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It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

SPENCER F. BAIRD,
Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,
Washington, April 15, 1879.

CONTRIBUTIONS

TO THE

NATURAL HISTORY

OF

ARCTIC AMERICA,

MADE IN CONNECTION WITH

THE HOWGATE POLAR EXPEDITION, 1877–78,

BY

LUDWIG KUMLIEN,

NATURALIST OF THE EXPEDITION.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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INTRODUCTION.

By Ludwig Kumlien.

The vessel conveying the Howgate preliminary Polar Expedition was the "Florence" of New London, Conn. She is a fore-and-aft schooner of fifty-six tons, and was built in Wells, Me., in 1851, for mackerel, and was subsequently used as a sealer in the southern seas.

Although a staunch and fair sea-boat, as far as her diminutive dimensions could allow, a less suitable vessel for the purpose could hardly have been chosen. To say that she was *too* small for thorough scientific work covers the ground, but quite fails to convey a proper idea of what drawbacks all scientific labors were subjected to on this account.

The schooner was fitted out in New London, and sailed on the morning of August 3, 1877, unfortunately at least two months later than desirable, had her object been purely scientific.

The primary object of the expedition, by Captain Howgate's order, was to collect material, skins, skin clothing, dogs, sledges, and Eskimo, for the use of a future colony on the shores of Lady Franklin Bay. The secondary object of the expedition was scientific work; and, thirdly, whaling was to be one feature of the cruise.

So far as the primary object is concerned, the expedition was as successful as could be expected: a large amount of skins was collected and made into clothing; the services of sixteen Eskimo were secured, who were willing to accompany the coming steamer northward; nearly thirty dogs were secured, and several good sledges, with an ample supply of whales' jaw-bones for shoeing the runners for some years.

As has been stated by Captain Howgate, "the peculiar nature of her mission lifted the enterprise from the level of an ordinary whaling voyage to the higher plane of geographical discovery." Every one, except the scientists, had a "lay" in the voyage; and, so far as the crew was concerned, their "lay" was to be their only remuneration; as a natural consequence, whaling became the primary object to them. The expedition was also fairly successful in this direction.

As far as the scientific work is concerned, some valuable work was

done, especially by Mr. Sherman in meteorology; still, nearly all the scientific labors were prosecuted under very discouraging conditions. The lack of any place to work in save a snow-hut on shore, in which neither sufficient light nor heat was to be obtained, rendered it very difficult to prosecute certain investigations. The late date of sailing and the early departure from the winter harbor deprived us of the most interesting and profitable season for scientific research.

The outward trip presented nothing to break the usual monotony of a long sailing voyage: fogs and light winds prevailed till off the north of Resolution Island, when a strong northeast gale was encountered. The schooner was heavily loaded and poorly trimmed, so that some uneasiness for safety was naturally felt, especially as we were close inshore among icebergs and rocks, in a thick fog and on an unknown coast. One boat was stove in and a few barrels of provisions washed from deck; otherwise no damage was done.

The first anchorage was in Niantilic Harbor, on the western shore of Cumberland Sound, September 12, forty-one days after leaving New London. Some natives were secured here, to assist in whaling; and all their worldly possessions, including dogs, sledges, boats, &c., were taken upon the decks, and the schooner weighed anchor and started for the opposite side of the sound. A short stay was made at the Kikkerton Islands, and on the 6th of October the Florence dropped anchor in the little harbor of Annanactook, at about lat. 67° N., long. 68° 50′ W.

Arrangements were at once begun by Mr. Sherman and myself to erect a shelter that would serve for an observatory and general working-place; an eminence on a little rocky islet in the harbor was chosen for this purpose, and our tent raised. Instrument-shelters were erected, and the meteorological work began in earnest.

As soon as the snow became compact enough, we engaged the Eskimo to build a snow-house for us, in which our tent served as a lining.

It was often difficult to get from the ship to the shore on account of the ice or unusually stormy weather.

We improved every opportunity at this late day to secure specimens; but as the ice soon formed over the sound, our endeavors were far from satisfactory, especially as we were unable to procure a boat with any degree of certainty, as they had to be kept in readiness for whaling.

The winter was spent by Mr. Sherman in taking observations; and to judge from the manner in which he assiduously applied himself to his work, night and day, through all weathers and under the most discour-

aging circumstances, the results of his labors cannot fail to be very valuable and do justice to Mr. Sherman's indefatigable perseverance and scholarly attainments. We spent our time in procuring and taking care of specimens, as well as taking our "watch" at the observatory when not too busy with other work.

From our peculiar surroundings and the isolation to which we were necessarily subjected, we lost much of our wonted enthusiasm during the long, dreary winter, and found rest only in continual work.

The spring of 1878 was stormy and backward, and the prevalence of southerly gales kept the ice closely packed about us till the fore part of July. This treacherous condition of the ice, and early departure from the winter harbor, robbed us of any opportunity to prosecute extended researches, except in the immediate vicinity of the harbor; thus the most valuable season was completely lost to us.

The Florence left her winter harbor on the 6th of July, having all the collected material for the future Arctic colony stored in her hold, and sixteen Eskimo and twenty-eight dogs on deck.

In the unnecessary haste of departure many valuable preparations had to be abandoned for want of time to get them aboard, as well as space to store them.

Short stoppages were made at two or three points on the outward passage from the sound, and on the 19th of July we rounded Cape Mercy and took the pack-ice of Davis Straits. It was on this day that the schooner received the bump which afterwards cost us so much trouble and anxiety.

The pack proved to be quite loose, but extensive, and the floes rather small, but the winds were invariably contrary and quite stiff, and the almost impenetrable fog made the navigation dangerous and tedious; we were often obliged to tie up to a floe and await a "lead" in the pack, or the lifting of the murky fog veil.

Godhavn Harbor, Disko Island, Greenland, was reached on the 31st of July. We were all in high spirits in anticipation of news from home, if not the presence of the expected expedition steamer. Of course the double disappointment was sorely felt.

The advent of the expedition was awaited with great anxiety, more especially as no word had been sent us via Denmark, so we naturally concluded the vessel or vessels were belated from some cause; but when three weeks of waiting brought us no news, the anchor was weighed, and the Florence put on a course for Cumberland once more, to return the Eskimo and their effects to their country.

During our sojourn in Godhaven every attention was paid to our comfort by the highly enlightened Danes resident there, and these three short weeks were to us the most enjoyable of the whole cruise. We pursued our scientific labors here as elsewhere when an anchorage was made, but in this case had the misfortune of being on an old and well-worked field.

On the evening of the 22d of August, the Florence left Godhaven and sped on a southerly course, with a fair north wind; this soon veered to ESE. and blew a gale. For four days the schooner lay hove-to under close-reefed storm-sail, while the hatches were battened down over the poor natives in the hold. We were entirely at the mercy of the elements and drifted with the sea. An impenetrable fog, with heavy rain, continued the whole time, and we were drifting among hundreds of icebergs, but luckily did not come in contact with any.

On the 27th *land* was sighted on our starboard quarter, and subsequent observations proved us to be in the mouth of *Exeter Sound!* We had drifted completely across Davis Straits.

On the 31st of August we again anchored at Niantilic, and *most willingly* landed our passengers and all their goods, and enjoyed a few days of *rest*,—rest from the howling of wind and wave and from the far less musical squall of the juvenile Eskimo and the fiendish howls of the dogs. We could also enjoy the luxury of clean and free decks once more, the first time since June.

On the 12th of September willing hands headed the Florence for home, very glad indeed to near the long-wished-for shores of the United States, but little dreaming of the terrible passage we were about to encounter.

We started with a fair free wind, which soon increased to a gale; and as the size of the schooner forbid scudding with more than a whole sail breeze, we were obliged to heave-to for two days. From this time till the 26th, when we made St. John's, Newfoundland, we were in a continual gale nearly the whole time. At the commencement of each storm, and they followed one another in quick succession, we made a fair run for a few hours, and then hove-to till the storm abated.

On the 11th of October, the Florence left St. John's, Newfoundland, for the United States. The passage was one of unusually severe weather: one storm followed an other before the sea could go down, and to add to our misery the schooner sprang a leak on the evening of the 19th, while carrying a good deal of canvas, with stiff free wind and heavy

head sea. We were somewhere off Sable Island at the time, our exact bearings being unknown to us. The pumps were kept manned, and diligent search made for the leak, but without avail. Such a condition of affairs cast a shadow of gloom over the whole company: our provisions gone, ship leaking badly, and not knowing at what moment it might gain on us; the elements in all their fury let loose, so that we were entirely in their power, drifting helplessly at the mercy of raging billows, without knowledge of our position within a hundred miles. On the evening of October 25, Thatcher's Island lights were sighted, and the Florence seemed to have become animated, for with a fair NW. breeze she sped like a thing of life, and before midnight we saw the reflected lights of Boston on the clouds, and the next morning dropped anchor in Provincetown, Mass. Provisions were secured and some slight repairs made.

On the morning of October 30, the Florence lay alongside of the same dock she had left fifteen months before, every man brought back alive and well.

ETHNOLOGY.

FRAGMENTARY NOTES ON THE ESKIMO OF CUMBERLAND SOUND.

By Ludwig Kumlien.

The Cumberland Straits, Sound, Gulf, or Inlet, extends from about lat. 65° N. to lat. 67° + N. It is the Cumberland Straits of Baffin, its original discoverer at the end of the sixteenth century; the Hogarth Sound of Captain Penny, who rediscovered it in 1839; and the Northumberland Inlet of Captain Wareham in 1841.

During the last quarter century it has often been visited by Scotch and American whalemen, ships frequently wintering on the southwestern shores.

It is at present unknown if it be a sound or gulf; it is generally considered as a gulf, but some Eskimo say that the Kingwah Fjord, one of the arms extending to the NE., opens into a large expanse of water, to them unknown. Icebergs are also sometimes found in this fjord that, from their positions, seem to have come from the northward, and not from the south.

The eastern shore of this sound forms the western boundary of that portion of Cumberland Island which lies between its waters and Davis Straits, and known as the Penny Peninsula.

In about lat. 66° N. the Kingnite Fjord extends from the sound in an ENE. direction, and nearly joins Exeter Sound from Davis Straits; they are separated only by a portage of a few miles. The Cumberland Eskimo make frequent excursions to the eastern shore via these fjords, but seem to have extended their migrations but a short distance northward, finding Cumberland Sound more to their tastes.

The width of Cumberland Sound opposite Niantilic is about thirty miles, possibly its widest part. It is indented by numerous and large fjords, few, if any, of them having been explored; many islands are scattered along both shores, and in some instances form quite considerable groups.

The present Eskimo are few in numbers. We would estimate the entire population, men, women, and children, on both sides of the sound,

from Cape Mercy on the east to Nugumente on the west, not to exceed four hundred individuals. It is certain that within the last thirty years the mortality has been very great among them; even the whalemen remark an astonishing diminution in their numbers at the present day, as compared with twenty years ago.

Numerous traditions exist among them of the time when they warred with other tribes, and old men, now living, have pointed out to us islands that were once the scene of battles, where the besieged party was starved into submission by their enemies. According to the usual story, the hurling of stones was one of the most effective and common modes of warfare; this was especially the case when one party could get upon a ledge above the other. At the present day they are peaceful and quiet, have no recognized leader, and no desire to fight, even if their numbers would permit of it.

As the story goes, the present population were the victors in those fights, and took possession of the country they now inhabit. Some say they came from the northwest, and found another tribe, which they overcame and drove away. Their stories on this subject vary, and sometimes with this unusually interesting tradition, as well as many others, they get events of a very recent date hopelessly mixed up with the rest; and it is no unusual instance to find that some whaler with a good imagination has supplied and restored lost portions of the narrative, to their entire satisfaction; but these restorations are chiefly remarkable for their utter disregard of truth or possibility.

The following tradition is a translation from one of the most reliable natives we became acquainted with:

"A long time ago (*tichemaniadlo*)* other Innuits (Eskimo) were found here; they were called "Tunak";† they were very strong, very large, and had short legs and large arms; they had very wide chests. Their clothes were made of bear skins, and their knives from walrus tusks. Did not use bows and arrows, but only the harpoon-lance; they harpooned the reindeer in the water, from their kyacks; used very large kyacks. The

* Here arises a great difficulty: *tichemani* signifies a long time, *i. e.*, it may be anywhere from a week to a year; *tichemaniadlo* is a very much longer period, generally conceded to antedate the advent of the whites; at least, this was the only example we could bring up which they could understand, except their own ages, which we could ascertain with less certainty. When a *very* long period (as in this case) is represented as having intervened, they repeat *tichemaniadlo* several times, but how much *time* is added by each repetition we are unable to say.

† Variously pronounced, "Tunare," "Tunnuk," or "Tunnak."

Tunuks made houses out of *stone.** They were able to lift large stones. We were afraid of them; we fought with them and killed them. They (the *Tunuks*) came in the first place from *Greenland.*† The women made clothes from their own hair. They had no dogs at that time, but they made sledges and harnesses, and finally (*witchou* = by and by) put the harnesses on three rocks, one white, one red, and one black; they then called, and when they looked they found the stones had been transformed into dogs. After a time they got plenty dogs; then they went about more. The present Eskimo could not understand their language. They lived to a great age (*E. tukewouk nami* = did not die!). Far to the west some Eskimo lately saw some *Tunuks;* they had bear-skin clothing. In the *Tunuks* land (where?) the *musk ox* (*oming muk*), bear, and seals are abundant. They build walls of stones on the land, and drive the reindeer into ponds, and catch them in kyacks. They have a large, long *callytong* (coat, or jumper jacket) that they fasten down around them on the ice while they are watching a seal's hole; underneath this

* *Vide* sketch of foundation, No. 1. Stone foundations of a somewhat peculiar pattern are found in many of the larger fjords. The subject of the sketch was about fourteen feet in its greatest diameter (the larger enclosure) inside; the smaller one about ten feet. The arrangement is much the same as the Eskimo use at the present day, a raised platform in the end opposite the entrance for a sleeping and general lounging place, and two smaller platforms on either side, where the lamps are kept, and where the garbage accumulates.

These foundations are now mere ruins. Some of the stones in the walls are so large that it must have required the united efforts of several men to place them in position. The stones gradually diminish in size from the foundation upward. Standing walls are from two to three feet high, and might have been a foot higher, to judge from the loose stones lying about. There was probably a frame-work of whale ribs, over which the seal-skin covering was spread.

On the north side of this foundation were seven kyacks, built of small stones; they lie parallel to each other, and are from ten to fifteen feet in length; they are built of a single row of stones, and only one tier high. These are said to indicate the number of inmates that have died. They appear to us more like the work of children. In the lamp-places we found the remains of *Pagomys fœtidus* (abundant), *Phoca barbata, Cistophora cristata, Trichechus rosmarus, Ursus maritimus* (the three last-named species occur now only as stragglers in the vicinity), *Rangifer tarandus, Beluga catodon, Larus* ———?, and *Somateria* ———? (*mollissima*, probably). Other bones are found, but not recognizable from decay. No implements were found except a stone skin-scraper. The present Eskimo say these stone foundations were made by the *Tunuks.* They are found in various out-of-the-way places, especially in the greater Kingwah Fjord.

†About twenty years ago, a man and women (Greenlanders) landed near Cape Mercy, having got adrift on a piece of ice on the Greenland coast. From this occurrence we conjecture that the story has received a modern addition.

garment, on the ice, they place a lamp; over this lamp they cook meat. Their eyes are sore all the time. We are afraid of them; do not like them; glad they have gone away."

This tradition differs somewhat in the particulars when told by different individuals, but the main points are essentially the same. Many will not tell it all; some, only parts of it. The ridiculous story about the dogs is firmly believed by the present Eskimo as the origin of these animals.

That the *Tunuks* have been seen of late years in the west is not improbable,—that is, natives, different in dress and stature; but they were most likely the tribe known as the Pelly Bay Eskimo from the north shores of Hudson's Straits and from Fox Channel, they being larger and more robust than the Cumberland Eskimo of the present day. It is certain that since the whalers have begun coming among the Cumberland Eskimo, and introduced venereal diseases, they have deteriorated very much. They now almost depend upon ships coming, and as a consequence are becoming less expert hunters, and more careless in the construction of their habitations, which are merely rude temporary shelters made at a few minutes' notice. Great suffering often ensues from living in these miserable huts. The seal skin that should have gone to repair the tent is bartered to the whalemen for a little tobacco, or some valueless trinket, which is soon thrown aside. The men are employed to catch whales, when they should be hunting in order to supply the wants of their families; and the women, half clad, but sporting a gaudy calico gown, instead of their comfortable skin clothes, and dying of a quick consumption in consequence, when they should be repairing garments or preparing skins, are loafing around the ships, doing nothing for themselves or any one else.

The Cumberland Eskimo of to-day, with his breech-loading rifle, steel knives, cotton jacket, and all the various trinkets he succeeds in procuring from the ships, is worse clad, lives poorer, and gets less to eat than did his forefathers, who had never seen or heard of a white man.

There is a practice among them that is probably of long standing, and is regularly carried out every season, of going into the interior or up some of the large fjords after reindeer. They generally go during the months of July and August, returning in September, to be on hand when the fall whaling begins. The purpose of this reindeer hunt is to procure skins for their winter clothing. Nearly all return to the sound to winter. They have regular settlements, which are hardly ever entirely deserted

at any season. The principal ones are known as Nugumeute, Niantilic, Newboyant, Kemesuit, Annanactook, Oosooadluin, Ejujuajuin, Kikkerton, and Middliejuacktuack Islands, and Shaumeer, situate at different points on both sides of Cumberland Sound. During the winter they congregate at these points in little villages of snow-huts.

The present principal headquarters are at the Kikkerton Islands, or at Niantilic, according to which point the whalers winter. The old harbor of Kemasuit, once the winter harbor of whalers and a favorite resort of the Eskimo, is now deserted, except by a few superannuated couples, who manage to catch enough seal to live on.

As a rule, the present race is of short stature, the men from five feet three inches to five feet six. There are some exceptions, but they are in favor of a less rather than a greater height. The women are a little shorter. The lower extremities are rather short in proportion to the body, and bow-legs are almost the rule. This probably arises from the manner in which the children are carried in the mother's hood, as well as the early age at which they attempt to walk. The habit of sitting cross-legged may also have a tendency to produce this deformity. Their hands and feet are small and well formed. Their hands are almost covered with the scars of cuts and bruises. It seems that in healing the injured part rises, and is always afterwards disgustingly prominent. There is a great variation in the color of their skin, and a description that would answer for one might not apply at all to another. Even among those that are of pure breed there are some whose skins are no darker than a white man's would be if subjected to the rigors of wind and cold, and the never-removed accumulation of soot and grease. Others again seem to have been "born so." The children, when young, are quite fair. The eyes are small, oblique, and black or very dark brown. The hair is black, straight, coarse, and very abundant. It is rarely wavy or curly among the full-blooded Innuits.

There are, of course, exceptions to the above in cases of half-breeds. Their faces are broad and flat, with rather large lips and prominent cheek-bones.

Infanticide is not practiced among the Cumberland Eskimo at the present day. I have learned from some of the most intelligent that this barbarous custom was in vogue in former times, however. Among the natives of Repulse Bay and those living on the north shores of Hudson's Straits, it is practiced to a considerable extent, especially with the tribe known as the Pelly Bay natives. The practice is confined almost en-

tirely to female children, the reason being, they tell us, that they are unable to hunt, and consequently of little account. It seems to have been referable to the same cause among the Cumberland Eskimo. Their intercourse with the whites seems to have modified some of the most barbarous of their primitive habits.

Twins are not common, and triplets very rare. The males outnumber the females. Infanticide may, to some extent, be the cause; but lung diseases, which are alarmingly prevalent, seem more fatal to the women than to the men.

Children are often mated by the parents while they are still mere infants. There is such an extreme laxity of morals that the young women almost invarialy become wives only a short time before they are mothers.

It is impossible to say at what age the women cease to bear children, as they have no idea of their own age, and few are able to count above ten. Puberty takes place at an early age, possibly at fourteen with the female. They are not a prolific race, and it is seldom a woman has more than two or three children, and often only one, of her own; still many, or almost all, have children; but inquiry will generally divulge the fact that some of the children have been bought. Almost every young woman has or has had a child, but the identity of the father is in no wise necessary in order to insure the respectability of the mother or child. Such children are generally traded or given away to some elderly couple as soon as they are old enough to leave the mother. The foster-parents take quite as good care of such adopted children as if they were their own.

So far as we could learn, they do not generally practice any rites or ceremonies of marriage. The best hunter, or the owner of the largest number of dogs and hunting-gear, will seldom have any difficulty in procuring the woman of his choice for a wife, even though she has a husband at the time. It is a common practice to trade wives for short periods or for good. They appear to have marriage rites sometimes, but we could induce no one to tell us, except one squaw, who agreed to, but only on condition that we became one of the interested parties and she the other. This was more than we had bargained for, and, although generally willing to be a martyr for the cause of science, we allowed this opportunity to pass without improving it.

Monogamy is at the present time the most prevalent. Polygamy is practiced only in the case of a man being able to provide for two or more wives. Three, and even four, are known of, but rare. Neither do two

or three wives in one hut make an altogether harmonious household; but all little difficulties are generally settled by the husband, in a manner better calculated to insure reverence to masculine strength than respect for superior intelligence.

The scarcity of women at present in proportion to the men makes polygamy a luxury only to be indulged in by the wealthy. Divorce, if it can be called by that name, is very frequent among them. All that is needed is that the husband tires of his wife, or knows of a better one that he is able to procure. Neither does it seem to trouble the woman much: she is quite sure to have another offer before long; and a change of this kind seems to benefit both parties. One rather remarkable and very laudable practice among these people is the adoption of young children whose parents are dead, or, as often happens, whose mother is the only recognized parent. Orphans, so to speak, are thus twice as common as among civilized nations. These children, whether bought or received as a gift, are always taken as good care of as if they were their own, especially if they are boys.

Among the Eskimo employed by the Florence was a family that had two children, who passed for brother and sister. One, the boy, was a nephew of "Eskimo Joe," of Polaris fame. He had been bought from the Hudson's Straits Eskimo, some two hundred miles to the south. He was a perfect little satan; and, though he gave us much annoyance, he was a never-failing source of amusement to us all. The girl, again, was a native of Exeter Sound, on the west coast of Davis Staits; still, both were considered as their own children, and well cared for.

Half-breeds are said to be of more irritable temperaments, and less able to bear exposure and fatigue, than the full-blooded Eskimo.

The food of the Cumberland Eskimo consists entirely of flesh, and in most sections of the sound of *Pagomys fœtidus*. In fact, this animal is their principal dependence for food, fuel, clothing, and light. The Eskimo will eat a few of the berries of *Vaccinium uliginosum* and *Empetrum nigrum*, the roots of *Pedicularis*, and occasionally a little *Fucus vesiculosus* in winter, but this constitutes a very small and unimportant part of their food.

As soon as the ice has fairly left the sound, the Eskimo hunter leaves the winter encampment, with his family and such portions of his household goods as will be needed, and takes a tour inland or up some of the large fjords after reindeer. The larger part of his possessions, including sledge, dogs, harnesses, winter clothing, &c., he secretes among the rocks in some unfrequented spot. His dogs are put on some little rocky islet,

to shift for themselves. They eke out a scanty subsistence by making good use of their time at low tide, *Cottus scorpius* constituting the greater part of their food at this season.

There are at present so many whaleboats owned by these Eskimo, that they experience little difficulty in making quite extensive cruises, three or four families constituting a boat's crew. They will load a whaleboat to within an inch or two of the gunwale, and then set out for a few weeks of enjoyment and abundance. The squaws do the rowing and the "captain" stands majestically in the stern with the steering oar, while the rest of the men are either asleep or on the lookout for game. The cargo consists of their tent-poles, the skin-tents, pots, and lamps, with sundry skin-bags containing the women's sewing and skinning utensils. Their hunting-gear, of course, forms a quite conspicuous portion of the contents of the boat. Very few there are at present who have not become the possessors of a half-barrel, and this vessel occupies a conspicuous place in the boat, and is almost constantly receiving additions of animal matter in some shape; a few young eiders or gulls will soon be covered up with the intestines of a seal and its flesh. From this receptacle all obtain a piece of meat whenever they feel hungry. This vessel is never emptied of its contents, except by accident or when scarcity of material forbids its repletion; and, as the temperature at this season is well up in the "sixties" during the day, this garbage heap becomes so offensive as to be unbearable to any one but an Eskimo.

They proceed at a very leisurely rate, rowing for a few minutes and then stopping for a time, chatting, smoking, or eating. When they feel tired they haul up on the rocks and have a sleep, and then resume the journey in the same vagabond manner. If, while thus cruising, any live creature that they think there is any possibility they can capture comes in sight, all hands become animated, the oars are plied with redoubled energy, guns and spears are in readiness, and every one is eager for the sport. Hours are often consumed in chasing half-grown duck or young loon, which when procured is but a bite; but the fun of the chase seems to be the principal object, and they enjoy it hugely. Thus they journey till they reach some suitable locality, when the boat is unloaded, the toopiks raised, the lamps put in their places, and all is ready for a grand hunt. The men divide and scatter over the mountains, leaving the camp in charge of the women and children; these busy themselves by hunting for and destroying every living creature that they can find.

On the return of the hunters, who perchance have brought some skins and a hunk of venison, there are joyous times in camp; the meat is dis-

posed of first, and then the younger people engage in various games, while the older ones gather around some aged crone, who excitedly recounts the hunts of her girlhood days, plentifully intermixing stray portions of the old sagas and legends with which her memory is replete. Thus they live from day to day, the men hunting and the women stretching the skins, till the season comes around when they must return to the coast. Happy, contented, vagabond race! no thoughts of the morrow disturb the tranquillity of their minds.

When a deer is killed any distance from camp, the meat is cached, with the intention of returning after it in winter; but with what the wolves and foxes devour and what the Eskimo never can find again, very little is brought back.

Many have now firearms of some pattern or other; and though they will hunt for a ball that has missed its mark for half a day, they do not hesitate to fire at any useless creature that comes in their way. Those that have no guns use bows and arrows made from reindeer antlers. Sometimes the deer are driven into ponds, and even into the salt water, and captured in kyacks with harpoons.

They have an interesting custom or superstition, namely, the killing of the *evil spirit* of the deer; some time during the winter or early in spring, at any rate before they can go deer-hunting, they congregate together and dispose of this imaginary evil. The chief *ancoot*, *angekok*, or medicine-man, is the main performer. He goes through a number of gyrations and contortions, constantly hallooing and calling, till suddenly the imaginary deer is among them. Now begins a lively time. Every one is screaming, running, jumping, spearing, and stabbing at the imaginary deer, till one would think a whole mad-house was let loose. Often this deer proves very agile, and must be hard to kill, for I have known them to keep this performance up for days; in fact, till they were completely exhausted.

During one of these performances an old man speared the deer, another knocked out an eye, a third stabbed him, and so on till he was dead. Those who are able or fortunate enough to inflict some injury on this bad deer, especially he who inflicts the death-blow, is considered extremely lucky, as he will have no difficulty in procuring as many deer as he wants, for there is no longer an evil spirit to turn his bullets or arrows from their course.

They seldom kill a deer after the regular hunting season is over, till this performance has been gone through with, even though a very good opportunity presents itself.

Salmo salar, and one other species of *Salmo* that I could not procure enough of to identify, are caught to some extent in June and September in some of the larger fjords; they are mostly caught with a spear, but sometimes with a hook. (For description *vide* under hunting-gear, &c.)

When these fish are caught, they are put into a seal-skin bag, and it remains tied up till the whole becomes a mass of putrid and fermenting fish, about as repulsive to taste, sight, and smell as can be imagined. *Cottus scorpius*, which contributes so largely towards the Greenlander's larder, is not utilized by the Cumberland Eskimo, except in cases of a scarcity of other food supplies; the fish is abundant in their waters, however, and fully as good eating as they are on the Greenland coast.

Birds and their eggs also contribute towards their sustenance in season; they are extremely fond of eggs, and devour them in astonishing quantities.

The "black skin" of the whale, called by them *muktuk*, is esteemed the greatest delicacy. When they first procure a supply of this food, they almost invariably eat themselves sick, especially the children. We found this black skin not unpleasant tasting when boiled and then pickled in strong vinegar and eaten cold; but the first attempts at masticating it will remind one of chewing India rubber. When eaten to excess, especially when raw, it acts as a powerful laxative. It is generally eaten with about half an inch of blubber adhering.

The greater portion of their food is eaten raw, especially in winter. When they cook at all, they only "simmer" it over their lamps in a pot of soapstone. These pots are from eight to twenty inches in length, usually about sixteen inches, and though of variable patterns, the length is generally three times the width or depth. Among such Eskimo as are able to procure old cast-away meat-cans from around the ships, tin has superseded the soapstone both for lamps and boiling-pots.

In summer, especially when on hunting excursions, they very often "fry" meat by making a little fireplace of stones, and laying a flat piece of stone on the top. The opening to receive the fuel supply is to windward. For fuel at such times they use *Cassiope tetragona* and *Ledum palustre;* these shrubs make a quick and very hot fire. It would be comparatively an easy task for these people to gather enough *Cassiope tetragona* during the summer to burn during the coldest weather, and not rely wholly upon blubber.

When the Eskimo have been simmering meat, especially seal, in their boiling-pots, they pour off the liquor and mix it with about an equal

quantity of blood; this makes a thick and rather greasy soup that must be quite nourishing; the children are very fond of it. It seems possible that from this dish has originated the popular error that these people *drink oil*, a notion that is simply preposterous.

I found among some of these people a little spoon, or rather a miniature scoop, made of ivory, which they used to drink the soup with; it appears to be an old utensil, now fast going out of use, for they can now procure tin mugs. A reindeer's rib, pointed at one end, is used to fish up the meat with, and sometimes to convey it to the mouth. These instruments are found in the graves, but seem to be but little used at the present day.

When a seal is brought to the encampment, especially if they have not been plenty for some days, all the villagers are invited to the hut of the lucky hunter, and the seal is soon dispatched. A couple of the younger men skin the animal and distribute the pieces to the assembled company as fast as needed. The testicles, being considered as the choicest titbit, are usually handed over to the hostess; the spinal cord is also rated as one of the choicest portions of the animal. During these feasts they gorge themselves to their utmost capacity, and are in good humor and hilarious. Though there may be ever so poor prospects to procure more food for the morrow, this does not deter them from gluttonously devouring the last morsel, and then go on allowance till they can get a fresh supply. I have seen them thus gorge themselves, and then lie down to sleep with a piece of seal meat by their side, which they attacked every time they awoke.

The intestines of birds, notably *Lagopus* and *Somateria*, are looked upon as choice parts, and birds brought to the encampment are generally "drawn" by the hunters. The fatty excrescence at the base of the upper mandible of the male *Som. spectabilis* is too great a temptation for them. It was with great difficulty that we could induce them to bring these birds to camp without having them thus mutilated.

Since whalers began to cruise in the Cumberland waters, they have found that it is decidedly to their advantage to hire boats' crews of natives to assist in the capture of whales. They make good whalemen. When such crews are secured, they wisely count in all of their family in the bargain, so that to secure the services of a crew of seven men one must feed thirty or more. While working for whalers, these Eskimo depend almost wholly on the ship for their food supply; as a consequence, they are fast becoming poor hunters, and prefer to lounge around a vessel

and pick up such scraps as offer themselves rather than to strike out for themselves and live independently and in comparative plenty.

As to meals, or regular meal-times, they eat when hungry, if they have anything. They always eat in the morning before going out to hunt; but the principal meal is in the evening, on their return. When supplied with rations by the ships, they often have their regular meals aboard; but this does in no wise hinder them from taking their usual evening allowance of raw meat when they return to their huts.

That the Eskimo possess considerable powers of abstinence cannot be disputed; but it is not so remarkable after all, for they certainly have had ample experience in this direction. That they are able to bear temporary or sustained exertion better than the whites is doubtful. They are acclimated and have clothing suited to the climate, and readily adapt themselves to the rude shelter of a snow-bank, if necessary; but give a healthy white man as good clothes, and he will stand as much fatigue, and perhaps more.

While hunting with the Eskimo, we often had our nose and face frozen, when it did not seem to affect the Eskimo in the least; but when it came to a tramp through the snow all day long, few of them would stand it any better than we could.

Some have judged their powers of endurance from the manner in which they will follow their game; but it seems to us it is rather their wonderful patience, for we have known them to follow animal tracks for a whole day, when we confess we could not discover the faintest trace of a track, except at long distances apart. They will discover any traces of animals on the snow that a white man would pass by and not notice. When traveling either on the ice or water, they make the journey by short, easy stages, stopping as soon as they feel the least tired, and recruiting; if they were required to walk a given distance, as on a regular march, they would give out.

The Cumberland Eskimo are known to make better and more beautiful clothing than the tribes of Northern Hudson's Bay and Straits. During the summer, and, in fact, at all seasons, except when the weather is very severe, the outer garment of the men is made from the skins of adult—or, more properly speaking, yearlings, as they are the best—*Pagomys fœtidus*. In very cold weather, they betake themselves to deer-skin clothing; but as these clothes are less strong than the seal-skin, they make the change as soon as the weather permits. The women wear the deer-skin clothes much later in the season than the men; their dress

is also made of the same kind of seal, unless they are fortunate enough to procure *Callocephalus vitulinus*, which skins are so highly prized that they use them even though there is only sufficient for a part of the fronts of their jackets.

Both the men and women wear a garment the exact duplicate in shape under the outer one; this garment is made either from the young seal in the white coat or of reindeer.

The coat of the men does not open in front, but is drawn on over the head like a shirt, and has a hood that fits the head snugly, while the woman's hood is large and loose, and the jacket is quite loose-fitting, so as to receive the child, which is always carried in the hood. The woman's jacket further differs from the men's in being shorter in front, and ending in a rounded point, while behind it reaches quite to the ground in the form of a lance-shaped train. This appendage is caught up in the same manner as the fashionable train of the present day among civilized nations, when the condition of the ground is unfavorable for its trailing. After all, is not this fashion borrowed from the Eskimo? There is often an approach towards this prolongation in the men's jackets, especially when made of deer skin, but never so long as on the woman's. Neither do little girls have a long train to the jacket; but as soon as they arrive at the age when they are no longer looked upon as children, they learn to imitate their mothers. There are never any pockets in the jackets of either sex, the hood serving for this purpose.

The pants of the men are made from the same material as the coat, with the exception that the young seal in the white coat is often used for the outer as well as the inner garment. The pants reach only to the upper part of the pelvis, and are kept up by means of a string around the body. They reach a little below the knee, where they are met by the boots. When made of deer skin, they are usually ornamented by fringes of cut skin around the lower edges.

The women's pants differ from the men's in being composed of two separate pieces, the lower reaching from a little below the knee to the middle of the thigh, and are kept in place by a string which runs to the upper edge of the other portion. The lower portion of these pantaloons is removed while they are at work in their igloos, and the bare thigh used, as a board would be, to lay the seal skin on while cleaning the blubber from it. The women have the habit of thrusting their hands between the upper and lower pantaloons the same as we do in a pocket; in fact, they use this space as a sort of pocket.

Little girls wear their breeches like the men till they get to be ten or

twelve years of age. Very small children are dressed in a fawn-skin jacket without attached hood; but their heads are, nevertheless, well bundled up in a double fawn-skin hood that fits the scalp closely. This hood is never removed, except perchance by accident, till the child outgrows it. The lower extremities are usually not clad at all.

The children are carried *on* the mother's back inside her jacket. The cut of the jacket is such that the child goes down as far as the mother's waist, when the closeness of the jacket prevents it going any farther. The hood allows the child freedom for its arms and head, but the legs are cramped underneath its body, and this is probably one cause of bow-leggedness and possibly the shortness of the lower extremities. I have seen the Eskimo mother, with a child fast asleep in her hood, building a toopik. This work often necessitated her stooping over so much as to seemingly endanger the dumping of the infant over her head on the ground; still, it did not seem to inconvenience the child in the least, as it slept soundly through the whole proceeding.

The *kámik*, or, as generally pronounced, *kumming*, or boots, are principally made from the skins of adult *Pagomys fœtidus*, with the hair off, the soles being made from the skin of *Phoca barbata*. For winter wear a very beautiful and serviceable boot is made from the skin of reindeer legs sewed together lengthwise; they are used only in dry snow, being quite useless when the snow is wet. Another style of boot is to have the leg of netsick skin, but with the hair on. These boots reach nearly to the knee, and are kept in place by means of a string around the top, and also secured by a seal-skin cord passing over the instep and around the heel. They are generally sewed with sinews from reindeer; but for boots the sinews from the dorsal vertebræ of *Beluga catodon* are preferred when they can be procured.

The stocking worn next to the foot is of heavy reindeer skin, the hair side next the foot; they reach above the knee. Over the stocking is worn a sort of slipper made from the eider-duck. The bird is skinned by making an incision on the back near one wing; through this opening the body is removed. The skin is cleaned of the fat by the Eskimo's teeth, and the skin farther prepared by chewing it. The tail-feathers are removed, and this end becomes the toe of the slipper, the feather side being worn inside. Its upper edges are bound with some kind of skin to give it additional strength, and if the entire slipper is covered with cloth will last a long time. They are very warm and comfortable. *Larus glaucus* is often used for this purpose. For children they use *Uria grylle* and *Rissa tridactylus* skins. Over all this is worn another slipper

made from the netsick skin, with the hair on, and the hair side worn outward and the hair pointing from the toe backwards. This very much facilitates the drawing on of the boot.

For summer wear the young of the netsick in the woolly coat is substituted for reindeer for the stockings. Dog skin is also sometimes used for stockings, but not so commonly among the Cumberland Eskimo as among those of Hudson's Straits, who use dog skins for pants as well as stockings.

All the clothing is sewed with sinews, reindeer or white whale. The reindeer sinews are dried in bulk as they come from the animal, and are split off as needed. The fibres are separated as fine as necessary, and then drawn quickly between the teeth to secure a more uniform size. The women all sew towards themselves, using the thimble on the first finger; they seldom use but one kind of seam; the edges of the skin are carefully matched together, and joined by sewing over and over the overcast seam. Their thimbles (called *tikik*, also signifies first finger) are made from the skin of *Phoca barbata;* in shape they are merely an oblong piece sufficiently large to cover the point of the finger. A rim is cut around the outside edge for about one half its length; this forms a sort of loop under which the finger is passed, and in this manner it is kept in place. We found this style of thimble much more convenient than the metal one of the usual form.

Very few of the Cumberland Eskimo at the present day use anything but steel needles, or bone ones made after the same pattern. We have seen an instrument said to have been used as a needle that is considerably different from anything we ever saw before. An Eskimo brought it to us, and wanted a hatchet in exchange. We thought it certain he would return and offer to trade at our terms, but he did not, and we never saw him again. This tool was almost exactly like an awl in shape, but had an *eye* near the point. They must have had to thread this instrument for each stitch. The needle part was apparently of deer horn and the handle of walrus ivory.

The favorite and principal tool of the women is a knife shaped like an ordinary mincing-knife. Nearly all the Cumberland Eskimo have now procured iron enough from some source or other so that they can have an iron knife of this pattern. Before they could procure enough iron, they made the knife of ivory, and merely sank flakes or pieces of iron into the edge, in the same manner as the natives of North Greenland do at the present time. This same practice of sinking iron flakes into the

edge was also used on their large skinning-knives, which were made from a walrus tusk, and much after the pattern of an ordinary steel butcher-knife. Some of these ivory knives have no iron in them; but at the present time they are used principally, if not entirely, for cutting snow and removing ice from their kyacks.

The women seldom use any other kind of knife than such as just described. With them they remove the blubber from the skins, split skins, cut up meat, and when sewing this instrument is used instead of scissors. They begin a garment by sewing together two pieces of skin and shaping them as they go along by means of the knife, cutting for an inch or two and then sewing. They always *push* the knife *from* them when working it.

