. II, London, 1855.

QUATREFAGES, A. DE. Histoire générale des races humaines. Introduction à l'étude des

races humaines, Paris, 1887.

—— and HAMY, E. T. Crania ethnica: les crânes des races humaines. Paris, 1882.

RAE, DR. JOHN. Remarks on the Natives of British North America. Jour. Anthrop. Inst. Gr. Brit, and Ireland, XVI, 199-201, London, 1887.

RATZEL, FRIEDRICH. The History of Mankind, II., London, 1897.

RECHE, O. Über den Nasenindex. Korresp.-Blatt Deutsch. Ges., Anthropol. Jg. 38, 49-52, Braunschweig, 1907.

RETZIUS, ANDERS. Blick auf den gegenwärtigen Standpunkt der Ethnologie mit Bezug auf die Gestalt des knöchernen Schädelgerüstes. Ethnologische Schriften von Anders Retzius nach dem Tode des Verfassers gesammelt. XXIII. Stockholm, 1864.

—— Ueber die Schädelformen der Nordbewohner. *Ibid.*, I, Stockholm, 1864.

—— Om Formen af Nordboernes Cranier. Förhandlingar vid Naturforskarnes Möte i Stockholm, 1842, Stockholm, 1843.

RETZIUS, GUSTAF. Crania suecica antiqua. Eine Darstellung der schwedischen Menschen-schädel aus dem Steinzeitalter, dem Bronzezeitalter und dem Eisenzeitalter sowie ein Blick auf die Forschungen über Rassencharaktere der europäischen Völker. Stockholm, 1900.

RETZIUS, S. Finska Kranier. Stockholm, 1878.

RICHARDSON, SIR JOHN. Origin of the

Eskimos. The Edinburgh New Philosophical Journal, LII, 323, Edinburgh, 1852.

RINK, H. The Eskimo Dialects. J. Anthrop. Inst. Gr. Brit, and Ireland. XV, 239-245, London, 1886.

—— On the Descent of the Eskimo. Mém. Soc. Roy. d. Antiquaires du Nord; Journ. Anthrop. Inst., II, 104-108, 1873.

—— On the Descent of the Eskimo. Papers for the Arctic Expedition of 1875, 230-232, Roy. Geog. Soc., London, 1875.

—— Tales and Traditions of the Eskimo. Edinburgh and London, 1875.

—— Die Ostgrönländer in ihrem Verhältnisse zu den übrigen Eskimostämmen. Deutsche Geographische Blätter, IX, Heft 3, 228-239, Bremen, 1886.

SAUER, M. Embalming with Aleutian Islanders. First Ann. Rept. Bur. Ethn., pp. 135-137, Washington, 1881.

SCHENK, ALEXANDRE. Note sur deux cranes d'Esquimaux du Labrador. Bull. Soc. neuchateloise de Géogr., XI, 166-175, Neuchatel, 1899.

v. SCHRENCK, L. Reisen und Forschungen im Amur-Lande. v. 3: Die Völker des Amur-Landes. St. Petersburg, 1881.

SCHLAGINHAUFEN, O. Ein Beitrag zur Craniologie der Semang nebst allgemeinen Beiträgen zur Craniologie. Abh. u. Ber. kgl. zool. u. anthrop.-ethnogr. Mus. Dresden, XI, No. 2, 1-50, 1907b.

SCHULTZ-LORENTZEN. Eskimoernes Invandring i Grönland. Medd. om Grönl., XXVI, 289-330, Kjøbenhavn, 1904.

SCHWALBE, G. Studien zur Vorgeschichte des Menschen. Sonderheft der Zeit. f. Morphol. und Anthrop. Stuttgart, 1906.

—— Über das Gehirn-Relief der Schläfengegend des menschlichen Schädels. Zeit. f. Morphol. und Anthrop., X, No. 1, 1-93, Stuttgart, 1906.

