SCATTERED OBSERVATIONS ON NARWHALS

By Dr. Morten P. Porsild

[*Plate 1*]

A peculiarity of ice conditions in Disko Bay, on the west coast of Greenland, is that the ice instead of first freezing over the bay at the heads of the fiords on the approach of winter and gradually spreading seaward, first forms late in December, when the drifting ice of Baffin Bay approaches the coast. The weather then becomes quiet, with intense cold, and ice rapidly spreads over Disko Bay from the islands near its opening inward toward its head.

"Then it often happens," to quote my article explaining the circumstances in the *Geographical Review* (vol. 6, pp 215–228, September, 1918), "that schools of white narwhals are cut off from the still open parts of Baffin Bay, and are gradually driven in towards the head of Disko Bay. Freezing continues, and finally the schools are restricted to the last smaller or larger open spaces in the ice, whence they cannot escape unless the weather changes and the ice is broken." Their presence there will be betrayed by a column of white vapor of their breath, condensed in the extremely cold air; and the Eskimos flock to the place from far and near to kill and capture the animals, which are valuable to them in many ways. Such a pool of trapped whales is called by the Greenlanders a *savssat* (pronounced s'set), a word used of living animals crowded into a small space. It ordinarily happens, however, that these pools themselves soon freeze over, and then the imprisoned animals are compelled to break breathing-holes through the ice, and keep them open, in order to get air. It has been my fortune to see several of these *savssats*, and to witness the slaughter and capture of the whales; and it is from such experiences that I have derived the information given below as to some features of narwhal life and anatomy.

So far as I know, it has not been previously recorded that various species of arctic whales are able intentionally to break holes through the ice for breathing. At the first *savssat* I visited the holes in the morning were from a few to several feet long and from one to three feet broad; by lengthening and merging into each other, the first holes broken developed to cracks. The holes are broken by blows with the thick and firm cushion on the upper side of the head, in front of the so-called "blowing-hole," or exit of the nostrils. The Eskimos at

Godhavn and Skansen, well acquainted with the habits of the narwhal in ice, declare positively that the male carefully guards his tusks from bumping into firm and tough ice. Once Ludvig Geisler, from Skansen, found a single large male sleeping near a lead in very hummocky ice, its mighty tusk projecting out over the surface of the ice and leaning against it. The animal awoke before Geisler could get his rifle clear and very slowly and cautiously drew back the tusk until it was quite clear, when it rapidly dived away.

In the drawing of G. Kleist (cf. Porsild, l.c., 1918, p. 221) illustrating the most ordinary form of *savssats*, may be seen a number of male narwhals emerging from a very small hole with their tusks resting on the surface of the ice. Here natural openings in the ice are gradually diminished by freezing, and the stronger males push away the weaker ones and the females. Eventually the animals become so worn out that they stay at the hole constantly, resting their tusks on the ice, and do not quit it again.

Whales of other species are also able to break breathing holes in ice. It is as common with white whales (*Delphinapterus leucas*) as with narwhals; some natives state that the holes broken by the white whales are a little trapeziform in shape and thus distinguished from those of the narwhals, but others deny this. Giesecke mentions in his diary a case where a harpooned northern right whale ran with the line under the ice and broke ice that was more than a foot thick. Numerous cases of a similar kind are related by him from the hunting of that species at Godhavn in olden time. The humpback whale (*Megaptera boöps*) has ordinarily left the waters of Disko Bay when the ice covering sets in, but sometimes it happens that a single straggler is delayed by the lure of unusually large schools of the polar cod (*Gadus saida*), and thus is surprised by the ice covering. It then breaks open large triangular or trapeziform holes. Some years ago a young specimen had made a trial in very hummocky ice intermingled with calf-ice from collapsed icebergs near my dwelling. It probably had become stupefied by the blow and had died by drowning or from wounds in the head. It was found dead and frozen in the ice by a dog.

It was not possible to ascertain even approximately the ratio between the males and the females, young and full-grown individuals, of the narwhals. Full-grown males with big tusks were most eagerly pursued as long as the animals were numerous. I do not doubt that the number of females by far exceeds that of the males. The ventral side of both sexes was considerably lighter colored than the back, but

the females were as a rule much lighter colored than the males, and in them the light color extended from the whole ventral side up over the flanks.