Tattooing does not seem to be as prevalent now as formerly, for it is mostly on the aged women that one finds it at present. The markings resemble India ink in appearance, and are done with gunpowder at present. Still, some use the old method, by taking the juice of *Fucus vesiculosus* L. (or a closely allied species), and some small algæ that apparently contain a good deal of iodine, and mixing with lampblack.

Instances came under our observation of people of apparently great age,—say seventy years and over, to judge from appearances; they had gray hair (a rare thing among the Eskimo), and were nearly blind; the women had the teeth worn close to the gums by chewing skins.

It is impossible to arrive at any definite conclusion regarding their age, as they keep no record of time and cannot refer to any past event by any means of notation. We could not learn of the rudest attempt at picture-writing or hieroglyphics; and, as they possess no records whatever, their traditions are handed down from generation to generation without being fixed by any means which allow even an approximate estimate of their growth and prosperity.

Most of them are unable to count beyond their ten fingers, and many are unable to go over six; some, again, are said to have names for numbers to twenty, but they are few. The numerals are differently pronounced, and we found difficulty in getting one sufficiently conversant with them to give us the numerals to ten.

One=*Atáusa*, or *atausat.*

Two=*Mácho.*

Three=*Píngasuit*, or *píngasat.*

Four=*Séseminé*, or *sesemat.*

Five=*Tódlimené*, or *tódlimát.*

Six=*Aúkbinigan.*

Seven=*Pingashuing* (?).

Eight=*Aukbinigan-machoni* (6 and 2).

Nine=*Schischimani* (? ?).

Ten=*Kowcolin.*

Above ten they are said to count their toes and take ten and one, ten and two, &c.; but we were unable to find one who knew their names. They will tell you they have caught seals or birds up to six, but if more they generally put it *amashuadly* (a good many), which may be any number from seven upwards.

In the treatment of the sick they are very superstitious, and in fact they resort almost entirely to their *ancoot*, *angekoks*, or medicine-men.

The following is a Greenlander's legend that proposes to give a reason why people die: "The cause of people's dying is laid to a woman, said to have discoursed thus: 'Let the people die gradually, otherwise they will not have room in the world.'"

Others relate it in this manner: "Two of the first people quarreled. One said: 'Let it be day and let it be night, and let the people die.' The other said: 'Let it only be night and not day, and let the people live. After a long wrangle it came to pass as the first had said."

It is interesting that this same curious legend exists among the Eskimo of Cumberland Sound; they say though that "those who quarreled finally arranged matters and had both *entire* day and *entire* night at the different seasons, so that both parties might be suited."

The lungs of *Lepus glacialis* are considered as a sure cure for boils and all manner of sores; they draw, they say, and their manner of applying them is the same as we would a poultice. They must be applied as soon after the animal's death as possible, and while they are yet warm.

In cases of scurvy they never use *Cochliaria*, but the stomach of a freshly killed reindeer, with the vegetable contents, instead. If the scurvy patient be very bad, the limbs are bound with pieces of the deer's stomach, whale or seal's blubber, or any kind of fresh meat. If a whale can be caught at such a time, the patient is sometimes bodily shoved into the carcass, or the lower extremities only are sunken into the flesh.

The most prevalent disease among them seems to be lung disease; it is alarmingly common, and consumption probably kills more than all other diseases combined.

The whalemen have introduced venereal diseases among them, which have spread at a terrible rate, and devastate the natives almost like a pest.

I could not learn that they have any knowledge of the medical properties of any plant or shrub. Some of the coarser kinds of *algæ* are procured at low tide from the cracks in the ice, and eaten raw, but only because they are fit to eat, they say; the roots of *Pedicularis* are also sometimes eaten.

When the women are about to be confined they are placed in a small snow-hut, if it be winter, and in a little skin tent, if summer, by themselves. Their only attendant is a little girl, who is appointed by the head *ancoot* of the encampment. A little raw meat—deer, if they have it—is put into the hut with her, and she is left to give birth to the child as best she can. The reason she is removed from her tent is, that should mother or child die in the tent nothing pertaining to the equipment of the establishment could ever be used again, not even the tent-covering or the husband's hunting-gear. In some instances they are obliged to modify this custom somewhat. We have known them to cut the tent-cover about two feet from the ground all around and use the upper portion. A man's wife accidentally shot herself in her igloo, but the gun was too great a sacrifice; he used it, but the rest of his household effects were left to waste away where they lay. We knew of another instance where the tent-poles were brought into use again in the course of a year after a death had occurred beneath them.

As soon as the mother with her new-born babe is able to get up and go out, usually but a few hours, they are taken in charge by an aged female *ancoot*, who seems to have some particular mission to perform in such cases. She conducts them to some level spot on the ice, if near the sea, and begins a sort of march in circles on the ice, the mother following with the child on her back; this manœuvre is kept up some time, the old woman going through a number of performances the nature of which we could not learn, and continually muttering something equally unintelligible to us.

The next act is to wade through snow-drifts, the aged *ancoot* leading the way. We have been informed that it is customary for the mother to wade thus bare-legged, but (whether from modesty or the temperature of $-50°$ F. we cannot say) on some occasions this part of the performance is dispensed with.

When a sick person gets so far gone that they deem recovery improbable, he is removed from the hut, and either dragged out upon the rocks to die, or a little snow shelter may be constructed for him, and some scraps of raw meat thrown in to him. Usually such proceedings are apt

to end fatally o the patient, even though his ailment might not have been so dangerous had proper care been taken. We know of one instance where a man was thus put out to die seven different times; but he recovered and crawled back to his igloo, and looks now as if he was good for a number of years yet. Stories are common of how aged and infirm people are put out of the way by the younger ones, to rid themselves of a useless burden; but of this we know nothing from personal observations, or from reliable sources.

Occasional instances of suicide happen, generally when the person is afflicted with some incurable disease. Hanging seems to be the favorite mode of killing themselves.

The *ancoot's* manner of operating is various, and almost every one has some method peculiar to himself. We could get but a glimpse of some of them, as they are averse to having a white man witness their performances, and we had the greatest difficulty in getting any one to explain to us their meaning. The following legend is supposed to give the directions for becoming an *ancoot;* it is interesting that this legend does not differ essentially from the Greenlander's. (*Vide* Grœnlands nye Perlustration, Eller Naturel-Historie, Hans Egede, 1741.)

We would here add that those who become *ancoots* are only such as are naturally possessed of a more penetrating mind than their fellows, generally the biggest rascals in the encampment, who seldom pay any attention to what is right or just, but ply their vocation so as to win for themselves renown among their fellows, and possess themselves of any coveted article as remuneration for their services.

The manner in which one may become an ancoot, or angekok.

Any one wishing to become an *ancoot* must go away a long distance from where there is any other person. Then he must find a large stone, and seat himself by it, and call on *Torngarsuk.** This spirit will then make himself present to him. The would-be *ancoot* will at first be very much frightened at the arrival and appearance of this spirit, so much so that he is seized with severe pains, and falls down and dies, and remains dead for three days. Then he comes to life again, and returns home a very wise man.

* *Torngarsuk* of the natives of South Greenland, and *Tornarsuk* of North Greenland, is the highest oracle, the master spirit of these people. There are many spirits of less power, called *Tornæt;* these can be seen only by the *angekoks*, after their meeting with *Torngarsuk*. It appears that this word signifies the greatest spirit of Good, as well as of Evil. They now call the Devil *Torngarsuk,* and in their ancient belief their God, so to speak, the same.

An *ancoot's* duty is, first, to mutter over the sick, that they may become well again; secondly, he will talk with *Torngarsuk*, and get information from him as to how he must manage so that they will have success in their undertakings; thirdly, of him he learns if any one is about to die, and what the cause is, or if some unusual death or misfortune is about to occur to the people.

Their devotion and belief in the *ancoots* are unlimited; they can never be induced to trespass on the commands or disbelieve the prophecies of these important personages. When one has been a very successful *ancoot* for a long time he may become a great *ancoot;* this necessitates a period of fasting, and then, as the story goes, an animal they call *amarook* (the same word is used for wolf, and for an animal which is probably mythical, unless it can be a *Gulo*) comes into his hut and bites the man, who immediately falls to pieces; his bones are then conveyed to the sea, where he lives for some time as a walrus; he finally returns among his people, a man in appearance, but a God in power.

If the prophecy of an *ancoot* does not come to pass as he had said it would, any phenomenon of nature, as a halo, corona, aurora, &c., is sufficient to have broken the spell, and the *ancoot* loses nothing of his reputation by the failure, for it is then believed that the measure, whatever it might have been, was not pleasing to *Torngarsuk*.

The people come to these soothsayers after all manner of information. We knew of one case where a young woman asked an *ancoot* if her yet unborn child would be a boy or girl. He retired outside the hut for a few moments, and when he returned he said it would "be a boy"; but he adds, "If it is not a boy, it will be a girl"! For this valuable information he charged three seal-skins and a knife. As a general thing, the *ancoots* are paid according to their reputation; still, it is very seldom they refuse to give them what they ask for in return for their valuable services.

They seem to have an idea of a future state, but what we denominate as the region down below they consider as the best place. In Egede's Grœnlands nye Perlustration, year 1741, is given a legend which is almost exactly the same as one that is found among the Cumberland Eskimo at the present day. But Egede says, in the Danish translation, "Himmel," heaven, as though this was the equivalent for the Greenlander's word; the Eskimo of Cumberland say "topani," which means simply "up." They do not distinguish any difference in the soul's condition after death, or rather of the two places where they expect to live

hereafter; one differs from the other only in this wise, that if death is caused by certain means they go to the one, and if they die a natural death they go to the other.

The following is their idea of the future: "In the spirit-land *all* will have it as good as or better than they had it on earth." Yet they designate two places where the soul goes after death, viz: "Some go up; others far down into the earth." But the lower place is considered preferable. This is described as a beautiful land, with everlasting sunshine, where the seal and reindeer abound in fabulous quantities, and food is consequently abundant. To this latter place go only such as are killed by other Eskimo, women who die in childbirth, such as drown in *salt* water, and *whalers;* they think, this being the better place, it is a sort of recompense for the suffering they underwent on earth; all the rest go up.

In this connection we will mention that the Cumberland Eskimo think the *aurora borealis* is the spirits of dead Eskimo dancing and having a good time generally. It has even considerable influence over them, and they are well pleased to see a bright *aurora*. The Greenlanders, on the other hand, say it is the spirits of dead Eskimo *fighting*.

We have been told by some that those who hunt in the kyack and get lost or driven upon the ice or some uninhabited island are supplied with food from these regions; that is, living game is thrown in their way for them to capture, so they will not starve. This is firmly believed by them.

Unlike the Greenlanders, the Cumberland Eskimo of the present day have no permanent habitations. They may live at the same locality for several winters in succession, but each year construct a new snow-house. The Greenlander has a permanent sod or stone hut, and lives in tents only while away hunting. The Cumberland natives live in snow-houses from the time the snow gets firm enough to be fit to build with till it melts, in June. They generally begin the construction of the snow-house, or igloo, in the latter part of October. A place is chosen which is sheltered from the north, under the lee of a rock, if possible, and where there is a considerable depth of snow. They begin by treading a circular space about sixteen feet in diameter; on this they keep piling snow and stamping it down as hard as possible till the whole mass is a raised platform as hard as ice. They then cut out a square block from the middle, about eighteen inches deep. After this block is removed they have a chance to cut others from around the sides, and this space is enlarged till it becomes of the desired dimensions. The sleeping platform is left as they finished treading it, no blocks being cut from this portion; it

also serves to stand on while constructing the wall, which is always done from the inside, the builder being furnished with fresh snow-blocks from the outside when his supply gives out. The wall is built in a spiral form, so that, if viewed from above, it would have the appearance of a conical coil.

The only tools used in building are a saw, if they can get it, for sawing out the blocks, and a long knife, made from a walrus tusk, for trimming them into shape. In cutting and fitting the blocks of snow, they show skill and ingenuity, so that they make as perfect an arch as the best mason. When the hut is done, or rather enclosed, there is neither door nor window, and the builder is a prisoner. A door, however, is soon made, but at the opposite end from where the entrance is to be; through this aperture the women and children begin dragging in the "furniture," while the men "chink" up the places where the blocks join each other. The structure is so strong that it readily bears a man's weight on the top. When everything is ready inside and out, the lamps are lit; sometimes more than the usual number are procured, and trimmed to burn as brightly as possible; the heat begins to melt the inner surface of the structure, but it soon freezes and forms quite a coating of ice; this, of course, adds considerably to the strength of the building. The inside is now lined with the seal-skin tent of their summer toopiks, fastened up all around the sides and top by means of small pegs of wood or bone. A window is cut through the wall over the entrance-way, facing the south; it consists of a half-moon-shaped bow of whalebone, over which are stretched the intestines of *Phoca barbata*, sewed together lengthwise. This window admits the light quite well.

The entrances are long, low structures, sometimes only two, often four or even five. They gradually diminish in size from the igloo, but each one has a door, which is so low and narrow that a large person is unable to get through them, even on hands and knees. The door to the hut proper is barricaded at night with a slab of ice or the scapula of a whale. Ice is also sometimes substituted instead of seals' intestines for the window. On either side of the entrance-ways, the dogs are allowed to lie, but never inside the dwelling apartment.

About one-half of the floor at the end opposite the entrance-way is from one to two feet higher than the rest. On this platform they keep all their skins, and it is used for a general lounging and sleeping place. On the top of the snow they lay a coating of *Cassiope tetragona*, or something of this sort, and neatly spread the skins over it. One can see at

almost any time an impish-looking head, covered with a thick mat of tangled black hair, plentifully powdered with reindeer-hair of various lengths and colors, protruding from among the pile of skins. The whole family crowd together on this platform, like so many pigs. The lamps are kept burning day and night, and the woman's place is directly in front of them on the sleeping-platform. Here they sit cross-legged and work. Back of the lamps and around them they pile up their meat. This accumulation of garbage is only cleaned out when it becomes necessary to make room for a fresh supply. This pile of putrifying flesh soon becomes extremely offensive both to sight and smell. Meat is sometimes brought in the huts that is already spoiled, even though the temperature may be 50 degrees below zero. This often happens with deer. We think the cause may be that the body of the animal immediately freezes on the outside and forms a coating of non-conducting ice, which prevents the escape of gas, which instead permeates the tissues. If the animal is disemboweled as soon as killed, it does not happen. Several carcasses, still warm, are often piled one upon the other, and the animal heat is probably sufficient to start decomposition before the mass freezes.

Around the lamps lie the bones they have picked the meat from, and such other parts as are discarded in time of plenty. This rubbish is not thrown out, but rooted among after a fresh supply, as it is needed.

Nearly every igloo has a little addition on one side, with an opening to it from the inside of the main hut. In this they keep their deer-skin clothes when not in use, and also an extra blubber supply. Over the lamp is hung a half-moon-shaped frame of whalebone, with seal-skin thongs drawn tightly across. On this they put their foot-gear to dry during the night.

When the snow begins to melt, and their igloos tumble, they have a sad time for a few days. The skin-tent, or toopik, must now be brought into requisition and do service alone. For the toopik they select a flat rock, from which the snow has melted, and by means of two sets of poles, those for the front end of the structure the shortest, and lashed together at the top, like an Indian wigwam, with a ridge-pole between them. Over this the skin cover is spread, and secured to the rock by means of stones laid on the lower edge. All the after portion of this tent is made from seal-skin, with the hair on, on the back generally a large male *Pagophilus grœnlandicus*. The forward part is made from what they term *mamma*, which is prepared from the skins of the netsick in the following manner: After the blubber has been removed in the usual

way (the skins of pregnant females and those suckling young are the best), they *split* the skins, or rather remove a membrane that lies between the blubber and the skin proper. The splitting is done with the woman's knife. The skin is laid upon a flat surface and the knife pushed away from the operator. When the *mamma* is removed from the skin it is treated in the same manner as the skins, stretched, and dried in the sun. It is tough and transparent, and, being very oily, does not easily get saturated with water.

When the toopik is about to be raised, the skin covering is first stretched out upon the rock, and the poles are pushed underneath, and then raised up, stretching the cover as tightly on the poles as possible. The toopik is carried with them when they go hunting in summer.

Such habitations are of variable dimensions, regulated by the number of occupants somewhat, but more by the industry of the hunter and the economy of his wife, for the skins need repairing very often; and, as a consequence, many of the more shiftless natives have extremely poor shelters, patched up with dog and bear skin and old cast-away pieces of canvas, which they have paid well for in serviceable seal-skins.

Their greatest concern is to procure the poles. At present many get broken oars, lance-poles, &c., from the whalers; but still, ingeniously lashed together, bone supports for the tent are yet found among them. The inside arrangement of the toopik does not differ essentially from that of the igloo, except it may be a little nastier as a rule and smell a trifle stronger. Sometimes whale-ribs are made use of instead of poles, and are very ingeniously lashed together. These were more in vogue formerly, before they could procure poles from the ships.

We think they were perhaps less nomadic in past times, as there are still extant sod foundations, which were no doubt used as permanent abodes.

At the present day, so many of the Cumberland Eskimo have procured some kind of firearms that their primitive modes of hunting and their hunting implements have, to a great measure, been modified, and even in some instances altogether lost. Bows and arrows are fast becoming an institution of the past; they do not now rely on them for killing reindeer as they did at one time. Bows and arrows are found around the settlements, broken and out of repair; the arrows, of different kinds, lying about unused, or doing service as some other tool. The children all have bows and arrows; but they seldom kill larger game than snowbirds and lemmings.

Of prime importance to the Eskimo is his *unang*, or spear. At the present day, the sealing spear is often made from an old whale-lance, having a wooden handle and an iron harpoon-head (*vide* sketches). The socket of the lance is put on the opposite end of the handle, and is used for a variety of purposes. This kind of spear is very useful to the Eskimo in catching the seals in their *atluks* through the ice. They are extremely expert in the use of this weapon, and possess such marvelous patience that they will stand by a seal's *atluk* all day awaiting the return of the animal.

This spear is carried on all occasions wherever they go and whatever kind of game they pursue. The opposite end of the spear from which the harpoon is fastened is also their principal tool in building fox-traps of ice, cutting down hummocks so as to get their sledges over the shore-ice, &c. Not the least important use of this instrument is to sound the ice with it. In traveling they very often come to places where the rapid running tide has worn the ice very thin, and by means of this spear they carefully feel their way along. They will even cross on a floe that is completely rotten by feeling around till they get upon a more solid spot and then advancing. They are very much averse to getting into the water, as none of them are able to swim.

The harpoon-head used with this spear is made of iron, and is about three and a half inches in length and one inch between the outside tips of the barbs. They manufacture them entirely by filing, and will sit and file for many days till they get the instrument in the desired form.

For whales and walrus they use a much different weapon, the same, we imagine, as they used before the whites came among them. It is a large, awkward, bulky-looking affair, with a shaft made from the horn of *Monodon monoceros*, or from parts of a whale's jawbone, ingeniously lashed together, when wood is not procurable. Some have the handle composed of as many as eight to a dozen pieces, beautifully and compactly lashed together, till the whole is as firm as though it were composed of a single piece.

Although such large spears were not rare among these natives, we found difficulty in getting them to part with them. A favorite harpoon-head is also hard to procure, though they may not have used it for years. Some considerable value seems to be attached to these old implements, especially if they have been successful with them in former times. We depend more upon the illustration here given of this spear than upon the choice of words. Their old harpoon-head for seals was probably

of the pattern here figured. This specimen is from a grave at Exeter Sound, and greatly resembles in pattern the iron seal harpoon-heads of the present day. Others were made like the walrus harpoon, but having *barbs*, instead of being iron-tipped. A very ingenious contrivance about these old spears is the perfect ball-and-socket joint which unites the *echeemung*, or bone portion (on which the harpoon is placed), with the shaft. The shaft, if made of wood, has a bone tip, which is cupped to receive the rounded end of the *echeemung;* they are kept in place by two thongs of seal-skin, which makes it sufficiently firm to use, but at the same time will allow the *echeemung* to double upon the shaft without breaking when an animal is struck.

As before mentioned, so few bows and arrows are now in use that it is almost impossible to procure a bow and set of arrows that *are* actually or *have been* in use. In the following illustration, no less than eight different patterns of arrows are represented. We have derived our information from various sources besides our own observations. We had instructed some of the most intelligent Eskimo to make for us wooden models of all the different kinds of arrows that they ever knew were in use. So far as we were able to procure or see the original, these models were faithfully and well executed, and leaves us no reason to think that they in any instance imposed upon us. Some of the arrows we have seen in the possession of sailors that had bartered for them for a mere song, but would not trade them to us, under the impression that they would bring fabulous sums in the States. They now probably adorn some third-rate gin-shop.

Of the arrows figured, No. 1 is made from reindeer antlers, with short wooden shaft, an old and very common form of arrow. No. 2 is perhaps still older. This is also made of reindeer horn. It is more common on the Greenland coast than among the Cumberland Eskimo. No. 3 is the only one of the kind I saw, and this I was unable to procure; the head was of flint, and the next piece of bone, with the wooden shaft lashed in two places, showing probably a scarcity of wood. No. 4 was a rare (?) form of arrow among the Cumberland Eskimo. The head was made of stone, with the forward portion of the shaft of bone and the rest of wood. No. 5 was iron-tipped, a favorite pattern when iron was scarce. No. 7 is now the style used by the children, and was probably the next pattern suggested after No. 5, as any pointed piece of iron can be utilized for this form of arrow. No. 6 has a lance-shaped and somewhat elongated iron head; such arrows were made only when they could get a considera-

ble iron supply. No. 8 is bone-tipped. I could not learn why the point should be so bent, but many had them so, and even preferred it. All their arrows were lashed with finely separated deer sinews. The feather-vanes were nearly always made from the primaries of *Strix scandiaca* or *Graculus carbo*. The arrows were all short; in fact, their length depended somewhat on the wood supply. We were unable to find but a single specimen of flint arrow-heads in the graves.

The bow is made from reindeer antlers; these are split, using only one of the halves in the construction of the bow. It is always made in three pieces, ingeniously lashed together. On the back of the bow are three or more strings, made like the bow-string; these are fastened at both ends of the bow, and also securely at the middle of the back. This of course gives additional strength to the affair, and is a convenient place to carry an extra string. The bows are very short, often not more than thirty inches. Not every Eskimo is able to manufacture his own bow; but each encampment has generally at least one skilled mechanic, who supplies the rest.

Bows and arrows were principally used in the capture of the reindeer, hare, and birds, seldom seals. These bows are surprisingly elastic, and the Eskimo are able to use them with wonderful dexterity. In shooting this weapon, the string is placed on the first joint of the first and second fingers of the right hand.

Another Eskimo implement fast going out of use is the *kakívak*, or salmon spear. A glance at the figure will give a better idea of this instrument than we can express in words. The two outside tines are each about seven inches in length, and are made of reindeer antlers. Near the tip and curving inward is a tooth-like prong about one and three-fourths inches in length. The points of these teeth come to the end of the middle tine, which is about six inches in length, perfectly straight, and made from walrus ivory. The three tines are securely lashed to a piece of the jaw-bone of the whale, of varying length, sometimes only a foot, but often two or three feet. When the bone shaft is too short to use, they generally have a short wooden handle lashed to it to make it the desired length. The two outside tines of this spear are very elastic, and spring out when a fish is struck, but close again when the body of the fish has passed beyond the tooth points which project inward. It is thus impossible for it to escape, the central tine having entered the body.

Another instrument, generally used in connection with the *kakívak*, is

the *ajâk-kaljûjak*, or ivory fish-bait. It is about four inches in length, and is made to look as much like a fish as possible. A line is passed through the middle of the back, and is fastened on the belly; here is a small ivory hook that reaches from an inch to two inches below the fish. The principal use of the *ajakkaljujak* is not, however, to *hook* fish, but to lure them within reach of the spear. The Eskimo takes his ivory fish and bobs it up and down in the water, generally in a tide crack or a hole in the ice on purpose, and watches till he spies a fish making for it. He then gently begins to haul in on his line, if the fish follows the lure, till it is within reach of his spear; sometimes a greedy fish will swallow the bait and get caught with this primitive gear. At the present day they seldom use this implement. Iron fish-hooks are supplied them from the ships; but they are poor fishermen compared with the Greenlanders.

One little implement of comparatively insignificant importance seems not to have been superseded by any modern substitute as yet. It is the *kadjuk*, a small piece of ivory of different shapes, used to insert in the lips of the seals while dragging them over the ice. We have given illustrations of the principal patterns we found in use. No. 8 is the same as No. 7 when seen from the top. This is a very ingenious piece of work. The main body of the piece is hollow, and the portion No. 11 has a head which prevents it pulling through, but at the same time turns freely, and prevents the line from twisting when the seal turns over. It is so well made that the inside piece cannot be got through any of the openings. No. 3. is No. 2 seen from the top. No. 10 is sometimes used as a part of the clasp on the sealing line. Nos. 1, 4, and 9 are the commonest patterns. No sealer's line is without one or more of these implements of some pattern or other; they are all made from walrus ivory.

Of prime importance to the Eskimo hunter is his hook for catching the young seal. Here again their old pattern has been modified by their contact with the whites. A glance at the accompanying figures will sufficiently explain the shape of these implements. The upper figure represents the ancient pattern; it was found in a grave in the Greater Kingwah Fjord, but so much decayed as to fall to pieces when handled; the hook part was made from a portion of a reindeer's antler, with a small barb cut near the point. Its resemblance to the iron hook of the present day is very apparent.

The sealing hook of the present day is made generally from a discarded whale lance; the handle is a light wooden shaft about five feet in length.

This instrument is used only to catch the young of *Pagomys fœtidus*, while they are still in the white coats; they are caught either while lying beside the *atluk* on the ice or while still in the snow-burrow. When an Eskimo sees a young seal on the ice, he begins to make his way cautiously toward it, stopping frequently, and giving the animal ample opportunity to satisfy its curiosity. The seal will work its head and fore part of the body in a jerky, awkward manner, and keep edging nearer and nearer to its *atluk;* the Eskimo watches every movement of the seal, and knows just the proper moment to advance a step or two and then stop. This manœuvre is kept up till he gets near enough to reach the seal with his hook. He then makes a quick jump, at the same time striking the hook into the animal. Sealing among the Cumberland Eskimo is sufficiently described under our notes on *Pagomys fœtidus*, in the report of the mammals, for us to leave it out of this paper.

When a seal-skin is about to be prepared for drying, the blubber is first removed somewhat roughly; the skin is then laid on a board, and with the woman's knife the membrane underneath the blubber is separated from the skin. The knife must be very sharp to do this successfully. The operators always push the knife from them; it takes considerable experience in order to do the job well. When all the blubber is removed, which will take three or four hours of faithful work, the skin is taken outside, and by means of the feet is rolled and rubbed around in the snow for some time, and by this process they succeed in removing every trace of grease from the hair. When thoroughly washed, the skin is put upon the stretchers, if it be winter, to dry; these stretchers are merely four poles, which are lashed together at the corners like a quilt-frame, the proper distance apart to suit the size of the skin. The skin is secured in place by seal-skin thongs passed through little slits along its edges and made fast to the poles. When the skin is properly stretched upon the frame, it is put above the lamps inside the snow-hut to dry. As the sun gets higher and begins to have some effect, the skins are stretched, flesh side up, on the southern slopes of snow-banks, and are secured by means of wooden or bone pegs about a foot in length. As the season advances and the snow melts they begin to stretch the skins upon the ground by means of the before-mentioned pegs. The skins are not allowed to rest upon the ground, but are raised a few inches to allow the air to circulate underneath. Skins dry very fast when exposed in this manner.

The first days of spring are always a busy time with the Eskimo

women. One thing is, they get more freshly killed skins to prepare, and then they generally have a surplus stock of the winter's catch which they could not take care of by the slow process of drying over the lamps in the huts during winter. The skins of the young in the white coats are dried in some considerable quantities, as it takes about fifteen to make a *single* suit of clothes, and many have *double* suits made from this material. They have no idea of any tan, and prepare the skins merely by rubbing them with their skin-scrapers.

We insert a sketch of a very old skin-scraper, such as are now found only in the old graves. It is made of stone, with a wooden handle, which is fastened to the stone by means of a strip of whalebone. Another and later pattern is made from the scapula of a reindeer. A better idea of its make can be got from the sketch than by a description. Such scrapers are still in use, but serve as a sort of auxiliary to a scraper made from a tin can, resembling a little scoop in shape, and having a wooden handle. This is the style of scraper made at the present day, and is by far the most effective instrument of the three. The manner of using these scrapers is to take the skin firmly in the left hand and putting the knee or foot upon the lower part of it holding it securely, while the scraper is worked with the right hand, pushing downward with some force. If the skins are very dry, when they begin they are somewhat softened by rubbing with the hands, or even chewing the most stubborn parts. They continue using these tools upon a hide till it gains the desired pliability. All the work of stretching, drying, cleaning, washing, and softening the skins falls upon the women.

The skins of *Phoca barbata* are stretched on a frame like those of the netsick, but not till the hair has been removed. The cutting of the hair is one of the nastiest and most disgusting sights one can imagine. It generally falls to the lot of some old woman to do this. The skins are allowed to lie and become somewhat putrid, a portion of the blubber remaining on. The only tool used is the woman's knife before mentioned. When about to clean one of these skins, the squaw takes off her boots, stockings, and pantaloons, and, tucking her feet under her body, lays this dirty, bloody, greasy, stinking skin on her bare thigh, the flesh side down. She then *pushes* the knife *against* the hair, cutting, or rather shaving it off. As her hand becomes too oily to hold on to the skin, she puts her fingers into her mouth, and thus cleans them. When properly cleaned, it is dried in the manner already spoken of, except that the back and belly of the animal are dried separately, as the skin is different on those por-

tions of the body, and would dry unevenly. When dry, it is almost as stiff and hard as a board. This skin is used mainly for the soles of boots; the pattern is cut from the hide, and then *chewed* till it becomes sufficiently softened to sew. This last operation is also mainly performed by the old squaws. When they are too old to sew, they become *oojook* chewers as the last resort, and when their teeth fail them they are better off in the grave.

Seal-skins are also manufactured into drinking cups; such cups generally have a depth and diameter of about three inches. A short, straight piece of bone, mostly the humerus of a gull or duck, is sewed into the upper rim on one side, projecting outside about two inches and a half; this serves for a handle. The hair side of the skin is used for the inside of the vessel. Larger vessels, somewhat resembling a small sack, were used to carry water in at their encampments; but when out traveling, they mostly carry their water supply in a seal's stomach, prepared for the purpose.

We would naturally expect these people to be very expert in making various devices for capturing their game in traps or snares. This does not seem to be the case, however. They make a fox-trap, which is nothing more than a little round hut of ice, with a hole in one side just large enough for the fox to crawl into. Inside the hut is a large slab of ice, which rests horizontally upon a small upright piece of ice; the end of the upright rests on the bait, and when the fox pulls at the meat he draws the upright down, and the ice slab falls upon him and he is a sure prisoner.

Another manner of catching foxes is to make an ice house much larger, so high that a man can readily stand up in it. A small funnel-shaped hole, just large enough to admit the fox, is made at the top of the structure, and the bait is hung inside just out of his reach. The fox will work a long time trying to secure it, and finally crawl in and jump down upon the floor of the hut, but then he is unable to get out again.

A sort of snare is sometimes made for hares. It is nothing more than a seal-skin line, with a number of slip-nooses upon it; this is laid across the runs of the animals, or upon their feeding-grounds. They are often caught in this manner; but the foxes are generally the only ones benefited by the capture; all that the Eskimo finds is a little hair and a few bones the next morning.

Birds are sometimes snared in about the same manner, except that

they use finely braided deer sinews for the snares, instead of seal-skin. They take a good many eiders on their nests in this manner.

When traveling over the frozen wastes in winter they use snow-shoes. These are half-moon-shaped, of whalebone, with seal-skin thongs tightly drawn across. They are about sixteen inches long. Another pattern is merely a frame of wood, about the same length, and eight or ten inches wide, with seal-skin thongs for the foot to rest on. As their dogs' feet often get very sore while traveling on crusty snow, they make them little moccasins of seal-skin to protect the feet.

Nearly all the Eskimo become snow-blind in spring, though they use eye-blinkers of wood. These are only a piece of wood fitting closely over the eyes, and having a horizontal slit about one-sixteenth of an inch wide; it affords a good deal of protection to the eyes, but they are generally not put on till the condition of their eyes forbids them going without. Some eye-blinkers of bone were found in a grave; they were apparently very old, and of a different pattern, but so much decayed as not to admit of handling.

All the Cumberland Eskimo of the present day have sledges of wood. This has either been bartered from the whalemen or secured from the wrecks of ships. There are, nevertheless, some remains occasionally found of sledges that were composed entirely of bone, whales' jaw-bone apparently. They were made in many pieces, and ingeniously lashed together. All their sledges of the present day are shod with bone, and when about to undertake a journey they pour warmed blood upon the under surface of the bone shoeing; some use water, but this does not last nearly so long as blood, and is more apt to chip off. This coating makes a very smooth surface, and also protects the runners. All their sledges have a sort of upright on the back end. This is nothing more than a deer's head, with the antlers attached, the antlers being lashed on the top edge of either runner. This serves for a variety of purposes, and is very handy indeed.

The kyack of the Cumberland Inuit does not seem to have undergone any change in pattern since the whites came among them. Still, these craft are extremely rude and bulky, compared with the Greenlanders' kyack; neither do they compare with the Greenlanders in expertness in its use. These kyacks are mostly so large that they would readily carry two persons, and quite heavy. They do not carry so much gear upon their kyacks as the Greenlanders; the seal spear, walrus spear, and bird spear, with their respective lines, are about all, unless they are after some

special kind of game, as, for instance, bears; then they carry a bear lance, which, however, does not materially differ from the whale lance. The *omiak*, or woman's skin boat, is now rare among them, as they are able to procure whale-boats from ships, and one boat will accommodate several families. Some of these boats still exist in the vicinity of Nugumeute and farther south. It required about fifteen skins of *Phoca barbata* to construct one, and several years' accumulation of drift-wood.

It seems very probable that before the advent of whalemen they practiced a great many rites and ceremonies, many of which are now obsolete, or exist only in tradition. Sometimes one of these old customs will be repeated, but, as a general thing, not in the presence of a white man, if they can help it.

One of these customs, which possesses a good deal of interest, is their manner of greeting a stranger. When a stranger arrives at an encampment, and is personally unknown to all or the major portion of the inhabitants of the village, he receives an introduction after the following manner: The villagers (the men) form themselves into a single rank, all of them, with the exception of the stranger and the head *ancoot* of the village, having hare-skin mittens on; they then begin a monotonous singing chant, keeping time with their arms, swinging them in front, raising the hand as high as the shoulder, with arm slightly bent, and then describing a half circle by lowering the hands as far as the abdomen. Finally, the *ancoot* and the stranger step out from the ranks and face one another. Both have mittens of seal-skin. The stranger complacently folds his arms over his breast, and inclines his head to one side, so as to fully expose his cheek, while the *ancoot* deals him a terrible blow on it, sometimes felling him to the ground. The two actors now change parts, and it becomes the stranger's turn to strike, which he does with a vengeance; the two then kiss each other, and the ceremony is over. The stranger is now duly initiated to share in any and all their customs, and due hospitality is shown him by all. Among his privileges he can also choose for himself a wife during his sojourn.

Another custom, which was once very popular, is the following: An *ancoot* dresses himself up in the most hideous manner, having several pairs of pants on, among the rest, and a horrid-looking mask of skins. The men and women now range themselves in separate and opposite ranks, and the *ancoot* takes his place between them. He then picks out a man and conducts him to a woman in the opposite ranks. This couple then go to the woman's hut and have a grand spree for a day

or two. This manner of proceeding is kept up till all the women but one are disposed of. This one is always the *ancoot's* choice, and her he reserves for himself. The people thus assembled are, of course, all well known to him, and he understands pretty well how to mate them so as to meet general approbation.

When the women have their monthly courses, they will not work, nor visit the ship, or even each others' huts.

The dead are generally covered with a little pile of stones, so arched over as to form a sort of tomb. It is also quite common at the present time to leave the dead fully exposed upon the rocks. All the Eskimo have a great horror of handling a corpse, so that when a person is very sick he is *carried out to die*, and where he lays the stone pile is erected around him. The hunting implements and many of the valuables of the deceased are put by him; such things as he will need for a long time *inside*, and the rest *outside* of the grave. We have found in one grave the skeletons of two dogs, remains of a sledge, whip, &c., and the partial skeleton of a *Pagomys fœtidus*. The right femur of the Eskimo skeleton in the grave was deformed, and had the appearance of having been broken and allowed to grow together without setting. He was probably lame during life, and the dogs and sledge had been given him in order to facilitate his traveling to the happy hunting-grounds. In another grave we discovered portions of a kyack. That decayed bow and arrows, spears, and all their hunting implements, were at one time plenty in graves, is very apparent; but of late years they have so amended this usage that it is no longer necessary for the articles to remain very long, so they are taken out and used by the relatives. In very recent graves we found tin cups and pots, knives, and even one fork and spoon, *comb*, pieces of cloth, needles, thread, thimble, and in one a *photograph* and a *Harpers' Weekly newspaper*, tub for meat, &c.; in fact, all the equipments and treasures of the deceased. The more valuable of these articles were outside, and would undoubtedly soon have been appropriated by the relatives. This is the reason that so little is found in graves at the present day. In the old graves the wood and bone implements seem to decay very fast, and can seldom be handled without falling to pieces. All the graves contain entire or partial skeletons of some animal or bird, mostly the netsick seal. This was put in for food, undoubtedly. Very few graves contain the perfect skeleton of the inmate. The dogs, wolves, and foxes despoil the graves, and scatter the bones in every direction. It is seldom that these tombs are so well constructed that the dogs cannot tear them down.

As a rule, they are not kind to the aged or feeble. We know of one instance where an old cripple, who had no one who would recognize his authority, was obliged to go sealing for himself. He had but one dog, and no sled; so, taking a seal-skin and allowing the dog to drag it, he was conveyed to the sealing-ground on this novel conveyance. There were every day large sleds leaving the encampment, but no one offered to help the old man, as there was no prospect of his being able to reciprocate the favor.

Among their many superstitious notions, the wearing of charms about the person is one of the most curious. These are called *amgoouk*, or *amusit*, and may be nothing but pieces of bone or wood, birds' bills or claws, or an animal's teeth or skin. To these charms they attribute supernatural powers, and believe them to be able to keep the wearer from sickness or misfortune. It is a common custom for the wife to throw a piece of seal's blubber on her husband's kyack when he is about to go hunting; this will give him success. Little strips of deer-skin are hung about the person in different places to insure success in some undertaking or to ward off some misfortune, real or imaginary. We discovered one of these charms, which seemed to possess unusual interest. It was worn by a little girl about eight years old. She had a small envelope of seal-skin that was worn on the back of her inside jacket. We succeeded in bribing her grandmother to show us the contents of the envelope, which proved to be two small stones, the one a bluish flint, the other *apparently* meteoric iron. The tradition connected with these stones, the grandmother said, is that a very long time ago an Eskimo, from whom she was a lineal descendant, had discovered the iron, and had picked up a stone to break a piece off and take home with him; but when he struck the iron fire flew from it, and he soon learned how to make use of this accidental discovery, and became a great man among the people. At this point we lost the thread of the old woman's narrative, and all we could further learn was that these two small pieces had been preserved in the family for successive generations, and were inherited by her from her mother, and that she had now given them to her grandchild, the child's mother being dead. The child will in turn give it to her children. She thought this charm of inestimable value, and could not be induced to part with it, for, she said, "No one has yet died while wearing this charm."

Another charm of great value to the mother who has a young babe is the canine tooth of the polar bear. This is used as a kind of clasp to

a seal-skin string, which passes around the body and keeps the breasts up. Her milk supply cannot fail while she wears this.

Many of the *ancoots* by long practice become quite competent jugglers, and often take advantage to show off their powers to the edification of their friends. A common trick with a full-fledged *ancoot* is to come suddenly into a hut with a harpoon toggled on his breast, and the handle sticking in his back, the wound bleeding profusely. Such demonstrations make a lasting impression upon the minds of those who witness it, and it becomes no less marvelous when they see that he survives, without even a mark after the wound.