SCHWERZ, FR. Beiträge zur Untersuchung der Sarasinschen Sagittalkurven. Korresp.-Blatt Deutsch. Ges., Anthrop, XXXIX, 41-46, Braunschweig, 1908.

SEEMANN, BERTHOLD. On the Anthropology of Western Eskimo Land, and on the Desirability of Further Arctic Research. Jour. Anthrop. Soc. London, III, CCXCIV-CCCVIII, London, 1865.

SERGI, G. Specie e varietà umane. Saggio di una sistematica antropologia. Torino, 1900.

—— Di una classificazione dei gruppi umani. Atti Soc. zom. Anthrop., XIV, 1908.

SOLLAS, W. J. Ancient Hunters and their Modern Representatives. 2d ed., London, 1915.

—— The Chancelade Skull. Jour. Roy. Anthrop. Inst., LVII, 89-122, London, 1927.

SOMMER, W. Drei Grönländerschädel (Zool. Ergebnisse der von der Gesellschaft für Erdkunde zu Berlin unter Leitung Dr. von Drygalskis ausgesandten Grönlandexpedition

nach Dr. Vanhöffens Sammlungen bearbeitet). Bibliotheka zoologica, XX, 3, 84-100, 1897.

SPENGEL, J. W. Die von Blumenbach gegründete Anthropologische Sammlung der Universität Göttingen. Die anthropologischen Sammlungen Deutschlands, Braunschweig, 1874.

STEENSBY, H. P. Contributions to the Ethnology and Anthropogeography of the Polar Eskimos. Meddelelser om Grønland, XXXIV, 255-405, Kjøbenhavn, 1910.

—— Om Eskimokulturens Oprindelse, Copenhagen, 1905.

STEENSTRUP, K. J. V. Beretning om Undersøgelsesrejserne i Nord-Grønland i Aarene 1878-80. Meddelelser om Grønland, V, 1-41, (2d ed.), Kjøbenhavn, 1893.

SUNDEWALL, F. Om Grönländarnes Cranier. Upsala Läkareförenings Förhandlingar. VII, 217-241, Upsala, 1872.

TARENETZKY, AL. Beiträge zur Craniologie der Ainos auf Sachalin. Mém. Acad. Imp. d. Sci. de St. Pétersb., XXXVII, no. 13, 1-55, St.-Pétersbourg, 1890.

—— Weitere Beiträge zur Craniologie der Bewohner von Sachalin-Aino, Giljaken und Oroken. Mém. Acad. Imp. des Sci. de St.-Pétersb., VIIe sér., XLI, no. 6, 1-45, St.-Pétersbourg, 1893.

TESTUT, L. Recherches anthropologiques sur le squelette quaternaire de Chancelade (Dordogne). Bull. Soc. d'anthrop. de Lyon,

VIII, 131-246, Lyon, Paris, 1889.

THALBITZER, W., ed. The Ammassalik Eskimo. M. o. G. 39, p. 917, 1914.

TOLDT, C., Jr. Die Japanerschädel des Münchener anthropologischen Institutes. Arch. f. Anthropol., XXVIII, 143-183, Braunschweig, 1903.

TOPINARD, PAUL. Anthropology, London, 1878.

TREBITSCH, RUDOLF. Die "blauen Geburtsflecke" bei den Eskimos in Westgrönland. Eine anthropologische Studie. Arch. f. Anthrop., XXXIV, (N. F. 6), 237-242, Braunschweig, 1907.

TURNER, L. M. Ethnology of the Ungava District, Hudson Bay Territory. Eleventh Ann. Rept. Bur. Ethn., 159-350, Washington, 1894.

TYLOR, E. B. Old Scandinavian Civilisation among the Modern Esquimaux. J. Anthrop. Inst., XIII, 348-357, 1884.

VIRCHOW, R. Die Altnordischen Schädel zu Kopenhagen, Beschrieben und in ihren Beziehungen zu anderen Schädeln des Nordens erläutert. Arch. f. Anthrop., IV, 55-91, 1870.

