less than 88° F. Thus cyprinoids and trout (the red-throat or Rocky Mountain trout) endure conditions of temperature and chemical impurity of water under which it would at first sight be regarded as improbable not to say impossible, for them to survive. We know that the fresh water species of trout can all at will take to a seawater habitat and, as in New Zealand, become so vastly changed that a specialist would hardly recognize the transformed fish as belonging to familiar species, yet the young salmon and the young trout cannot for more than a few seconds endure salt water. Indeed in the young larval stages they die very soon after transference to salt water—the physical nature of the yolk sack becomes so seriously altered. The whole subject is not only one of great biological and physiological interest, it is also of immense practical importance. If the cyprinoids, the salmonoids, and the gadoids, can furnish examples of this transformation of habitat—the exchange of a fresh water life for life in salt water, there is every reason to think that a much larger range of genera will be found to possess powers of endurance no less remarkable.

The Bras d'Or Lakes in Cape Breton as is well known are peculiar inclosed lakes of sea water, or rather of water whose salinity is markedly less than that of the sea outside. Lobsters, cod, and other valuable marine creatures, are found in these waters, but not in any great abundance. The lobsters are said to be of large dimensions, but by no means so numerous as along the shores washed by the ocean. Cod of very large size too are captured, some 56 and 58 lbs. weight having been taken in Little Bras d'Or Lake; but it has been remarked that the head in these specimens is disproportionately large, as though they were not so well fed as their congeners in the open sea. Cod indeed occur in all parts of the extensive Bras d'Or waters, numbers being taken with hook and line through the ice at Whycocomagh which is at least 30 miles from the sea coast (to the north-east), and 25 miles from the coast (on the south-east) of Cape Breton Island, and the water in some places is almost fresh.

Only one or two members of the cod family (Gadidæ) are, however, known to be truly fresh water species. All the rest are marine. The fresh water codfish known as the cusk, burbot, ling and eel-pout, and by many other names, is a typical Gadoid somewhat resembling the sea-ling *Molva molva*, and ranges from 2½ lbs. to 10 lbs. or 12 lbs. though in extreme north western lakes it is recorded at 50 lbs. or 60 lbs. weight. An allied form belonging to the hake family (*Merluccidæ*) has been found to forsake the salt water, and in winter at any rate resort in considerable numbers to freshwater. An instance of this is afforded by Darling's Lake, near Rothesay, New Brunswick. In this lake, which communicates with the Kennebeccasis River, a considerable branch of the River St. John, large numbers of silver hake (*Merluccius bilinearis, Mitchill*) are caught on hook and line through the ice. This being a salt water fish, its presence in the waters of Darling's Lake is explained by its habit of following the shoals of gaspereaux or alewives when they ascend in spring from the sea. The true cod (*Gadus morrhua*) is found in moderate abundance in the Baltic Sea, the waters of which are of low salinity especially in the bays and inlets along the shores. Other members of the family *Gadidæ* occur there such as the haddock, the ling, the whiting, the pollock and the green cod; but none are so numerous as the true cod. As might be surmised, the cod does not reach the size which it attains in the open sea, rarely exceeding 12 or 15 pounds, whereas in the salt water outside it reaches a weight of 50 or 60 lbs. * The specimens indeed become more stunted the further one goes up the Baltic, in the Sound and southern part of the Baltic, off Copenhagen, the size ranges from 3 to 6 lbs., whereas 300 miles further up, off Gothland Island, they run from 2 to 3 lbs: at 150 miles further up near Stockholm, nearly 500 miles from the Sound, the weight is barely 1 or 2 pounds. They differ in colour, being darker, and showing few spots, in contrast to the rich brownish red mottled markings and spots of the cod nearer the sea or out in the open ocean. The Baltic cod spawn in comparatively shallow water somewhat late in the season off Gothland and Stockholm. A similar instance of the sea-cod's change of habit is recorded in Iceland. In Olufs Fjord lake, a sheet of fresh water near the mouth of the romantic Olufs Fjord, and separated by a neck of land from the sea out-

* The well known Scottish authority, Dr Parnell, was certainly wrong when he said 'Cod are never found but in salt water, and remain habitually in the depth of the sea (Fishes of the Firth of Forth, p. 334).