A very interesting legend is one which they tell as to the origin of man, as regards creation, and the beginning of all things. They say it came so of itself. Of the creation of man they say: In the beginning there grew up from the earth a man; he got a wife from one of his *thumbs* (!), and from this pair the race has originated. But the whites, whom they call *cablunet*, or *codlunak*, they have sprung from *dogs*. An Eskimo woman at one time gave birth to human beings and dogs. These latter she put in an old boot, and threw them out into the sea, saying, "Go hence, and become white people." From this they say whites live on the sea, and their ships are like the Inuits' boots, round at both

MAMMALS.

FRAGMENTARY NOTES ON THE MAMMALIA OF CUMBERLAND SOUND.

By Ludwig Kumlien.

The following list contains little else than fragmentary notes on such species as I procured, or with certainty identified, during my short sojourn in the northern waters of Cumberland Sound (the Hogarth Sound of Penny), at about lat. 67° N.

The region about our winter harbor was marvelously barren, and very few mammals are found there. Its location is such that many of the species that frequent the southern waters are seldom found about Annanactook, as it is so far "inland." It is a rarity for a bear to stray up the sound any distance, and some of the seals and most of the cetaceans are only of irregular occurrence.

Near the southern entrance of the sound, however, the harp seal, polar bear, walrus, and many of the cetaceans, are regular visitors. I have not the least doubt that many cetaceans are found in these waters that I did not see. Should I place confidence in the information of whalemen regarding whales, I could easily make out many species, and some very marvelous ones; but my experience has been that whalemen generally are not to be relied upon in this matter, as they confound species to such a degree that one can never unravel the snarl, and their own peculiar nomenclature makes matters worse instead of better.

My stay was also much too short for anything like a satisfactory investigation of certain interesting problems. I was even obliged to leave some valuable skeletons, and could have procured many more had there been any place to stow them away on shipboard.

There seems to be a prevalent belief among the Eskimo, as well as the whalemen, that the mammals have disappeared from this section of country at a wonderful rate within the last few years. I found the remains of *Trichechus rosmarus*, *Cistophora cristata*, and *Ursus maritimus* in the ancient kitchenmiddens in Kingwah Fjord, in localities where these animals occur at the present day only as rare stragglers. It is hardly probable that such large animals could have been brought any distance,

so they must at a comparatively recent date have been found in the immediate vicinity. I could find no trace of the musk-ox, or any Eskimo that had seen one; but almost any of them could describe the animal very intelligently, and would tell you they are found far to the north. The Eskimo name for this animal, "omingmuk," is by no means a rare *name* among them, and it is possible that they were once found on Cumberland Island, but are now extinct, as other species are in a fair way of becoming.

The vicinity of the Kikkerton Islands offers many advantages to a naturalist; it is now a permanent whaling station, and a person could at any time secure the valuable assistance of natives, besides having ample conveniences for drying, stowing, &c. It would be comparatively easy to secure a good skeleton of an adult right whale at this place if a person went about it in the proper manner. Almost any of the smaller cetaceans, and all the seals, adult, young, and fœtal, could be secured at a very trifling outlay of presents to the Eskimo.

1. Ursus maritimus, Linné.

"Nannok," Cumberland Eskimo.

It is a rare occurrence to find a bear any distance up Cumberland Sound; they are common about Cape Mercy, Shaumeer, and Nugumeute, but seldom stray above Niantilic, or the Kikkerton Islands. Below Niantilic, on the southern side of Bear Sound, in the vicinity of what the Eskimo call Okaglik and Kokaluyah, they are quite plenty. Many are captured here every year, especially in spring, by the Eskimo, who fearlessly attack them in their frail kyacks, but are afraid of them on the ice or land. From Nugumeute to Hudson's Straits they appear to be even more plenty, and westward, in the northern waters of Hudson's Bay, whalemen often procure twenty or more skins in a season.

In October, 1877, an enormous female with two cubs paid the Eskimo encampment, at the Kikkerton Islands, a visit. They swam over the Salmon Fjord, probably scenting a dead whale that was on the beach near the huts. The bears made a lively time among the huts, and a considerable outlay of ammunition and dogs was made before they were finally captured. There were about two hundred dogs and half as many natives, besides the crews of two whalers; all this motley crowd made war on the bears; one of the whaling captains, a little braver than the rest, got too close to the old bear, and she dealt him a blow which knocked his gun many feet into a snow-bank; she then began to make way with him, but was prevented by the Eskimo and dogs. A young Eskimo was

served in a similar manner, but sustained quite serious injuries. Great consternation and fear prevailed among the women and children, and that memorable night, when the *nannokes* besieged their quiet camp, was long a lively topic of conversation.

When the Florence took the pack-ice off Cape Mercy, a huge male was suddenly espied alongside, but he did his best to get away as fast as possible; a boat was lowered and his capture was as devoid of excitement as the killing of a sheep in a barn-yard. We had at this time sixteen Eskimo and thirty dogs on deck, and the greater portion of the meat was utilized as food by one or the other without any symptoms of poisoning. During the season that *Pagomys fœtidus* have their young, the bears begin to wander up the fjords in search of them, and are at this time often found a considerable distance from the open water.

In and about the old stone-hut foundations in the neighborhood of Annanactook I found the remains of bears. There is a story among the Eskimo that the bear, walrus, and hooded seal were once plenty there, but for some cause do not now frequent the locality. A very young cub skin was secured in April by a Shaumeer Eskimo. The vicinity of Cape Mercy is one of the most frequented localities for bears; here they come down on the pack-ice with the current from the north. Eskimo from the region northward in Cumberland are in the habit of coming here to hunt them.

2. Vulpes lagopus, Linné.

"Touyunaik," Cumberland Eskimo.

The Arctic fox is quite common on both sides of Cumberland in all suitable localities. During the winter they often fare badly, and become quite impudent when pressed by hunger, even coming upon the schooners' decks at night. They were a source of annoyance as well as amusement to us around our observatory. We were not the fortunate possessors of enough glass to let the light in through the wall of snow that surrounded our tent, so we had recourse to oiled sheeting stretched over the aperture, borrowing the idea from the Eskimo window of seal intestine. But as we had no dogs about our snow-house, the foxes became so bold during the long cold nights of winter that they often came and sat around the stovepipe that projected through the roof of the hut. Our cloth windows had to be repaired very often, as they would tear them down and eat them for the oil the cloth contained. It was almost impossible to catch them with a steel trap. I tied the bait underneath the tongue, and carefully placed the trap in a little excavation in the

snow, and covered the whole with snow; but they dug beneath the trap, and secured the bait from below, often even without springing the trap. With an ice trap made after the Eskimo pattern I was more successful.

As soon as the seals begin pupping, the foxes fare better; this season is in fact the grand banqueting time for these animals, after the long sufferings and privations of winter. At this season (March, April, and May), they destroy a great many young seals. I have often found the remains of the seals so well *skinned* and cleaned that it seems impossible it could have been done by an animal. They begin by biting the skin around the mouth, and drawing the entire animal through the aperture, and turning the skin inside out; even the flippers are drawn through to the nails, and every vestige of the meat removed. Nor is the skin bitten in the least, although it is finely cleaned of all the fat. But the most remarkable part of all is, that the skeleton remains intact and finely cleaned. When the Eskimo find such skins, they always make use of them, as they are quite as well skinned as if they had done it themselves. The white variety appears to be much more abundant than the blue. According to the Eskimo, the two varieties interbreed, and the young are sometimes dark and both parents white, and *vice versa*. During the winter months they congregate in considerable numbers about any carcass, especially a whale, and get themselves thoroughly begrimed with grease.

It often happens that some venturesome fellow succeeds in getting upon the ducks' island, in breeding time, by means of the ice, and is left there; but when the birds leave he gets enough shell-fish, &c., at low-water to live on till the ice makes. If they are a short distance from the mainland or from other islands, they do not hesitate to take to the water.

3. Canis familiaris, Linné, var. **borealis.**

"Kidmik," or "Mikkie," Cumberland Eskimo.

As might be expected, the dogs of the Cumberland Eskimo are afflicted with the much dreaded rabies. I paid considerable attention to the subject, in hopes of being able to throw some light on the cause of this disease, but, like many others before me, with little success. In the first place, so far as the dogs about our winter harbor were concerned at least, there are other causes besides the so-called hydrophobia that lessens their ranks, though when a dog dies this is always the cause assigned. Some of the best dogs that died at Annanactook during the winter of 1877–78 died from injuries inflicted on the head by a club in the hands

of their masters. After these dogs were disabled they wandered about the settlement staggering and howling, and were to all appearance *bona fide* victims of hydrophobia; but on dissection it was only too plain what the matter was. Many of the dogs are so overworked and so illy treated that they could not survive the repeated injuries inflicted upon them if they were as strong again.

The Eskimo have the habit of putting a slut in heat on ahead as leader, as by this method they considerably accelerate the movements of the rest of the team, and save themselves some extra labor; but these dogs often prove themselves too eager, and rupture blood-vessels. I have seen such cases where the dog vomited clear blood, and also discharged it copiously through the anus; such cases survive but a few days generally. Again, many young dogs are taken from the mother long before they are prepared by nature to shift for themselves. I have positive evidence of this being a prolific cause of so many *young* dogs dying. Of all the dogs that died at Annanactook, at least four-fifths of the adults were males, and the greater number of these died about the time the females were in heat.

I was very much interested to see if the theory that hydrophobia is prevalent only in countries where the females are subjected to indiscriminate slaughter, or animal instinct thwarted or perverted under the ban of an ignorant and false modesty, would work here, instances being cited of Turkey and other countries, where the dog is held sacred and allowed to run at large, that hydrophobia is unknown. According to the theory, then, that its origin is always the result of unrequited affection, we should *not* find this disease among the Eskimo dogs, where it may reasonably be expected that nature has allowed the proper proportion of the sexes and man does not interfere; but here is the point: Has the Eskimo dog unrestrained freedom to follow the instincts of his animal nature? We answer, By no means. To be sure, there are plenty of females, but they are appropriated by such dogs as possess the greatest strength; the females go to them, and the weaker dogs are given the cold shoulder. As a general thing, the possession of a slut is a disputed point, which ends in a hard fight between the dogs; but there is no further question after the battle, and the vanquished dog has to bear a double disappointment; this he seems unable to do, and worries himself into a melancholy that soon takes the form of the so-called hydrophobia.

I carefully watched a team of three dogs that I often went sealing with; one was a female and two were males; the slut seemed to be ap-

propriated by one of the dogs without question, till one day a strange dog from another settlement was added to the team. The possession of the slut now became the cause of a series of severe fights, which ended in favor of the strange dog, which immediately became the guardian of the slut. The beaten dog began to lag and droop, and in a *few days was dead*, having gone through all the stages of hydrophobia to all appearance.

This was not the only instance of a similar nature that came under my observation; still I do not wish to be understood that I place unshaken faith in this theory. I had too short a time for observation, and too few examples to warrant me in making generalizations on these data; but I think it well worth the time for any one who does get the opportunity not to overlook these facts. I dissected a number of the male dogs that died from the rabies, but I never could detect any of the organs diseased except the penis, testicles, and sometimes the kidneys. Why this should be the case I am at a loss to say. There is one other theory that may throw some light on the subject, viz, the constant interbreeding of the dogs. I have known of instances where a dog had possession of the mother and her yearling whelps, all, mother included, of which he was father to. It is certain that the progeny resulting from such connections are very inferior, and tend toward degenerating the race. It often happens that female dogs cohabit with wolves, the dog being driven off by the superior strength of the wolf. This progeny again is characterized by superior strength and great powers of endurance, and is less apt to suffer from disease.

It sometimes happens, the Eskimo tell me, that a family goes into the interior and remains for a year or more, but seldom loses any dogs by disease; they have an idea that the salt-water has something to do with their dogs dying, for they say they do not die when they live away from it. It does not seem probable, however, that the disease would prove contagious, assigning either of the above causes for its origin.

Again, is it positively known that the disorder *is not* communicable by bite? I am by no means sure of this. The Eskimo always carefully get out of the way of dogs afflicted in this manner, and they told me that if one of the sick dogs bit me I would get the same disorder. This information may have been imparted to them by whalemen, however.

4. **Canis occidentalis**, var. **griseo-alba**, Bd.

"Amarook" (?), Cumberland Eskimo.

Wolves are frequently seen during the winter months on both shores of Cumberland; their principal resorts, however, are further inland,

where the reindeer herds abound. It often happens that the Eskimo dogs and wolves interbreed; the female dog is especially liable to cohabit with a wolf, and the progeny are considered much superior beasts, but are very hard to manage. I have seen Eskimo dogs that corresponded hair for hair with the Arctic wolf.

The Eskimo say there are packs of dogs now in some localities that have run wild, and in all probability returned to the original wolf type. There are stories of some kind of animal, that from the description given by some may be a *Gulo*, but others say it is only the common dog; such animals are always reported from the interior.

It is said that the female wolf is considerably fleeter than the male, being longer-bodied. The females, the Eskimo say, always distance the males in the chase after the reindeer, and generally succeed in killing the deer before the male comes up.

5. Mustela erminea, Linné.

Two specimens, procured in the Kingnite Fjord, one in the summer and one in the winter fur. Appears to follow the lemming in their migrations; is nowhere abundant in Cumberland, and even unknown to some of the Eskimo. Said to be able to capture the hare and ptarmigan by attaching itself to some vital part and not loosening its hold till the victim is dead. I am rather skeptical on this, however. Still, the Eskimo say they have seen them do it, and it really puzzles me to tell what else they should live upon during winter, as they do not hibernate.

6. Myodes torquatus, (Pall.) Keys. & Blas.

"Awingak," Cumberland Eskimo.

I procured but a single specimen of the lemming; this was caught near Cape Mercy. They may yet be common somewhere along the sound, as I saw traces in different places where we stopped. According to the Eskimo, they are getting less common every year. Whalemen have told me that twenty years ago some ships procured as many as four hundred skins at Niantilic, in the spring, from the young Eskimo, who killed them with bows and arrows. From what I could learn of the Eskimo, the lemming is very irregular in its migrations, appearing in great numbers at one place, and then disappearing for many years.

7. Lepus glacialis, Leach.

"Okoodlook," Cumberland Eskimo.

Common in all suitable localities. Many do not undergo any change of color during summer, and I doubt if it be more than partial change

with any. I have seen pure white specimens during all the summer months, and occasionally one about half-gray. The Eskimo firmly believe that the lungs of the hare applied fresh to a boil or sore of any kind is a sure cure. The specimens I examined in Cumberland were much smaller than Greenland specimens.

8. **Rangifer tarandus**, (Linné) Bd.

"Tuktoo," Cumberland Eskimo.

The reindeer are found in considerable numbers on both sides of Cumberland Sound, but by far the greater number on the western shore. It is no rare instance to find them during the summer months on the sea-coast; they seem to delight in feeding upon the *fuci* exposed at low tide. In winter they retire to the larger valleys and go farther inland, being seldom seen on the coast at this season of the year.

The Eskimo go reindeer-hunting every summer, commonly during the months of July, August, and September. At this season they make quite extensive excursions inland, where the deer are more abundant and much more easily procured. Within the last few years they are reported as less common on the Penny Peninsula; but I hear of no apparent diminution in their numbers to the west and southwest, especially toward Lake Kennedy, where they are reported as very abundant.

Before the introduction of firearms among the Eskimo by the whalemen, they took advantage of the habits of the deer in coming down to the coast, and drove them into the water, where they were easily captured with a kyack. The Eskimo bring the skins back with them to their winter encampment, having cached the meat for the ostensible purpose of returning for it in winter. This seldom happens, however, and the wolves generally make way with it. It is said that when a herd is first approached by a hunting party that has been living on the sea-coast, they scent them a long way off, but that they soon lose this power; the fact being, I take it, that the peculiar odor of the salt-water has left the Eskimo. During the winter they herd together in large droves, and when a suitable valley is found paw up the snow for a considerable extent, till it looks as if a herd of swine had been rooting in the snow. These droves are continually beset by packs of wolves, which keep a vigilant watch for any that unluckily stray out of the herd, for such a one is immediately attacked and run down. It is seldom, however, that the wolves can do much damage to the herd when they keep together, as they form a circle, with the weaker ones in the centre, and can thus keep the wolves at bay.

9. Callocephalus vitulinus, (Linné) F. Cuv.

"Kassigiak," Cumberland Eskimo.

The so-called "fresh-water seal" of the whalemen is one of the rarer species in the Cumberland waters. They are mostly met with far up the fjords and in the fresh-water streams and ponds, where they go after salmon. They are rather difficult to capture, as at the season they are commonly met with there is so little blubber on them that they sink when shot. The skins are highly prized by the Eskimo women for their jackets, and if they do not have enough for the entire garment will use what they have, always putting it within the most convenient sight of the wearer. It is said by the Eskimo that the young remain in the white coat but three or four days, differing greatly in this respect from *Pagomys fœtidus*. Neither do they make an excavation underneath the snow for the reception of the young, like the above-mentioned species, but pup later in the season, on the bare ice, fully exposed. The adult males often engage in severe combats with each other. I have seen skins so scratched up that they were nearly worthless; in fact, the Eskimo consider a "kassiarsoak" (a very large kassigiak) as having an almost worthless skin, and seldom use it except for their skin tents. The skins of the young, on the contrary, are a great acquisition. It is said, possibly with a shade of exaggeration, that the affections of the Eskimo damsel can be secured by a present of kassigiak skins, when all ordinary means of persuasion have failed to move her.

10. Pagomys fœtidus, (Fab.) Gray.

"Netsick," adults generally; "Tigak," adult males; "Netsiavik," young after shedding and till one year old; "Ibeen," young in white coats, of the Cumberland Eskimo. "Pickaninny pussy," young, pigeon-English of the whalers.

This seal is very common in all the fjords and bays from Hudson's Straits northward along Cumberland Island to the extreme head of Cumberland Sound, on all the outer islands about Cape Mercy, and on the west coast of Davis Straits. I have seen skins from Lake Kennedy that I could not distinguish from those found in Cumberland Sound. This seal was never noticed but a few miles from land; was not met with in the pack-ice, nor on the Greenland coast except far up the fjords. This was in July and August; but I am informed that they become more common toward autumn, and are found in considerable numbers some distance from land; they are less common here, however, than on the west coast.

It was a source of great curiosity to the Greenlanders to see the

clothing of the Cumberland Eskimo made from the skins of the young seal; they at first mistook it for bear. I was informed that, in the vicinity of Disko at least, they never procure enough of the skins of the young in the white coat to use them for clothing to any extent.

In the Cumberland waters they are resident, and do not migrate at all unless much disturbed, and then they merely seek a more secluded locality. On the Greenland coast they appear to migrate up the ice fjords in summer, but to be more generally distributed at other seasons.

The netsick shows a decided predilection for the quiet still bays and fjords, seldom venturing far from land. They are the only seal caught through the ice in winter, and are consequently the chief and almost sole dependence of the Eskimo for food, fuel, light, and clothing.

The skins of the adults are made into summer clothing, while the young are in great demand for under-garments and for trousers. Children often have entire suits of the young in the white coats; such clothing looks very beautiful when new, but it is new but a few days, and after this it is repulsive enough. The females were found *enceinte* in the latter part of October, and a fœtus nearly ready for birth was taken from the uterus January 16. It was two feet from the end of nose to the end of hind flippers. It was so doubled in the uterus, however, as to occupy a space hardly a foot in length; the hind flippers were turned forward on the tibiæ, the fore flippers hugged the sides, and the head bent over on the neck and inclined to one side.

In a large fjord known as the Greater Kingwah the tide runs so swiftly at one locality that it never freezes for a space varying from ten to one hundred acres. Here the netsick gather in considerable numbers all winter, and it is a favorite resort for such Eskimo as are fortunate enough to possess a gun. Being but a few miles from our winter harbor, there were almost daily excursions to these tide rifts by our Eskimo hunters. After the 1st of March very few pregnant females were killed at this place, they having by this time chosen the localities for having their young. Those killed after this date were all adult "tigak," or old stinking males.

It was interesting that the young—yearlings and some two-year olds, such as had not yet arrived at maturity—were seldom, if ever, killed in this open water, but lived in colonies by themselves. When an Eskimo finds a number of *atluks* (breathing-holes) near together, he always marks the place by raising little mounds of snow near the holes, for he knows that here is a colony of young animals, which have better skins and

meat than the old ones, and are moreover much easier to capture. I have counted nearly seventy of these atluks on a space of two acres.

When a pregnant female has chosen the place where she is to have her young, she makes an excavation from six to ten feet in length under the snow, and from three to five feet wide, the height varying with the thickness of the snow covering. The atluk is at one extremity of this excavation, and in such a position that it is always a ready channel of retreat in case of danger.

The first young found in the Upper Cumberland waters was during the early days of March; still I have taken a fœtus from the mother in the middle of April. The most profitable time for hunting the young seal is during the month of April; after this date they have shed so much that the skins are nearly worthless till the hispid hair has got to be of the proper length, when they are considered as the prime article, and second only to the young of *Callocephalus vitulinus* in quality.

The first young one I procured that had begun to shed was April 15. I have seen examples that were nearly or quite destitute of the white coat, but still not having the next coat in sight. Such specimens on close examination will be found to have a very fine coat of the new hair, but so short as not to be perceptible except on close examination, still showing the exact location and distribution of the dark and light markings; the *skin* at this time is very black, and often much scratched up, probably by the mother in trying to make the young one shift for itself. I often examined the stomachs of young as well as adults, but till after they had begun shedding the white coat, and were, in all probability, 25 to 30 days old, I found nothing but the mother's milk. After they begin to shift for themselves, their food, for a time at least, consists of *Gammari* of different species.

Before the young shed the white coat, they are from 23 to 36 inches from the nose to end of flippers; the average the season through, from a good series of measurements, was about 30 inches. They are very variable in color; some are pure white; others very white on the lower parts, but more or less dusky on back; others again are a fine straw-yellow, with the same dusky variation as in the white ones. The yellow is also variable in the intensity of shade. Rarely some are found that are quite dusky all over, especially on the head and back; these are generally small and scrawny individuals. The hair is also quite as variable in texture as in color. In some it is fine, long, and woolly (mostly in the pure white examples). In others it is straight or wavy, while

some have short and quite hispid hair. They weigh at birth from four to six and one-half pounds, but grow at an astounding rate, becoming exceedingly fat in a few days. The blubber on the young a few days old is almost white and thickly interspersed with blood-vessels; it is not fit to burn. There is usually but one young at a birth; still twins are not of rare occurrence, and one instance came under my observation where there were triplets, but they were small, and two of them would probably not have lived had they been born. The season for hunting the young at lat. 67° N. begins about the middle of March and continues until the latter part of April. The first two weeks of April are the most productive, as later the hair is apt to be very loose, and many even have large bare patches on them.

When the season fairly opens, the Eskimo hunter leaves the winter encampment with his family and dog-team for some favorite resort of this seal; he soon constructs his snow-hut, and is as well settled as if it had been his habitation for years, for the seals he catches bring him and his family food and fuel, and snow to melt water from is always plenty, so that his wants are easily supplied, and he is contented and happy.

The manner of hunting the young seal is to allow a dog to run on ahead of the hunter, but having a strong seal-skin line about his neck, which the Eskimo does not let go of. The dog scents the seal in its excavation, which could not have been detected from the outside by the eye, and the hunter, by a vigorous jump, breaks down the cover before the young seal can reach its atluk, and if he be successful enough to cut off its retreat, it becomes an easy prey; otherwise he must use his sealing-hook very quickly, or his game is gone. It sometimes happens that the hunter is unfortunate enough to jump the snow down directly over the hole, and gets a pretty thorough wetting. The women often take part in this kind of sealing, and many of them are quite expert. The children begin when they are four or five years old. The teeth and flippers of their first catch are saved as a trophy and worn about the little fellow's neck. The next year when he begins, this will give him good luck, they think.

There exists a considerable spirit of rivalry among the mothers as to whose offspring has done the best, size, &c., considered. This runs to such a high pitch that I have known some mothers to *catch* the seal, and then let her child *kill* it, so as to be able to swell the number of his captures.

Some of the Eskimo hunters belonging to the Florence brought as many as seventy at one load. They were kept frozen, and we almost lived on the meat during the season, and learned to like it very much.

Some of the hispid seals pup on the ice without any covering whatever. Six instances of this nature came under my observation, and they were all young animals. The young exposed in this manner almost always fall a prey to foxes and ravens before they are old enough to take care of themselves.

As the season advances and the young begin to shed their coats, the roof of their *igloo* is often, or perhaps always, broken down, and the mother and young can be seen on sunny days basking in the warm sunshine beside their atluk. The mother will take to the water when the hunter has approached within gunshot, and leave the young one to shift for itself, which generally ends in its staring leisurely at the hunter till suddenly it finds a hook in its side; a stout seal-skin line is then made fast to its hind flippers, and it is let into the atluk; it, of course, makes desperate efforts to free itself, and is very apt to attract the attention of the mother if she is anywhere in the vicinity. The Eskimo carefully watches the movements of the young one, and, as soon as the mother is observed, begins to haul in on the line. The old one follows nearer and nearer to the surface, till at last she crosses the hole at the proper depth, and the deadly harpoon is planted in her body, and she is quickly drawn out. If the mother has seen the hunter approaching the atluk, however, she will not even show herself. I have never known of an instance where they have attempted to defend their offspring from man. I once saw a raven trying to kill a young seal while the mother was making frantic but very awkward attempts to catch the bird in her mouth. When the young first assume the coat of the adults (about the time the ice begins to loosen), they seem possessed of a vast amount of curiosity, and while swimming near the land, as they almost always do, can be lured within gunshot by whistling or singing. They would often play about the schooner, diving underneath and coming up on the opposite side, apparently enjoying it hugely. They delight to swim among the pieces of floating ice in the quiet bays. The young and yearlings of this species are often found together in small bands. The adult females will average four feet and a half to the end of the flippers. Such specimens are probably from four to seven years old; the males are a little larger. There is great variation in the skulls, but the sexes can readily be distinguished by the skull alone, the males having a longer and narrower head, with the ridges more prominent.

It is only the adult males (called "tigak," stinker, by the Eskimo) that emit the horribly disagreeable, all-permeating, ever-penetrating odor that has suggested its specific name. It is so strong that one can smell an Eskimo some distance when he has been partaking of the flesh. They say it is more nourishing than the flesh of the females, and that a person can endure great fatigue after eating it. If one of these *tigak* comes in contact with any other seal meat, it will become so tainted as to be repulsive to an educated palate; even the atluk of the *tigak* can be detected by its odor.

There is sometimes caught a hairless variety of this seal that the Eskimo call "okitook." I have seen one such skin. It had a few fine curly hairs scattered over it, but they were very different in texture from the ordinary hair. I do not know if the specimen otherwise differed from the ordinary seal. The food of the adults consists largely of different species of crustaceans, and during winter especially they subsist to a considerable extent upon fish. I have found in them the remains of *Cottus scorpius*, *C. grœnlandicus*, *Gadus ogac* (commonly), and *Liparis vulgaris*. During the time the adults shed for nearly a month previous I could detect nothing but a few pebbles in their stomachs. They become poor at this time, and will sink when shot in the water. The milk is thick and rich, and is sometimes eaten by the natives. The excrement looks like pale, thickly clotted blood.

There are sometimes found albinos, of which the Eskimo tell marvelous stories, one being that when they rise to breathe in their atluks they come stern first, and, in fact, they think such animals have their breathing apparatus on the posterior end of the body. I imagine this originated from a native once harpooning an albino in its atluk and finding his harpoon fastened in one of the hind flippers.

Toward spring, when the sun is shining brightly, these seals can be seen in all directions basking on the ice. They are to all appearance asleep, but manage to wake up regularly every few minutes to make sure that there is no danger about. At this season it is a favorite method of the Eskimo to hunt them by crawling flat on his belly toward the seal, and when discovered to imitate the movements of the animal, and to advance only when the seal looks in the opposite direction. In this manner they often approach so close as to be able to push them away from their atluks. This seal is of some commercial importance. The Scotch whalers often buy from the natives during the winter a thousand skins. These are brought with the blubber, and often cost the pur-

chaser not over 3 to 7 cents, and this mostly in tobacco, trinkets, or ship stores. To encourage them to procure more skins, they are furnished with a cheap *breech*-loading gun and a few hundred cartridges, which they soon waste, and then their guns are of course worthless. At the rate both young and adults are slaughtered at the present day, they will soon become so scarce that there will not be enough to supply the wants of the natives.

11. Pagophilus grœnlandicus, (Müll.) Gray.

"Kiolik," Cumberland Eskimo.

The saddle-back is of frequent occurrence about the southern waters of Cumberland Sound in spring and autumn. It is rather rarely found singly, but generally in considerable schools. They are even occasionally found as far up the sound as Annanactook, but mostly the young. Their procreation is unknown to the Cumberland Eskimo. A few schools were noticed at different times during September, 1877, and October, 1878, from the islands off the middle Labrador coast to Cumberland, at times at considerable distances from land. Every Eskimo who can secure it will have an adult male kiolik skin on the back of his toopik. The skins are here never used for clothing, the hair being too short and thin. They disappear from Cumberland when the ice makes, and return again in spring with open water, but stay only a short time. The flesh is much inferior to the netsick.

12. Phoca barbata, O. Fab.

"Ogjook," Cumberland Eskimo; "Oo-sook," Greenlanders.

This seal was first noticed a little to the southward of Cape Chidly, and thence northward to our winter harbor in about lat. 67° N. According to the Eskimo they are the most common about Cape Mercy, Nugumeute, and the southern Cumberland waters, where they remain the year around, if there is open water. They remain in the sound only during the time there is open water, as they have no atluk.

On the west coast of Davis Straits they are not rare, but are said by whalemen to diminish in numbers above lat. 75° N. They appear to be more common on the southern shores of the west coast of Davis Straits than on the northern, so that the natives go southward some distance to secure the skins. Was noticed among the pack-ice in Davis Straits in July and August.

The ogjook delights in basking upon pieces of floating ice, and generally keeps well out at sea. I have never seen any numbers together, but almost always singly. The old males do not seem to agree well, and

often have severe battles on the ice-floes when they meet. They use the fore flippers, instead of the teeth, in fighting.

In Cumberland they begin working northward as fast as the floe edge of the ice breaks up, arriving in the vicinity of Annanactook about the latter days of June. In autumn they move southward as fast as the ice makes across the sound, always keeping in open water. They are seldom found in the smaller fjords or bays, but delight in wide expanses of water. They dive to great depths after their food, which is almost entirely *crustacea*, mollusks, and even clams of considerable size. This seal has a habit of turning a summersault when about to dive, especially when fired at; this peculiarity, which is not shared by any other species that I have seen, is a characteristic by which it may be distinguished at a considerable distance. During May and June they crawl out upon an ice-floe, to bask and sleep; at such times they are easily approached by the Eskimo in their kyacks and killed. An adult will often measure ten feet between the two extremes. The color is variable; the tawniness more or less clouded with lighter or darker markings irregularly dispersed. By July some of them become almost naked. At this season their stomachs contained nothing but stones; some of them nearly of a quarter pound weight. They seem to eat nothing during the entire time of shedding, probably six weeks. Certain it is they lose all their blubber, and by the middle of July have nothing but "whitehorse," a tough, white, somewhat cartilaginous substance, in place of blubber. At this season they sink when shot. Some specimens were procured that had scarcely any teeth at all, and in many adults the teeth can almost be plucked out with the fingers. The young are born upon pieces of floating ice, without any covering of snow. The season of procreation is during the fore part of May. After the young have shed their first woolly coat (which they do in a few days), they have a very beautiful steel-blue hair, but generally so clouded over with irregularly dispersed patches of white that its beauty is spoiled.

A fœtus was procured near the Middliejuacktwack Islands April 28. Its extreme length was four feet seven inches.

	Inches.
Length of head	$8\frac{3}{20}$
Width of muzzle	4.5
Width of fore flipper	4.3
Length of fore flipper to end of nails	$7\frac{3}{20}$
Greatest expanse of hind flipper	13.5
Length of hind flipper	12
From end of nose to eye	3.2
Distance between eyes	3.50

Color uniform grizzly mouse-color, with a tinge of olive-gray. Muzzle, crown, and irregular patches on back and fore flippers white. From nose to eyes a black line crossing the head back of the eyes, forming a perfect cross. Nails horn-blue, tipped with white. Iris dark brown. Nose black. Muzzle wide; lips full and fleshy, giving the animal a bull-dog expression. Body long and slender. Beard pellucid, abundant, white, stout, the bristles growing shorter from the eye toward the nostrils. Hind flippers large and heavy, looking disproportionate. The hair rather short, but fine and somewhat woolly. There was interspersed another kind of hair, stiff and of a steel-blue; the next coat, I take it.

The Eskimo are firm in the belief that the ogjook sheds its first coat within the uterus of the mother. In this instance there was certainly plenty of loose hair in the uterus; but the specimen had been dragged some miles in its envelope over the rough ice, and banged around considerably, besides having been kept three or four days in an Eskimo igloo among a heap of decaying garbage, so it is not to be wondered at if the hair was loose. There was little blubber on the specimen, and this was thickly interspersed with blood-vessels. The intestines toward the anus were filled with dung. The kidneys were very large, the heart remarkably so. The cartilaginous prolongation of the thorax, so prominent in *Pagomys fœtidus*, is wanting in this species.

The ogjook is of great value to the Eskimo, who prize the skins very highly. All their harnesses, sealing-lines, &c., are made from the raw skins; besides this, they make the soles of their boots, and sometimes other portions of their dress, from the skin. In such localities as the whalemen do not visit, and the natives are obliged to construct skin boats, this seal is in great demand. It takes fifteen skins for an ominak, or skin boat, and these skins require renewing very often. The skin of the back and belly dries unevenly, so the Eskimo skin the animal by cutting it longitudinally along both sides, and drying the skin of the upper and lower parts separately. It is a prevalent belief among whalemen that seals' livers, and more especially those of this species, are poisonous; but I am inclined to rate this as imagination. We ate the livers of all species we procured without any bad effects.

13. Trichechus rosmarus, Linné.

"Awouk" and "Ivik," Cumberland Eskimo.

The walrus is quite common about Cape Mercy and the southern waters of Cumberland, but at the present day rarely strays far up the sound. Their remains, however, are by no means rare, even in the Greater King-

wah, and many of the old Eskimo hut foundations contain the remains of this animal. The Eskimo say they got mad and left; certain it is they are found around Annanactook only as stragglers at the present day. Considerable numbers were observed on pieces of floating ice near Cape Mercy in July. About Nugumeute they are largely hunted by the Eskimo living there. The Eskimo say the tusks of the male always bend outward toward the tips, while those of the female bend inward.

14. Cistophora cristata, (Erxleb.) Nilss.

The bladder-nose appears to be very rare in the upper Cumberland waters. One specimen was procured at Annanactook in autumn, the only one I saw. The Eskimo had no name for it, and said they had not seen it before. I afterward learned that they are occasionally taken about the Kikkerton Islands in spring and autumn. I found their remains in the old kitchenmiddens at Kingwah. A good many individuals were noticed among the pack-ice in Davis Straits in July.

CETACEA.

1. Balæna mysticetus, Linné.

"Akbik," Cumberland Eskimo.

Also called "Pumah." I think the word had its origin in this wise. When whalemen first began to cruise in these waters, few, if any of them, had a knowledge of the Eskimo language, and, to make the natives understand what they were after, imitated the spouting of the whale by blowing. This was soon taken up by the Eskimo as the "codlunak" (white man's) word for whale, and soon came into general usage, and thus one of the first words was made that now constitutes a part of the pigeon-English of the whalemen's jargon.

The Cumberland Sound, or Hogarth Sound of Penny (Northumberland Inlet of Wareham in 1841), has been renowned among Scotch and American whalemen for more than a quarter of a century as a favorite resort of the right whale, and one of the most profitable whaling stations on the globe. But this locality, like all others, has been so thoroughly hunted nearly every season for a number of years that it no longer sustains its pristine renown as a profitable whaling ground.

So many ships were sometimes found here at one time that there arose a great spirit of strife among the crews as to which vessel would procure the most whales, and as a consequence whales were struck when there was but the slightest chance of securing them, and the line had to be cut to set them free. Such whales in all probability die, but not before

they have succeeded in permanently frightening others, which, instead of seeking the upper waters of the sound for a few weeks' quiet feeding, strike out and are seen no more.

Instead of allowing these animals to go up the sound, and find their favorite feeding grounds, they are attacked and chased as soon as they show themselves at the mouth of the sound. In fact, they have been so persistently persecuted that now very few pass up above Niantilic or the Kikkerton Islands.

The fall whaling begins late in September and continues till the ice makes across the sound. The whaling at this season is attended with great danger and hardships to the crews, and it is while prosecuting this fall "fishing" that the foundation to many a stubborn case of scurvy is laid.

The spring whaling begins generally in March or April, and continues along the floe edge until July, when the ice has left the sound.

The Eskimo from the southern part of the sound and along the coast from Nugumeute to Hudson's Straits report whales as found in those localities all winter; it is then quite probable that they reproduce on these coasts during the latter part of winter.

According to Eskimo tradition, these animals were once very abundant in the Cumberland waters, and their remains now bleaching on the rocky shores faithfully testify to this fact.

Of late years, whalers frequenting Cumberland Sound have been in the habit of employing natives to catch whales, supplying them with boats and all necessary equipments. It is needless to say that they are more successful than the whites in this hunt.

With their own primitive gear, the Eskimo seldom attacked a large whale; but yearlings were frequently caught. I was presented with a harpoon-head by the captain of a Peterhead whaler, that had been taken out of a very large whale caught near the Kikkerton Islands; it was imbedded in the *muscles*, so that the whale must have been struck while it was quite small in order that the harpoon should have pierced through the blubber. The weapon is, moreover, of a pattern which the Eskimo I showed it to say they never saw before; but I must confess I can see but a very slight difference in it from those in use at the present day.

The "black skin," called "muktuk" by the natives, is considered as a great delicacy; when they have not eaten of this food for some time, and then get an opportunity to indulge to their heart's content, they eat till they can hardly move.

2. **Physalis antiquorum**, Gray.

Razor-back of whalers.

I cannot positively assert that the razor-back frequents the Cumberland waters to any great extent; in fact, I somewhat doubt if it does, one reason being possibly the scarcity of fish. I have seen it north of Hudson's Straits and about Cape Mercy, as well as on the Greenland coast in Disko Bay.

3. **Megaptera longimana** Gray.

Hump-back of whalers.

I could not ascertain that this whale is common in Cumberland at any season. It frequents the southern waters, but is little troubled by the whalers. The Eskimo do not seem to have a very clear idea of it.

4. **Orca gladiator**, (Bonn.) Sund.

"Killer" of whalers.

The killer is a very common whale in the Cumberland waters. They arrive with the white whales, which they follow up the fjords. Many thrilling stories are told by the Eskimo as well as whalemen of desperate fights between this animal and other whales. The Eskimo are rather afraid of it, especially the solitary kyacker. I have known the white whales to come in close proximity to the ship and lie along her sides, when they were pursued by these voracious sea-wolves.

5. **Phocæna communis**, Brooks.

The porpoise is by no means rare, especially in the southern waters during spring and autumn. I neither saw nor heard of them in the vicinity of Annanactook.

6. **Beluga catodon**, (Linné) Gray.

White fish, or White whale, of whalers. "Killeluak," Cumberland Eskimo.