On several females I noticed wounds two to four inches long near the genital openings. They were narrow, resembling incisions made by a knife, and ran lengthwise of the body. All the wounds that I saw were infested with apparently the same parasite that always infests the fold of the skin about the root of the tusk (*Cyamus nodosus* Lütken). In his monograph of the species of *Cyamus* (Kgl. Vidensk. Selsk. Skr. 5 R. naturv. and math., Afd. 10. Kjöbanhavn, 1873) C. F. Lütken states that he does not yet know whether this parasite occurs only on the male narwhals or not.

Several, but not all the full-grown females were with young. The stage of development of the fœtus of the gravid ones varied greatly, the fœtuses ranging from very small to nearly full-grown. This corroborates previously expressed opinions that a definite rutting season does not exist amongst narwhals.

As is well known, two tusks grow in the upper jaw of both sexes of the narwhals, but as a rule the left one of the male protrudes and develops into the large tusk. Both tusks of the female, and as a rule the right one of the male, remain included in the tissues; but in rare cases both tusks are developed in the males, the right one then often somewhat shorter and weaker than the left one. A specimen with two tusks was seen several times during one of the *savssats*, but unfortunately was not secured.

The undeveloped tusks often show a characteristic appearance, for they are in the process of absorption, especially in old individuals. The surface is then "louse-eaten," say the Greenlanders, who also pretend to be able to distinguish the incipient tusks of the females from the right one of the males, the latter being straight, they say, whereas the former are slightly curved. The small tusks soon become solid. Those of the young individuals are very strong, and are used by the Eskimos as part of their towing implements.

The root end of the developed tusk in young individuals is very thin-walled, but in old specimens this cavity is gradually filled up with very fine bone. The bone of the root end of very old tusks is technically the best of the whole tusk, being not liable to splitting and warping as the other parts often are. However, there is always a thin canal left, leading up to the large cavity running through the whole length of the tusk. When uninjured this cavity is filled with a spongy core, rich in blood.

The distal part of every protruding tusk, as well in the young as in the full-grown individuals, is white and polished. In the rare cases of two developed tusks, sometimes the right one is shorter, but its distal part is polished to the same distance from the point as the other. From the polished point towards the base, the spiral furrows always show a dense red-brown or greenish algal growth, heretofore not mentioned. According to an investigation kindly made by Prof. L. Kelderup Roseavinge at Copenhagen, this alga is a sterile species of *Rhodochorton* probably *Rh. rothii* very common along the shores of Greenland. Several diatoms not determined were also found by me.

The tusks of a large number of old males are broken at various distances from the point. Of 314 specimens seen at one time by the late Prof. H. Jungersen, 107 were broken. The cavity is opened by the breaking, and the blood-filled content gradually oozes away. The broken end with its spirals becomes worn, the algal growth on the outer surface disappears, and the sharp edges of the fracture are smoothed and polished; often the algæ also develop a short distance into the cavity. The strangest feature is, however, that not seldom *a point of another smaller tusk is found thrust into the cavity and then broken off*, a real "tooth-filling." The occurrence of this strange phenomenon is well known to the Eskimos of Greenland, who tell wonderful tales about it. They say an old male with a broken tusk entices a younger one to thrust its tusk into the cavity, whereupon by a jerk, it breaks the tusk of the younger narwhal. Robert Brown (Proc. Zool. Soc., London, 1868, p. 90) says; "They seem to fight with them; for it is rarely that an unbroken one is got, and occasionally one may be found with the point of another jammed into the broken place, where the tusk is young enough to be hollow or is broken near enough to the skull."

Of "filled" specimens I have seen four, two at Godhavn, the best of which is here figured (plate 1). Another pair was kindly shown to me by Mr. J. Krogh, chief factor of the colony of Jakobshavn. All specimens were sent to the Zoological Museum at Copenhagen. Among the specimens seen by Professor Jungersen one was remarkable, as the filling was broken in the cavity of the larger tusk, *not reaching its outer end.* Thus it could not be pulled out, but only taken out after sawing.