—— Anthropologie Amerika's. Zeit. f. Ethnol., Verhandl., IX, 144-156, Berlin, 1877.

—— Eskimos. Zeitschr. f. Ethnol., Verhandl., X, 185-188, Berlin, 1878.

—— Eskimos von Labrador. Zeitschr. f.

Ethnol., Verhandl., XII, 253-274, Berlin, 1880.

—— Beiträge zur Craniologie der Insulaner von der Westküste Nordamerikas. Zeitschr. f. Ethnol., Verhandl., XXI, 382-403, Berlin, 1889.

—— La crâniologie américaine. Congrés international des Américanistes. Compte-rendu, 7me Session, 251-260. Berlin, 1890.

—— Crania ethnica americana, Berlin, 1892.

—— Zwei Koreaner-Schädel. Zeitschr. f. Ethnol., Verhandl., XXXI, pp. 749-751, Berlin, 1899.

WARUSCHKIN, ALEXANDER. Über die Profilirung des Gesichtsschädels. Archiv. f. Anthropol., XXVI, pp. 373-448, Braunschweig, 1900.

WELCKER, HERMANN. Kraniologische Mittheilungen. Archiv für Anthropologie, I, 89-160, Braunschweig, 1866.

WETTSTEIN, E. Zur Anthropologie und Ethnographie des Kreises Disentis. Inaug.-Diss. Zürich, 1902.

WHYMPER, F. Travels and Adventure in the Territory of Alaska. New York, 1869.

WILSON, DANIEL. Lectures on Physical Ethnology. Smithsonian Report for 1862, 240-302, Washington, 1863.

—— Prehistoric Man, vol. II, London, 1876.

WILSON, THOMAS. The Antiquity of the Red Race in America. Report U. S. Nat. Mus. for

1895, pp. 1039-1045, Washington, 1897.

WOLff, TH. Beiträge zur Anthropologie der Orbita. Inaug.-Diss, Zürich, 1906.

TRANSCRIBER'S NOTES

Supplied missing anchor for footnote [33] on p. 153.

Silently corrected simple spelling, grammar, and typographical errors.

Retained anachronistic and non-standard spellings as printed.