The white whales begin to work up the sound as soon as the ice begins to loosen. They become very abundant, especially in the Great Kingwah Fjord. In July many hundreds repair to the sand-beaches of this fjord, and some whalers have attempted to catch them in nets, but with indifferent success. They are sometimes driven up into shallow water at flood tide, and by the receding of the water many are left high and dry. It is a question of interest what they go into this fjord after. It is not to have their young, as they are already with the mothers; nor does it seem to be after food, as little or nothing is found in their stomachs at this time. One thing I noticed, when they go up the fjord they have a ragged appearance and dirty color, and, according to some whalemen,

are covered with parasites; but after they have been rolling and rubbing themselves on the sand-beaches for a few days they look much smoother and their color is a creamy white. The Eskimo say the males and females keep separate, but I do not think there is much truth in this statement. Some think they go on these shoals to avoid the attacks of the killers, which play sad havoc among them outside, but do not follow them into shallow water; but if this were the reason, they would take refuge in any small bay or inlet, and not choose this particular fjord year after year. I found no external parasites, but the internal ear cavity was nearly filled with worm-like animals nearly two inches long. They were firmly attached by one end, and stood erect, having somewhat the appearance of very coarse hairs. While migrating into the sound they always keep just at the floe edge, and if the ice is broken do not seem to like getting among it. In the winter of 1876–77, a couple got belated and froze up in the Kingwah tide rifts. They were harpooned by the Eskimo in January. A considerable number of these whales are caught by the Eskimo from their kyacks.

7. Monodon monoceros, Linné.

Narwhal of whalemen. "Killeluaksuak," Eskimo.

By no means abundant, but of regular occurrence in spring and autumn. These whales give the Eskimo much trouble to capture, on account of their agility. The horn is often used for the handle of the harpoon, and for various other purposes where wood is scarce.

BIRDS.

By Ludwig Kumlien.

The following list is of necessity fragmentary and very incomplete from various reasons. In the first place, the expedition did not arrive at the proposed winter-quarters until October, when the weather had become so inclement that most of the birds had gone southward. During the brief stops that were made at different harbors in the autumn of 1877, I was often obliged to remain on shipboard for want of a boat, instead of cruising about, as I would otherwise have done. Of course I often went out with the Eskimo; but as they were looking for whales and seals, I got only such birds as accidentally came in our way. In the spring, the schooner was under weigh before the birds had fairly begun nesting. The last three weeks of our sojourn in the winter harbor I was prevented from making any explorations, except in the immediate vicinity of the harbor, on account of the ice, which was driven northward by the long-continued southerly gales. This ice formed so perfect a barrier about us that we could not get out of the harbor, and to have ventured among it with a boat when the strong currents were whirling and crashing it in every direction would have been a piece of foolhardiness that could but have resulted disastrously.

There is no point on either side of Cumberland Gulf or Sound that is less suitable for a naturalist than was Annanactook Harbor. It is formed by a cluster of small rocky islands, the outermost of a large group lying between the Greater and Lesser Kingwah Fjords. The nearest point to the mainland from the harbor was about nine miles. There were extensive valleys, with large grassy flats and sandy beaches, much frequented by different kinds of birds, both for feeding and breeding grounds.

When the season was so far advanced that these places became the resorts of birds, I seldom got an opportunity to go on a cruise, for with the inclemency of the weather, the uncertainty of procuring a boat, and the treacherous condition of the ice, it was almost sure that one or the

other of these drawbacks would indefinitely postpone a contemplated journey. At this time I had the use of but one hand, and could not manage a kyack.

All the islands in the vicinity of Annanactook are rocky—solid rock, in fact—with extremely scanty vegetation. The shores are generally steep bluffs, and very little beach is exposed at low tide. A few miles up the Greater Kingwah, however, are very extensive beaches, and thither all the waders congregated as soon as the ice began to loosen from the shores. After leaving our winter harbor, the Florence made brief stops at different points, but for such short periods that it gave me very little time for explorations.

After our arrival on the Greenland coast I received very great assistance from Governor Edgar Fencker and lady, of Godhavn, through whose kindness I procured many valuable specimens. I can never forget the kindness and unbounded hospitality of this educated and refined gentleman and enthusiastic naturalist.

To Inspector Krärup Smitz and lady, of Godhavn, I am under very great obligations, not alone for the valuable donations of interesting Eskimo implements, but for their untiring zeal in making our sojourn as pleasant as possible, and the ready and entertaining information on many little known subjects pertaining to Arctic matters.

I was not a little surprised, as well as delighted, to find in Governor Fencker a person perfectly familiar with the birds of North America as well as Europe. During his eleven years' residence in Northern Greenland he has, of course, added much to the knowledge of Arctic ornithology, and I was pleased to learn that he contemplated giving the world the benefit of his observations in an illustrated work on the birds of Greenland. Such a work, embellished with his superb drawings, cannot fail to rank very high among the ornithological literature of the age.

I have not the least doubt that future explorations in Cumberland waters will yield a much richer harvest than I gathered. Many species will be added, especially if the Lake Kennedy region is visited in summer.

For the benefit of any future explorer who may visit this section of country I will give what appears to me the best route and manner of reaching Lake Kennedy. A person wintering in Cumberland will be very apt to be stationed either at Niantilic on the western shore, or the Kikkerton Islands on the eastern, a little farther to the north. These points are favorite resorts for Eskimo in winter, and hunting parties

leave both settlements for the interior every summer, so there would be no difficulty in securing Eskimo guides and assistants, who are absolutely necessary to the success of such an enterprise. Good strong dog-teams, to carry boats and all the required equipments, can be secured from the Eskimo, they driving their own teams.

The start should be made in May, and the course up the so-called "Mollu Keitook" fjord that opens into the gulf about forty miles north of the Kikkerton Islands on the western shore. This fjord can at this season be traveled with ease with sledges its entire distance—about ninety miles. During this stage of the journey the Eskimo could secure enough seal in the fjord for both man and beast. When the inland country was reached, reindeer would make a very acceptable substitute. But this supply should in no wise be solely depended upon. When the head of the fjord is reached there will be found a fresh-water stream, the eastern exit for the Kennedy Lake waters. This stream should be followed to the lake. If it be late in the season, a whale-boat may be taken up the stream with comparative ease. There are some places where the stream runs in narrow gorges, but the surrounding country offers suitable places for a portage over such points, into the numerous lake-like expansions that will be met with. If it be in May there will be found an abundance of snow for traveling with sledges on the land, and the comparatively level character of the country, which becomes more strikingly so as one nears the lake, will present but few obstacles to a good dog-team.

A light canvas tent should be a part of the equipment. While the snow lasted this could be inclosed within a wall of snow, and later be made very comfortable with a stone wall.

The lake abounds in numerous small islands, has sandy as well as grassy beaches, and is a favorite resort for myriads of waterfowl. It is so large that one cannot see across it. Its location is probably between the 66th and 67th parallels of north latitude. Salmon are abundant in its waters, and a seal that, from the skin, I could not distinguish from *Pagomys fœtidus*, abounds in considerable numbers. The vicinity is the favorite feeding-ground of immense herds of reindeer. Wolves and foxes are very numerous, and among the Eskimo there is mention of an animal that from their descriptions and drawings seems to be a *Gulo*.

Fossils (Silurian) seem to be very abundant, and petrifactions marvelously perfect abound in the lowlands. The surrounding country has much the general aspect of a high northern prairie, being quite flat and

sustaining a good growth of grass and plants. The ascent to the Cumberland coast on the east and the Fox Channel on the west is so gradual that it is hardly perceptible, the coast-line in both instances being precipitous. This is especially true of the western slope, where it is so gradual that it is with the greatest astonishment one suddenly finds himself on the summit of an enormous cliff, with the breakers of Fox Channel dashing on the rocks below him and an expanse of water stretching to the westward as far as the eye can reach.

The western outlet of the lake is larger than the eastern, and is said to empty through a deep gorge near Point McDonald.

A far less satisfactory time to go is after the breaking-up of the ice. There is no doubt it could be performed with less labor and fatigue at this time, but for the naturalist the best season would be over.

When the collections are ready, they can be safely cached till winter, and brought down in comparative safety on dog-sledges. A very interesting station for a naturalist would be near the mouth of the gulf, in the vicinity of the Kikkerton Islands; at this place there would be open water in April or May, and many valuable birds could be secured before they scatter over the country to breed. When the birds arrive at Annanactook, the season is already so far advanced that they immediately begin nesting. I have concluded to retain in the present list many species on very slight evidence in the hope that it may in some degree assist future explorers and put them on the lookout for some species that might otherwise escape their notice.

The birds do not congregate in large numbers on the islands in Cumberland to breed, the way they do to the southward and on the Greenland coast. There is an exception with *Somateria mollissima*. Some species that breed by myriads two hundred miles to the southward, and are equally numerous on the coast of Greenland to 73° N. lat., are found only as occasional stragglers in the Cumberland waters.

Some idea of the barrenness of the islands around Annanactook may be arrived at from the fact that from October to July *one hare* and *two ptarmigans* were brought in, and there were twelve Eskimo that hunted the greater part of the time, and I was out on every occasion when I thought it at all likely that such game could be procured. Scotch whalers have told me that near Nugumeute they have had as high as *two hundred ptarmigans* during the winter, and hares in abundance.

I have added the Eskimo names of the birds in such instances as I could do so with certainty. The Greenlanders' names are often quite

different from the Cumberland Sound Eskimo; these have also been added. These names will be of use to any one visiting this region not conversant with the Eskimo language.

1. **Turdus aliciæ**, Bd.

One specimen caught on shipboard off the coast of Newfoundland, October 22, 1878.

2. **Saxicola œnanthe**, Bechst.

Breeds along both shores of Cumberland and on the west coast of Davis Straits, but rare.

One of the commonest land birds on Disko Island, Greenland, and around Disko Bay, both on the islands and mainland. I showed specimens to Eskimo from Nugumeute and Frobisher Straits, and they instantly recognized them and said they breed there, but are not plenty.

3. **Anthus ludovicianus**, Bechst.

Kung-núk-took, Cumberland Eskimo.

The first specimens were seen in the spring at Annanactook Harbor on the 30th of May. There was no bare ground; but they frequented the tide-rifts at low water, searching after small marine animals.

It looked very strange to see this bird running about among the stones and *in* the water like a *Cinclus*. I examined the stomachs of specimens killed in these localities, and found them to contain *Gammarus*, *Læmodipodia*, *Caprella*, and a few small *mollusks!* There can be no doubt that they were feeding on this food from necessity, and not choice, for there was no bare ground and no insects at this time. During the first of June we had the severest snow-storm of the season, and I think most of them perished. They would come around the observatory and shelter themselves as best they could. They were so far reduced that they were easily caught with the hand.

In autumn they leave for the south about the middle of September. At this season, besides their diet of insects, they feed on the berries of *Empetrum nigrum* and *Vaccinium uliginosum*. During summer their food consists almost entirely of insects, largely of dipterous larvæ, which they procure among the *carices* around the fresh-water ponds. At Annanactook they began building about the 20th of June. The nest was always placed deep in a rock crevice, so far in, in fact, that I could not secure any of the nests I found. On the Greenland coast, especially in the vicinity of habitations, they often build in a tussock, much like a sparrow; but there the ravens are not so numerous or destructive to birds and eggs as in Cumberland.

They practice every artifice to decoy an intruder from the vicinity of the nest—shamming lameness, and uttering the most plaintive cries; flitting from crag to crag before the pursuer till they have led him far beyond the nest, when suddenly they seem to have recovered, and take longer flights, till at last they jump up very smartly and fly away apparently highly elated at the little ruse they have so successfully practiced.

This little bird is considered a great enemy by the Eskimo. They say it warns the reindeer of the approach of the hunter, and, still worse, will tell the reindeer if it be a very good shot that is in pursuit, that they may redouble their efforts to escape. The Eskimo never lose an opportunity to kill one of these birds. I have seen one with a rifle wasting his last balls in vain attempts to kill one when he knew that there was a herd of reindeer not more than a quarter of a mile away. They are generally distributed on both sides of Cumberland Sound and the west shores of Davis Straits to lat. 68° N. at least, but nowhere very abundant. Toward autumn they become more or less gregarious, and seem to migrate along the seashore.

4. **Sitta carolinensis**, L.

Caught on shipboard off the coast of Newfoundland October 22.

5. **Dendrœca coronata**, (L.) Gray.

A single example, an adult male, in Godhavn Harbor, Greenland, July 31, 1878.

6. **Siurus nævius**, (Bodd.) Coues.

Caught on board the Florence in Straits of Belle Isle, August 18.

7. **Tachycineta bicolor**, (Vieill.) Cab.

A couple of these swallows followed the schooner for two days in succession off Belle Isle, in August, 1877. Where were they during the night?

8. **Pyrrhula ——?**

July 19, 1879, while hunting among the mountains near Oosooadluin Harbor, in the northern waters of Cumberland, my attention was called by a bird whistling somewhat like *Ampelis garrulus*, but louder and clearer. I soon discovered it flitting among some small willows on the grassy ledges of a perpendicular cliff about 1,500 feet above tide-level. I could not scale the cliff, and had to content myself by watching it. It was apparently nesting among the willows, but kept continually just

out of range. At the time I pronounced it undoubtedly the female of *Pyrrhula europea*, which it resembled very much indeed, but now I incline to the belief that it was more likely the *male* of *Pyrrhula cassinii*, and that the female was sitting. I made a life-size drawing of it, and showed it to all the Eskimo in the vicinity. None could recognize it; but some said they had seen such a bird at Lake Kennedy, but that they were "tummumik abertook," all red. This may have been *Pinicola enucleator*, *Carpodacus purpureus*, or *Pyrrhula europea*, as I doubt not but the last species would be called "all red" by an Eskimo. The red part would certainly make the most lasting impression on his mind. I tried for some hours to procure this bird, but at last it flew over a ravine that I could not cross. I never got an opportunity to revisit the locality, and this interesting discovery had to be left unsettled. The bird was apparently *slate*-colored on the breast, the upper and lower tail-coverts conspicuously white, the top of head and throat much darker than the back. The flight was undulating. It kept whistling almost constantly, which led me to think it was a male bird.

9. Carpodacus purpureus, (Gm.) Gray.

During a dense fog, September 1, 1877, off Resolution Island, north of Hudson's Straits, one of these birds was caught on board the Florence. The Eskimo describe a bird about the size of the purple finch that occurs in the interior, and is "all red." Such information is, however, in no manner reliable, as "abertook" may be any color from umber to vermilion, and "all," especially when it comes to red, may be but a small part of the plumage.

10. Loxia leucoptera, (Wils.).

Caught on board the schooner in a fog off Bonne Bay, Newfoundland, August 15, 1877. Very common in the low pines at the head of Conception Bay, Newfoundland, October, 1878.

11. Ægiothus linaria, (L.) Cab.

"Anarak," Cumberland Eskimo. "Orpingmatook," Greenlanders.

Arrive in Cumberland as soon as the snow begins to disappear from the mountain sides. I found them about Niantilic and the Kikkerton Islands in September and October, but very few at our winter harbor. They are now common from Nugumeute to Hudson's Straits, and inland toward Lake Kennedy. Wherever there is a valley with any considerable vegetation, especially low willows, they are almost sure to be found. Observed abundantly on Disko Island, Greenland, where I found half-

fledged young in the last days of July. The nest here was built in small willows, like a *Chrysomitris*. Although they seemed to be migrating in October, I did not see any flocks, but only a few straggling individuals. They seem to wander from the land very often in fogs. I have counted a dozen or more in the rigging at one time from Hudson's Straits to Niantilic. Off Kikkertarsoak Islands, on the Labrador coast, as much as one hundred miles from land, these birds came aboard of the schooner in a gale. They were all young birds.

12. Ægiothus holbölli, Reinhdt.

A large linnet was caught in a thick fog in Grinnell Bay, September 3, 1877. It measured 6.25 inches in length. The specimen was "picked" by one of the ship's company while I went down into the cabin after my skinning tools. The body (without feathers) was preserved in alcohol, and Mr. Ridgway pronounces it *Æ. holbölli*. It was the only specimen I procured that differed in the least from a typical *linaria*.

13. Chrysomitris tristis, (L.) Bp.

An adult male caught on shipboard, August 22, 1877, off Cape Mugford, Labrador.

14. Plectrophanes nivalis, (L.) Meyer.

"Kopernúak," Cumberland Eskimo. "Kopanauarsuk," Greenlanders.

The first snowbird seen at our winter harbor was April 5, an adult male. The weather was quite severe, and there was no bare ground. It staid about the vessel some days, gleaning a scanty subsistence from the cook's rubbish pile. After this date I saw none until May 8. They then began to appear around the Eskimo encampments, and were in full song, and a very beautiful song they have. Never did I so enjoy a bird's song as I did their lively ditty after the long, silent, dreary winter. By the 13th five pair had arrived in the neighborhood, and the males seemed to try and outdo each other in their efforts to be musical. Such companions were they for me that I had no heart to destroy them, much as I wanted specimens in full plumage. The young Eskimo had no such scruples, however, and supplied me with specimens killed with their bows and arrows.

By the last days of May they had paired and chosen their breeding-places. The first eggs were procured June 20. The nests are very often in such deep fissures in the rocks that it is impossible to get at them. They are obliged to hide away their nests in this manner to escape the ravens. One of the most favorite positions for the nest is inside of an

Eskimo grave; *i. e.*, inside the stone cairn that they erect over the body. I have even seen a nest built *in an Eskimo cranium*. The nest is large and bulky, nearly the entire structure being composed of *Poa arctica* and other grasses, and invariably lined with feathers or hair. One nest, found July 11, that contained small young, was thickly lined with the hair of *Vulpes lagopus*. Some contain only feathers; others both hair and feathers. The number of eggs in all the nests I found was six. They present an almost endless variation in size and coloration, great difference being observable even in the same nest.

The snow bunting is generally distributed on both sides of Cumberland, but is nowhere abundant. Almost any locality is suitable, but I doubt if the food supply would be sufficient if they did not scatter well over the country. They are very common on Disko Island and around Disko Bay. Half-fledged young were taken near Godhavn August 2. The first plumage of the young is a uniform ashy gray. The food of the snowbird in summer consists largely of aquatic dipterous larvæ. For these they are constantly searching among the grass at the edges of fresh-water ponds. During the autumn they feed mostly on various kinds of seeds. They are very fond of the berries of *Empetrum nigrum* and *Vaccinium uliginosum*. As soon as the young are full-grown, they begin to congregate in small loose flocks, and move southward with the first snows of September. The young have by this time become lighter in plumage, and the russet wash begins to appear on the head and neck. They were often seen on board the schooner on the passage, at one time *two hundred miles* at sea, off Cape Chidly. There seems to be a striking difference in the size between Greenland and Alaskan specimens, the latter being the larger.

15. Plectrophanes lapponicus, (L.) Selby.

"Kióligak," Cumberland Eskimo. "Narksormutak," Greenlanders.

Not nearly so common as the preceding in Cumberland. In the autumn of 1877, I found a good many in the vicinity of Niantilic, but nowhere else; saw no males in the breeding plumage after September. During the summer of 1878, I procured one single specimen in June. I think they breed in the interior on the level land, and do not frequent the sea-coast so much as *P. nivalis*. I found them very common on Disko Island, and procured eggs and young in July and August. Their food at this time seemed to be entirely dipterous larvæ, for which they searched about fresh-water pools. In autumn they feed on seeds and berries. Many lit on the schooner during fogs and storms all the way

from Cape Chidly to Niantilic. According to the Eskimo they are more common than *nivalis* from Nugumeute southward and in the interior. There appears to be quite a marked difference in specimens from Greenland and from Alaska, and a comparison of a large series may give some interesting results. The Eskimo say they will eat *blubber* and *meat* if their food gets covered by snow. I have seen a specimen that was so covered with some oily substance that the feathers on the breast and belly were matted together. I am told by Nugumeute Eskimo that in summer the males "akapok amasuit" (talk a great deal). From this I infer that they are probably lively songsters during the breeding season.

16. Junco hyemalis, (L.) Sel.

Once obtained on shipboard off Belle Isle, October, 1878.

17. Scolocophagus ferrugineus, (Gm.) Sw.

Caught on shipboard during a gale off the north coast of Newfoundland, October, 1878.

18. Corvus corax, Linné.

"Tudlúak," Cumberland Eskimo. "Kernetook," Greenlanders; but also called "Tullnak."

The raven is extraordinarily common on both shores of Cumberland and on the eastern shore of the Penny Peninsula. In winter they congregate about the Eskimo encampments, where they can almost always get dead dog, if nothing more. All the specimens collected by me in Cumberland are of remarkable size, much larger than any I ever saw on the Greenland coast. The same was remarked by Governor Fencker, of Godhavn, who said he never could see any reason why the American raven should be called a variety of the European till he saw my specimens from the western coast of Davis Straits.

When the raven gets closely pressed by hunger, he will attack almost anything but man. Young reindeer fall an easy prey to them. When they attack a young deer, there are generally six or seven in company, and about one-half the number act as relays, so that the deer is given no rest. The eyes are the first parts attacked, and are generally speedily plucked out, when the poor animal will thrash and flounder about till it kills itself. In the capture of the young of *Pagomys fœtidus* they evince a considerable degree of intelligence. I have, on different occasions, witnessed them capture a young seal that lay basking in the sun near its hole. The first manœuvre of the ravens was to sail leisurely over the seal, gradually lowering with each circle, till at last one of them

suddenly dropped directly *into* the seal's hole, thus cutting off its retreat from the water. Its mate would then attack the seal, and endeavor to drag or drive it as far away from the hole as possible. The attacking raven seemed to *strike* the seal on the top of the head with its powerful bill, and thus break the tender skull. In two instances I allowed the combat to proceed until the seal was killed, and then drove the ravens away. I found no marks on the seal, except the blows on the head, which had fractured the skull in two places.

December 13, 1877, I witnessed a very amusing chase after a *Lepus glacialis*. There were two ravens, and they gave alternate chase to the hare. Sometimes the raven would catch the hare by the ears, and hare and raven would roll down the mountain side together thirty or forty feet, till the raven lost his hold, and then its companion would be on hand and renew the attack. They killed the hare in a short time, and immediately began devouring it.

They are extremely destructive to the eggs and young of all birds that have an open nest. They breed so early in the season that the young are fully fledged by the time the eiders begin laying, and the entire raven family then take up their abode on the duck islands, and gorge themselves with eggs and young. Nor is it only the eggs they eat, but their mischievous nature must out, and I have seen them drive the duck from her nest and deliberately break the eggs.

The Eskimo accuse the raven of warning the deer of the approach of the hunter by a peculiar croak not uttered at other times. This helps to add odium to their not over-enviable reputation. They are constant attendants of the Eskimo while seal-hunting. If the hunter procures more seal than he can take back with him, he will cover them with snow and return for them; but the operation has been watched by the black robbers from the neighboring cliffs, and a good number of them are soon made acquainted with the discovery, and as soon as the Eskimo is gone the seal is exhumed and soon reduced to the mere skeleton. I tried on several occasions to catch them by baiting a hook with a piece of meat, and carefully concealing the string in the snow. They took hold of the meat very cautiously, and lifted it till they saw the string, and then flew away in great haste.

During the winter, while making skeletons, I used to throw the refuse outside of the observatory; and I have repeatedly watched the ravens sit around and wait till I went to dinner, about 3.30 p. m. It was then, of course, quite dark; but as soon as I left the hut they came and got their meal, but were extremely cautious, often turning the pieces over

many times before they swallowed them, and even throwing and tossing them, to be sure that there was no trap about it. Some pieces that looked suspicious they would not eat, but walked around them and turned them over, but could not be convinced that there was not some trickery about them. I have often found them hunting about the observatory after some stray scraps, even on my return from dinner, when it was so dark that I could not see them but a few feet away. On moonlight nights I have known them to make visits to the rubbish pile outside our observatory; but such cases are rare, and only at the season when they cannot get any food without the greatest difficulty. At Annanactook Harbor they began building as early as March 20, but I saw some carrying pieces of skin and hair from the Eskimo encampments many days earlier than this, and when we had a temperature of −40° Fahr.

They nest only on the south side of the highest and most inaccessible cliffs, so the nest can seldom be reached. I examined one nest built on a little shelf of a high cliff. It was composed almost entirely of pieces of Eskimo skin clothing, among which were scattered the larger wing-bones of gulls, the larger primaries of several species of birds, twigs of salix, &c. The inside had a good lining of *Poa alpina*, and a considerable quantity of reindeer, fox, and dog hair, the whole presenting a very cozy appearance indeed. As soon as the seals begin to pup under the snow on the ice, they follow the foxes, which find the seal and drag them out. Now the ravens can fare well on the leavings. The Eskimo firmly believe that it does not hurt the ravens' eggs to freeze. They say the shell cracks, but the inner membrane is very thick and tough. I found that the Scotch whalers are also of this opinion, some positively asserting that they had known *frozen* ravens' eggs to hatch!

The young are full-fledged by the latter part of May. During the autumn months they feed largely on the berries of *Vaccinium uliginosum* and *Empetrum nigrum*. I have often observed them fishing at low tide among the stones. I killed a couple to ascertain the nature of the food they got. I found it to be *Cottus scorpius* and *Liparis vulgaris?*, with a few small crustaceans.

They are resident in Cumberland the entire year, but appear more numerous in winter, from their habit of staying about the Eskimo encampments.

The raven is considered as worse than useless by the Eskimo. They make no use of them except to wipe the blood and grease from their hands and face with the feathers.

19. Empidonax flaviventris, Bd.

Taken at sea off Cape Farewell, Greenland, September, 1878. This is, I think, the first recorded instance of its occurrence in Greenland.

20. Brachyotus palustris, (Bechst.) Gould

"Sutitnk" (?), Greenlanders.

Apparently rare. Found breeding in the Kingnite Fjord in the Penny Peninsula; also in the Greater Kingwah. Probably will be found more common in the interior toward the southwest in Hall's Land, if it be the species described to me by Eskimo from there. They say it nests underneath an overhanging shelf of rock on or near the ground. Appears to be rare on the coast of Greenland. Is found as far north as 70° N. lat.

21. Nyctea scandiaca, (L.) Newt.

"Opigjúak," Cumberland Eskimo. "Opik" and "Opirksook," Greenlanders.

I was very much surprised not to find this owl more common. At the Kikkerton Islands and up Kingnite Fjord were the only localities where I met it on the west coast. From Hudson's Straits to Nugumeute, in Hall's Land, it is more common, probably on account of the greater abundance of hares and ptarmigans in this region. It probably breeds on the Hunde Islands in Disko Bay, and on the "islands" (the rocks projecting through the glacier) in the glacier on the mainland, to the eastward of Rittenbenck, Greenland. They are by no means strictly nocturnal. I have seen them chasing ptarmigan at midday in October, when the sun was shining brightly. I have seen them coursing along the shore at low tide, apparently *fishing;* but whether they were hunting for snipe or fish I am unable to say, as they were so shy that I could not get within rifle range of them. The primaries are highly prized by the Eskimo for their arrows. These birds migrate to the southward about the same time as the majority of the waterfowl.

22. Falco candicans, Gm.

"Kirksoveasuk," Greenlanders.

During the whole year's collecting on Cumberland Island I saw but one single specimen, late in November, 1877. He was beset by a large concourse of ravens that were teasing him, as the jays do hawks and owls at home. According to the Cumberland Eskimo, they are very rare, and seldom seen except in winter. Many do not know them at all. On Disko Island, especially in the Godhavn district, they are common and resident. These hawks seem to prefer nesting in the vicinity of "bird rocks," where they can procure plenty of birds with very little

trouble. In winter they subsist wholly on ptarmigans and hares. Governor Fencker, during his long residence in Northern Greenland, has had good opportunities for studying this bird, and he thinks there is but one species inhabiting the country, having known of instances where the parents of a nest represented the two extremes of plumage. Nor does the difference seem to be sexual, seasonal, or altogether dependent upon age, but more probably partaking of that remarkable phenomenon familiar in *Scops asio*.

During my frequent excursions about Disko Island I often had an opportunity of witnessing this hawk preying upon jaegers, kittiwakes, &c., but was surprised that they are not possessed of swifter flight. A duck hawk would have made a short job of catching a kittiwake that one of these hawks followed till he fairly tired the bird out. Their success seems to depend more upon a stubborn perseverance than alacrity of flight. The flesh of the young birds is by no means despicable food, and is highly prized by the Danish colonists.

23. Falco communis, Gm.

A regular breeder in Cumberland. Usually found about the Eider Islands. Procured nearly full-fledged young in August that were taken from the nest on a high cliff in the Greater Kingwah Fjord.

24. Astur atricapillus, (Wils.) Jard.

A single specimen, at Niantilic, September 19, 1877.

25. Haliaëtus albicilla, Linné.

"Netkoralik," Greenlanders.

I saw this eagle at American Harbor, in October, 1877, at two different times. In the spring of 1878 I often noticed a pair that finally built a nest on a high but not inaccessible cliff in Kingwah Fjord. I could have shot the birds, but waited until I should be able to procure the eggs, and then get the birds. Unfortunately the wind set in from the south, and I could not get near the place on account of ice till the Florence set sail for the Greenland coast. Enough was ascertained, however, to show that this bird *does* breed on the western shores of Davis Straits, although probably sparingly. On the coast of Greenland it is by no means uncommon. Eggs were procured from Claushavn through the kindness of Governor E. Fencker.

26. Lagopus albus, (Gmel.) And.

"Akagik" (both species), Cumberland Eskimo.

Very few ptarmigan were found about our winter harbor; but, from the Eskimo accounts, they are quite common in the larger valleys, where

there is a ranker growth of willows. The stomachs of those I examined of this species contained willow buds and small twigs. From Nugumeute southward and westward in the interior they are abundant according to the Eskimo stories, but which species is of course impossible to say. They begin to change color as soon as the snow commences to melt, in lat. 67° N. about the middle of May. This change in plumage is more tardy as one goes farther north. I was informed by intelligent Greenlanders that north of Upernavik, near the glacier, they had found ptarmigans nesting, and that the male was in perfect winter plumage. This was probably *L. rupestris*. If this be true, it is possible that in sections where much snow remains during the summer the change is very late, or, perhaps, does not occur at all.

27. Lagopus rupestris, (Gmel.) Leach.

"Akagik," Cumberland Eskimo. "Akeiksek," Greenlanders.

I am unable to throw any light on the distribution of these birds in Cumberland, as I was unable to procure but a single specimen of this species and two of the preceding. The crop was crammed full of sphagnum moss.

28. Ægialitis semipalmata, (Bp.) Cab.

"Koodlukkáleak," Cumberland Eskimo.

Arrived at Annanactook about the middle of June. By no means rare. Breeds on the mossy banks of fresh-water ponds along both the Kingwah Fjords, as well as other localities in Cumberland. It seems remarkable that the Cumberland Eskimo should discriminate between this and the following species, when they confound all the larger gulls under one name. They told me that *Æ. hiaticula* was larger, flew faster, and had a stronger voice than *semipalmatus!!* All of which is true. The condition of the ice at the time these birds were nesting kept me from visiting their breeding-grounds, although but a few miles away. They migrate southward as soon as the fresh water is frozen.

29. Ægialitis hiaticula, (L.)

"Tukagvajok," Greenlanders.

I am not aware that this species has hitherto been introduced into the North American fauna, though long known as a common bird on the Greenland coast, where *Æ. semipalmata* is rare. It is apparently more common than the preceding in Cumberland. Arrives about the same time, and breeds in similar localities. Very common about Disko Island, Greenland, where young birds were procured. This bird is readily distinguishable from *Æ. semipalmata* by its greater size and more

robust form, in having a white patch above and behind the eye, and much wider pectoral band; it will also be found that only the outer and middle toes are united by a web.

30. Strepsilas interpres, (L.) Ill.

"Telligvak," Greenlanders.

Common about Disko Bay, Greenland, and northward to 73° N. lat. at least. Breeds on the Green, Hunde, and Whale Islands in Disko Bay. They nest among the *Sterna arctica*, and it is impossible to distinguish between the eggs of the two species. Not observed in Cumberland Sound, nor on the east coast of the Penny Peninsula; still, the bird was instantly recognized by the Cumberland Eskimo, when they saw it on the Greenland coast, and they had the same name for it as the Greenlanders.

31. Recurvirostris americana, Gm.

I enter this bird on my list on Eskimo authority,—poor authority, it is true, but I have in my possession a drawing, made by a wild Eskimo, that is so unmistakably this bird that I do not hesitate to accept it, especially when he gave me a perfect description, and that without any attempt on my part to draw him out. He says he saw them for the first time in the summer of 1877, while reindeer hunting, south of Lake Kennedy.

32. Lobipes hyperboreus, (L.) Cuv.

"Shatgak," Cumberland Eskimo.

Arrives in Cumberland in June. Large flocks were repeatedly seen going to and coming from their breeding-grounds in Kingwah Fjord. Not nearly so common in Cumberland as the following species. The remarks on the habits of *P. fulicarius* as observed by me will apply to this species only in part. I have seen them as far south and farther north, and nearly as far from land, as the following species, but only a few individuals. They seem to prefer the shore more, are often noticed running about on the ice-cakes, and when they see anything in the water they want jump in after it. Breed plentifully on the islands in Disko Bay and around Upernavik; on these islands they nest among *Sterna macrura*, on the rocks; in Cumberland, around fresh-water ponds, on grassy banks. They are apparently less gregarious than *P. fulicarius*, and prefer the smaller bays to the more open and boisterous waters. I have often seen a whole flock alight on the drift-ice and feed by jumping into the water after the food when seen; but *fulicarius* would have lit *in* the water in the first place. Eggs were procured on the Green Islands in Disko Bay.

33. Phalaropus fulicarius, (L.) Bp.

"Shatgak," Cumberland Eskimo. "Whale-bird," or "Bowhead Bird," of whalemen.

These birds were met with at great distances from land. The first seen on our outward passage was on August 4, 1877, in lat. 41° N., long. 68° W.; here large flocks were met with. As we proceeded northward, their numbers increased till we reached Grinnell Bay. Off the Amitook Islands, on the Labrador coast, two hundred miles from the nearest land, I saw very large flocks during a strong gale. Hardly a day passed but some were seen, either flying about in a rapid and vigorous manner, often rising to a considerable height, and then suddenly darting off in the direction of a spouting whale, or swimming about with that grace so eminently characteristic of the phalaropes. They follow the whales, and, as soon as a whale is seen to blow, immediately start for him, as a quantity of marine animals are always brought to the surface.

Very few were seen north of Frobisher Straits, for the weather by this time had probably become too severe for them, and I think the birds seen on the passage were migrating southward. I am more inclined to think so, as the next year, in going over nearly the same route a month later, very few were seen. They arrive in Cumberland with the breaking-up of the ice, and from this time till they begin breeding are seldom seen on the shore, but cruise out in the sound. Whalemen always watch these birds while they are wheeling around high in the air in graceful and rapid circles, for they know that as soon as they sight a whale blowing they start for him, and from their elevated position they can of course discern one at a much greater distance than the men in the boat. I doubt if it be altogether the marine animals brought to the surface by the whale that they are after, for if the whale remains above the surface any length of time they always settle on his back and hunt parasites. One specimen was brought me by an Eskimo that he had killed on the back of an *Orca gladiator;* the œsophagus was fairly crammed with *Lærnodipodian crustaceans*, still alive, although the bird had been killed some hours; they looked to me like *Caprella phasma* and *Cyamus ceti.* According to the Eskimo who killed it, the birds were picking something from the whale's back. I have often seen them dart down among a school of *Delphinapterous leucas* and follow them as far as I could see. On one occasion a pair suddenly alighted astern of my boat, and were not three feet from me at times; they followed directly in the wake of the boat, and seemed so intent on picking up food that they

paid no attention whatever to us. They had probably mistaken the boat for a whale.

They are without doubt the most graceful of all birds on the water, so light and buoyant that they do not seem to touch the water. While swimming, they are continually nodding the head and turning from one side to the other. They have greater powers of flight than either *hyperboreus* or *wilsoni*, and fly much more swiftly. In Cumberland, as well as on the Greenland coast, they nest with *hyperboreus*.

Governor Fencker tells me they are not found as far north as *hyperboreus;* probably few breed above 75° N. lat. Are common on the outlying islands between Nugumeute and Hudson's Straits. About the entrance of Exeter Sound, on the east coast of Penny Peninsula, are some islands which the Eskimo call "Shatgak nuna"—Phalaropes land—so they are probably very common there.

When they begin nesting they live more on shore, and probably get their food along the beaches at low tide. There is great variation in plumage, even among the apparently adult birds, in spring. I think it quite probable that they do not attain their full plumage the first year.

34. Tringa minutilla, Vieill.

Noticed in Niantilic, September, 1877, and in Disko Fjord, Greenland, August, 1878.

35. Tringa fuscicollis, Vieill.

Breeds in Kingwah and Kingnite Fjords, and probably in other suitable localities on both shores of Cumberland Sound. Considerable numbers were observed along the beach near Nuboyant, on the west shore, in July; they were in all probability breeding. We were cruising close to shore, but I could not land.

36. Tringa maritima, Brünn.

"Sigereak," Cumberland Eskimo. "Sarbarsook," Greenlanders.

The purple sandpiper is the first wader to arrive in spring and the last to leave in autumn. The 4th of June is the earliest date I met them at Annanactook; this was during a heavy snow-storm, and the earliest date possible that they could have found any of the rocks bare at low tide. The flock lit on the top of one of the small islands in the harbor, and sheltered themselves from the storm by creeping behind and underneath ledges of rocks; they then huddled together like a flock of quails in winter. I have often noticed the same habit with them in late autumn, while they were waiting for low tide. They remained in the vicinity of Annanactook till November,—as late as they could find any exposed

shore at low tide; were very common in all the localities that I visited on Cumberland Island. Saw a good many on the Greenland coast. It is said that some remain in the fjords of South Greenland all winter.

They seem completely devoid of fear, and can almost be caught with the hands. Although such lovers of the rocky sea-shore, they nest on the borders of fresh-water lakes. Hundreds were breeding a few miles from our winter harbor, but it was impossible to reach the mainland on account of the treacherous condition of the floating ice. The specimens collected by me on Cumberland Island differ so much from the Alaskan, that I conjecture the probability of a western variety when a series can be brought together for comparison.

By the latter days of June very few were to be seen on the sea-shore, they having gone inland to breed.

They appear very sociable, and when a large flock is together they keep up a lively twitter, by no means unpleasant. As the breeding season approaches, the males have a peculiar cry, resembling somewhat that of *Actiturus bartramius*, but lower and not so prolonged. When this note is uttered they assume a very dignified strut, and often raise the wings up over the back and slowly fold them again, like the upland plover. After the breeding season commences very few are seen on the sea-shore till the young are full-grown. They are somewhat crepuscular in their habits.

37. Tringa subarquata, (Gould) Temm.

Not uncommon in North Greenland. Eggs were procured at Christianshaab, Greenland, through the kindness of Governor Edgar Fencker. Not observed on any part of Cumberland that I visited.

38. Tringa canutus, Linné.

A small flock lit on the schooner's deck in November after the harbor was frozen over. Saw none in the spring or summer. Seem to be quite common in North Greenland, but probably do not nest south of lat. 70° N.

39. Calidris arenaria, Linn.

One small flock in September, 1877, at Niantilic; no specimens were procured.

40. Limosa hudsonica, (?) (Lath.) Sw.

Two godwits were seen near Cape Edwards, on the west coast of Cumberland Sound, in September, 1877, but I could not, with certainty, ascertain the species.

41. Totanus melanoleucus, (Gm.) Vieill.

A single specimen on Arctic Island, Cumberland Sound, September 14, 1877.

42. Numenius borealis, (Forst.) Lath.

A few flocks seen passing northward up Kingwah Fjord in June. One specimen procured. Not noticed in autumn. Well known to the Cumberland Eskimo.

43. Grus ——? (probably **fraterculus**).

Quite common in some localities. Breeds in Kingwah and Kinguite Fjords in Cumberland, in Exeter Sound, and Home Bay on the west coast of Davis Straits. Common, especially during spring, at Godhavn.

44. Cygnus ——?

Swans occasionally occur in the Southern Cumberland waters; but the species is uncertain, as I could not procure a specimen. Said to be of regular occurrence in the Lake Kennedy region.

