

thought that the large masses of algae (*Fucus* sp.) that covered the beach had protected the animals.

At Middelfart also, where the ice period was relatively short, few dead animals were found — mainly *Mytilus edulis*.

The author is of opinion that the continuous cold is the direct cause of the death of the "surface" forms; for the animals living in the sand he thinks that suffocation is the reason. A. D.

A. C. JOHANSEN. Mortality among Porpoises, Fish and the larger Crustaceans in the waters around Denmark in Severe Winters. Rep. Dan. Biol. Station no. XXXV, Copenhagen 1929.

In this paper the Director of the Danish Biological Station, Dr. A. C. JOHANSEN, has accumulated all observations available as to dead fish and other animals in the Danish waters, with especial regard to the severe winter 1928/29. In the south-eastern part of the North Sea dead soles were caught at 15 to 25 fathoms in the last half of March and in April¹⁾.

Along the shores of Jutland no dead fish were found, but dead specimens of *Cancer pagurus* and *Portunus holsatus* often occurred in great numbers.

In the Baltic dead porpoises were taken in hundreds by the motor trawlers in the deep water near Bornholm, in which place the waters had been open nearly the whole winter. As porpoises are not normally abundant in this locality, it is thought that these specimens had congregated there when trying to escape the ice in the Belts.

From the Danish part of the Skagerrack no dead fish were reported, nor from the deeper parts of the Kattegat. From the shallow parts, however, dead cod and plaice were reported, as well as young brill.

In the Belt sea dead fish — especially cod, haddock, plaice and flounder — were caught, often in great numbers, in the nets in some places only, mainly in the waters to the S.W. of Ærø. On the beaches eels also were found, of which 250 to 300 kg. were secured in one place.

In the fjords and other narrow waters dead eels and frequently *Gobius niger*, *Zoarces viviparus*, *Pleuronectes flesus*, *Gadus callarias*, *Clupea sprattus* and others were found in great quantities.

The author is of opinion that the cause of death generally is the cold water. In some cases (the porpoises) it is the ice itself, but in others it is want of oxygen, as, for example, in the waters S.W. of Ærø. In those waters the oxygen is often entirely absent, as is the case in many narrow waters.

The area where dead fish were found is generally very limited, and the author is of opinion that the stock of fish has not been seriously injured. Perhaps the most affected is the eel. A. D.

H. O. BULL. Studies on Conditioned Responses in Fishes. Part II. Journ. Marine Biol. Assoc. N. S., vol. XVI, no. 2, Plymouth 1930, p. 615—637.

In this second paper Mr. BULL continues his experiments on training fishes to react in a special way to special sense-impressions.

¹⁾ J. du Conseil Vol. IV, Nr. 3 J. R. LUMBY and G. T. ATKINSON: On the unusual Mortality amongst Fish during March and April 1929 in the North Sea.