

PLATE VIII.—Way in which cod gill-nets are set at the bottom on the east coast of Newfoundland.

1. Ends of the net or gang.
2. Stone killick, generally on the head end of the gang.
3. Stone mooring.
4. Anchor-line, one end of which is bent to lower corner of the net, and the other to the killick or stone mooring.
5. Buoy-lines. These are sometimes bent to the killicks, and at other times to the lower corner of the net, as shown by the dotted line.
6. Buoys.

PLATE IX.—The ordinary way in which cod gill-nets are set floating at Newfoundland.

1. Ends of the net or gang.
2. Buoys.
3. Anchor-lines.
4. Anchors. (Iron anchors, stones, or stone killicks may be used.)

PLATE X.—Norwegian net and trawl buoy made of glass floats.

PLATE XI.—Way in which cod gill-nets are set for underrunning in Ipswich Bay.

1. End of the gang of nets.
2. Anchor-line, also called the "underrunning line."
3. Anchor.
4. Buoy-line.
5. Buoy.

PLATE XII.—Manner in which the nets are underrun.

PROTECTION OF WHALES.*

[From a Christiania paper of January 25, 1881.]

As Norwegian laws cannot be enforced outside of Norwegian territory, the law of June 19, 1880, regulating the protection of whales on the coast of Finmarken, left it to the King to determine the limits of that portion of the sea to which protection should be applied. We have recently communicated a royal proclamation of January 5, 1881, giving the limits referred to. According to this the zone of protection extends one geographical mile from the coast, counted from the outermost islands which are never under water. In the Varangerfiord the outer limit of the zone of protection is a straight line from Kibergnas to Grause-Jacobselv; at Kibergnas, however, protection is to be enforced also outside that line at a distance less than one geographical mile from the coast.

The season of protection extends from the beginning of the year till the end of May. It is not easy to say beforehand what influence this limitation of the fishing season will have on the whale-fisheries, which are carried on in spring during the capelin-fisheries, and during summer. We do not possess sufficient data to show the result of the fisheries prior to the 1st of June and after that date. Svend Foyn has informed us that of 45 whales caught by him in 1876, 5 were caught during the period May 8—when fishing commenced—till the 1st of June; in 1877, 13 whales were caught prior to the 1st of June, and in 1878,

* *Fredning af Hval.* Translated by HERMAN JACOBSON.

when altogether 97 were caught, 19 were caught prior to that date. The difference shown above is, therefore, brought about by the early or late commencement of the season and by the varying length of the capelin-fisheries; it should also be borne in mind that a number of whales are caught every year outside the zone of protection, where fishing is free all the year round.

The whale-fisheries have increased in importance of late years and form a considerable source of income to a number of our population. As far as we remember, Svend Foyn commenced operations in good earnest in 1868, and during the next eight or ten years he averaged 20 to 50 whales a year. After that period his fisheries increased rapidly; thus, in 1878 he caught 97 whales; in 1879, 83; and in 1880, 85. A joint-stock company, Jarfjord, in 1879 caught 45 whales, and in 1880, 60. These favorable results have stirred up a spirit of speculation, and recently there have been founded in and near Tönsberg no less than three new joint-stock companies for working the whale-fisheries, viz, the Stokke Company, which has bought a harbor at Pasvik, near Jarfjord, the Finmarken Company, which possesses a harbor in West Finmarken, on the south coast of the island of Sörö, and the Westfold Company, which has a harbor on the island of Magerö, near the North Cape. Each of these companies has a considerable capital and employs a steamer.

Whilst the protective law was being discussed, there was a great difference of opinion as to the advisability and necessity of limiting such important fisheries, already involving considerable interests; and the majority of the committee (of the Norwegian Parliament) who had the matter in charge were opposed to it. What finally decided the committee to declare in favor of a protective law was undoubtedly a regard to the very generally prevailing opinion that the whale-fisheries have exercised a hurtful influence on the cod-fisheries (capelin-fisheries). The cod follows the capelin, and the capelin, it is said, is chased towards the coast by the whale. It was maintained that the capelin would stay away if the whales were exterminated, and it was also said that the manner in which the whale-fisheries are carried on, the noise of the steamers, the shooting, &c., disturbed the capelin and chased them away from the coast, and that the filth inseparably connected with the preparing of the whale after it is caught would fill the sea-water and the coast with impurities and refuse, and thereby keep the capelin away. Science does not share this opinion, but maintains that the capelin seeks the coast in order to spawn, but that the whale only comes to seek food. It also is well to draw a comparison between the whales and the schools of herrings which periodically approach the southern coast of Norway. There is an old law prohibiting the catching of whales in a herring-fiord; but no spring-herring fisherman will at this day entertain the opinion that the whale chases the herrings towards the coast. Not even in the southern portion of Norway could any movement be set on

foot against the steamship traffic as a means of chasing the herrings from the coast.

Greater weight might possibly be attached to another reason advanced in favor of a protective law, viz, that an unlimited fishing season would diminish the number of whales and seriously endanger the future of the whale-fisheries. A reckless destruction of whales during the spawning season would certainly be a most senseless proceeding; and if we consider that last year no less than 145 whales were caught on a comparatively small extent of coast, such a fear is not entirely unfounded. Not long ago it has been found necessary to conclude an international convention between Norway, Sweden, Germany, Denmark, and England for the purpose of protecting the seal during its spawning season against the war of extermination waged against it near Iceland, Greenland, and Jan Mayen. It is to be hoped that it will be more generally recognized that we owe it to the coming generations to protect the useful and interesting animal life of the Arctic and Antarctic regions.

THE FOOD OF YOUNG WHITEFISH—*COREGONUS CLUPEIFORMIS*.

By Prof. S. A. FORBES.

DEAR SIR: The letter to Mr. Frank N. Clark which you kindly sent me last summer, resulted in an arrangement by which he was to hatch out a lot of whitefish eggs in January, and send me the young fry at intervals for a study of their food.

Having finished my study of these specimens, and thinking it probable that you would like to know the result, I will give you a brief outline of the observations made.

Mr. Clark writes me that these fry were divided into two lots, one (hatched January 18) being kept in a small tank in the hatchery, and the other (hatched January 20) in a perforated can in the stream from a spring. The water in the hatchery varied in temperature from $31\frac{1}{2}^{\circ}$ to 48° , but was usually at about 37° ; that of the spring was uniformly at 47° .

These lots were examined from the spring water February 1, 15, and 25. There were 242 individuals in these three lots. Only 8 of these gave any evidence of food in the intestine, and these in only trivial quantity. It included a few common forms of filamentous algæ, with smaller amounts of desmids and diatoms.

Samples of the water sent me contained an abundance of algæ, but no animal life except *protozoa* and *rotifera*. The remainder of this lot died late in February.

From the hatching-house four lots were sent, numbering 340 specimens, February 1, 15, and 25, and March 15. The last of these had reached a stage of development little, if any, in advance of that of the