45. Anser albifrons, var. **gambeli**, (Hart.) Coues.

Not observed in any numbers about our winter harbor, but undoubtedly occurs in abundance on the fresh-water lakes. This is probably the goose that the Eskimo take in such great numbers at Lake Kennedy, where they drive them towards the sea-coast while they are in moult. Are common on the Greenland coast to 72° N. lat., and probably much farther. Large flocks were met with on the pack-ice in the middle of Davis Straits, July 24, 25, and 26. Eggs were procured in the Godhaven district in Greenland. The skin of the breast is sometimes used by the Eskimo for under-garments.

46. Anser hyperboreus, Pall.

Appears to be rare and migratory in the Cumberland waters. Saw a few specimens in early spring and late autumn.

47. Branta hutchinsii, Sw.

A single specimen procured June 10 in Kingwah Fjord. The Eskimo who killed it said he has seen many to the southward of Nugumeute. Saw no Canada geese at any time during my stay.

48. Anas boschas, Linn.

"Kaertooluk," Greenlanders.

Not observed in Cumberland, and unknown to the Eskimo. Not rare on the Greenland coast as far north as Upernavik. The flesh of this duck on the coast of Greenland is scarcely fit to eat, being almost as rank as a loon's.

49. Bucephala ——?

Flocks of whistlers were observed on three occasions in May; but I could not with certainty identify the species, as none were killed. *B. islandica* is quite common in the Godhavn district on the coast of Greenland; breeds near Christianshaab.

50. Histrionicus torquatus, (Linn.) Bp.

"Tornaniartook," Greenlanders.

Three examples seen, and one killed at Annanactook. Not uncommon in the Godhavn district on the Greenland coast.

51. Harelda glacialis, (Linn.) Leach.

"Agingak," Cumberland Eskimo. "Aglek," Greenlanders.

Arrived at the head of Cumberland during the latter days of May. As soon as there was extensive open water they became quite numerous, and their loud and incessant cries could be heard at any hour out of the twenty-four. They nest on the small rocky islands, especially about the Greater Kingwah Fjord, but singly, and not in colonies. They are gregarious when they first arrive, but soon pair and scatter. Common on the whole Greenland coast, and breed far to the north. These ducks are the noisiest birds for their size I have ever met. During the breeding plumage, scarcely any two males can be found that are precisely alike.

52. Polysticta stelleri, (Pall.) Eyton.

A beautiful adult male was shot in Disko Fjord in August, 1878. The specimen is now in the collection of Governor Edgar Fencker of Godhavn. During the time we were blockaded by the ice-jam at Annanactook Harbor, in Cumberland, I saw three or four of these eiders. At one time a superb specimen sat for hours on a cake of ice but a short distance from the ship; but I could not reach it on account of the breaking ice. I watched him a long time with a good glass, and there is no question of its identity. In late autumn I saw some that I think were of this species.

53. Somateria mollissima, (Linn.) Leach.

"Metuk," Cumberland Eskimo. "Mettek" and "Amaulik," Greenlanders.

This eider is one of the commonest birds in Cumberland, and the only species that congregates together in any considerable numbers to breed. They are at all times gregarious. The old males separate from the females and young as soon as the breeding season is over, and assemble by themselves in large flocks. They also migrate southward much

earlier than the females and young. During the autumn of 1877 we procured about seventy of these birds; but not a single adult male was shot or even seen. They were met with in large flocks at sea off the outer islands on the east coast of Hall's Land; here I also remarked that they seemed to be all males. As soon as there is any open water they are found in spring; still they were not common at Annanactook till the latter days of May. Eskimos from the south reported them on the floe edge near Niantilic early in May, and I saw a few on an iceberg near the Middliejuacktwack Islands on the 30th of April. They can stand almost any temperature if they can find open water. I saw one adult male in the tide rifts of the Greater Kingwah in January. The day I saw him it was —50° F.; but he proved too lively for me. The Eskimo could have procured him on different occasions; but they had some superstitious notion regarding so unusual an occurrence, and would not kill it.

In the fall of 1877 I often found broods still unable to fly, though more than three-fourths grown, as late as the middle of October. Small flocks continued about the open tide-holes till November 17. At this date I killed six young males; the temperature was —7° Fah. They had at this time about fifty miles to the open water.

Their food in autumn consists almost entirely of mollusks. I have taken shells from the œsophagus more than two inches in length; from a single bird I have taken out forty-three shells, varying from one-sixteenth to two inches in length. The adult birds in spring did not seem to be quite so particular; in them I found almost all the common forms of marine invertebrates, and sometimes even a few fish (*Liparis*, and the young of *Cottus scorpius*).

By the first week of June they were abundant; enormous flocks would congregate on an ice-field and hold high carnival. I have watched such gatherings with a great deal of interest. When thus assembled, some old veteran would make himself conspicuous, and jabber away at a terrible rate, often silencing the greater portion of the rest, who appeared to listen for a short time, when the entire crowd would break out, each one apparently expressing his or her opinion on the subject. There always seemed to be the best of good feeling in those meetings, however, and all points were apparently settled to every one's satisfaction. I have often lain behind a rock on their breeding-islands and watched them for a long time. On one occasion we disturbed a large colony, and the ducks all left the nests. I sent my Eskimos away to another island,

while I remained behind to see how the ducks would act when they returned. As soon as the boat was gone they began to return to their nests, both males and females. It was very amusing to see a male alight beside a nest, and with a satisfied air settle himself down on the eggs, when suddenly a female would come to the same nest and inform him that he had made a mistake,—it was not his nest. He started up, looked blankly around, discovered his mistake, and with an awkward and very ludicrous bow, accompanied with some suitable explanation, I suppose, he waddled off in search of his own home, where he found his faithful mate installed. Now followed an explanation that seemed to be hugely enjoyed by all in the vicinity. A pretty lively conversation was kept up, probably on the purport of our visit, as they seemed much excited. I could spare no more time to watch them, and crept out from my hiding-place into full view of all, and a look of greater disgust and astonishment than these birds gave me is difficult to imagine; they evidently regarded such underhand work beneath the dignity of a human being, and probably rated me worse than a gull or raven. So sudden and unexpected was my appearance that many did not leave their nests, but hissed and squaked at me like geese; these same birds left their nests before when the boat was within a quarter of a mile of the island.

The first eggs were procured June 21. The islands on which they nest are but small barren rocks, of an acre or less in extent, and often but a few feet above high tide-mark. There are a few patches of *Poa arctica* and *Cochlearia officinalis* scattered about, and these contain the greater number of nests. Each nest has a little circle of green sod about it, which is manured every year and becomes quite luxuriant. These mounds are sometimes a foot high and as much in diameter, having been used as a nest for many years in succession. Very little repairing is necessary to fit the nest for the reception of the eggs,—merely a little grass or moss. But little down is used till the full complement of eggs is laid. The nests are often so close together that it is impossible to walk without stepping on them. A nest seldom contains more than five eggs, often three or four, and I never saw as many as six but twice.

The principal breeding-places in Cumberland are between lat. 66° and 67° N. The lower of these places is about ten miles off shore from Mallukeitu; the greatest number of birds nest here. The seven islands to the northward about twenty-five miles are favorite resorts; also the small islands to the SE. of Annanactook. There is also a group known

to the Eskimo as the "Shutook" Islands, in the Greater Kingwah, where I found them extremely abundant. In the Mallukeitu Fjord, according to the Eskimo, is another very much frequented breeding-place, but I did not visit it.

Thousands of eggs could be gathered on these rocks during the latter part of June and the first three weeks of July. It seems to me that it would pay whalemen to gather the down which can here be secured in great quantities. The islands are so close together that they could all be worked within two days of each other. There are a great many immature birds, both male and female, that do not breed; they assemble in large flocks, and are often met with at considerable distances from land. I have found such flocks commonly in Cumberland, on the west coast of Davis Straits and Baffin's Bay, and on the Greenland coast abundantly. Many large flocks were seen in the middle of Davis Straits, among the pack-ice, in the latter part of July. During the first days of August I saw immense flocks of eiders on the western end of Disko Island, all males, flying southward. The specimens collected by me in Cumberland present certain striking and remarkable points of difference from specimens from the South Labrador and Newfoundland coasts, especially in the form and size of bill. I had prepared a series of skulls, selected from over two hundred birds, that was calculated to show the variation among them; but, unfortunately, they were among the specimens that I had to leave behind, in the unnecessary haste of our departure, of which I was given but a few hours' warning.

These ducks are of great use to the Eskimo; their eggs are eagerly sought after and devoured in astonishing quantities. The birds themselves constitute a good portion of their food at certain times, and the skins are used for a portion of their foot-gear in winter, and sometimes for clothing. We found the flesh of the young in autumn very acceptable indeed; but the adults in spring were rather rank. Some specimens were procured that weighed over five pounds. They become extremely fat by the end of June; and when an Eskimo can get a number, he will eat little else but the fat. I was often saved much labor by having them remove the fat from the skins, which they did with their teeth, and much more effectually than I could have done it with a knife. These birds suffer much from the depredations of gulls and ravens. *Larus glaucus* even nests among the ducks, and the ravens live off the eggs and ducklings the entire season.

54. Somateria spectabilis, (L.) Boie.

"Kingalalik," Cumberland Eskimo. "Siorakitsook" and "Kingalik," Greenlanders.

The king eiders were not noticed till the 20th of June. I saw a few large flocks at different times during spring; but there were a hundred *mollissima* to one *spectabilis*. They appear to keep by themselves, and not to mix with *mollissima*, at least during the breeding season. I never saw any on the eider islands. The Eskimo say that some years they are very plenty and others very few are found. One Eskimo told me that he once found them nesting in great numbers some distance up the Greater Kingwah, but not in company with the common eider. They arrive later and leave earlier than *mollissima*. In July I saw many of these ducks, males and females, about America Harbor. The sexual organs of those I procured were not developed, and they were all in the plumage of the female. I suspected them to be such birds as were thached very late the preceding season. Saw a great many in the same plumage on the west coast of Davis Straits and around Disko Island; many of the males seemed to be assuming the plumage of the adult. Governor Fencker told me that there were always a good number of these birds around in summer that did not breed. Many flocks of male birds were noticed west of Disko, all flying southward. Governor Fencker has procured identified eggs of this duck at Upernavik by shooting the parent on the nest. They are very common around Disko, but breed farther north. I shot a half-grown young in Kingwah Fjord in October, 1877. The lump of fat at the base of the bill of the adult males is esteemed a great delicacy with the Eskimo, and it is very seldom they bring one back that does not have this choice tit-bit removed.

55. Œdemia ——?

From the Middle Labrador coast north to lat. 67°, I saw at different times large scoters, but could not identify the species.

I will here make mention of a duck that I saw on two or three occasions. It seemed to have the size and general make-up of a scoter, but had much white on the scapulars and about the head. A duck was winged by one of the ship's officers; he said it had a white ring around the neck and the rest of the body was nearly all black. The bird that I saw was unknown to me; it may possibly have been the *Camptolæmus labradorius*. I find in my notes that the first one I saw was pronounced a partially albino scoter; but, seeing more just like it, I gave this theory up.

56. Mergus serrator, Linné.

"Pye," or "Pajk," Cumberland Eskimo and Greenlanders.

A regular breeder in Cumberland, but not very common. Nests on the perpendicular faces of high cliffs. Found on the Greenland coast to 73° N. lat. at least, and probably farther. Begins nesting in Cumberland about July 1.

57. Sula bassana, Briss.

Noticed at different times from Beaver Island, Nova Scotia, to lat. 65° N., most numerously in the Gulf of St. Lawrence and the South Labrador coast. Not observed in Cumberland.

58. Graculus carbo, Linné.

"Okaitsok," Cumberland Eskimo and Greenlanders.

A regular breeder in Cumberland; did not appear to be common, but the Eskimo say that some years they are quite plenty. The primaries were formerly in great demand for their arrows.

59. Buphagus skua, (Brünn.) Coues.

"Sea-hen" of whalemen.

One specimen procured at sea, lat. 41° N., long. 68° W., Atlantic Ocean. Others were seen at the time. Appears to be of frequent occurrence on the George's, Newfoundland, and Nova Scotian banks in winter. Seen near Lady Franklin Island, north of Hudson's Straits, in September; they then had young ones on the rocks.

60. Stercorarius pomatorhinus, (Temm.) Vieill.

"Ishungak," Cumberland Eskimo and Greenlanders.

These birds were first observed at Bonne Bay, Newfoundland, August 16. From this point northward to 71° N. they were common at nearly all points, and from Belle Isle to Hudson's Straits they were abundant. They nest about Nugumeute and Grinnell Bay, but not in Cumberland Sound. On the western shore of Davis Straits they are common, and nest at the mouth of Exeter Sound and at Shaumeer. I have, however, nowhere found them so very common as on the southern shores of Disko Island; at Laxbught and Fortuna Bay there must have been many hundred pairs nesting. Their breeding-place was an inaccessible cliff, about half a mile from the seashore. The greater number of the birds nesting here were in the plumage described in Dr. Coues's monograph of the Laridæ as the *nearly* adult plumage; but there were also a good many birds that were unicolored blackish brown all over, *but with the long vertically twisted tail-feathers.* That these were breeding I think there can be no doubt, as I saw them carrying food up to

the ledges on the cliff, for the young I suppose. They were very shy at Disko, and the greatest caution was required to shoot them. I shot none, even in full plumage, that did not have some white on at least one of the tarsi. They live to a great extent upon the labors of the kittiwake, though they do not hesitate to attack *Larus leucopterus* and even *glaucus*. They are destructive to young birds and eggs. It is a common sight to see five or six after one gull, which is soon made to disgorge, and then the jaegers fight among themselves for the morsel, which often gets lost in the *mêlée*. Eggs were procured at Claushavn, Greenland; the nest contained three eggs.

61. Stercorarius parasiticus, Brünn.

"Ishungak," Cumberland Eskimo and Greenlanders.

This species seems to have the same general distribution as the foregoing, but, so far as my observations went, far from as common. Eggs were obtained from the Waigat Straits. They do not breed in Cumberland Sound; in fact, I rarely saw one in the Cumberland waters. This species seems to depend on *Rissa tridactyla* for the greater part of its food.

62. Stercorarius buffoni, (Boie) Coues.

"Ishungak," Cumberland Eskimo and Greenlanders.

A very few of these birds visited the upper Cumberland waters in June, and soon disappeared. I doubt if they breed there. I saw but very few in all the localities I visited. Seems to be more common on the east than on the west coast of Davis Straits. One fine specimen was found dead on the ice, with a *wrought-iron nail* three inches in length in the œsophagus. The nail had probably fallen out of a whale-boat that had been dragged over the ice, and the bird had mistaken it for a fish. This species has probably the most northerly range of any of the jaegers. Breeds in the Waigat Straits and about Omenak on the Greenland coast. Said by the Eskimo to be the first to return in the spring. They certainly were the first to visit Annanactook.

63. Larus glaucus, Brünn.

"Nowgah," Cumberland Eskimo. "Naga," Greenlanders.

This gull is the first bird to arrive in spring. In 1878 they made their appearance in the Kingwah Fjord by the 20th of April. It was still about seventy miles to the floe edge and open water; still they seemed to fare very well on the young seals. Many are caught by them, and those partially devoured by foxes are carefully cleaned of every vestige of flesh. At this season, the Eskimo delight in capturing them in various ways. One of the most popular is to build a small snow-hut on the ice in a locality

frequented by the gulls. Some blubber or scraps of meat are exposed to view on the top, and seldom fails to induce the bird to alight on the roof of the structure. This is so thin that the Eskimo on the inside can readily see the bird through the snow, and with a quick grab will break through the snow and catch the bird by the legs. Some use a spear, thrusting it violently through the roof of the hut. Many are killed by exposing pieces of blubber among the hummocky ice and lying concealed within proper distance for bow and arrow practice.

By the middle of May they had become very abundant about Annanactook; still, there was no open water within fifty or sixty miles. These were all adults in full plumage; saw no immature birds till July. They settle on ice around the Eskimo encampments, and even on the rocks in close proximity to the huts. During this season they keep up an almost constant screaming at all hours of the day and night.

May 24, I noticed a couple of pairs building. I think this is the earliest date they would begin nidification at this latitude. June 4, I saw a few *L. glaucus* among a large flock of *Som. mollissima* that were diving for food outside the harbor in a small lead in the ice. As soon as the duck came to the surface, the gull attacked it till it disgorged something, which was immediately gobbled up by the gull. The gull picked several times at what was disgorged, which leads me to the belief that the food was small crustaceans. This piratical mode of living is very characteristic of *Larus glaucus*. At this season of the year there was so little open water in the vicinity that they would have had great difficulty in procuring any food therefrom themselves. I have taken the eggs by June 8, when there was more than a foot of newly fallen snow on the rocks; but the greater number do not nest within two weeks of this time.

A great many of these birds nest in Cumberland on what the Eskimo call "Nawyah nuna"—land of the Glaucous Gulls. This is an enormous cliff about one and one-half miles in length and over 2,000 feet in height, and nearly perpendicular. This cliff is about four miles from the seashore to the ENE. of America Harbor. Many hundreds of nests are scattered about on the little projecting shelves of rock, and the birds sitting on them look like little bunches of snow still unmelted on the cliff. The ascent to this locality is very laborious; but the marvelous beauty of the place will well repay any future explorer to visit it, for the plants that grow in such rich profusion at the base of the cliff, if nothing more.

This is the most common gull in Cumberland during the breeding season. I did not see any south of Resolution Island in September and

in October, but a very few as far south as the Kikkertarsoak Islands on the Labrador coast. They are far less common on the Greenland coast than *L. leucopterus*, while in Cumberland it is just the opposite. Eskimo from Cape Mercy tell me they are found all winter off the cape and about Shaumeer. A single specimen staid in the tide-rifts of the Greater Kingwah during the winter of 1877–78. In autumn they remain in the upper Cumberland waters as long as they continue open.

I have examined some nests that were built on the duck islands, always on the highest eminence; the structure seemed to have been used and added to for many years in succession, probably by the same pair. In shape they were pyramid-formed mounds, over four feet at the base and about one foot at the top, and nearly two and a half feet in height. They were composed of every conceivable object found in the vicinity, grass, sea-weed, moss, lichens, feathers, bones, skin, egg-shells, &c. The normal number of eggs is three, but often only two are found. Have taken the downy young in the latter part of June. I had an opportunity of seeing how these young hopefuls are instructed in egg-sucking. The parent carried a duck's egg to the nest and broke a hole in it, and the young one just helped himself at his leisure. After the young are full-fledged, these birds are eminently gregarious, and are often seen feeding in considerable flocks. The flesh is highly esteemed by the Eskimo; we found the young by no means despicable food.

The Eskimo use the skin with the feathers on for a part of their winter's foot-gear. They are extraordinarily greedy and voracious; nothing in the animal kingdom seems to come amiss to them. I have seen a half dozen tugging at an Eskimo dog skin; but this proved too much for them, though they made desperate attempts to get off some small pieces, which they would have eaten had they succeeded. Eggs, young or disabled birds, fish, and crustaceans are their common fare. They are also very fond of feeding upon seal carcasses. The first plumage of the young is much lighter than that of a yearling bird. This is just the opposite of *L. leucopterus*, they being the darkest when young. The young of *L. glaucus* gets darker in autumn, but when first fully fledged resembles more the bird of two years, except that there is no trace of blue on the mantle, and they have somewhat darker primaries.

64. Larus leucopterus, Faber.

"Nowyah," Cumberland Eskimo. "Nayangoak," Greenlanders.

The Eskimo do not distinguish between *L. glaucus*, *leucopterus*, *glaucescens*, and *argentatus;* they are all "nowyah"; in fact, I am led to

think it a sort of general term as they use it,—something like "gull." This species is far less common in Cumberland than *glaucus*. On the Greenland coast it is the most common gull, except *Rissa tridactyla*. My opportunities for studying *leucopterus* were not very extensive, and my conclusions may be too hasty; but still it is worth while for others that may get better opportunities, to observe if the following points of difference are constant:

First. *Leucopterus*, 24 inches or less; *glaucus*, 27 to 32 inches.

Second. Tarsus and toes of *leucopterus* in fully adult birds often *orange-red*, and not flesh-colored as in *glaucus*.

Third. Ring around the eye in *leucopterus* flesh-colored; in *glaucus*, reddish purple.

Fourth. Young of *glaucus* in first plumage as light as the bird of the second year; the young of *leucopterus* nearly as dark as the young of *glaucescens*. The bill is also weaker and thinner than in *glaucus*.

Governor Fencker says he has often had birds that answered nearly to the description of *L. hutchinsii*, but with chrome-yellow bill, with vermillion spot, and not flesh-colored, with dusky tip; these birds were always found to measure *less*, however, than the average *glaucus*, which is directly the opposite of my experience with *hutchinsii*. There may be a gradation between the two species as far as regards size; but the above cited points of difference have proved good so far as my observations have gone. They mix indiscriminately with *glaucus* at all times, but are always readily distinguishable by their smaller size. Eggs were procured at Claushavn, Greenland, which are indistinguishable from those of *glaucus* except in size. A fine specimen, a full-fledged young, was secured on the Hunde Islands, Disko Bay, that had *four feet*, the second pair growing out of the knee-joint in front.

65. **Larus glaucescens**, Licht.

"Nowyah," Cumberland Eskimo.

So far as I am aware this is the first instance on record of this bird being taken on the Atlantic coast. They are quite common in the upper Cumberland waters, where they breed. Arrived with the opening of the water and soon began nesting. The nest was placed on the shelving rocks on high cliffs. Two pairs nested very near our harbor; but the ravens tore the nest down and destroyed the eggs. Only a single well-identified egg was secured. This gull is unknown to Governor Fencker on the Greenland coast. They remained about the harbor a great deal, and were often observed making away with such scraps as

the cook had thrown overboard; were shy and difficult to shoot. Full-grown young of this species were shot in the first days of September; these were even darker than the young of *L. argentatus*, the primaries and tail being *very nearly black*.

66. Larus marinus, Linn.

"Nayardluk," Greenlanders.

Observed in Cumberland only in late autumn; cannot ascertain that they breed there; quite common on the Greenland coast form 63° to 70° N. lat. Abundant in October on the South Labrador coast and Newfoundland. Hundreds daily frequent St. John's Harbor, Newfoundland.

67. Larus argentatus, Brünn.

"Nowyah," Cumberland Eskimo.

Not uncommon in Cumberland, and breeds to lat. 67° N. A mere straggler on the Greenland coast. Specimen shot June 20 in Cumberland contained ova as large as buckshot.

68. Pagophila eburnea, Gm.

"Nayauarsuk," Greenlanders.

Very common in Kingwah Fjord and vicinity just before it froze up, for a few days only. None seen in spring. Does not breed in Cumberland. By no means common on the Greenland coast. The food of those I examined consisted of small crustaceans. I saw one trying to swallow the *wing* of a *Som. mollissima* that the cook had thrown overboard, when I shot it. The wing was so lodged in the œsophagus that it would certainly have choked the bird had it not disgorged. Those that visited our neighborhood seemed to have a very decided preference for meat. I once saw three or four alight on a seal that had just been killed, and attempt to get at the flesh. They are easily decoyed within shot by strewing pieces of meat on the ice. Were one of the most abundant and greedy birds around a whale carcass that had been killed in the vicinity. The specimens I procured that were nearly in adult plumage had a greenish yellow bill at base and bright yellow tip, with *no dusky markings;* the younger birds only had the bill clouded with dusky. There appears to be a marked difference in the size of the sexes, the female being one to two inches shorter than the male.

69. Rissa tridactyla, Linn.

"Nowaváh" (Little Nowyah), Cumberland Eskimo. "Tattarat," or "Tatarak," Greenlanders and Eskimo about Frobisher Straits.

The kittiwake was first noticed in the Straits of Belle Isle, on our outward passage, the 18th of August, 1877. From this point northward

they were with us constantly, if we were near land or far out at sea, in storm or calm, fog or snow; no day—scarcely an hour—but some of these interesting birds were our companions; often a few individuals only, at other times flocks of many hundreds or even perhaps thousands on the islands of the north Labrador coast. In Cumberland they are by far the most common gull, and in fact the most abundant species in fall, but so far as I could learn do not breed there. From September till the ice covered the water they were extraordinarily abundant, congregating in immense flocks. When the tide runs strong they follow the stream for many miles in regular order, about half their number constantly dipping into the water, while the rest fly on ahead a few feet; while thus feeding they remind one of a flock of passenger-pigeons feeding in a grain-field. The food obtained at such a time is mostly small crustaceans.

When a good feeding-place is found, the whole flock settles down, and so close together that almost any number can be shot. The jaegers are always on the alert for such flocks, and when they get near the gulls, they all foolishly take wing, when the jaeger singles out a likely looking subject, which is soon made to disgorge. The flock soon settles again, and the same manœuvre is repeated.

I did not see a single kittiwake in the upper Cumberland waters during spring or summer, where there were thousands the previous autumn. A very few immature birds were noticed on an iceberg, July 18, near Cape Mercy; but these were all I saw till nearing the Greenland coast, where they are more common still. The flesh is highly esteemed by the Danes resident on the Greenland coast; in fact, they form no inconsiderable portion of their meat supply during the latter part of July and August and September. We found the flesh of the young quite acceptable.

A few young birds were observed along the east coast of the Penny Peninsula as far as Exeter Sound, and in the pack-ice an occasional specimen was seen; but when nearing the coast of Disko their numbers increased to thousands. They followed the schooner constantly from this point till we got to the southern shores of Newfoundland, where few were seen.

Among the specimens collected by me were some that had scarcely any hallux, while in others it was as well developed as in any gull, and having a perfect nail. There is also every gradation between the two.

I saw a gull a little larger than *tridactyla*, in Godhavn Harbor, one day; it had a black head. The same afternoon Governor Fencker saw

it in front of one of the Eskimo huts, feeding from a pile of garbage; he also failed to secure it. The bird looked to me like an adult *L. franklini*, a bird not hitherto taken up as belonging to the Greenland fauna.

70. Xema sabinii, (Sab.) Leach.

On the 6th of October, 1877, on the passage from the Kikkerton Islands northward, a pair of these birds kept close to the stern of the schooner for many miles. I could easily have shot them, but it would have been impossible to procure them had I done so. Saw no others at any time.

71. Sterna macrura, Naum.

"Emukitilak," Cumberland Eskimo and Greenlanders.

On the 19th and 20th of June there were thousands of these birds about Annanactook Harbor, but this was also the only time I saw any. The Eskimo say they breed on the Seven Islands in Cumberland some years. They were first noticed in the Gulf of Saint Lawrence in August. From this point they seemed more or less common along the entire Labrador coast and the islands north of Hudson's Straits, but not in Cumberland. On the Greenland coast they are abundant, in suitable localities, to lat. 73° N. In Disko Bay they are very common, and breed by thousands. They begin migrating southward during the latter days of August, when the young are large enough to take care of themselves. Appeared to be plenty at the mouth of Exeter Sound, where "kaplin" are very abundant.

72. Fulmarus glacialis, Leach.

"Oohudluk," Cumberland Eskimo. "Kakordluk" (white) and "Igahsook" (dark), Greenlanders.

On our outward passage these birds were first noticed off Belle Isle, August 20. From this point northward their numbers increased; they were everywhere close in shore and far out at sea, at all times and in all weather. Nearly all the Fulmars I saw in the autumn of 1877 were light-colored; saw none so dark as I did in the spring. They were very common in Cumberland till the middle of October. Were especially abundant off shore, Cape Chidly, Resolution Island, Grinnell Bay, and Frobisher Straits, during the latter part of August, September, and fore part of October. These were white with a pearly grey mantle and bright yellow bill. I also procured a few that were ashy; these I presumed were young birds; but in July, 1878, I found a few of these dark-colored ones, darker than any I ever saw in fall, breeding near Quickstep Harbor,

in Cumberland, on some small rocky islands. When fresh these dark-colored birds have a *bright olive-green gloss*, especially apparent on the neck and back. The bill is shorter, stouter, and thicker, dusky brown instead of yellow. On Blue Mountain, Ovifak, Greenland, these birds breed by myriads to the very summit of the mountain, about 2,000 feet. Here I could see *but few dark* birds; even the full-fledged nestlings were white.

In Exeter Sound and to the northward along the west shores of Davis Straits and Baffin's Bay, the dark variety seems to predominate. Near Cape Searle they are extraordinarily abundant, breeding by thousands on the Padlie Island, and they are so tame about their nesting-places that they can be killed with a stick. The eggs, even after being blown, for many months still retain the musky odor peculiar to the birds. Perfectly fresh eggs are quite good eating, but if a couple of days old the musky odor has so permeated them, even the albumen, that they are a little too much for a civilized palate.

So far as my observations went, more dark birds were seen in spring than in fall, so the dark plumage cannot be characteristic of the young.

The mollimoke is one of the greediest of birds. I have seen them feeding on the carcass of a whale, when their looks and actions were perfectly those of a vulture,—completely begrimed with blood and grease, and so full that they could not take wing. I found great difficulty in procuring white specimens that were not more or less daubed over with "gurry," especially about the head and neck. These birds possess extraordinary powers of flight, and are marvelously graceful on the wing, rising with the billow and again settling into the trough of the sea without any apparent motion of the wings.

73. **Cymochorea leucorrhoa**, Coues.

Noticed sparingly about Cape Mercy and Exeter Sound. Two specimens seen in Disko Fjord in August, when they were probably nesting. Far less common on the passage southward than the following.

74. **Oceanites oceanica**, Keys.

Traced as far north as Resolution Island on our outward passage; on the homeward, first seen about one hundred miles south of Cape Farewell.

75. **Puffinus kuhli**, (Briss.) Boie.

Common from Belle Isle to Grinnell Bay. Not observed in Cumberland, on the Greenland coast.

76. Puffinus major, (Briss.) Faber.

Abundant from Belle Isle to Resolution Island. Not observed in Cumberland.

77. Colymbus torquatus, Linn.

"Toodlik," Cumberland Eskimo and Greenlanders.

Quite common in Cumberland, where it breeds. Saw no specimens that approached the variety *adamsi*.

78. Colymbus arcticus, Linn.

"Codlulik," Cumberland Eskimo.

Not common, but breeds in Kingwah Fjord. First specimen shot June 24. Saw a few in autumn near Grinnell Bay. Not found in North Greenland according to Governor Fencker.

79. Colymbus septentrionalis, Linn.

"Kuksuk," Cumberland Eskimo. "Karksauk," Greenlanders.

Very common in all the localities visited by me. Begins nesting in the upper Cumberland waters in the latter part of June. The nest is placed on the low rocks with very little grass and moss beneath the eggs. They are very noisy, especially during the mating season. Do not leave as long as there is open water.

80. Utamania torda, Leach.

"Akparnak," Greenlanders.

Was seen on many occasions and often in close proximity to the ship from the outer islands of the Middle Labrador coast to Frobisher Straits. They were often noticed considerable distances from land. Are not found in Cumberland, but by no means rare on the entire west coast of Greenland to latitude 69° N. Off the North Labrador coast I noticed on several occasions a small auk (?) intermediate in size between *Mergulus alle* and *Uria grylle*, with much the same pattern of coloration as the former, but with tufts or plumes of white feathers on the head. I saw some with single young, and at one time killed three at a single discharge; but the ship was under such headway that the sailor stationed on the waist could not reach them with his pole and net. The bird is entirely unknown to me, but I suspect it will be found to be one of the small auks hitherto supposed to belong only to the North Pacific.

81. Fratercula arctica, (L.) Ill.

"Killaugak," Greenlanders.

Observed abundantly in the Gulf of St. Lawrence, and thence northward to Hudson's Straits. Not known to the Cumberland Eskimo; but common on the Greenland coast to 70° N. at least. Breeds plenti-

fully on the Hunde and Green Islands in Disko Bay, where eggs were procured. There seems to be no appreciable difference in Gulf of St. Lawrence specimens and those from North Greenland except in size.

82. Mergulus alle, L.

"Kaerrak," Greenlanders.

Common on the north coast of Labrador, off Resolution Island, Grinnell Bay, and Frobisher Straits, but did not see any in Cumberland. I showed specimens to the Eskimo, and they called it a young "akpa" (*Lomvia arra*). So I presume the bird is very rare, if found at all, in the Cumberland waters. Still they are abundant off Exeter Sound and to the northward on the west coast of Baffin's Bay. Governor Fencker says they nest to latitude 78° N., and perhaps farther. Nest abundantly on the Whale Islands in Disko Bay. I procured young off Resolution Island in the fore part of September. They were very common among the pack-ice in Davis Straits during July. Often a considerable number would be seen sitting on the ice. They seem devoid of fear. I have caught them from the schooner's deck with a net on the end of a pole while they were swimming alongside.

83. Uria grylle, (L.) Lath.

"Pesholak," Cumberland Eskimo. "Serbek," or "Sergvak," Greenlanders.

Was first observed off Resolution Island in the first days of September, 1877. They were then busily engaged fishing and carrying the fish up the cliffs to the young, which were not yet in the water. They are most expert divers and are often seen fishing where there is a considerable depth of water. I once shot an adult female that was carrying a little *Morrhua* 7 inches in length up to her young. This was on the 19th of September, and the young were not more than three-fourths grown at this date. I visited no locality either on Cumberland or on the Greenland coast where this bird was not abundant. Some sections are of course more suitable than others, and here they are very numerous. They began to change into the winter plumage in the latter part of September. Some of the earlier-hatched young were much earlier than this, but the adults were not in perfect winter dress till the middle of October. They remained about our winter harbor as long as there was open water, and even one or two staid in the Kingwah rifts all winter. In spring they returned as soon as there was open water. About the Southern Cumberland waters some remain all winter,—the Eskimo say only the young birds. At Annanactook Harbor they began nesting about June 25. The normal number of eggs is two; very rarely

three are found. Always nest in crevices and fissures of cliffs, where it is often extremely difficult to get at them. They are very tame; but it is next to an impossibility to shoot one on the water if the bird is watching you, for they dive quite as quickly as a loon. I have seen three entirely black specimens, which I considered to be *U. carbo*. One was procured in Cumberland, but was lost, with many others, after we arrived in the United States. I have examined specimens of *carbo* since in the Smithsonian collection, and my bird was nothing but a melanistic specimen of *U. grylle*. I also have seen an albino specimen.

There were a few birds in an air-hole in the ice near our harbor in the latter days of June that to all appearance resembled the autumn plumage of the young; but the ice was too treacherous for me to venture out, so I sent an Eskimo. He returned and reported them "Kanitucalo pechulak" (very near a Guillemot). But if he meant that they were in imperfect plumage or another species closely resembling *grylle*, I could not make out. He could not get close enough to the air-hole to procure the specimen he killed, and I never saw or heard anything more of them.

84. Lomvia arra, Brandt.

"Akpa," Cumberland Eskimo and Greenlanders.

I had hoped to be able to throw some light on the subject of the relationship of the Murres, but I find my material corresponds with my opportunities for observation—very poor and unsatisfactory. I first met these birds in numbers off the coast of Resolution Island, but many were seen farther south. About Grinnell Bay and Frobisher Straits they are common even as far as the mouth of Cumberland, but apparently quite rare in the waters of that sound The Eskimo say they formerly bred in great numbers on the Kikkerton Islands; but they have now apparently abandoned them. There are large breeding-places about Cape Mercy and Walsingham, the largest "rookery" being on the Padlie Islands in Exeter Sound. On the Greenland coast they are very abundant, breeding by thousands in many localities. Observed plentifully in the pack-ice in July. All the specimens collected by me were typical *arra*. I procured but one single *troile*. The var. *ringvia*, Brünn., Governor Fencker has not met during eleven years' collecting on the Greenland coast; and var. *troile* appears to be far from common. There is a remarkable variation in the distribution of the dark color, some being white on the throat quite to the bill, and again I have seen specimens entirely black. The dark markings on the eggs of *L. arra* and *troile*, as well as *A. torda*, can readily be obliterated with luke-warm water.

FISHES

COLLECTED IN CUMBERLAND GULF AND DISKO BAY.

By Tarleton H. Bean.

The collection of fishes made by Mr. Kumlien embraces ten species, as follows:

1. *Boreogadus saida.*
2. *Gadus ogac.*
3. *Gymnelis viridis.*
4. *Liparis vulgaris.*
5. *Cyclopterus lumpus.*
6. *Cottus scorpius.*
7. *Cottus scorpius* sub-species *grönlandicus.*
8. *Cottus scorpioides.*
9. *Gymnacanthus pistilliger.*
10. *Gasterosteus pungitius* sub-species *brachypoda.*

With these I have combined several species collected by Lieut. W. A. Mintzer, U. S. N., in Cumberland Gulf in 1876, the two following being additions to Mr. Kumlien's list:

11. *Lycodus mucosus.*
12. *Salvelinus Naresi.*

Besides giving a report upon these twelve species recently obtained by the United States National Museum, I have made a list of the species recorded from Northeastern North America, which is by no means complete, but is as nearly so as the limited time allowed me for searching would permit. Of course there are many Greenland species which we may be sure are found also on our northeastern coast, but we have as yet no positive evidence of their occurrence.

The additions to our collections and to our knowledge of the species made by Mr. Kumlien are by far the most important contributions from the region in question hitherto received by the museum, and that excellent naturalist deserves hearty acknowledgments for the valuable material which he has secured in the face of great obstacles. Two of the species taken by him have not before been recorded from the northeast

coast—*Cottus scorpius* and *Gasterosteus pungitius* sub-species *brachypoda*. Many of the others are extremely rare in collections.

Lieutenant Mintzer's collection also, though small in the number of species, is rich in interest, and has greatly extended our acquaintance with some of the rarest of northern forms.

Family, PLEURONECTIDÆ.

1. Pleuronectes Franklinii Günther.

Pleuronectes Franklinii Günth., Cat. Fish. Brit. Mus., iv, 1862, p. 442.
Pleuronectes (Rhombus) glacialis Rich., F. B. A., iii, 1836, p. 258.
Platessa glacialis Rich., Voy. Herald, Fishes, 1854, p. 166, pl. xxxii.

Richardson records the species from Bathurst's Inlet (67° 40′ N., 109° W.); Dr. Günther has Arctic American specimens from Dr. Rae and the Haslar collection. Judging from the descriptions given by Richardson and Günther, *Pleuronectes Franklinii* is very closely related to *P. glaber* (Storer) Gill.

2. Hippoglossus vulgaris Fleming.

Halibut Kumlien, in lit. Feb. 16, 1879.

Mr. Kumlien writes me, that "in February a large halibut was caught in a seal breathing-hole by an Eskimo, but it was something entirely unknown to them."

It may be that this was not *Hippoglossus vulgaris*, but *Platysomatichthys hippoglossoides* (=*Reinhardtius hippoglossoides* (Walb.) Gill).

Family, GADIDÆ.

3. Boreogadus saida (Lepech.) Bean.

Gadus fabricii Rich., Faun. Bor. Amer., 1836, p. 245: Günther, Cat. Fishes Brit. Mus., iv, 1862, p. 336.
Boreogadus polaris Gill, Cat. Fishes E. Coast N. A., 1873, p. 17.

21746. (310.) Annanactook, Cumberland Gulf, A. L. Kumlien. D. 14, 18, 18. A. 21, 19. P. 17. V. 6. Length 250 millimetres.

The inequality of the caudal lobes mentioned by Gill* is evident in this example; the length of the upper lobe, measured from the origin of the middle caudal rays, is 31 millimetres, of the lower lobe 27. The outline of the lower lobe is decidedly convex below. The middle caudal rays, instead of pursuing the horizontal of the median line of the body, are slightly raised, giving the fin a peculiar shape, which may perhaps be due to outside circumstances, or may be characteristic of the adult.

* Proc. Acad. Nat. Sci. Phila. 1863, p. 233.

The inequality of the lobes and the singular shape are not present in the smaller individuals referred to below.

Mr. Kumlien sent the following notes of color: "Brassy red; belly white; eye red. Fins dark purple brown." A sketch of this specimen by Mr. Kumlien has the caudal lobes equal.