A fight between narwhals has never been observed by the Eskimos of my acquaintance. They declare the narwhals to be peaceful and well-behaved animals. If fighting amongst males regularly takes place, one might expect to find their heads scarred and wounded, but neither I nor my Eskimo informers ever saw this. In one of the cases I have

seen, the filling was jammed so solidly that it could be pulled out only with a pair of tongs, and under the filling was found a wing-feather of a guillemot. I must confess that I am at a loss to understand how that curious filling is effected. The fact seems to have been observed at a very early date. The learned Danish historian of the seventeenth century, Olaus Wormius, wrote several papers about the true nature of what was then styled "Unicornu." I owe this information to the late Prof. H. Jungersen of Copenhagen, who had promised to renew the histological and zoological investigation of the "filling." Since he was prevented in so doing by his premature death, I feel free here to quote part of his letter, hoping that some other zoologist will take up the question. I do not have access here in Greenland to the works of the elder authors mentioned hereafter, and thus can not prosecute the investigation of the older literature myself.

Professor Jungersen writes:

> I have not yet succeeded in finding the *ipsissima verba* of Wormius; I am acquainted only with the resumé given by the Dutch author, Claas Mulder, 1835, of La Peyrère's account of 1678. In translation it reads as follows: "La Peyrère narrates that he heard from the Chancellor of the Kingdom of Denmark that the king of this country wished to present as a gift to some one a fine specimen of a Unicornu, and therefore had an entire horn sawed through at its thickest end. It was supposed to be quite solid, but it was found to be hollow. To the greatest surprise of all, a small horn of the same shape and quality as the big one was seen in the cavity. Further, the sawer cut the big horn through across without damaging the small one, and it was noticed that the small one was concealed in the big one as far as the cavity extended. . . . . I think it is the same case mentioned by Wormius. He mentions the Royal Apothecary, Elias Fleischer, who sawed the tusk for him, and who by vigorously shaking and pushing succeeded in getting the small tusk out. Wormius adds that he never before observed a case like this, although he had seen many narwhals' tusks."
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> As far as I can see, Mulder has however never seen the writings of Wormius. La Peyrère owes his knowledge to Wormius, either from his writings or his correspondence.[1] I have hitherto not been able to find the quotation myself; all our old literature being at this moment in the hands of Dr. Garboe, who at present is studying all the tales of the olden time about the "Unicornu."
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> If La Peyrère relates rightly, that "small horn" is however very enigmatic, reaching down to the very base of the large tusk. Old Peter Camper has, on