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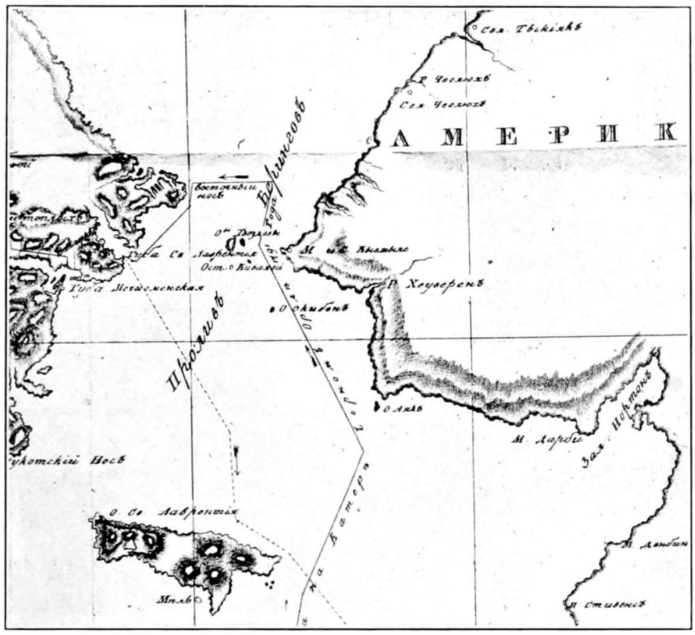
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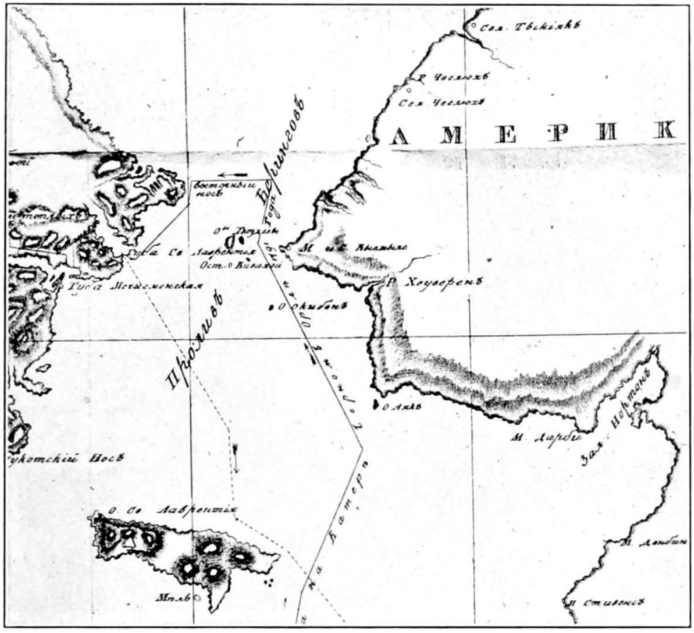
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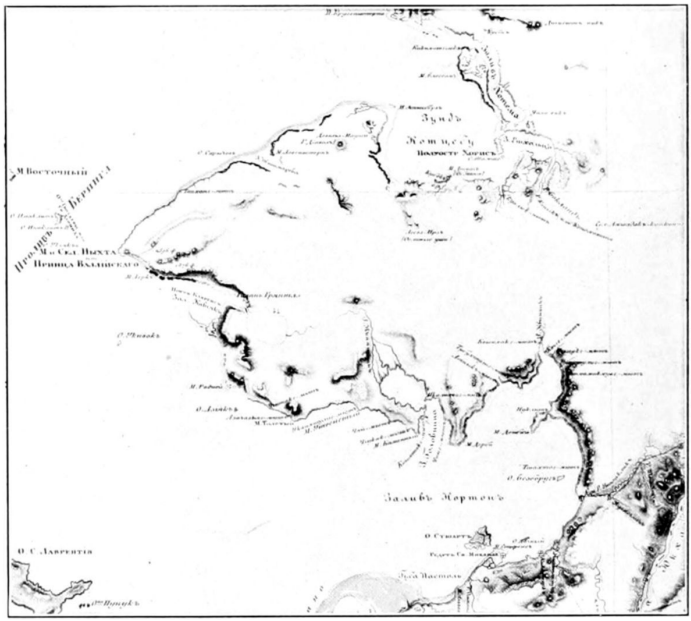
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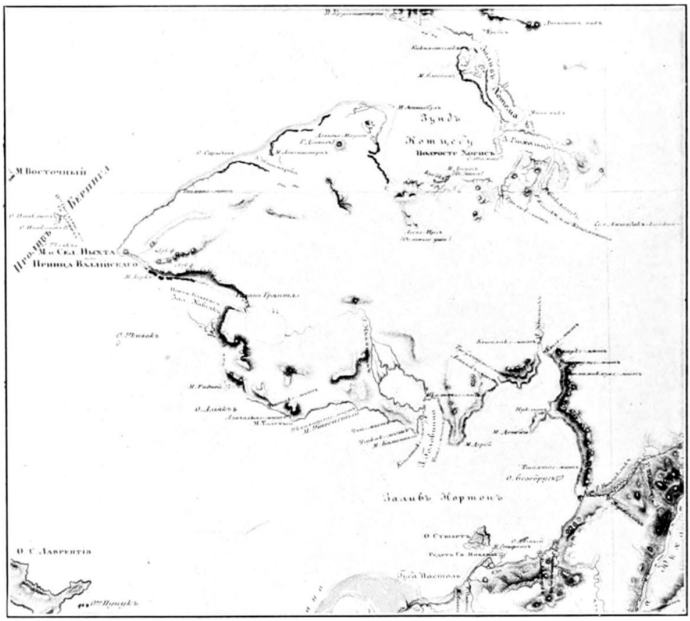
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