21747. (481.) Kingwah Fjord, Cumberland Gulf, A. L. Kumlien. D. 13, —, 20. A. 16, 21. V. 6. Length 180 millimetres.

"Found on a seal-hole. Iris silvery white. Fins dark purple brown. Belly and lower parts silvery. Back brassy olive brown."—*Kumlien.*

21748. (857.) Head of Cumberland Gulf, A. L. Kumlien. D. 13, 16, 20. A. 19, 21. P. 19. V. 6. Length 160 millimetres.

"Dark brassy red, becoming blue-black on head. Silvery white on belly. Pectorals white. All the rest of the fins dark purple-blue."—*Kumlien.*

21753. (369.) Cumberland Gulf, Jan. 2, 1878, A. L. Kumlien. Length 112 millim.

"The principal food of *Pagomys fœtidus* at this season."—*Kumlien.*

I have followed the lead of Malmgren* and Collett† in employing the name *Gadus saida* Lepech. Professor Collett has made a direct comparison of examples of this form of cod from Archangel, Greenland, Spitzbergen, and Nova Zembla, and he believes the *polaris* of Sabine, 1824, *Fabricii* of Richardson, 1836, and *agilis* of Reinhardt, 1838, to be identical with *G. saida*. The only difference that he observed is that individuals from the White Sea have, as a rule, darker fins than the rest, which he justly attributes to a difference in the surroundings of the bottom in the different places. They agree in squamation, structure of the teeth, position of the anus, and in every particular of the structure of the body so completely that they cannot possibly be separated.‡

4. Pollachius carbonarius (Linn.) Bon.

Merlangus carbonarius RICH., Last of the Arctic Voyages, 1855, p. 375.

Richardson records the species from Davis Strait.

5. Gadus morrhua Linn.

Gadus morrhua RICH., F. B. A., iii, 1836, p. 243.

Richardson states that Davis observed many cod in the possession of the Eskimo who live between Cape Raleigh and Cumberland Strait.

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*Öfv. Kgl. Vet. Akad. Förh. 1864, p. 531.

†Christiania Vid. Selsk. Förh. No. 14, 1878, (p. 80).

‡Men iövrigt stemme de i Skjælbeklædning, Tandbygning, Stillingen af Anus og i ethvert Punkt af deres Legemsbygning saa fuldkommen overens, at nogen Adskillelse mellem den ikke er mulig.—*Collett, l. c.*

6. Gadus ogac Rich.

Gadus ogac RICH., Faun. Bor. Amer., iii, 1836, p. 246.
Gadus ovak RHDT., Vid. Selsk. Naturvid. og Math. Afh., deel vii, 1838.
Gadus ogat KRÖYER, Voy. en Scand., &c., pl. xix.

21723. (1417.) ♂ Godthaab, Greenland, August 11, 1878. D. 13, 19, 22. A. 22, 21. V. 6. Length of specimen 330 millimetres.

A black spot on the second dorsal, $\frac{2}{3}$ as long as the eye, between the thirteenth and fifteenth rays.

21724. (1418.) ♀ Godthaab, Greenland, August 11, 1878. D. 14, 18, 20. A. 20, 18. V. 6. Length of specimen 359 millimetres.

The lateral line shows an interruption, measuring 22 millimetres on the left side, the right being normal. The first portion of the lateral line ends at the vertical through the interspace between the first and second dorsals; the second portion begins at the vertical let fall from the sixth ray of the second dorsal.

21725. (1419.) ♀ Godthaab, Greenland, August 11, 1878. D. 14, 17, 18. A. 19, 20. V. 6. Length of specimen 300 millimetres.

Richardson records this species at Cape Isabella, Peninsula of Boothia.

Gadus ogac Rich., may be only a variety of *G. morrhua* Linn., as claimed by Dr. Günther; but after examining many specimens of the latter species and comparing them with Mr. Kumlien's examples, I prefer to consider these distinct from *G. morrhua* and identical with Richardson's species. It may be that a larger series would lead me to the same conclusion reached by Dr. Günther. I have studied all the common cod in the United States National Museum, a very large series, recently increased by the addition of a monster weighing 100 pounds, and find that *Gadus ogac* is distinguished from *G. morrhua* by several important characters, among which are (1) a more slender caudal peduncle; (2) a longer barbel; (3) a larger eye; (4) a greater distance between the eyes; (5) a longer pectoral; and (6) the more advanced position of the ventrals. These differences may be seen in the tables of measurements, in which are given the proportions of parts of the body in hundredths of the total length without the caudal.

The general color of Mr. Kumlien's specimens is very dark brown, and the sides are marbled with white.

Table of Measurements.

Species, *Gadus ogac* Rich.

Current number of specimen	21,723.		21,724.		21,725.	
Locality	Greenland.		Greenland.		Greenland.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length (without caudal)	305	.....	330	.....	275	.....
Length to end of middle caudal rays	330	.....	359	.....	300	.....
Body:						
Least height of tail	.....	5	.....	5	.....	5½
Head:						
Greatest length	.....	27½	.....	30	.....	30
Width of interorbital area	.....	9	.....	9	.....	9
Length of snout	.....	9	.....	10	.....	.....
Length of barbel	.....	6	.....	6½	.....	6½
Length of maxillary	.....	12	.....	13	.....	13
Length of mandible	.....	15	.....	15½	.....	16
Diameter of orbit	.....	6	.....	6	.....	6½
Dorsal (first):						
Length of longest ray	.....	14½	.....	16	.....	14
Pectoral:						
Length	.....	16	.....	17	.....	17½
Ventral:						
Distance from snout	.....	25	.....	25	.....	25
Length	.....	15	.....	15	.....	15
Dorsal	13, 19, 22	.....	14, 18, 20	.....	14, 17, 18	.....
Anal	22, 21	.....	20, 18	.....	19, 20	.....
Ventral	6	.....	6	.....	6	.....

Table of Measurements—Continued.

Species, *Gadus morrhua* Linn.

Current number of specimen	17,405.		17,406 *a*.		17,406 *b*.		17,406 *c*.	
Locality	Lofoten, Norway.		Bergen.		Bergen.		Bergen.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length (without caudal)	312	.....	413	.....	296	.....	300	.....
Length to end of middle caudal rays	341	.....	448	.....	324	.....	330	.....
Body:								
Least height of tail	.....	.....	.....	5½	.....	6	.....	6
Head:								
Greatest length	.....	29	.....	28½	.....	30	.....	28
Width of interorbital area	.....	7½	.....	7⅓	.....	7⅓	.....	7
Length of snout	.....	.....	.....	10	.....	10⅓	.....	9
Length of barbel	.....	5⅔	.....	4½	.....	5⅓	.....	5
Length of maxillary	.....	13	.....	12⅔	.....	13	.....	12
Length of mandible	.....	15	.....	15	.....	15	.....	14½
Diameter of orbit	.....	5½	.....	5	.....	6	.....	5½
Dorsal (first):								
Length of longest ray	.....	.....	.....	15	.....	15	.....	14
Pectoral:								
Length	.....	11⅔	.....	13⅓	.....	14	.....	14⅓
Ventral:								
Distance from snout	.....	27	.....	26	.....	27	.....	27
Length	.....	14½	.....	14	.....	15½	.....	14

Family, LYCODIDÆ.

7. Gymnelis viridis (Fabr.) Rhdt.

21739. (726.) Head of Cumberland Gulf, June 13, 1878. Length of longer 63 millim. Length of shorter 59 millim.

"Gravel beach, at low tide."—*Kumlien.*

21749. (648.) Head of Cumberland Gulf, May 30, 1878. *a*, 109 millim. *b*, 103 millim. *c*, 65 millim. *d*, 60 millim.

"Coogjannernak of the Eskimo."—*Kumlien.*

21757. (661.) Head of Cumberland Gulf, June 6, 1878. D. 95. A. 77. Length of specimen 104 millim.

"Gravel beach."—*Kumlien.*

21758. (647.) Head of Cumberland Gulf, May 30, 1878. D. 105. Length of example 147 millimetres.

"Tide-rifts, among stones."—*Kumlien.* Color-sketch accompanying.

21759. (646.) Head of Cumberland Gulf, May 30, 1878. D. 102. Length 142 millim.

"Tide-rifts, among stones."—*Kumlien.*

21760. (645.) Head of Cumberland Gulf, May 30, 1878. D. 100. Length 142 millim.

"Tide-rifts, among stones."—*Kumlien.*

21999. (86.) Niantilic, Cumberland Gulf, August, 1876. W. A. Mintzer, U. S. N. *a*, 210 millim. *b*, 176 millim.; D. ca. 95; A. 77; P. 13. *c*, 175 millim.; A. 75; P. 12. *d*, 124 millim.; A. 78; P. 13.

"Found between high and low water mark."—*Mintzer.*

This species is recorded from Prince Regent's Inlet (Rich., F. B. A., iii, 1836, p. 271; stomach of kittiwake gull); Northumberland Sound, 76° 53′ N. (Rich., Last Arc. Voy., 1855, p. 367, pl. xxix, and as var. *unimaculatus*, p. 371, pl. xxx); lat. 81° 52′ N. (Günth., P. Z. S., 1877, p. 293), and Franklin Pierce Bay (Günth., op. cit., p. 476).

Kröyer has found in the stomachs of specimens examined by him, "crabs . . . . once *Gammarus locusta* Linn.; another time Entomostraca."* Prof. Robert Collett found in the mouth of a specimen secured in the summer of 1878 by the Scandinavian Expeditions, an example of *Modiolaria lævigata* Gray.†

8. Lycodes mucosus Rich.

Lycodes mucosus Rich., Last of Arctic Voyages, 1855, p. 326, pl. xxvi.

16930. Cumberland Gulf, W. A. Mintzer, U. S. N.

A single individual of this species, originally described from Northumberland Sound, was found by Lieutenant Mintzer, and presented by him to the United States National Museum. From the appearance of the specimen it must have been picked up dead; but it is in a good state

*Naturhistorisk Tidsskrift, 3 R., I. B. (author's extra), p. 34.

†Christiania Vid. Selsk. Forh. 1878, No. 14, (p. 78).

of preservation. As there is little on record concerning the species, and the example under consideration is much larger than the types, and, while it agrees in all important particulars with Richardson's description and figure of *L. muscosus*, still shows some differences in the measurements, I have drawn up a description and prepared an accompanying table of measurements. It will be observed that in Lieutenant Mintzer's specimen the head is longer and wider and the height and width of body slightly less than in the types, which variations may be accounted for by the difference in size.

Like all the other described species of *Lycodes*, except *L. paxillus* Goode & Bean, of which I have knowledge, the width of the body at the vent is very much less than just behind the pectorals, and the height of the body at the same point is also considerably less than it is in the anterior part of the body; in other words, the body tapers decidedly, and the tail is much compressed.

Description.—The length of the example is 430 millimetres (17 English inches). Scales are entirely wanting.

The greatest height of the body (at the pectorals) is contained 8 times and its greatest width (just behind the pectorals) 9 times in the total length. The width at the vent is contained 8 times in the length of the head, and twice in the length of the longest dorsal ray. The height at the ventrals about equals the height of the body at the pectorals. The height of the body at the vent equals half the greatest width of the head, and is contained $11\frac{1}{2}$ times in the total length.

The head is very large, its length being $\frac{7}{25}$ of the total, and its greatest width contained $5\frac{3}{4}$ times in the whole length. The distance from the tip of the snout to the nape is $\frac{1}{5}$ of total length, and $\frac{4}{5}$ of the length of the mandible. The distance between the eyes is contained 6 times in the length of the head. The length of the snout is $\frac{1}{3}$ of the length of the head. The nostrils are much farther from the eyes than from each other, their distance from the eyes being contained $4\frac{1}{3}$ times in the length of the head. The length of the upper jaw is contained $6\frac{1}{4}$ times in the total length; of the lower jaw, $6\frac{2}{3}$ times; the upper jaw slightly exceeding the mandible in length. The eyes are very small, close together, and high, their long diameter being equal to $\frac{1}{11}$ of the length of the head.

The distance from the tip of the snout to the beginning of the dorsal fin is contained $3\frac{1}{4}$ times in the total length. The first ray of the dorsal is contained $5\frac{3}{5}$ times in the length of the head, and the longest, 4 times.

The distance of the anal from the snout is $\frac{11}{20}$ of the total length and

almost equals twice the distance of the pectoral from the snout. The first anal ray is contained $9\frac{1}{3}$ times in the length of the head, the longest $4\frac{1}{3}$ times. The vent is nearly in the middle of the total length.

The distance from the tip of the snout to the base of the pectoral is contained $3\frac{1}{2}$ times, and the length of the pectoral $6\frac{2}{3}$ times in total length. The length of the pectoral equals that of the mandible, and only slightly exceeds one-half of the length of the head.

The distance of the ventral from the tip of the snout equals the length of the head. The length of the ventral equals the long diameter of the eye.

Radial formula.—D. (including half of caudal) 90; A. (including half of caudal) 71; P. 18; V. 3.

Colors.—These agree, in the main, so closely with Richardson's description of them, that it is unnecessary to say more than that the cross-markings are faint and narrow.

The gape of the mouth is very wide. The character and arrangement of the teeth agree perfectly with the original description.

Table of Measurements.

Current number of specimen	16,930.		
Locality	Cumberland Gulf.		
	Millimetres.	100ths of length.	Times in total.
Extreme length	430		
Body:			
Greatest height (at pectorals)		$12\frac{1}{2}$	8
Greatest width (behind pectorals)		11	9
Width at vent		$3\frac{1}{2}$	In head 8
Height at ventrals		13	Nearly 8
Height at vent		8.7	$11\frac{1}{2}$
Head:			
Greatest length		28	$3\frac{4}{7}$
Distance from snout to nape		20	5
Greatest width		$17\frac{1}{2}$	$5\frac{3}{4}$
Distance between eyes		$4\frac{1}{2}$	In head 6
Length of snout		$9\frac{1}{2}$	In head 3
Distance of nostrils from eye		$6\frac{1}{2}$	In head $4\frac{1}{3}$
Length of upper jaw		16	7
Length of mandible		15	$6\frac{2}{3}$
Distance from snout to orbit		$9\frac{3}{5}$	$10\frac{1}{3}$
Long diameter of eye		$2\frac{3}{5}$	In head $10\frac{3}{5}$
Dorsal:			
Distance from snout		31	$3\frac{1}{4}$
Length of first ray		5	20
Length of longest ray		7	14
Anal:			
Distance from snout		55	$1\frac{9}{11}$
Length of first ray		3	33
Length of longest ray		$6\frac{1}{2}$	15
Distance of vent from snout		55	$1\frac{9}{11}$
Pectoral:			
Distance from snout		$28\frac{1}{2}$	$3\frac{1}{2}$
Length		15	$6\frac{2}{3}$
Ventral:			
Distance from snout		28	$3\frac{4}{7}$
Length		$2\frac{1}{2}$	40
Dorsal	90		
Anal	71		
Pectoral	18		
Ventral	3		
Scales	None.		

9. Lycodes polaris (Sabine) Rich.

Blennius polaris SABINE, App. Parry's First Voy., p. ccxii.

Lycodes polaris RICH., Last Arc. Voy., 1855, p. 362.

Described from North Georgia, lat. 75° N., long. 110° W. Recorded, also, from the west side of the Peninsula of Boothia by Capt. J. C. Ross.

10. Uronectes Parryi (Ross) Günther.

Ophidium Parrii Ross, in Parry's Third Voy., App., p. 109; Polar Voyage, p. 199.—RICH., F. B. A., iii, 1836, p. 274.

Discovered in Baffin's Bay and Prince Regent's Inlet. Observed near Felix Harbor, ejected by a glaucous gull.—*Rich., l. c.*

Family, STICHÆIDÆ.

11. Centroblennius nubilus (Rich.) Gill.

Lumpenus nubilus RICH., Last Arc. Voy., 1855, p. 359, pl. xxviii.

This species was described from Northumberland Sound, lat. 76° 53′ N.

Family, ZIPHIDIONTIDÆ.

12. Murænoides fasciatus (Schn.) Gill.

Gunnellus fasciatus RICH., Last Arc. Voy., 1855, p. 357, pl. xxvii.

Richardson records the species from Northumberland Sound.

Family, CYCLOPTERIDÆ.

13. Eumicrotremus spinosus (Fabr.) Gill.

Cyclopterus spinosus GÜNTH., P. Z. S., 1877, pp. 293, 476.

Günther has examined specimens from Franklin Pierce Bay.

14. Cyclopterus lumpus Linn.

21726. (1411.) Godthaab, Disko Island, Greenland.

Mr. Kumlien brought down a single specimen 430 millimetres in length, and furnished the following notes of color: "Varying shades of dusky olive green. Dorsal light. Belly nearly white. Iris umber."

Family, LIPARIDIDÆ.

15. Liparis vulgaris Fleming.

Liparis lineata (LEP.) KRÖYER, Nat. Tidsskrift, ii, 2, p. 284; iii, 1, p. 244; Voy. en Scand., &c., pl. xiii, fig. 2.

Liparis lineatus COLLETT, Christiania Vid. Selsk. Forh. 1878, No. 14, (p. 32).

21762. (657.) Annanactook, Cumberland Gulf. D. 42. A. II, 34. P. 35. C. 11.

Taken in "7 fathoms. Nee-fitz-shak of the Eskimo."—*Kumlien.*

21763. (859.) Head of Cumberland Gulf, June 29, 1878. (*a*) D. 19, 23; A. 34. (*b*) D. 19, 21; A. 35.

"Fastened to kelp in 7 fathoms."—*Kumlien.*

21764. (860.) Annanactook, Cumberland Gulf, June 29, 1878.

"Fastened to kelp."—*Kumlien.*

21765. (858.) Head of Cumberland Gulf, June 29, 1878. D. 41. A. 34. P. 34. C. 10. "Fastened to kelp in 5 fathoms."—*Kumlien.*

21752. (573.) Annanactook, Cumberland Gulf.

Referred doubtfully to *L. vulgaris.* The specimen is young and in bad condition. It was taken in 9 fathoms.

Richardson (F. B. A., iii, 1836, p. 263) mentions this species from the west side of Davis Strait in lat. 70°, and from Regent's Inlet.

Professor Collett found the alimentary canal of one of his specimens filled with small amphipods, one of them being *Caprella septentrionalis* Kr., together with many individuals of *Protomedeia fasciata* Kr.*

16. Liparis Fabricii Kröyer.

Liparis Fabricii GÜNTHER, P. Z. S., 1877, pp. 294, 476.

Dr. Günther has examined specimens collected in Discovery Bay and Franklin Pierce Bay.

Family, AGONIDÆ.

17. Aspidophoroides monopterygius (Bloch) Storer.

Aspidophoroides monopterygius GÜNTH., P. Z. S., 1877, p. 295.

A young individual was taken in 30 fathoms, lat. 65° N., long. 53° W.—*Günther, l. c.*

Family, COTTIDÆ.

18. Cottus scorpius Linn.

21989. (151.) ♀ Niantilic Harbor, Cumberland Gulf, A. L. Kumlien.

21742. (180.) ♂ Niantilic Harbor, Cumberland Gulf, A. L. Kumlien.

Mr. Kumlien collected this individual on the 25th of September, 1877, at which time its colors must have been exceedingly brilliant, judging from the traces which still remain. He states in his notes, that it lives "among the rocks at the bottom, feeding largely on crustacea and mollusks." *Cottus scorpius*, and the sub-species *grönlandicus*, but especially the latter, formed an important part of the food supply of the expedition.

These specimens of *Cottus scorpius* are clearly identical with Scandinavian examples of the same species, as may be seen from the tables of measurements which follow. In all the tables it must be remembered that the unit of length is the total length without caudal. So far as I know, the true *Cottus scorpius* has not previously been found on the east coast of America. A young individual, catalogue-number 10374, collected at Eastport, Me., by the United States Fish Commission, may be compared with one a trifle larger, catalogue-number 22060, which

* Collett, l. c.

was presented to the United States National Museum by Prof. Robert Collett. The agreement between these two in all essential particulars is very striking. We may safely record this species, then, at least as far south as Eastport. The true *Cottus scorpius* may be distinguished from the sub-species which follows by its narrower interorbital distance, and the lesser length of the dorsal spines, particularly the anterior ones.

Table of Measurements.

Species, *Cottus scorpius* Linn.

Current number of specimen	21,742 *a*, ♂.		21,989, ♀.		10,374, juv.	
Locality	Cumberland Gulf.		Cumberland Gulf.		Eastport, Me.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length	169	.....	180	.....	88	.....
Length to origin of middle caudal rays	140	.....	150	.....	72	.....
Body:						
Greatest height	.....	23	.....	24	.....	24
Greatest width (at pectoral base)	.....	21	.....	21	.....	20
Height at ventrals	.....	23	.....	24	.....	24
Least height of tail	.....	6	.....	6	.....	6½
Head:						
Greatest length	.....	38	.....	38	.....	39
Distance from snout to nape	.....	26	.....	27	.....	28
Greatest width at base of præop. spines	.....	23	.....	23	.....	23
Width of interorbital area	.....	5½	.....	4½	.....	5
Length of snout	.....	9	.....	9	.....	8
Length of upper jaw	.....	18½	.....	18	.....	17
Length of mandible	.....	20	.....	20	.....	19
Distance from snout to orbit	.....	10	.....	10	.....	.....
Diameter of orbit	.....	8	.....	8	.....	10
Dorsal (spinous):						
Distance from snout	.....	34	.....	36	.....	35
Length of base	.....	23	.....	25	.....	22
Length from end of dorsal to origin of middle caudal rays	.....	10	.....	10	.....	.....
Length of first spine	.....	10	.....	9	.....	11
Length of second spine	.....	11	.....	10	.....	12
Length of third spine	.....	12	.....	11	.....	13
Length of fourth spine	.....	12	.....	12	.....	12
Length of fifth spine	.....	12	.....	12	.....	11
Length of sixth spine	.....	12	.....	12	.....	10
Length of seventh spine	.....	10	.....	11	.....	8
Length of eighth spine	.....	9	.....	9	.....	5½
Length of ninth spine	.....	6	.....	7	.....	3
Length of tenth spine	.....	3½	.....	2	.....	.....
Length of longest ray	.....	16	.....	17	.....	16
Length of last ray	.....	5	.....	6	.....	.....
Anal:						
Distance from snout	.....	64	.....	64	.....	63
Length of base	.....	25	.....	24	.....	26
Length of first ray	.....	5	.....	7	.....	6
Length of longest ray	.....	13	.....	14	.....	12
Length of last ray	.....	6	.....	6½	.....	7
Caudal:						
Length of middle rays	.....	20	.....	20	.....	22
Pectoral:						
Distance from snout (upper axil)	.....	35	.....	34	.....	36
Length	.....	26	.....	27	.....	26
Ventral:						
Distance from snout	.....	32	.....	32	.....	34
Length	.....	20	.....	20	.....	21
Branchiostegals	Right VI Left VII	.....	VI	.....	VI	.....
Dorsal	X, 16	.....	X, 16	.....	IX, 15	.....
Anal	14	.....	13	.....	14	.....
Pectoral	Right 19 Left 18	.....	17	.....	17	.....
Ventral	I, 3	.....	I, 3	.....	I, 3	.....

Table of Measurements—Continued.

Current number of specimen	17,433 *a*, ♂.		17,433 *b*, ♀.		3,285, ♀.		22,060, juv.	
Locality	Bergen, Norway.		Bergen, Norway.		Sweden.		Christiania, Norway.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length
Extreme length	190	.....	230	.....	.....	.....	104	.....
Length to origin of middle caudal rays	154	.....	190	.....	200	.....	85	.....
Body:								
Greatest height	.....	24	.....	25	.....	28	.....	24
Greatest width (at pectoral base)	.....	22	.....	22	.....	25	.....	21
Height at ventrals	.....	24	.....	23⅓	.....	25½	.....	23
Least height of tail	.....	7	.....	7½	.....	7½	.....	7
Head:								
Greatest length	.....	40	.....	41½	.....	40	.....	39
Distance from snout to nape	.....	31	.....	30	.....	29	.....	27
Greatest width at base of præop. spines	.....	28	.....	27	.....	27	.....	25
Width of interorbital area	.....	5	.....	5	.....	5½	.....	5
Length of snout	.....	9	.....	9	.....	8	.....	8
Length of upper jaw	.....	20	.....	20	.....	19	.....	18
Length of mandible	.....	21	.....	22	.....	21	.....	20
Distance from snout to orbit	.....	11	.....	10½	.....	10	.....	9½
Diameter of orbit	.....	9	.....	9	.....	8½	.....	9
Dorsal (spinous):								
Distance from snout	.....	36	.....	38	.....	37½	.....	34
Length of base	.....	27	.....	25	.....	25½	.....	25
Greatest height	.....	12	.....	10	.....	.....	.....	12
Length of first spine	.....	11	.....	11	.....	9½	.....	10
Length of second spine	.....	12½	.....	13	.....	11	.....	11
Length of third spine	.....	15	.....	14	.....	12	.....	11
Length of fourth spine	.....	15	.....	14	.....	13	.....	12
Length of fifth spine	.....	14	.....	13	.....	13	.....	12
Length of sixth spine	.....	13	.....	11	.....	12	.....	11½
Length of seventh spine	.....	11	.....	9	.....	10	.....	10
Length of eighth spine	.....	9	.....	6	.....	8	.....	8
Length of ninth spine	.....	6	.....	3	.....	5	.....	5
Length of tenth spine	.....	4	.....	.....	.....	.....	.....	3
Length of longest ray	.....	21	.....	18	.....	19	.....	17
Length from end of dorsal to origin of middle caudal rays	.....	10	.....	10½	.....	8	.....	9
Anal:								
Distance from snout	.....	64	.....	65	.....	64	.....	64
Length of base	.....	24	.....	22	.....	27	.....	26
Length of first ray	.....	10	.....	6	.....	6	.....	7
Length of longest ray	.....	16	.....	14	.....	14½	.....	13
Length of last ray	.....	9½	.....	8	.....	7	.....	8
Caudal:								
Length of middle rays	.....	23	.....	21	.....	.....	.....	22
Length of external rays	.....	15	.....	15	.....	.....	.....	.....
Pectoral:								
Distance from snout (upper axil)	.....	37	.....	37	.....	36	.....	34
Length	.....	32	.....	27	.....	28	.....	26
Ventral:								
Distance from snout	.....	34	.....	33	.....	32	.....	31
Length	.....	25	.....	19	.....	18	.....	18
Dorsal	X, I, 15	.....	IX, I, 14	.....	IX, I, 15	.....	X, 15	.....
Anal	12	.....	12	.....	13	.....	12	.....
Pectoral	16	.....	17	.....	16	.....	Right 16 Left 15	.....
Ventral	I, 3	.....	I, 3	.....	I, 3	.....	I, 3	.....

19. Cottus scorpius L., sub-species **grönlandicus** C. & V.

Cottus grönlandicus CUV. & VAL., Hist. Nat. Poiss., iv, p. 185: GILL, Cat. Fishes E. Coast N. A., 1873, p. 22.

Cottus scorpius var. *grönlandica* LÜTKEN, Aftryk af Videnskabelige Meddelelser fra den naturhistoriske Forening Kjöbenhavn, 1876, p. 16.

21728. Godthaab, Greenland, A. L. Kumlien.

21729 Godthaab, Greenland, A. L. Kumlien.

21730. Godthaab, Greenland, A. L. Kumlien.
21731. Godthaab, Greenland, A. L. Kumlien.
21740. (151.) ♂. Niantilic Harbor, Cumberland Gulf, A. L. Kumlien.
21751. (67.) Young. Arctic Id., Cumberland Gulf, A. L. Kumlien.
16931. Many young. Cumberland Gulf, Lieut. W. A. Mintzer.

I have reached practically the same conclusion concerning the relations of *C. scorpius* and *C. grönlandicus* as Dr. Lütken, Malmgren, and Collett, since it is probable that they use the term "variety" in the same sense in which I use "sub-species." Dr. Lütken, however, supposes the *Cottus variabilis* of Ayres to be a synonym of *C. scorpius* sub-species *grönlandicus;* but it is identical with *Cottus æneus* Mitchill. The *Cottus Mitchilli* of Cuvier and Valenciennes, which was a mere name based on the *Cottus scorpius* of Mitchill, is evidently a synonym of *C. scorpius* sub-species *grönlandicus;* but the name *Cottus Mitchilli*, as used by Dr. DeKay and Professor Gill and understood in the museum catalogues, was associated with the species which should be called *C. æneus* of Mitchill. DeKay's *Cottus æneus* as described and figured is a compound of *æneus* and *octodecimspinosus.* His *C. Mitchilli* is the true *æneus* of Mitchill.

C. æneus Mitchill is the smallest of the marine sculpins of the east coast so far as known, and appears to be the least widely distributed. Its limits may be stated as Long Island on the south and Maine on the north. It has the narrowest interorbital space of our five known species. It is not uncommon to find individuals of 2½ inches in length full of spawn. The base of the anal is almost invariably shorter than that of the first dorsal. It is highly probable that DeKay's figure* of *Cottus æneus* Mitchill was drawn from a specimen of *Cottus octodecimspinosus* Mitchill, the only known Eastern American sculpin with so long a spine on the præoperculum. The number of anal rays (13) in this figure has never been recorded in *Cottus æneus*, but is common in *C. octodecimspinosus.* DeKay's figure of *Cottus Mitchilli* is a fair representation of the *æneus* of Mitchill.

Cottus scorpius sub-species *grönlandicus* has about the same southern limit as *C. æneus*, but it ranges northward to Greenland. It is abundant at Wood's Holl, Massachusetts, in winter. The United States Fish Commission has found it common in summer at different points along the coast between Cape Cod and Halifax, Nova Scotia. At Salem and Gloucester it was caught from the wharves. The stomach of an adult of medium size, taken at Wood's Holl, Mass., by the United States Fish Commission, contained three crabs, *Cancer irroratus.*

*New York Fauna, Fishes, 1842, p. 52, pl. vi, fig. 19.

Cottus octodecimspinosus Mitchill is known from Halifax on the north to Beesley's Point, New Jersey, on the south, where it was collected by Prof. S. F. Baird in 1854. It is considered a shallow-water species; but the United States Fish Commission has a specimen from 68 fathoms in the Gulf of Maine, where the temperature was about 42° Fahr. The greater portion of the examples were from 10 fathoms or less.

Add to these *Cottus scorpioides* of Fabricius, and it will complete the list of Eastern North American species of the genus *Cottus* so far as known.

As already intimated, *Cottus scorpius* sub-species *grönlandicus* is quite readily separated from the typical *C. scorpius* by its wider interorbital distance and its higher spinous dorsal, which differences are best exemplified in the specimens from Greenland, and appear, along with others, in the measurement tables.

Table of Measurements.

Species, *Cottus scorpius* sub-species *grönlandicus*.

Current number of specimen	21,731.		21,730.	
Locality	Godthaab, Greenland, Aug. 8, 1878.			
	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length			226	
Length to origin of middle caudal rays	185		186	
Body:				
Greatest height		24		23
Greatest width at pectoral base		22		
Height at ventrals		24		23
Least height of tail		5½		5½
Length of caudal peduncle		11		12
Head:				
Greatest length		39		38
Distance from snout to nape		28		27
Width of interorbital area		7½		6
Length of snout		9		9
Length of upper jaw		19		19
Length of mandible		20½		20½
Distance from snout to orbit		10		10
Diameter of orbit		9		9
Dorsal (spinous):				
Distance from snout		35		33
Length of base		27		26
Length of first spine		16½		15
Length of second spine		18		16½
Length of third spine				16½
Length of fourth spine		18		16½
Length of fifth spine		19		15½
Length of sixth spine		16½		14½
Length of seventh spine		14		13½
Length of eighth spine		11		12
Length of ninth spine		8		7½
Length of tenth spine		5		5
Length of eleventh spine				3
Length of longest ray		17		19
Length of last ray		6½		8
Anal:				
Distance from snout		62		62
Length of base		25		25
Length of first ray		7		7
Length of longest ray		14		15
Length of last ray		6½		8

Table of Measurements—Continued.

Current number of specimen	21,731.		21,730.	
Locality	Godthaab, Greenland, Aug. 8, 1878.			
	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Caudal:				
Length of middle rays				21½
Pectoral:				
Distance from snout (upper axil)		35		34
Length		28		29
Ventral:				
Distance from snout		29½		31
Length		21		24
Branchiostegals	Right VI		VII	
	Left VI		VII	
Dorsal	X, 16		XI, 17	
Anal	14		14	
Pectoral	Right 17		17	
	Left 17		17	
Ventral	I, 3		I, 3	

Current number of specimen	21,729.		21,728.	
Locality	Godthaab, Greenland, Aug. 8, 1878.			
	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length	235		218	
Length to origin of middle caudal rays	195		178	
Body:				
Least height of tail		5½		6
Length of caudal peduncle		10		
Head:				
Width of interorbital area		6		6
Length of snout		9		
Length of upper jaw		19		
Length of mandible		20		
Dorsal (spinous):				
Length of first spine		20		18
Length of second spine		21		19
Length of third spine		21		18½
Length of fourth spine		21		18
Length of fifth spine		21		19
Length of sixth spine		21		18½
Length of seventh spine		19		14
Length of eighth spine		16		14
Length of ninth spine		13		9
Length of tenth spine		10		6
Length of eleventh spine		6		
Length of longest ray		20		20
Anal:				
Distance from snout		62		62
Pectoral:				
Length		31		
Ventral:				
Distance from snout		33		32
Length		25		23
Branchiostegals	Right VI		VI	
	Left VI		VI	
Dorsal	XI, I, 16		X, I, 16	
Anal	14		13	
Pectoral	Right 17		17	
	Left 17		18	
Ventral	I, 3		I, 3	

Table of Measurements—Continued.

Current number of specimen	21,025 *a*, ♀.		13,879.	
Locality	Halifax, N. S.		Eastport, Me.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length	240	.....	129	.....
Length to origin of middle candal rays	198	.....	106	.....
Body:				
Greatest height	.....	26	.....	25
Greatest width	.....	24	.....	.....
Height at ventrals	.....	26	.....	25
Least height of tail	.....	7	.....	7
Head:				
Greatest length	.....	42	.....	40
Distance from snout to nape	.....	30	.....	28
Width of interorbital area	.....	6½	.....	6
Length of snout	.....	9	.....	9
Length of maxillary	.....	20	.....	18
Length of mandible	.....	22	.....	19
Long diameter of orbit	.....	9	.....	9½
Dorsal (spinous):				
Distance from snout	.....	38	.....	35
Length of base	.....	23	.....	25
Length of first spine	.....	12	.....	12
Length of second spine	.....	13½	.....	13
Length of third spine	.....	14	.....	14
Length of fourth spine	.....	15	.....	14
Length of fifth spine	.....	14	.....	14
Length of sixth spine	.....	12¼	.....	13
Length of seventh spine	.....	11	.....	12
Length of eighth spine	.....	8½	.....	10
Length of ninth spine	.....	6	.....	7
Length of tenth spine	.....	.....	.....	5
Length of longest ray	.....	18	.....	16½
Length of last ray	.....	8	.....	.....
Anal:				
Distance from snout	.....	64	.....	63
Length of base	.....	30	.....	25
Length of first ray	.....	9	.....	9
Length of longest ray	.....	14½	.....	12½
Length of last ray	.....	8	.....	7
Candal:				
Length of middle rays	.....	20½	.....	21
Pectoral:				
Distance from snout	.....	37	.....	36
Length	.....	28	.....	27
Ventral:				
Distance from snout	.....	32	.....	30
Length	.....	20	.....	21
Branchiostegals	VI	.....	VI	.....
Dorsal	IX, 18	.....	X, 17	.....
Anal	15	.....	14	.....
Caudal	+, 12, +	.....	.....	.....
Pectoral	17	.....	Right 18 Left 17	.....
Ventral	I, 3	.....	I, 3	.....

20. Cottus scorpioides Fabr.

Cottus scorpioides Fabr., Faun. Grönld.: Lütken, Aftryk af Videnskabelige Meddelelser fra den naturhistoriske Forening Kjöbenhavn, 1876, p. 12.

21744. 7 specimens. Cumberland Gulf, A. L. Kumlien.

21745. 4 specimens. Lat. 66° 24′ N., long. 68° 49′ W. A. L. Kumlien.

21750. (670.) Young. Head of Cumberland Gulf. A. L. Kumlien.

22327. (180.) ♀ adult. Cumberland Gulf. A. L. Kumlien.

22330. (151.) Young. Niantilic, Cumberland Gulf. A. L. Kumlien.

22331. Young. Cumberland Gulf. Lieut. W. A. Mintzer.

Mr. Kumlien brought down many examples of a species of *Cottus* which closely resembles *scorpius* and *grönlandicus*, and yet agrees with

neither of them. It is a species characterized by a very short head and short jaws, the head constituting only one-third of the total length without the caudal, and the upper jaw equalling less than one-seventh of the same length. The length of the upper jaw of *C. grönlandicus* equals slightly more than one-sixth of the total length without caudal, and in *C. scorpius* it is contained only $5\frac{1}{3}$ times in the length exclusive of the caudal. The species agrees with Fabricius's description and with Dr. Lütken's diagnosis of *Cottus scorpioides*. For the sake of comparison, I have prepared a table of measurements of the head and jaws of 9 additional specimens of *C. grönlandicus* to follow the measurements of *C. scorpioides*. The unit of length in the tables is the total length to the origin of the middle caudal rays.

Description.—The shape of the body resembles that of *Cottus scorpius* L., but the caudal peduncle is longer and more slender.

The greatest height of the body, which is at the ventrals, equals the distance from the tip of the snout to the nape, and is contained $4\frac{1}{3}$ times in the length without caudal. The caudal peduncle is slender and long; its least height is less than the long diameter of the orbit, and its length to the origin of the middle caudal rays equals the length of the longest anal ray.

The length of the head, measured to the end of the opercular flap, is contained 3 times in the unit of length. The width of the head at the base of the præopercular spines equals the distance from the snout to the nape, and nearly equals the length of the anal base. The long diameter of the eye equals half the length of the upper jaw, and is very little less than the length of the snout. The distance between the eyes equals $\frac{1}{3}$ of the length of the mandible, and is contained 20 times in the unit of length. The length of the snout equals $\frac{1}{2}$ the length of the mandible, and is contained 14 times in the unit of length.

The distance of the spinous dorsal from the snout equals twice the length of the longest ray of the second dorsal and is nearly or quite equal to the length of the head. The first spine is contained 11 times, the second $9\frac{1}{2}$ times, and the third, fourth, and fifth 9 times in the unit of length. From this point the spines diminish gradually in length to the last, which is $\frac{1}{3}$ as long as the first. The longest ray of the second dorsal is contained $6\frac{1}{4}$ times in the unit of length.

The distance of the anal from the snout equals twice the length of the pectoral. The anus is directly under the origin of the second dorsal.

The length of the anal base is about equal to the distance from the

snout to the nape. The first and last rays are usually equal in length, and equal the length of the snout. The longest anal ray equals in length the caudal peduncle.

The length of the middle caudal rays is contained from 5 to 6 times in the unit of length.

The distance of the pectoral from the snout is contained $3\frac{1}{3}$ times, and its length $3\frac{1}{3}$ to 4 times in the unit of length.

The distance of the ventral from the snout equals twice the length of the upper jaw. The length of the ventral in females is contained 5 times (in one nearly 6 times) in the unit of length; in males, about $4\frac{1}{3}$ times.

Radial formula.—B. VI; D. IX–X, 15–16; A. 11–13; P. 15–16; V. I, 3.

Dr. Lütken is of the opinion that "*Cottus pachypus* Günther (from Port Leopold) is the genuine *C. scorpioides*," in which opinion I fully coincide after a comparison of Mr. Kumlien's specimens with Fabricius's description of *C. scorpioides* and the description of *C. pachypus*.

Cottus scorpioides appears in Professor Gill's List of East Coast Fishes with a doubt as to its reference to the genus *Cottus*, to which genus, however, it was properly referred by Fabricius.

Table of Measurements.

Species, *Cottus scorpioides* Fabr.