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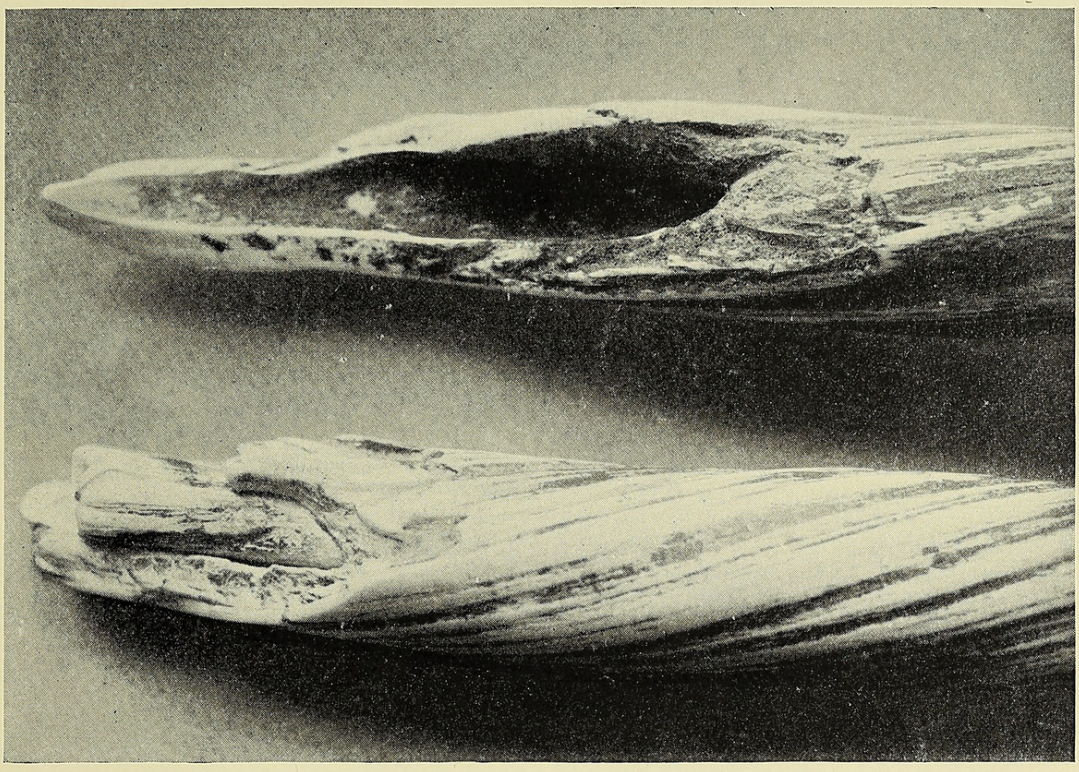
[1] Or from verbal information. La Peyrère visited Copenhagen, 1644–45, in the suite of the French ambassador. He became a friend of Wormius, studied in his famous "Museum" and got from him most of the materials for his books: *Relation de Groenlande* and *Relation d'Islande*. Cfr. C. C. A. Gosch: Udsigt over Danmarks zoologiske Literatur, 2. Afd., I, Bd., P. 29.—M. P. P.

A

B



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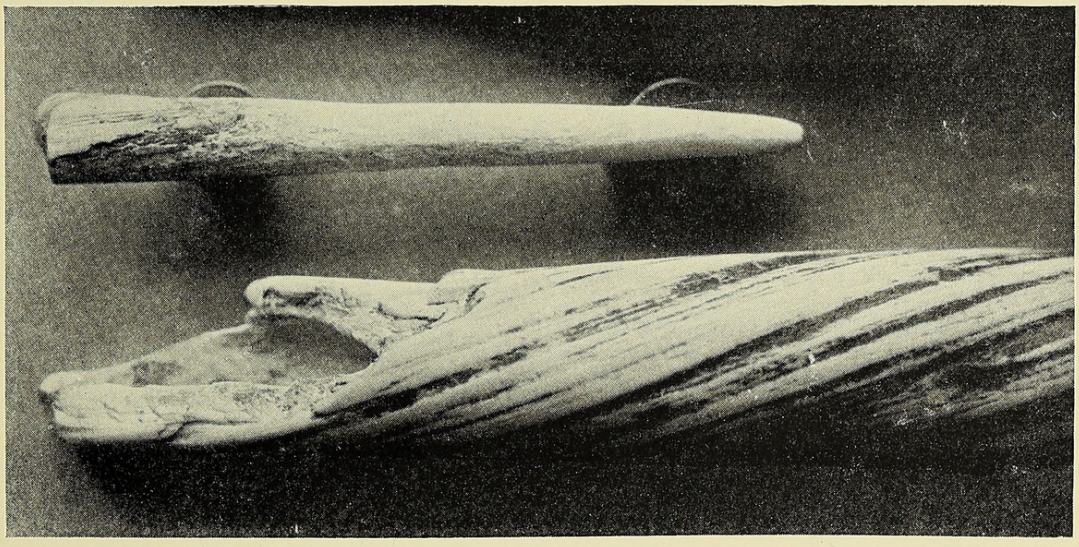

BROKEN AND FILLED NARWHAL TUSKS

A.—A large broken tusk, not "filled." The bloody contents of the cavity have disappeared; the algal growth has developed over parts of the fracture and into the cavity; the point is worn and white, its edges smoothed. *B.*—A strong tusk broken and afterwards "filled." The sharp edges of the fractures worn and smoothed. *C.*—The same specimen with the "filling" pulled out.