Current number of specimen	21,745 *a*.		21,745 *b*, ♂.		21,745 *c*, ♀.	
Locality	Lat. 66° 24′ N. Long. 68° 49′ W.					
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length	101					
Length to origin of middle caudal rays	83		115		115	
Body:						
Greatest height		22				
Height at ventrals		22				
Least height of tail		6		6		
Length of caudal peduncle				13		13
Head:						
Greatest length		33		33		32
Distance from snout to nape		23				24
Greatest width		23				
Width of interorbital area		5				5
Length of snout		7		8		8
Length of maxillary		13		14		13
Length of mandible		16		16		$15\frac{1}{2}$
Diameter of orbit		8		7		$7\frac{1}{2}$
Dorsal (spinous):						
Distance from snout		32		33		33
Length of base		21				
Length of first spine		8				
Length of second spine		9				
Length of third spine		10				
Length of fourth spine		10				
Length of fifth spine		10				
Length of sixth spine		10				
Length of seventh spine		9				
Length of eighth spine		7				
Length of ninth spine		5				
Length of longest ray		16				

Table of Measurements—Continued.

Species, *Cottus scorpioides* Fabr.

Current number of specimen	21,745 *a*.		21,745 *b*, ♂.		21,745 *c*, ♀.	
Locality	Lat. 66° 24′ N. Long. 68° 49′ W.					
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Anal:						
Distance from snout		60		60		61
Length of base		24				
Length of first ray		8				
Length of longest ray		13				
Length of last ray		8				
Caudal:						
Length of middle rays		21				
Pectoral:						
Distance from snout		31		30		
Length		29		30		
Ventral:						
Distance from snout		29		29		26
Length		21		23		17
Branchiostegals	VI					
Dorsal	IX, 16		X, 16		IX, 16	
Anal	13		12		12	
Pectoral	15		16		16	
Ventral	I, 3		I, 3		I, 3	

Current number of specimen	21,745 *d*, ♀.		22,327, ♀.		Averages.
Locality	Lat. 66° 24′ N. Lon. 68° 49′ W.		Cumberland Gulf.		
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	100ths of length.
Extreme length			223		
Length to origin of middle caudal rays	102		190		
Body:					
Greatest height				23	23
Greatest width				22	
Height at ventrals				23	23
Least height of tail		6		5½	6
Length of caudal peduncle		14			13
Head:					
Greatest length		33		32	33
Distance from snout to nape		23		23½	23
Greatest width				22	23
Width of interorbital area		5		5½	5
Length of snout		7		7¼	7½
Length of maxillary		14		14	13⅔
Length of mandible		15		15	15½
Distance from snout to orbit				8	
Diameter of orbit		7		7	7
Dorsal (spinous):					
Distance from snout		31		30	32
Length of base				27	
Length of first spine				10	9
Length of second spine				11	10½
Length of third spine				11½	11
Length of fourth spine				11½	11
Length of fifth spine				11½	11
Length of sixth spine				10½	10
Length of seventh spine				9	9
Length of eighth spine				7	7
Length of ninth spine				5	5
Length of tenth spine				3	3
Length of longest ray				16	16
Length of last ray				6½	
Anal:					
Distance from snout		61		61	61
Length of base				23	23⅓
Length of first ray				7½	7¼

Table of Measurements—Continued.

Species, *Cottus scorpiodes* Fabr.

	21,745 *d*, ♀.		22,327, ♀.		Averages.
Current number of specimen					
Locality	Lat. 66° 24′ N. Lon. 68° 49′ W.		Cumberland Gulf.		
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	100ths of length.
Anal:					
Length of longest ray				12½	13
Length of last ray				7	7½
Caudal:					
Length of middle rays				17	19
Pectoral:					
Distance from snout		30		30	30
Length		27		25	28
Ventral:					
Distance from snout		29		29	28
Length		20		18	20
Branchiostegals			VI		
Dorsal	IX, 15		X, 16		
Anal	11		12		
Pectoral	16		16		
Ventral	I, 3		I, 3		

Species, *Cottus scorpius* sub-species *grönlandicus*.

Current number of specimen	22,272 *a*.		22,272 *b*.		22,272 *c*.	
Locality	Bucksport, Me.		Bucksport, Me.		Bucksport, Me.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length without caudal	71		75		72	
Length to end of middle caudal rays	87		91		88	
Head:						
Greatest length		40		39		39
Length of upper jaw		18		17½		18
Length of mandible		21		19		19½

Current number of specimen	22,272 *d*.		22,272 *e*.		22,272 *f*.	
Locality	Bucksport, Me.		Bucksport, Me.		Bucksport, Me.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length without caudal	63		64		66	
Length to end of middle caudal rays	76		79		80	
Head:						
Greatest length		40		39		39
Length of upper jaw		17		17		17
Length of mandible		20		20		19

Current number of specimen	22,272 *g*.		22,272 *h*.		22,272 *i*.	
Locality	Bucksport, Me.		Bucksport, Me.		Bucksport, Me.	
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length without caudal	58		51		57	
Length to end of middle caudal rays	71		63		70	
Head:						
Greatest length		40		40		39
Length of upper jaw		17		18		17½
Length of mandible		19		21		19

21. Cottus quadricornis Linn.

Cottus quadricornis Rich., Last Arc. Voy., 1855, pp. 348–9: Günth., P. Z. S., 1877, p. 293.

Richardson records the species from the Coppermine River region and Coronation Gulf (68° 30′ N., 110° W.).—*Günther.*

22. Cottus polaris Sabine.

Cottus polaris Rich., Last Arc. Voy., 1855, p. 351.

Richardson refers to this species as occurring at North Georgia, lat. 75° N., and at the Peninsula of Boothia. The radial formula appears to me more like that of a *Centridermichthys* than anything else, but the genus to which it properly belongs is uncertain.

23. Gymnacanthus pistilliger (Pall.) Gill, MS.

Cottus ventralis Cuv. & Val., Hist. Nat. Poiss., iv, p. 194: Collett, Christiania Vid. Selsk. Forh. 1878, No. 14, (p. 15).

21732. (1373.) Godthaab, Disko Id., Greenland, A. L. Kumlien. D. XII, I, 16. A. 18. V. 3. Ventrals nearly reach vent.

21733. (1374.) Godthaab, A. L. Kumlien. D. XII, 15. A. 19. V. 3. Ventrals reach fifth ray of anal.

21734. Godthaab. A. L. Kumlien. D. XI, 16. A. 18. V. 3. Ventrals extend little more than half way to vent.

21735. Godthaab. A. L. Kumlien. D. XI, 17. A. 18. V. 3. Ventrals reach third ray of anal.

21736. Godthaab. A. L. Kumlien. D. XII, 17. A. 19. V. 3. Ventrals nearly reach vent.

21737. Godthaab. A. L. Kumlien. D. XII, I, 15. A. 18. V. 3. Ventrals reach fourth ray of anal.

21741. (151.) Niantilic Harbor, Cumberland Gulf, A. L. Kumlien.

21743. (180.) Niantilic Harbor, A. L. Kumlien.

22332. Niantilic Harbor, Aug. 1876, Lieut. W. A. Mintzer.

17431. Christiania, Norway, M. G. Hetting, inspector of fisheries. D. XII, 14. A. 16. V. 3. Ventrals reach fourth ray of anal.

Dr. Lütken rejects the name *Gymnocanthus*, Swainson, because the genus was badly defined. There can be no difference of opinion as to the fact that the genus was poorly characterized; but there is an attempt at definition and a reference to a figure of the type-species, so that one need not hesitate as to what is intended. If we begin to reject names of genera because they are not accompanied by complete descriptions, we may find it difficult to draw the line between what we shall accept and what we shall reject. In retaining Swainson's name it may not

be amiss to reproduce his description.* Concerning the specific name *pistilliger*, Dr. Lütken says:† "Influenced by Steindachner's notice (Wien. Sitzungsb. 1876) on *C. pistilliger*, Pallas, I have sought information concerning this species in the Berlin Museum; the type is only a bad half skin preserved in spirits; Prof. Peters has been so obliging as to send it to me for investigation, and I have thereby been able to convince myself that the 'pistils' which Pallas describes as soft threads with spongy heads are in reality only the half cruciform, spiny scales which distinguish a certain part of the side of the body in *C. tricuspis*. Since the name '*pistilliger*' is thus founded on a misapprehension, its reputed priority (1811) cannot require that it be given the preference over the next in the series, and we should therefore fix upon the name *Phobetor ventralis*, Cuv. & Val." If we were to throw out all names which are based upon a misapprehension it would involve us in a great deal of unnecessary confusion, and it would be difficult to decide how far the elimination should proceed. The fact that Dr. Lütken could recognize the peculiarity in which the specific name originated is a sort of apology for its adoption by Pallas.

24. Icelus hamatus Kröyer.

Icelus hamatus Günth., P. Z. S., 1877, pp. 293, 476.

This species was collected in Discovery Bay, Franklin Pierce Bay, and at Cape Napoleon, in the month of August, by Captain Feilden, and in Franklin Pierce Bay, August 11, 1875, by Mr. C. Hart.

25. Triglops pingelii Reinh.

Triglops pingelii Günth., P. Z. S., 1877, p. 476.

Taken in Franklin Pierce Bay, August 11, 1875, by Mr. C. Hart, naturalist on board H. M. S. "Discovery."

The United States Fish Commission has many specimens in its collections of 1877 and 1878.

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*Nat. Hist. Fishes, Amphibians, & Reptiles, II, London, 1839, pp. 181 & 271.

p. 181. Gymnocanthus. Nape of the head contracted; eyes with bony orbits.

p. 271. Gymnocanthus Sw. Resembling in general aspect the last, (*Cottus claviger*, C. & V.), but there are no upper orbits; spines of the head few and naked; ventral fins very long, and of 3 rays; dorsals distinct; the rays of the first naked on their terminal half (?); caudal fin truncate.

G. ventralis, C. & V. iv, pl. 79, fig. 1.

†Aftryk af Videnskabelige Meddelelser fra den naturhistoriske Forening Kjöbenhavn, 1876, p. 10.

Family, GASTEROSTEIDÆ.

26. Gasterosteus insculptus Rich.

Gasterosteus insculptus Rich., Last Arc. Voy., 1855, p. 356, pl. xxv.

The types were from Northumberland Sound, lat. 76° 53′ N.

27. Gasterosteus pungitius Linn., sub-species **brachypoda** Bean.

In small streams on the sides of Oosooadlin Mountain, and in a little pond on the top, 1,500 feet above tide-level, Mr. Kumlien collected numerous examples of a many-spined stickleback, which resembles *Gasterosteus pungitius* Linn., in most particulars, but may be readily distinguished from it by its *very short ventral spines.* The tables of measurements and radial formulæ appended will show other differences, which are, however, not so important.

Description.—The greatest height of body is contained $5\frac{3}{4}$ times in its length to origin of middle caudal rays (in gravid females, $4\frac{1}{2}$ times); the greatest width, 10 times (in gravid females, 8 times). The height at ventrals is contained $5\frac{3}{5}$ times in length of body (in gravid females, 5 times or slightly less). The least height of tail equals half the length of the first dorsal spine. The length of caudal peduncle is $\frac{1}{7}$ of length of body.

The length of head equals 4 times the length of upper jaw, and is from $\frac{1}{4}$ to $\frac{7}{25}$ of length of body. The greatest width of head nearly equals length of middle caudal rays. The distance between the eyes equals the length of snout, which equals the length of antecedent spine of soft dorsal. The length of the operculum equals the length of ventral spine, which is slightly less than a third of length of head. The length of mandible equals the long diameter of the orbit.

The distance of the spinous dorsal from the snout is from $\frac{1}{4}$ to $\frac{3}{10}$ of length of body, and is almost uniformly less than its length of base. The first and second spines of the dorsal are equal in length, and are about $\frac{2}{3}$ as long as the ventral spine. The last spine of the dorsal is slightly less than the first. The antecedent spine of the second dorsal is somewhat longer than the first of the spinous dorsal, and half as long as the first ray following it. The first ray of the soft dorsal is contained $8\frac{1}{2}$ times in length of body, and is three times as long as the last ray.

The distance of the anal from the tip of snout equals $\frac{3}{5}$ of length of body; its length of base is twice the length of its first and longest ray, and slightly less than $\frac{1}{4}$ of length of body. The anal spine is half as long as the first anal ray (in young individuals, $\frac{2}{3}$).

The length of the middle caudal rays is contained $8\frac{1}{2}$ times in length of body; the length of external rays, $7\frac{1}{2}$ times.

The distance of the pectoral from the tip of snout is contained $3\frac{1}{3}$ times

in the total, and about equals twice its own length. When expanded, the pectoral extends usually to the 7th dorsal spine (6th to 8th).

The distance of the ventral from the tip of snout slightly exceeds $\frac{7}{20}$ of length of body. The length of the ventral spine is always a little less than $\frac{1}{3}$ of the length of the head.

Radial formula.—D. IX–XI, I, 10–11; A. I, 9–11; C. +, 12, +; P. 10; V. I, 1.

Color.—General color dull silvery, minutely punctulated with black; upper half of body with large irregular areas of black; chin, throat, and abdomen black in males, silvery in the females studied. Nilsson records a similar condition in *G. pungitius.**

The relations of *Gasterosteus pungitius* var. *brachypoda* to the *pungitius* (=*Pygosteus occidentalis* (C. & V.) Brevoort) of New England are shown in the table of comparative measurements which follows. I do not use the name *Pygosteus occidentalis*, for the reason that our many-spined stickleback bearing that name shows no characters by which it may be separated from the *Gasterosteus pungitius* of Linné as a species, and the genus *Pygosteus* has nothing to exclude it from *Gasterosteus*. The genus *Pygosteus*, although credited to Brevoort, was not defined by him; it appears in Gill's Catalogue† as a name only. The first to indicate characters by which it was thought the genus could be distinguished was Jordan; they are stated to be the following: "Dorsal spines 7 or more; sides mailed or not."‡ So far as the squamation is concerned, the collections of the United States National Museum show all sorts of individual variation, and justify the ground taken by Günther in his arrangement of the varieties of *G. aculeatus;* certainly, the squamation is not even of specific importance. The number of dorsal spines in the specimens of *G. pungitius* studied ranges from 7 to 11. In *Gasterosteus inconstans*,§ Kirtland, the range is from 3 to 6. I have seen a fresh-

* "*Variat abdomine nigro.*"—Prod. Ichth. Scand., 1832, p. 86.

† Catalogue of the Fishes of the Eastern Coast of North America from Greenland to Georgia, by Theodore Gill, Jan. 1861, p. 39.

‡ Manual of the Vertebrates of the Northern United States, 1876, p. 248.

§ *Eucalia inconstans*, Jordan, Manual of Vertebrates, 1876; Proc. Acad. Nat. Sci. Phila., 1877, p. 65. The generic characters ascribed to *Eucalia* are: (1) "Dorsal spines in a right line," which is also true in *Gasterosteus aculeatus*, L.; even in the many-spined stickleback, *G. pungitius*, I have frequently seen the last four or five spines in a right line, while the anterior ones preserved their zigzag arrangement; (2) "Ventral plates coalesced into a narrow plate on the median line between the ventral fins," just as in *G. aculeatus* and *G. pungitius*; (3) "A distinct sub-quadrate post-pectoral plate," which is present in most sticklebacks; the "associated characters" indicated contain nothing generically distinctive.

water stickleback from Maine,* which resembles *G. pungitius* in many respects, but has only 2 dorsal spines. The number of dorsal spines would seem, therefore, to be certainly of not more than specific value.

Gasterosteus nebulosus seems to me to be separated from *G. pungitius* by no constant character, but only by its habitat. *Gasterosteus mainensis* is identical with *G. pungitius*.

Apeltes (DeKay) Jordan is well separated from *Gasterosteus* by the structure of its pubic bones.

The United States National Museum has received from the Musée d'Histoire Naturelle, of Paris, one of the types of *Gasterosteus blanchardi* Sauvage, described from specimens sent from Boston, United States. This species is our common many-spined stickleback, *G. pungitius*, as will appear from the table of measurements, and the name must be regarded as a synonym of the latter. It is worthy of remark in passing that the shape of the post-pectoral plate in species of *Gasterosteus*, which has been employed as an important diagnostic character, is so variable, even on the two sides of the same fish, that it is not to be depended upon.

The sticklebacks of eastern North America, so far as observed be me, may all be referred to the genera *Apeltes* and *Gasterosteus*.

The basis of the foregoing description of the stickleback collected by Mr. Kumlien is the table of measurements which follows. Only 8 examples were measured, but these show the extremes of variation in the numerous specimens secured. In none of the individuals does the length of the ventral spine exceed one-third of the length of the head.

Mr. Kumlien has sent me the following notes on the species: "The *Gasterosteus* was taken from a pond more than a thousand feet above the sea on the mountain side. Said ponds were not over 18 inches deep, and of course freeze solid in winter. In fact, there was but very little water at the time I procured the fish. It is impossible that they could have come up from below, as the pond empties by a series of perpendicular falls, some of them 30 feet or more. In my note-book I find that they were light greenish above, barred with dusky brown and black; beneath white, irregularly blotched with black. Caudal pinkish. Male (?) with a crimson spot at base of pectoral fin."

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* *Gasterosteus Atkinsii* Bean, Proc. U. S. Nat. Mus. ii, p. —.

Table of Measurements.

Current number of specimen	21,738.	21,771.	21,766.	21,768.	21,773.	21,773*a*.	21,773*c*.	21,773*d*.	
Locality	Cumberland Gulf.		Cumberland Gulf.		Cumberland Gulf.		Cumberland Gulf.		
	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Averages.
	♂	♂	♂	♀ Gravid.	♀ Gravid.	♀ Spent.	Young.	Young.	
Extreme length to origin of middle caudal rays	48	46	47	52	56	57	28	31	.....
Length to end of external caudal rays	55	52	53	59	63	65	32	35	.....
Body:									
Greatest height	.17	.17	.175	.23	.22	.18	.17	.18	.187
Greatest width	.10	.10	.10	.13	.125	.125	.10	.08	.107
Height at ventrals	.15	.17	.17	.21	.20	.18	.16	.18	.177
Least height of tail	.03	.03	.03	.03	.03	.03	.04	.04	.032
Length of caudal peduncle	.15	.135	.14	.14	.14	.14	.14	.14	.14
Head:									
Greatest length	.275	.27	.28	.25	.25	.25	.27	.28	.265
Greatest width	.11	.11	.12	.12	.115	.115	.11	.11	.113
Width of interorbital area	.06	.06	.065	.06	.06	.06	.065	.06	.06
Length of snout	.06	.06	.065	.06	.06	.06	.065	.06	.06
Length of operculum	.08	.08	.09	.08	.08	.08	.08	.09	.08
Length of upper jaw	.07	.07	.07	.06	.06	.06	.07	.07	.066
Length of mandible	.08	.08	.08	.07	.07	.07	.08	.08	.076
Diameter of orbit	.07	.07	.075	.07	.07	.07	.08	.08	.073
Dorsal (spinous):									
Distance from snout	.29	.27	.28	.27	.25	.26	.28	.31	.276
Length of base	.30	.32	.30	.33	.34	.34	.29	.27	.31
Length of first spine	.06	.05	.055	.....	.05	.05	.06	.06	.057
Length of second spine	.06	.05	.06	.06	.055	.06	.06	.06	.058
Length of last spine	.05	.045	.04	.05	.045	.05	.05	.06	.05
Dorsal (soft):									
Length of base	.25	.26	.26	.24	.25	.25	.24	.25	.25
Length of antecedent spine	.06	.055	.055	.06	.055	.06	.07	.07	.06
Length of first ray	.12+	.12+	.12	.13	.12	.12	.12	.12	.12
Length of longest ray	.13	.12+	.12	.13	.12	.12	.12	.12	.12
Length of last ray	.05	.04	.03	.....	.045	.04	.....	.....	.04
Anal:									
Distance from snout	.60	.57	.59	.63	.60	.63	.60	.57	.60
Length of base	.22	.25	.24	.24	.23	.24	.22	.24	.235
Length of first spine	.06	.06	.06	.06	.06	.05	.08	.08	.064
Length of first ray	.12	.125	.125	.12	.12	.11	.....	.12	.12
Length of longest ray	.12	.125	.125	.12	.12	.11	.....	.12	.12
Caudal:									
Length of middle rays	.12	.12	.11	.12	.12	.11	.....	.12	.117
Length of external rays	.14	.14	.13	.13	.13	.14	.13	.13	.134
Pectoral:									
Distance from snout	.30	.30	.32	.30	.29	.28	.32	.29	.30
Length	.15	.16	.16	.17	.16	.155	.17	.17	.16
Ventral:									
Distance from snout	.37	.36	.37	.36	.34	.36	.34	.36	.357
Length	.09	.08	.08	.08	.08	.08	.085	.09	.083
Dorsal	ix, i, 10	xi, i, 11	x, i, 11	xi, i, 11	xi, i, 10	xi, i, 11	x, i, 10	ix, i, 10	.....
Anal	i, 9	i, 11	i, 10	i, 10	i, 10	i, 10	i, +	i, 10	.....
Caudal	v, 12, iv	+, 12, +	+, 12, +	iv, 12, iv	v, 12, v	iv, 12, iv	.....	+, 12, +	.....
Pectoral	10	10	10	10	10	10	10	10	.....
Ventral	i, 1	i, 1	i, 1	i, 1	i, 1	i, 1	i, 1	i, 1	.....

Table of Comparative Measurements.

	*Gasterosteus pungitius** Linn. (averages of 7 examples).	*G. pungitius* var. *brachypoda* Bean (averages of 8 examples).
	1000ths of length.	1000ths of length.
Body:		
Greatest height	.170	.187
Greatest width	.100	.107
Height at ventrals	.170	.177
Least height of tail	.036	.032
Length of caudal peduncle	.150	.140
Head:		
Greatest length	.265	.265
Greatest width	.110	.113
Width of interorbital area	.062	.060
Length of snout	.062	.060
Length of operculum	.084	.080
Length of upper jaw	.070	.066
Length of mandible	.080	.076
Long diameter of eye	.082	.073
Dorsal (spinous):		
Distance from snout	.286	.276
Length of base	.276	.310
Length of first spine	.066	.057
Length of second spine	.066	.058
Length of last spine	.050	.050
Dorsal (soft):		
Length of base	.245	.250
Length of antecedent spine	.080	.060
Length of first ray	.140	.120
Length of longest ray	.140	.120
Length of last ray		.040
Anal:		
Distance from snout	.570	.600
Length of base	.220	.235
Length of first spine	.086	.064
Length of first ray	.130	.120
Length of longest ray	.130	.120
Caudal:		
Length of middle rays	.110	.117
Length of external rays	.137	.134
Pectoral:		
Distance from snout	.300	.300
Length	.160	.160
Ventral:		
Distance from snout	.370	.357
Length	.121	.083

* = *Pygosteus occidentalis* (C. & V.) Brevoort, from which the averages were taken.

Table of Measurements.

Genus, *Gasterosteus*.

Current number of specimen	*Pungitius* L., 22,015 *a*.	*Pungitius* L., 22,015 *b*.	*Blanchardi* Sauvage (type) (39) 21,139.
Locality	Christiania, Norway, R. Collett.		Boston, U. S.
	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.
Extreme length to origin of middle caudal rays	33	29	46
Length to end of external caudal rays	38	34	52
Body:			
Greatest height	.18	.18	.16
Greatest width	.10	.10	.09
Height at ventrals	.18	.18	.16
Least height of tail	.04	.04	.04
Length of caudal peduncle	.13	.13	.135

Table of Measurements—Continued.

Genus, *Gasterosteus*.

Current number of specimen	*Pungitius* L., 22,015 *a*.	*Pungitius* L., 22,015 *b*.	*Blanchardi* Sauvage (type) (39) 21,139.
Locality	Christiania, Norway, R. Collett.		Boston, U. S.
	Millimetres and 100ths of length.	Millimetres and 100ths of length.	Millimetres and 100ths of length.
Head:			
Greatest length	.28	.30	.28
Greatest width	.12	.13	.12
Width of interorbital area	.06	.06	.06
Length of snout	.06	.06	.06
Length of operculum	.10	.09	.08
Length of maxillary	.07	.07	.07
Length of mandible	.08	.08	.08
Diameter of orbit	.08	.08	.08
Dorsal (spinous):			
Distance from snout	.29	.30	.27
Length of base	.28	.30	.28
Length of first spine	.065	.07	.06
Length of second spine	.07	.07	.065
Length of last spine	.055	.055	.055
Dorsal (soft):			
Length of base	.26	.24	.26
Length of antecedent spine	.08	.08	.07
Length of first ray	.14	.15	.13
Length of longest ray	.14	.15	.13
Length of last ray	.04		.04
Anal:			
Distance from snout	.59	.60	.56
Length of base	.24	.23	.23
Length of first spine	.09	.09	.08
Length of first ray	.14	.15	.13
Length of longest ray	.14	.15	.13
Length of last ray	.04		.045
Caudal:			
Length of middle rays	.13	.13	.12
Length of external rays	.14	.15	.14
Pectoral:			
Distance from snout	.30	.32	.30
Length	.16	.17	.16
Ventral:			
Distance from snout	.37	.39	.36
Length	.13	.13	.12
Dorsal	X, I, 12	IX, I, 10	IX, I, 11
Anal	I, 10	I, 9	I, 10
Caudal	IV, 12, IV	+, 12, +	V, 12, IV
Pectoral	9	10	10
Ventral	I, 1	I, 1	I, 1

Family, MICROSTOMIDÆ.

28. Mallotus villosus (Müll.) Cuv.

Mallotus villosus Rich., F. B. A., iii, 1836, p. 187.

Signalized from Bathurst's Inlet. Mr. Kumlien mentions "small herring-like fish that enter the sound in great numbers in early spring, but soon leave. They are called 'ice-fish' by the whalers." I suppose they belong to the species named above.

Family, SALMONIDÆ.

29. Salmo salar (Linn.) Günther.

Salmo salar Kumlien, in lit.

Mr. Kumlien writes me that this salmon was obtained in quantities in the Cumberland waters, and that he recognized at least two species of

Salmo, but could not secure specimens that were not split or otherwise mutilated.

Salvelinus Naresi occurs there, as will be seen in the present paper.

30. Salmo Hearnii Rich.

Salmo Hearnii Rich., F. B. A., iii, 1836, p. 167.

The species was described from the Coppermine River, lat. 67° 42½′ N.

31. Salvelinus alipes (Rich.) Gill & Jordan.

Salmo alipes Rich., F. B. A., iii, 1836, p. 169: Günth., P. Z. S., 1877, p. 476.

Boothia Felix (Rich.); Discovery Bay (Günth.).

32. Salvelinus nitidus (Rich.) Gill & Jordan.

Salmo nitidus Rich., F. B. A., iii, 1836, p. 171.

The species was described from Boothia.

33. Salvelinus Hoodii (Rich.) Gill & Jordan.

Salmo Hoodii Rich., F. B. A., iii, 1836, p. 173.

Richardson described it from Boothia Felix.

34. Salvelinus arcturus (Günth.) Gill & Jordan.

Salmo arcturus Günth. P. Z. S., 1877, p. 294, pl. xxxii.

Dr. Günther established the species upon specimens obtained in lat. 82° 28′ N. and 82° 34′ N.

35. Salvelinus Naresi (Günther) Bean.

Salmo Naresi Günther, Proc. Zoöl. Soc. Lond., iii, 1877, p. 476, pl. L.

22000 ♀. Cumberland Gulf, Aug. 1876. Lieut. W. A. Mintzer.

22000 *a*. ♀. Cumberland Gulf, Aug. 1876. Lieut. W. A. Mintzer.

22000 *b*. ♂. Cumberland Gulf, Aug. 1876. Lieut. W. A. Mintzer.

Of this small charr, Lieutenant Mintzer secured the above-named specimens, and labelled them "Salmon Trout." The larger of the two females contains well-developed ova, some of which are free in the cavity of the abdomen. The species agrees very closely with Dr. Günther's description of *S. Naresi*. The description and table of measurements which follow will afford a means of estimating the correctness of an identification which records the species about 20 degrees south of the locality from which it was originally described.

Description.—The greatest height of the body is contained 5 times in the total length without caudal, and equals twice the length of the upper jaw. The height at the ventrals equals the distance from the tip of the snout to the nape. The least height of the caudal peduncle equals the length of the middle caudal rays.

The greatest length of the head is contained 4⅓ times in total length without caudal, and about equals twice the length of the base of the first

dorsal fin. The greatest width of the head is a little less than half its length. The distance between the eyes equals their long diameter and half the length of the mandible. The length of the snout equals half the length of the middle caudal rays. The length of the operculum equals the distance between the eyes. The length of the upper jaw is contained from 10 to 11 times in total length without caudal, and the length of the mandible $7\frac{3}{4}$ times. The distance from the snout to the orbit is $\frac{1}{4}$ or nearly $\frac{1}{4}$ of the distance from the same point to the base of the pectoral. The long diameter of the eye equals $\frac{1}{3}$ of the greatest height of the body. The teeth are arranged just as in the specimens examined and described by Dr. Günther.

The distance of the first dorsal from the tip of the snout equals $\frac{3}{5}$ of the distance of the anal from the same point, and is contained $2\frac{2}{9}$ times in total length without caudal. The length of the base of the first dorsal is contained $8\frac{1}{2}$ to 9 times in total length without caudal, and of its longest ray, 7 times.

The adipose dorsal is placed at a distance from the tip of the snout, equal to $\frac{4}{5}$ of the total length, exclusive of the caudal. Its height about equals the distance from the snout to the orbit.

The distance of the anal from the snout equals $\frac{3}{4}$ of the total length as before measured. The length of the anal base equals half the length of the head in the larger female, and $\frac{1}{10}$ of total length in the smaller. The longest ray of the anal equals twice the distance between the eyes, and the last ray equals half the length of the base of the first dorsal.

The length of the midle caudal rays is contained $2\frac{1}{8}$ times in the length of the external rays and $12\frac{1}{2}$ times in total length.

The distance from the tip of the snout to the base of the pectoral equals twice the greatest width of the head. The length of the pectoral equals the distance from the snout to the nape. The fin when extended falls short of the vertical through the origin of the first dorsal by about one-third of its own length.

The distance of the ventral from the tip of the snout equals 3 times the length of the pectoral. The length of the ventral equals $\frac{1}{8}$ of total length. The ventral terminates at a distance from the vent equal to the least height of the caudal peduncle.

Radial formulæ.—B. 10? to 11?; D. 13; A. 11; P. 15 to 16; V. I, 9.

Cæca pylorica.—In the larger female, 28.

The coloration cannot be made out accurately. There are a few small spots on the side of the body, which now appear white. Parr marks are

present in all the examples, and yet there is excellent reason for believing the largest specimen at least mature.

In the measurements the unit of comparison is the length to the origin of the middle caudal rays. The figure of *S. Naresi* is employed, and the agreement between that and the Cumberland Gulf specimens is striking.

Table of Measurements.

Current number of specimen	22,000, ♀.		22,000 *a*, ♀.		22,000 *b*, ♂.		Fig. of *S. Naresi* in P. Z. S., iii, 1877, pl. L.	
Locality	Cumberland Gulf.		Cumberland Gulf.		Cumberland Gulf.			
	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.	Millimetres.	100ths of length.
Extreme length	139	.....	121	.....	88	.....	197	.....
Length to origin of middle caudal rays	120	.....	103	.....	74	.....	172	.....
Body:								
Greatest height	.....	20	.....	19	.....	19	.....	19½
Greatest width	.....	12	.....	10	.....	10	.....	.....
Height at ventrals	.....	17	.....	15	.....	16	.....	18
Least height of tail	.....	8	.....	8	.....	8	.....	8½
Head:								
Greatest length	.....	23	.....	23	.....	26	.....	22
Distance from snout to nape	.....	17	.....	17	.....	19	.....	.....
Greatest width	.....	11	.....	10½	.....	11	.....	.....
Width of interorbital area	.....	6½	.....	6½	.....	.....	.....	.....
Length of snout	.....	4	.....	5	.....	5	.....	5
Length of operculum	.....	6½	.....	7	.....	7	.....	6
Length of upper jaw	.....	10	.....	9	.....	10½	.....	10
Length of mandible	.....	13	.....	13	.....	14	.....	.....
Distance from snout to orbit	.....	5	.....	5½	.....	.....	.....	.....
Long diameter of eye	.....	6½	.....	6	.....	8	.....	5½
Dorsal (first):								
Distance from snout	.....	45	.....	46	.....	47	.....	46
Length of base	.....	12	.....	11	.....	12	.....	12
Length of longest ray	.....	14	.....	14	.....	16	.....	12
Dorsal (adipose):								
Distance from snout	.....	79	.....	80	.....	80	.....	80
Length of base	.....	3	.....	.....	.....	.....	.....	.....
Height	.....	5	.....	.....	.....	.....	.....	4½
Anal:								
Distance from snout	.....	75	.....	75	.....	73	.....	75
Length of base	.....	12	.....	10	.....	11	.....	10
Length of longest ray	.....	13	.....	13	.....	13	.....	12
Length of last ray	.....	5½	.....	6	.....	6	.....	5
Caudal:								
Length of middle rays	.....	8	.....	8	.....	.....	.....	8½
Length of external rays	.....	17	.....	17	.....	19	.....	18
Pectoral:								
Distance from snout	.....	22	.....	22	.....	23	.....	22
Length	.....	18	.....	17	.....	20	.....	18
Ventral:								
Distance from snout	.....	53	.....	54	.....	55	.....	54
Length	.....	12½	.....	13	.....	14	.....	12½
Vent from tip of ventrals	.....	8	.....	7½	.....	.....	.....	.....
Branchiostegals	11?	.....	10?	.....	.....	.....	11	.....
Dorsal	13	.....	13	.....	13	.....	13	.....
Anal	11	.....	11	.....	11	.....	11	.....
Pectoral	16	.....	15	.....	14	.....	.....	.....
Ventral	I, 9	.....	I, 9	.....	I, 9	.....	I, 9	.....
Number of cæcal appendages	28	.....	.....	.....	27	.....	42	.....

Family, CLUPEIDÆ.

36. Clupea harengus Linn.

Clupea harengus Rich., F. B. A., iii, 1836, p. 231.

Richardson mentions the occurrence of the herring at Bathurst's Inlet, 67° N., 109° W.

Family, SACCOPHARYNGIDÆ.

37. Saccopharynx flagellum Mitch.

Ophiognathus ampullaceus HARWOOD, Phil. Trans., 1827, p. 49, pl. 7 (*fide* Rich.).
Saccopharynx ampullaceus RICH., F. B. A., iii, 1836, p. 271.

"The individual described by Dr. Harwood, measuring four feet and a half in length, was captured in the entrance of Davis Strait, by Captain Sawyer, of the ship Harmony."—RICH., *l. c.*

U. S. NATIONAL MUSEUM, *April* 3, 1879.

SUPPLEMENTARY NOTE.—The description of a species of *Cottus* from the United States by Sauvage* has just come to my notice. The subject of the description and figure is undoubtedly the *Cottus æneus* of Mitchill.

MAY 23, 1879.

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* *Cottus* (*Acanthocottus*) *anceps* SAUVAGE, Nouv. Archiv. du Muséum d'Histoire Naturelle, Paris, Deuxième Série, Tome Premier, 1878, p. 145, pl. i, fig. xiii.

CRUSTACEA.

By S. I. Smith.

The following crustaceans were all collected in the Gulf of Cumberland.

Crangon boreas J. C. Fabricius (Phipps).

A female (No. 145) 110^{mm} in length, "Niantilic Island," September 24, 1877.

Hippolyte Grœnlandica Miers (J. C. Fabricius).

Two females: one (No. 1644) 100^{mm} in length, from stomach of *Cottus scorpius*, September 6, 1878; the other (No. 207) 80^{mm} long, from stomach of sculpin (No. 150), 1877.

Hippolyte Fabricii Kröyer.

A female (No. 537), 52^{mm} long, 7 fathoms, tide-hole, "Annanactook Island," June, 8, 1878; and a male (No. 862), 42^{mm} in length, head of Cumberland Gulf, June 29, 1878.

Gammarus locusta J. C. Fabricius (=*G. ornatus* Milne-Edwards).

"Penny Harbor, latitude 66°" (No. 225), October 4, 1877; "Arctic Island," low water (No. 65), September 13, 1877; "Annanactook Harbor" (No. 576), June 20, 1878.

Amathilla Sabini Bate and Westwood (Leach).

Head of Cumberland Gulf (No. 86); "Annanactook Harbor" (Nos. 584 and 593), 4 fathoms, June 19, 1878; (No. 585), Cumberland Gulf.

Hyperia medusarum Bate (O. F. Müller).

"Annanactook Harbor," No. 586, June 19, 1878.

Caprella septentrionalis Kröyer.

"Annanactook Harbor" (No. 583), "caught through crack in ice, 4 fathoms, on kelp," May 19, 1878; "Grave Island beach" (Nos. 626 and 627), June 27, 1878; (No. 420).

Lepas fascicularis Ellis and Solander.

Cumberland Gulf, at surface.

Balanus balanoides Stimpson.

Large well-developed specimens, of the low, broad form. Arctic Island, September 13, 1877. This and the preceding were identified by Mr. E. B. Wilson.

There is also in the collection a specimen of *Hyas araneus* Leach (No. 1420), from "Godthaab, Greenland, September 11, 1878." On its carapax were specimens of *Balanus crenatus*.

ANNELIDES.

By A. E. Verrill.

ANNELIDA.

Harmothoe imbricata (L.) Malmgren.

Penny Harbor, Cumberland Gulf, low-water, October 4, 1877, lot 230. Head of gulf, on gravel beach, May 28, and June 1, 1878, lots 642, 660, and 664.

Nereis pelagica Linné.

Penny Harbor, Cumberland Gulf, lat. 66°, low-water, October 4 and 5, 1877, lots 221, 222, 237. Head of gulf, on gravel beach, May 28, 1878, lot 642.

Phyllodoce Grönlandica Œrsted (?).

A specimen in bad state of preservation. Cumberland Gulf.

Syllis, sp.

Penny Harbor, low-water, October 4, 1877. Head of Cumberland Gulf, gravel beach, low-water, May 28, 1878.

Cistenides granulata (Linné) Malmgren.

Cumberland Gulf, low-water.

Thelepus cincinnatus (Fabr.) Verrill.

Amphitrite cincinnata Fabr., Fauna Grönl., p. 286, 1780.

Thelepus circinnatus Malmgren, Nordiska Hafs-Annulater, in Öfversigt af Kongl. Vet.-Akad. Forhandl. 1865, p. 387, pl. xxii, fig. 58 (specific name incorrectly spelled).

Lumara flava Stimpson, Invert. of Grand Manan, p. 30, 1853.

Cumberland Gulf. Common on the American coast south to Cape Cod, and in deeper water as far as Long Island Sound.

Malmgren and several other recent writers have erroneously written the name of this species "*circinnatus*."

Spirorbis lucidus (Mont.) Mörch.

Very common in Cumberland Gulf, on ascidians, algæ, polyzoa, etc., low-water to 9 fathoms; Penny Harbor, October 4; Annanactook Harbor, May 20, 1878; head of the Gulf, May 28, 1878.

Spirorbis quadrangularis Stimpson.

Cumberland Gulf, low-water. One specimen.

GEPHYREA.

Phascolosoma margaritaceum (Sars) Kor. & Dan. (?).

Phascolosoma margaritaceum Koren and Danielssen, Fauna Litt. Norveg. iii, p. 135, pl. 15, figs. 43, 44, 1877.

A large specimen, about 6 inches long, from the stomach of a *Cottus*, in Cumberland Sound, September 6, 1878 (lot 1685), probably belongs to this species.

Total length 150^{mm}; diameter of body, 18^{mm}; length of proboscis from anal opening to end, 112^{mm}. Body large, round, abruptly rounded posteriorly, with a slight mammilla at the tip; anteriorly it tapers gradually into the proboscis, which is long and becomes slender toward the end. The surface appears nearly smooth to the eye, except that there are more or less irregular transverse wrinkles and slightly raised folds. Under a lens it is seen to be everywhere finely transversely wrinkled and striated, and in many parts reticulated with longitudinal wrinkles, while small, depressed, sucker-like organs are scattered over the surface of the body and base of the proboscis; at the posterior end of the body the longitudinal wrinkles become distinct grooves, converging to the tip, with rows of suckers between them, and the circular wrinkles, crossing the interspaces, are conspicuous. The proboscis is destitute of papillæ and hooks, and is smoother than the body, with faint indications of transverse lighter and darker bands of color. Tentacles numerous, slender. Internally the two dorsal retractors arise only a short distance behind the anal opening, their bases being wide apart toward the sides. The ventral retractors, arising near the middle of the body, are large and stout, with their thick bases close together, barely leaving space for the nervous cord to pass between them. Segmental organs large, thick, cylindrical, obtuse, dark brown, about 25^{mm} long and 3^{mm} in diameter; their openings somewhat in advance of the origin of the dorsal retractors and lower down on the sides. Intestine very long, forming a double coil of numerous turns, filling the posterior part of the body to the end. Generative organ voluminous, surrounding the intestine. A slender

transverse muscle passes from the rectum to the opposite side of the body, and the rectum is attached to the adjacent wall by a large bundle of muscular fibers. Muscles of the body-wall form a continuous layer, without distinct fascicles.

NEMERTINA.

Amphiporus Stimpsoni Verrill.

Ommatoplea Stimpsoni GIRARD, in Stimpson, Invert. of Grand Manan, p. 28, fig. 18, 1853.

Gravel beach, low-water, Cumberland Gulf, June 1, 1878, lot 663. "Color, deep purplish brown above, lilac beneath." Also from reef in Penny Harbor, October 5, 1877, lot 222.

Amphiporus, sp.

Body thick, depressed, somewhat tapered to both ends, 25^{mm} to 35^{mm} long, as contracted in alcohol. Head with a small roundish cluster of minute ocelli on the pale antero-lateral margins. Neck with a slightly marked transverse groove, converging backward in form of a V, on the dorsal surface. Color, in alcohol, dark bluish green; the under surface and margins of head yellowish white. In life, "bright pea-green."

Penny Harbor, Cumberland Gulf, lat. 66°, October 4, 1877, lot 225. Arctic Island, low-water, September 13, 1877, lot 66.

MOLLUSKS.

LIST OF SHELLS OBTAINED BY MR. LUDWIG KUMLIEN, NATURALIST TO THE HOWGATE EXPEDITION, 1877-78, AT POINTS IN CUMBERLAND SOUND, ARCTIC REGIONS, WEST FROM BAFFIN'S BAY.

By W. H. Dall.

The locality at which the schooner Florence, conveying the party, made her winter quarters, according to Mr. Kumlien's report, was not favorable for extensive collections in any department.

The prevalence of ice in the irregularities of the sound and other circumstances, especially the abrupt and rocky character of the shores, rendered it difficult to obtain specimens of invertebrates, which in point of fact were all collected at a few small areas of beach, some of which were a long distance from winter quarters.

Nevertheless, when the difficulties are considered, the results are very creditable to Mr. Kumlien's energy and perseverance, and are not without value for the study of geographical distribution.

The number of specimens is small; but twenty-four species are represented, some of which were also obtained by a party under Lieutenant Mintzer, U. S. N., who explored for minerals in nearly the same region a year or two previous to the visit of the Florence.

As was to be expected, none of the species are new: *Modiolaria faba* Fabr., which has almost been lost sight of by naturalists, and *Glycimeris Kurriana* Dkr., a species whose validity has been much questioned, were among the most interesting forms obtained.

The species are as follows (those with an asterisk are represented by only one or two specimens, and only *Buccinum grönlandicum* was at all numerous):

* *Ommastrephes illecebrosa*, Lesueur.

* *Buccinum glaciale*, Linné.

* *Buccinum ciliatum*, Fabr., var. *Mölleri*, Rve.

* *Buccinum humphreysianum*, Bennett (probably).

* *Buccinum belcheri*, Rve.

Buccinum tenebrosum, Hancock, (typical).
Buccinum grönlandicum, Chemn.
* *Trophon truncatus*, Ström.
Margarita umbilicalis, Brod. & Sby.
Margarita helicina, Fabr., vars.
Litorina grönlandica, Mörch.
Acmæa testudinalis, Linné.
Aeolidia papillosa, Linné.
* *Dendronotus reynoldsii*, Couthouy.
Mya truncata, Linné.
* *Glycimeris Kurriana*, Dkr. On mud flats.
Saxicava arctica, Linné.
**Astarte borealis*, Gray; attached to kelp.
* *Turtonia minuta*, Fabr.; in nest of *Modiolaria*.
Modiolaria lævigata, Gray.
Modiolaria discors, Linné.
Modiolaria (*Crenella*) *faba*, Fabr.
Chiton (*Tonicella*) *marmorea*, Fabr.

Rhynchonella psittacea, Fischer; dead broken valves, apparently disgorged by some bird, were found on the hills at a considerable distance from the sea. They are evidently not fossil, and are probably to be found living in suitable places at low-water mark.

NOVEMBER 26, 1878.

MOLLUSCOIDS.

BY A. E. VERRILL.

TUNICATA.

Ascidiopsis complanata Verrill.

. *Ascidia complanata* FABR., Fauna Grönlandica, p. 332, 1780.—VERRILL, Amer. Journ. Sci. i, p. 98, 1871, fig. 11.

Ascidia callosa STIMPSON, Invert. of Grand Manan, p. 19, 1853.

Ascidiopsis complanata VERRILL, Amer. Journ. Sci. iii, p. 289, pl. viii, f. 8, 1872.

Some of the young specimens are translucent pale olive; others are older, with a dark olive-brown, thicker, and rougher test. It appears to be the most common species. It is broadly attached by one side, obliquely, and both tubes are on the upper side, near one end. They are both short and broad.

Lot No. 235, Penny Harbor, Cumberland Gulf, at low-water, October 4, 1877. No. 592, head of Cumberland Gulf, attached to roots of kelp, May 19, 1878. No. 595, Cumberland Gulf, May, 1878. No. 664, head of Cumberland Gulf, on gravel beach, June 1, 1878.

Halocynthia Verrill = **Cynthia** Savigny (*non* Fabr., 1808).

The name *Cynthia* having been preoccupied, and no other tenable name having been given to the group, I propose to substitute *Halocynthia* for the typical section of Savigny's genus, characterized by the square apertures, compound tentacular appendages of the mantle, and the development of two ovaries. The other subdivisions established by Savigny appear to be of generic value, in the modern sense.

Halocynthia rustica Verrill.

Ascidia rustica LINNÉ.—FABRICIUS, Fauna Grönlandica, p. 330, 1780, *pars.*

Ascidia monoceros MÖLLER, Kröyer's Naturhist. Tidssk., vol. iv, p. 95, 1842.

Ascidia condylomata PACKARD, Mem. Boston Soc. Nat. Hist., i, p. 277, 1867.

Cynthia monoceros VERRILL, Amer. Journ. Sci., vol. i, p. 93, 1871.

Distinguished by the irregular, unequal warts and tubercles of the surface, the larger ones mostly situated above the middle, and by the more or less prominent subconical tubercle at the summit, between the bases of the tubes. This terminal tubercle is often surmounted by several hard chitinous points, and in the young a similar point often occurs

on some of the other tubercles. The form of the body is more or less cylindrical, often two inches or more high and one in diameter, after preservation in alcohol. The tubes are terminal and divergent. Color, in life, reddish.

The very young specimens are low and nearly flat in contraction, and nearly smooth.

It is common on the Grand Banks, where it grows to a large size. It has not been found on the New England coast.

Lot No. 592, head of Cumberland Gulf, attached to roots of kelp, May 19, 1878. Both adult and young.

Halocynthia echinata Verrill.

Ascidia echinata LINNÉ.—FABRICIUS, Fauna Grönlandica, p. 331.

Cynthia echinata STIMP., Invert. of Grand Manan, p. 20, 1854.—BINNEY, in Gould, Invert. of Mass., p. 18, pl. xxiii, fig. 3260.—VERRILL, Amer. Journ. Sci. i, p. 96, 1871.

Lot No. 596, Cumberland Gulf, May 10, 1878.

Besides the two species of this genus brought home by the expedition, the following occur on the American coast north of Cape Cod: *H. pyriformis* (Rathke), Southern New England to Greenland; *H. villosa* (Fabr.), perhaps young of the preceding, Labrador to Greenland; *H. tuberculum* (Fabr.) = *Cynthia carnea* (Ag.) Verrill = *C. placenta* Packard (young), Cape Cod to Greenland; *H. pulchella* Verrill (as *Cynthia*), Eastport, Me., to Grand Banks; *H. partita* (Stimp.), Massachusetts Bay to North Carolina.

POLYZOA.

Crisia eburnea (L.) Lamouroux.

Gulf of Cumberland. One specimen.

Diastopora patina (Lam.) Smitt.

Annanactook Harbor, on *Laminaria*, 7 fathoms, May 19; and on *Halocynthia rustica*, head of Cumberland Gulf, May 5, 1878.

Alcyonidium mytili Dalyell.

Gulf of Cumberland, on algæ. Godthaab, Greenland, on carapax of *Hyas araneus*.

Gemellaria loricata (Linné) Busk; Smitt.

Gemellaria dumosa STIMPSON, Invert. of Grand Manan.

Specimens three inches high, Penny Harbor, Cumberland Gulf, low-water, October 4, 1877, lots 226 and 238, covered with fry of *Crenella faba*; same locality, May 28, 1878.

Cellaria articulata Smitt, ex Fabricius.

Salicornaria borcalis Busk.

Cellaria borcalis Smitt, Öfversigt af Kongl. Vet.-Akad. Förh. 1867, p. 361, tab. xx, fig. 17, 1867.

On *Halocynthia rustica*, attached to roots of *Laminaria*.

Head of Cumberland Gulf, May 19, 1878, lot 592. Some of the specimens are very young, with only a single clavate joint; others are nearly two inches high, and beginning to branch.

Membranipora Sophiæ Busk.

With the last (lot 592). Also from Annanactook Harbor, May 19, 1878, on roots of *Laminaria*, 7 fathoms.

Escharina ansata (Johnst.) Gray.

Mollia vulgaris, forma *ansata* Smitt, Översigt af Kongl. Vetenskaps-Akad. Förh. 1867, p. 14, tab. xxv, f. 78–83, 1867.

Several specimens occurred on the roots of *Laminaria*, 7 fathoms, Annanactook Harbor, May 19, 1878 (lot 597). Some agree with the var. *ansata* Smitt (*Lepralia ansata* Johnst.), but in most cases there are well-developed calcareous papillæ near the sides of the apertures as in the var. *papillata*.

I adopt the generic name *Escharina* given by Milne Edwards to a group, including the present species, in 1835 (in Lamarck, An. sans Vert., ed. 2, vol. ii, pp. 218, 230), and for which he cited *as the type E. vulgaris* (Moll.). Dr. Gray (List Brit. Animals in British Museum, p. 124, 1848) also restricted the name to the same and closely allied species. Dr. Smitt, however, united this group with *Hippothoa*, which seems to be a sufficienty distinct genus.

The restricted genus *Escharina*, as I limit it, is characterized by the well-marked median sinus of the apertures of the zoœcia, together with the lateral avicularia, usually developed near one or both sides of the apertures. The mode of growth is usually Lepralia-like, but may also be Escharine. It is therefore equivalent, or nearly so, to the genus *Schizoporella*, recently proposed by Hincks for the same typical species.

The genus *Escharoides*, proposed by Edwards in the same work, has also been incorrectly used by some writers; for although Gray restricted it, in 1848, to one of the original species, *E. coccinea* (Abildg.), thus making it equivalent, in part, to *Discopora* Smith, the last-named writer has applied it to a group, typified by *E. rosacea*, not included by Edwards. As the name should be restored, in accordance with Gray's limitation, I have proposed elsewhere the name *Escharopsis*, as a substitute for *Escharoides* of Smitt, including two Northern Atlantic species

(*E. lobata* (Lamx.)=*E. Sarsii* Smitt, and *E. rosacea*), both common in the Gulf of St. Lawrence. This genus, with an Escharine growth, has apertures much as in *Escharina*, except that the lateral avicularia are situated within their borders by the side of the sinus.

Discopora Lam., following Edwards, should be restricted to forms like *D. Skenei*, with median avicularia, the type of Lamarck being *D. verrucosa*, a species closely related to *D. Skenei*, but not the *Cellepora verrucosa* of Esper, a very different form, to which Gray erroneously restricted this generic name.

Celleporella hyalina (L.) Gray.

Cellepora hyalina LINNÉ.

Mollia hyalina SMITT, op. cit. p. 16, tab. xxv, f. 84, 85.

Hippothoa hyalina SMITT, Florida Bryozoa.

Very common, Annanactook Harbor, 7 fathoms, on *Laminaria*, May 19, and 9 fathoms, May 20, 1878, lot 570. Penny Harbor, low-water, on *Margarita helicina*, October 4, 1877, lot 226. Gravel beach, head of Gulf of Cumberland, May 28, 1878, lot 642, and on *Halocynthia rustica*, lot 572, May 19.

RADIATES.

By A. E. Verrill.

ECHINODERMATA.

Pentacta frondosa Jæger (Gunner, sp.).

Cucumaria frondosa Forbes, Brit. Starfishes, 1841.—Duben and Koren, 1844.

One large specimen, Godthaab, Greenland, August 11, 1878.

Strongylocentrotus Dröbachiensis A. Agassiz.

Penny Harbor, Gulf of Cumberland, reef at low-water, October, 4, 1877, lot 420.

Leptasterias Grönlandica Verrill.

Asteracanthion Grönlandicus Steenst.—Lütken, Oversigt over Grönlands Echinodermata, p. 29, 1857.

Head of Gulf of Cumberland, Niantilie Harbor, lot 144; low-water, September 25, 1877, lot 179; Arctic Island, lot 66; Penny Harbor, lat. 66°, at low-water, October 4, 1877, lot 224; also same locality, lot 290.

Leptasterias Mulleri Verrill, 1866.

Asteracanthion Mulleri Sars, Fauna Litt. Norveg., i, p. 56, f. 38, 39; Oversigt af Norges Echinodermer, p. 88.

Annanactook Harbor, 4 fathoms, May 19, 1878, lot 580.

Stephanasterias albula Verrill.

Asteracanthion albulus Stimpson, Invert. of Grand Manan, p. 14, fig. 5, 1853.
Asteracanthion problema Steenstrup.—Lütken, op. cit. p. 30.

Common in Cumberland Gulf. Gravel beach at the head of the gulf, etc. The only lot with the date remaining is 649, May 30, 1878. With lot 725 is the following note: "Dull lilac above, yellowish white beneath."

All the specimens are young, with the rays irregular in length and variable in number.

The genus *Stephanasterias*, proposed by me for this species several years ago, is characterized by a peculiar structure of the skeleton and spines as well as by its remarkable method of fission, so well elucidated by Dr. Lütken. When adult, there are usually six regular equal rays, such specimens becoming four or five inches in diameter. But in smaller specimens, still undergoing self division, there are usually two to four

longer rays, with three to five shorter reproduced rays on one side. The rays are rounded, and uniformly covered with small clustered spinules, arranged in divergent groups on each plate. The plates are regularly arranged, both transversely and longitudinally, and more closely united than in *Asterias* and *Leptasterias*. The plates of the ventral rows are directly united with the adambulacral, so as to leave no spaces between for the papulæ, which are, therefore, absent along the ventral surface next the adambulacral plates; on the dorsal surface they are usually arranged in pairs. The major pedicellariæ are arranged along the edges of the ambulacral grooves, and a few usually occur in the adoral angles, between the bases of the rays.

Ophioglypha nodosa Lyman.

Ophiura nodosa LÜTKEN, Addit. ad Hist. Ophiuridarum, p. 48, pl. ii, fig. 9, *a–b*, 1858.

Lot 249. Annanactook Harbor, low-water, October 7, 1877. "Color crimson."

HYDROIDA.

Sertularia argentea Ellis and Sol.

Gravel beach, head of Cumberland Gulf, low-water, May 28, 1878.

Halecium tenellum Hincks.

Gravel beach, head of Cumberland Gulf, low-water, lot 642, May 28, 1878.

Obelia, sp.

With last. Also from Penny Harbor, low-water, October 4, 1877, attached to *Acidiopsis complanata*.

ANTHOZOA.

Urticina crassicornis Ehrenberg, 1834.

Actinia crassicornis MÜLLER, Prodromus, 1776.
Tealia crassicornis GOSSE, Ann. Nat. Hist.; Actinologia Brit., p. 209, pl. iv, fig. 1.
Rhodactinia Davisii AG.—VERRILL, Revision Polyps, in Mem. Boston Soc. Nat. Hist. vol. i, p. 18, (author's copies, 1864).

Head of Cumberland Gulf, low-water, lot 667, on roots of *Laminaria*. Annanactook Harbor, May 19, 1878.

Bunodes spectabilis Verrill.

Actinia spectabilis FABRICIUS, Fauna Grönlandica, p. 342, 1780.
Bunodes stella VERRILL, Revision of Polyps Eastern Coast of U. S., in Mem. Boston Soc. Nat. Hist. i, p. 16, pl. i, figs. 1–8, 1864.

A more extensive acquaintance with this species, and a careful comparison with the description of Fabricius had, some time ago, caused me to unite my *B. stella* with the Greenlandic species (see Check-list of

Marine Invertebrata), although it had not been recorded from any locality between the Bay of Fundy and Greenland. The numerous specimens in this collection serve to confirm that conclusion.

Common at low-water in the Gulf of Cumberland (lots 179, 237, 664), Penny Harbor, October 4, lot 237. Gravel beach, head of gulf, June 1, 1878.

PORIFERA.

Two or three species of sponges, not yet determined, are in the collection. The most interesting, as well as most common one, forms elongated, erect, rather flaccid tubes, two or three inches high and .25 to .35 in diameter, open at top.

It occurred on the gravel beach, head of the gulf, attached to stones, June 13, 1878, lot 770; also in lot 643.

INSECTS.

DIURNAL LEPIDOPTERA.

By W. H. Edwards.

Family, PAPILIONIDÆ.

Sub-family, PAPILIONINÆ.

Genus, *Colias*, Fabricius.

1. C. Hecla, Lefebvre.

One female was taken at Quickstep Harbor, Gulf of Cumberland, latitude 66°. This species inhabits Southern Greenland and regions to the westward. It has been attributed to Iceland, but, as is now supposed, erroneously. It also inhabits Southern Lapland.

Mr. M'Lachlan, in his Report on the butterflies collected by the recent British Arctic Expedition, states that *C. Hecla* was taken as far north as latitude 81° 45′, at Hayes Sound; and he gives information obtained from Captain Feilden, R. N., attached to the Alert as naturalist, on the habits of Lepidoptera in these high latitudes. "During the short period when there is practically no night, butterflies are continuously on the wing, supposing the sun's surface not to be obscured by clouds or passing snow showers. That about one month in each year is the longest period in which it is possible for these insects to appear in the perfect state, and that about six weeks is the limit of time allowed to plant-feeding larvæ, during all the rest of the year the land being under snow and ice." Mr. M'Lachlan doubts if there is sufficient time in each year for the preparatory stages of the butterfly,—egg, larva, and chrysalis,—and is disposed to think that more than one year is necessary. In the northern United States, the larvæ of Colias frequently pass the winter when half-grown, or even younger, and I think it probable this is the habit of *Hecla*. From two to three weeks at the end of the short Arctic summer, and less time at the beginning in the following year, would seem to suffice for the whole round of transformations.

In Dr. Staudinger's Catalogue, *Colias Boothii*, Curtis, is put down as a synonym of *Hecla;* but, in the opinion of Mr. M'Lachlan, the two are distinct species.

It is remarkable that the collection of butterflies made by the British Expedition, between latitude 78° and 82°, well toward the Arctic Sea, should exhibit a greater number of species, namely, 5, than is known in Southern Greenland, where we are told but 4 species have hitherto been taken, and this northern series does not embrace the genus Chionobas, one or two species of which are found in Greenland. Besides *C. Hecla* and *Argynnis Polaris*, taken by Mr. Kumlien, were *Argynnis Charidea*, *Lycæna Aquilo*, and, most surprising of all, *Chrysophanus Phlæas*, a species represented throughout the northern United States under a slightly different form, *Americana*.

Family, NYMPHALIDÆ.

Sub-family, NYMPHALINÆ.

Genus, *Argynnis*, Fabricius.

1. **A. Freya**, Thunberg.

Two males were taken in Southwest Greenland. This species is distributed over the boreal regions of both continents; in America, from Greenland to Alaska; and it follows the Rocky Mountains as far to the south as Colorado. It is subject to very little variation.

2. **A. Polaris**, Boisduval.

One male was taken at Quickstep Harbor. This species is more restricted in distribution than *Freya*, and, so far as known, is limited to Northeast America, from Labrador to the Arctic Sea. It was taken by the British Expedition as far to the north as latitude 81° 52′, and by the American Expedition (Polaris) at 81° 50′. It varies much in color, and the example sent me by Mr. Kumlien is remarkably melanic on the upper surface, the hind wings especially showing scarcely any fulvous.

Sub-family, SATYRINÆ.

Genus, *Chionobas*, Boisduval.

1. **C. Semidea**, Say.
Oeno, Boisduval.

Two males were taken at Quickstep Harbor. One of these has the upper surface dark blackish-brown, and the discal belt on hind wings beneath distinctly outlined on both edges. The other is light or pale black-brown, and the belt is almost lost in the dense markings which cover the wing. But specimens from the White Mountains of New Hampshire show similar variation. This species inhabits Labrador, and the Rocky Mountains at very high altitudes as far south as Colo-

rado and New Mexico. In the White Mountains it is abundant on the summit of Mount Washington; but in the territory between this region and Labrador it is unknown, as also between Mount Washington and the Rocky Mountains. How far to the northwest of the continent it flies is not known to me. It has not appeared in collections from Alaska, in which *Freya* was represented in considerable numbers. The peculiar distribution of this species, *C. Semidea*, by which it inhabits mountain summits thousands of miles apart and not the intervening country, and in the White Mountains of New Hampshire is thoroughly isolated and restricted to a very small area, is explained as in the case of plants similarly distributed and isolated (address of Prof. Asa Gray, Dubuque, 1872). The advance to the southward of the glacial ice pushed before it multitudes of plants and animals, forcing them along very distant lines of longitude in many cases; and when the receding of the ice took place, and a milder temperature began to prevail, some species which had obtained a foothold at the south remained there, finding a climate in which they could live, upon lofty mountains only, being unable to exist in the lowlands. In the case of this butterfly, such a climate was found at or near the snow-line in the Rocky Mountains, and upon the summits of the White Mountains.

INSECTS.

HYMENOPTERA, NOCTURNAL LEPIDOPTERA, DIPTERA, COLEOPTERA, NEUROPTERA, AND ARACHNIDA.

By S. H. Scudder and others.

The insects collected by Mr. Kumlien were very few in number, amounting to only sixteen species; and they appear to add little to our previous knowledge of the fauna. Nevertheless, as all lists from high northern localities possess a certain importance, the following is given. The Hymenoptera were determined by Mr. E. T. Cresson; the report on the Lepidoptera is by Mr. A. R. Grote; Mr. E. Burgess has named the Diptera, Dr. J. L. LeConte the Coleoptera, Dr. H. Hagen the Neuroptera, and Mr. J. H. Emerton the Arachnid.—Samuel H. Scudder.

The Diurnal Lepidoptera were placed in the hands of Mr. W. H. Edwards for examination, and appear on pp. 155–157.

HYMENOPTERA.

1. No. 944. *Bombus lacustris* Cress. One specimen; American Harbor, Gulf of Cumberland, July 6, 1878.

2. No. 1287. *Bombus* sp. near *B. scutellaris* Cress., and probably *B. grœnlandicus* Smith. One specimen; Godhavn, Greenland, August 3, 1878.

3. No. 1431. *Limneria* sp. (not described). One specimen; Disko Fjord, Disko Island, Greenland, August 9, 1878.

NOCTURNAL LEPIDOPTERA.

4. *Laria Rossii* Curtis, Appendix to the Second Voyage of Sir J. Ross, lxi, Pl. A, fig. 10.

The specimens belonging to this species are (1) a dried larva, black, with yellowish brown hairs, and on each side a row of yellow tufts, arctiiform; (2) a slight cocoon formed of the larval hair like those of the genus *Orgyia*; (3) a single worn male specimen of the moth. The specimens were collected at Annanactook, Cumberland Island, the latter part

of June. The cocoon has attached to it a fragment of a lichen and several coniferous needles, and was evidently formed on the ground; these objects are merely slightly attached and form no part of the structure itself. The cocoon, which is close in texture, yet very frail and light, contains the black and shining pupa, which is unusually thickly clothed with brownish hair.

Curtis says of this species: "It is a very abundant insect, especially in the caterpillar state, for about a hundred were collected on the 16th of June 1832, near Fury Beach." His description of the larva does not well accord with the present specimen. He says: "The caterpillar is large and hairy, and of a beautiful shining velvety black, the hairs being somewhat ochreous; there are two tufts of black hair on the back, followed by two of orange." His description of the pupa and web, as well as of the perfect insect, agrees with the specimens now received. He gives the food-plant of the larva as *Saxifraga tricuspidata* and *S. oppositifolia*.

I have recorded (Psyche, 1, 131) the occurrence of this species above the tree-line on Mount Washington, N. H. It is another instance of the distribution of our existing species of moths, through the agency of the change in climate attending the Glacial Epoch.

5. No. 1431. *Anarta melanopa* (Thunb.).

A single specimen collected at Disko Fjord, Disko Island, August 9, 1878. This species has been taken above timber-line, 13,000 feet elevation, by Lieut. W. L. Carpenter, on Taos Peak, Rocky Mountains. It is found also in Labrador, and has been collected by Mr. George Dimmock near the summit of Mount Washington.

6. No. 1127.

A single specimen of a small dusky gray moth too much rubbed for positive identification and otherwise mutilated. The eyes are naked, the ocelli apparent. It was taken at Kikkerton Island, Gulf of Cumberland, July 25, 1878.

DIPTERA.

7. No. 1061. *Culex* sp. One specimen; American Harbor, Gulf of Cumberland, July 10, 1878.

8. Nos. 1061, 1127. *Tipula arctica* Curt. Two specimens; American Harbor, Gulf of Cumberland, July 10, 1878; and Kikkerton Island, Gulf of Cumberland, July 25, 1878.

9. No. 1431. *Rhamphomyia* sp., perhaps *R. nigrita* Zett. Two specimens; Disko Fjord, Disko Island, Greenland, August 9, 1878.

10. A Tachinid of unrecognizable genus; two pupa cases and a fly which has escaped from one in confinement, with crumpled wings; found parasitic on the larva of *Laria Rossii*, Annanactook, Cumberland Sound.

11. No. 12-3. *Calliphora erythrocephala* Meig. One specimen; Godthaab, Greenland.

12. No. 1098. *Scatophaga apicalis* Curt. (= ? *S. squalida* Meig.). One specimen; off shore, American Harbor, Cumberland Sound, July 13, 1878.

COLEOPTERA.

13. No. 1061. *Amara hæmatopus* Dej. (Feronia); *Stereocorus similis* Kirby. One specimen; American Harbor, Cumberland Sound, July 10, 1878. The species is found generally throughout subarctic America.

14. No. 1641. *Agabus* (*Gaurodytes*) *tristis* Aubé. Five specimens in poor preservation; Lake Caroline Mann, Cumberland Island, September 1, 1878. The species is abundant in Alaska and extends down to California in the Sierra region.

NEUROPTERA.

15. No. 1641. A Limnophilid, perhaps an *Halesus*. Several larval cases with dried larvæ in some of them; the cases are composed of minute scales of mica. Lake Caroline Mann, Cumberland Island, September 1, 1878.

ARACHNIDA.

16. No. 1051. *Lycosa* sp., probably *L. grœnlandica* Thor. One dried specimen; American Harbor, Cumberland Sound, July 10, 1878.

PLANTS.

LIST OF THE PLANTS COLLECTED AT POINTS IN CUMBERLAND SOUND BETWEEN THE SIXTY-SIXTH AND SIXTY-SEVENTH PARALLELS OF NORTH LATITUDE AND ON THE SOUTH SHORES OF DISKO ISLAND, GREENLAND.

By Asa Gray.

The Howgate Expedition arrived in Cumberland Sound about the middle of September, 1877; the ground was then covered with snow, but this melted on the southern slopes some days later, and exposed a few plants still in flower, *Campanula rotundifolia*, *Lychnis apetala*, *Stellaria longipes*, var. *Edwardsii*, &c.

In the succeeding summer the Florence left her winter-harbor early in July, and while there was yet considerable snow remaining in the valleys. At the time we left our winter-quarters there were but four or five plants in flower in the vicinity, such as *Taraxacum Dens-leonis*, *Cochlearia officinalis*, *Saxifraga stellata*, and *Saxifraga rivularis*, var. *hyperborea*.

Pyrola rotundifolia, var. *pumila*, showed buds on a southern slope by the last day of May, but the same plants were not in flower by *July 7*. The season appeared to be unusually backward, frequent snow-storms prevailing till the latter days of June.

At America Harbor, on the east side, and nearly opposite Annanactook, the winter-harbor, plants were in much richer profusion and apparently more than a week earlier than at the former place.

As large a number of plants were collected here as our short stay would admit of. A few days were also spent at the Kikkerton Islands, and such of the islands as were accessible to us faithfully hunted over, but many species were not yet in flower.

On the south shores of Disko Island, Greenland, we collected for a few days in August, and here the bulk of our plant-collection was made.

Many species were found here that we had collected in Cumberland, but they were strikingly more luxuriant and generally quite abundant. In the following list the species collected at points in Cumberland Sound will be indicated by the letter C; those from Disko Island, Greenland, by the letter G.—L. K.

Thalictrum alpinum, L. G.
Ranunculus nivalis, L. C.
Ranunculus affinis, R. Br. C.
Ranunculus, not identified.
Papaver nudicaule, L. C and G.
Arabis alpina, L. G and C.
Cochlearia officinalis, L. C.
Cochlearia aretica, Schl. G.
Draba stellata, Jacq. C.
Draba stellata, var. *nivalis*, Regl. C.
Draba crassifolia, Grah. G.
Draba hirta, L. C.
Silene acaulis, L. C and G.
Lychnis alpina, L. G.
Lychnis apetala, L. C.
Lychnis affinis, Wahl. C and G.
Cerastium alpinum, L. C and G.
Stellaria longipes, Goldie.
Stellaria longipes, var. *Edwardsii*. C and G.
Arenaria peploides, L. G.
Dryas octopetala, L.
Dryas octopetala, var. *integrifolia*, Ch. & Sch. C and G.
Potentilla nivea, L. C.
Potentilla maculata, Pour. C.
Sibbaldia procumbens, L. G.
Alchemilla vulgaris, L. G.
Saxifraga rivularis, L. C.
Saxifraga rivularis, var. *hyperborea*, Hook. C.
Saxifraga cernua, L. G.
Saxifraga stellaris, L. C.
Saxifraga nivalis, L. C and G.
Saxifraga cæspitosa, L. C and G.
Saxifraga tricuspidata, Retz. C and G.
Saxifraga oppositifolia, L. C.
Epilobium latifolium, L. C and G.
Archangelica officinalis, L. G.
Erigeron uniflorum, L. G.
Gnaphalium Norvegicum, Gunn. G.
Antennaria alpina, L. G and C.

Arnica alpina, Murr. G.
Taraxacum Dens-leonis, Desf. G and C.
Taraxacum palustre, DC. C.
Campanula rotundifolia, L. C and G.
Campanula uniflora, L. G.
Vaccinium uliginosum, L. C and G. (var.)
Aretostaphylos alpina, L. C and G.
Cassiope hypnoides, Don. C and G.
Cassiope tetragona, Don. C and G.
Bryanthus taxifolius, Gray. G.
Rhododendron Lapponicum, Wahl. C and G.
Ledum palustre, L. C and G.
Loiseleuria procumbens, Desv. C and G.
Pyrola rotundifolia, L.
Pyrola rotundifolia, var. *pumila*, Hook. C and G.
Diapensia Lapponica, L. C and G.
Armeria vulgaris, L. C and G.
Veronica alpina, L. G.
Euphrasia officinalis, L. G.
Bartsia alpina, L. G.
Pedicularis Langsdorffii, Fisch. G.
Pedicularis Langsdorffii, var. *lanata*.
Pedicularis hirsuta, L. C and G.
Pedicularis flammea, L. G.
Pedicularis Lapponica, L. G.
Mertensia maritima, Don. G.
Oxyria digyna, Campd. C and G.
Polygonum viviparum, L. C and G.
Empetrum nigrum, L. C.
Betula nana, L. C and G.
Salix herbacea, L. C and G.
Salix glauca, L. C.
Salix arctica, R. Br.? C.
Habenaria albida, R. Br. G.
Habenaria hyperborea, R. Br. G. New to Greenland!
Tofieldia borealis, Wahl. C and G.
Luzula spadicea, DC. C.
Luzula spadicea, var. *parviflora*, Mey. G.
Luzula arcuata, Wahl. C.

Luzula arcuata, var. *hyperborea*. C.
Eriophorum Scheuchzeri, Hoppe. C.
Eriophorum vaginatum, L. C.
Eriophorum polystachyum, L. C.
Carex lagopina, Wahl. G.
Carex rigida, Good. G.
Carex rariflora, Wahl. G.
Hierochloa alpina, L. C.
Alopecurus alpinus, L. G.
Poa alpina, L. C and G.
Festuca ovina, L. C.
Festuca ovina, var. *breviflora*. C.
Glyceria angustata, R. Br. G.
Woodsia hyperborea, R. Br. G.
Cystopteris fragilis, Bernh. G.
Aspidium Lonchitis, Sw. G.
Polypodium Dryopteris, L. G.
Equisetum arvense, L. G and C.
Lycopodium Selago, L. G and C.

LICHENS.

LIST OF LICHENS COLLECTED IN THE VICINITY OF ANNANACTOOK HARBOR, CUMBERLAND SOUND, AT ABOUT LAT. 67° N., LONG. 68° 49′ W.

By Edward Tuckerman.

Cetraria nivalis, (L.) Ach. G.
Cetraria cucullata, (Bell.) Ach. G.
Cetraria islandica, (L.) Ach. G.
Cetraria islandica, var. *Delisæ*, Br. G.
Dactylina arctica, (Hook.) Nyl. G.
Alectoria ochroleuca.
Alectoria ochroleuca, var. *cincinnata*, Fr. G.
Alectoria ochroleuca, var. *nigricans*, Ach. G.
Alectoria jubata, (L.).
Alectoria jubata, var. *chalybeiformis*, Ach. G.
Theloschistes parietinus, (L.).
Theloschistes parietinus, var. *pygmæus*, Fr. D.
Parmelia saxatilis, (L.) Fr. G.
Parmelia saxatilis, var. *omphalodes*, Fr. G.
Parmelia saxatilis, var. *panniformis*, Fr. G.
Parmelia physodes, (L.) Ach.
Parmelia physodes, var. *encausta*, Fr.
Parmelia physodes, var. *alpicola*, Nyl. G.
Parmelia stygia.
Parmelia stygia, var. *lanata*, (Mey.). G.
Parmelia conspersa, (Ehr.) Ach. G.
Parmelia centrifuga, (L.) Ach. G.
Umbilicaria vellea, (L.) Nyl. G.
Umbilicaria proboscidea, (L.) Stenh. G.
Umbilicaria proboscidea, var. *arctica*, Ach.
Umbilicaria anthracina, (Wahl.) Schœr. G.
Umbilicaria cylindrica, (L.) Delis. G.
Umbilicaria hyperborea, Hoffm. G.
Umbilicaria crosa, (Wel.) Hoffm. G.

Peltigera canina, (L.) Hoffm. G.
Peltigera pulverulenta, (Tayl.) Nyl. G.
Pannaria hypnorum, (Hoffm.) Kœrb. G.
Placodium elegans, DC.
Placodium vitellinum, (Ehrh.) Hepp. G.
Lecanora rubina, (Vill.) Ach.
Lecanora rubina, var. *opaca*, Ach.
Lecanora tartarea, (L.) Ach. G.
Lecanora oculata, (Dicks.) Ach.
Lecanora ventosa, (L.) Ach. G.
Stereocaulon tomentosum, Fr.
Stereocaulon tomentosum, var. *alpinum*, Lawr.
Stereocaulon paschale, (L.) Fr. G.
Stereocaulon denudatum, Flœrk. G.
Cladonia rangiferina, (L.) Hoffm.
Cladonia rangiferina, var. *alpestris*, Schœr.
Cladonia uncialis, (L.) Fr. G.
Cladonia bellidiflora, Ach. (Schœr.). G.
Cladonia cornucopioides, (L.) Fr. G.
Cladonia cornucopioides, var. *inerassata*, Auct. G.
Cladonia deformis, (L.) Hoffm. G.
Heterothecium pezizoideum Ach. G.
Buellia papillata, (Sommerf.) Flot. G.
Sphærophorus fragilis, (L.) Pers.

ALGÆ.

LIST OF ALGAE COLLECTED AT POINTS IN CUMBERLAND SOUND DURING THE AUTUMN OF 1877.

By W. G. Farlow.

Odonthalia dentata.
Rhodomela subfusca.
Rhodomela tenuissima.
Polysiphonia arctica.
Delesseria rostrata.
Delesseria alata.
Rhodophyllis veprecula.
Euthora cristata.
Phyllophora interrupta.
Phyllophora membranifolia.
Ptilota plumosa, var. *serrata.*
Ceramium rubrum.
Callithamnion Pylaisæi.
Callithamnion Rothii.
Chordaria flagelliformis.
Dictyosiphon fœniculaceus.
Phlœospora tortilis.
Sphacelaria arctica.
Chætopteris plumosa.
Ectocarpus hiemalis.
Ectocarpus Farlowii.
Ectocarpus Landsburgii?
Ectocarpus firmus, var.
Monostoma ———?
Cladophora arcta.
Ulothrix flacca.
Hæmatococcus lacustris (*Protococcus nivalis*).

MINERALS.

By F. M. Endlich.

The following is the catalogue of the minerals collected by Dr. Kumlien. Each one of the species is represented by a number of specimens Interesting, among them, is a collection of the supposed meteoric stones from Ovifak.

Smithsonian number.

9580. Supposed meteoric stones from Ovifak, Disko Island, Greenland.

9581. Granite, probably from a drift-bowlder, Greenland.

9582. Rose quartz. A large number of specimens from Greenland.

9583. Orthoclase, from Niantilic Gulf, Cumberland.

9584. Tourmaline, crystals with one end termination. Some of them are of considerable size. Color black. Niantilic Gulf.

9585. Muscovite, crystals and large plates. The latter contains some hematitic inclusions. Niantilic Gulf.

9586. Muscovite, crystals. Niantilic Gulf.

9587. Orthoclase, massive, yellow. Niantilic Gulf.

9588. Biotite, in small crystals. Niantilic Gulf.

9589. Quartz, colorless. Niantilic Gulf.

9590. Chalcedony, gray and blue. Disko Fjord.

9591. Argyllite, red, compact. Ovifak.

9592. Chalcopyrite, massive, in quartz. Cumberland Gulf.

9593. Pyrrhotite, associated with some pyrite. Cumberland Gulf.

9594. Smoky quartz, massive. Cumberland Gulf.

9595. Chlorite, crystallized. Cumberland Gulf.

9596. Apatite, crystalline. Cumberland Gulf.

9597. Garnet, variety, probably *Spessartite*, crystallized in clusters and single large crystals. Cumberland Gulf.

9598. Apophyllite. Small quantities associated with *Chalcopyrite*. Cumberland Gulf.