

NOTES AND MEMORANDA.

THE *Bulletin of the United States Fish Commission* for 1889 contains a report upon a physical investigation of the waters off the southern coast of New England in the schooner *Grampus* during the summer of 1889, by Professor W. Libbey of Princeton College. This forms the first instalment of a series which promises to throw much light on the relations of temperature and salinity to the distribution of fishes and their food, and was itself directly suggested by researches upon the shad and the menhaden.

The observations cover the area between lat. 39° N. and lat. $41^{\circ} 10'$ N., and long. 70° W. to long. $71^{\circ} 30'$ W., soundings being obtained as nearly as possible every 10' along lines 10' apart. At each station a very complete series of temperature observations was made, and samples were collected at surface, bottom, and in the deeper soundings at an intermediate point. The specific gravities of these samples were determined by means of a Kilgard salinometer.

The temperature profiles along meridians of longitude are of great interest, extending as they do from near the coast over the edge of the continental plateau into deep water. The bathy-isothermal line of 50° F. shows a remarkable curvature off the continental platform, which the report says "would seem to point to a mechanical intrusion of cold water from the surface of the continental platform." The conclusion is confirmed by the specific gravity observations; and the report goes on to say, "The existence of this body of warm water off the continental edge may offer an explanation of the richness of this particular spot in all forms of marine life, as shown by the successful dredging of the *Albatross* upon it."

It is much to be desired that the samples collected should be subjected to analytical examination, and to more refined determinations of density, as in this case it is of the first importance to identify the waters surveyed, and it seems likely that two distinct kinds are present.—H. N. D.

THE following papers contain the results of work done at the Plymouth Laboratory and published elsewhere than in the *Journal of the Association* during the two years last past. They form a

continuation of the list published in Journ. Mar. Biol. Ass., i, pp. 364, 365.

Benham, Dr. W. B.—"The Nephridium of *Lumbricus* and its Blood-Supply, with Remarks on the Nephridia of other Chætopoda," Quart. Journ. Micr. Sci., xxxii, 293.

Cunningham, J. T.—"On some Disputed Points in Teleostean Embryology," Ann. Mag. Nat. Hist., 1891, 203.

Cunningham, J. T.—"An Experiment concerning the Absence of Colour from the Lower Sides of Flat Fishes," Zoologischer Anzeiger, 1891, 27.

Cunningham, J. T.—"Spermatogenesis in *Myxine glutinosa*," Quart. Journ. Micr. Sci., xxxiii, 169; Zool. Anzeiger, 1891, 22.

Driesch, Dr. Hans.—"Tektonische Studien an Hydroidpolypen," parts i and ii, Jenaische Zeitschrift, xxiv, 189 and 657 (N.F. xvii); part iii, Jenaische Zeitschrift, xxv, 467 (N.F. xviii).

Garstang, W.—"Note on a New and Primitive Type of Compound Ascidian," Ann. Mag. Nat. Hist., 1891, 265, and Zoologischer Anzeiger, 1891, 22 (preliminary note).

Greenwood, Miss M.—"On the Action of Nicotine on Certain Invertebrates," Journ. Physiology, xi (suppl.).

Harmer, S. F.—"On the British Species of *Crisia*," Quart. Journ. Micr. Sci., xxxii, 127.

Harmer, S. F.—"On the Origin of the Embryos in the Ovicells of Cyclostomatous Polyzoa," Proc. Camb. Phil. Soc., vii.

Harmer, S. F.—"On the Regeneration of Lost Parts in the Polyzoa," Rep. Brit. Ass., 1890.

Johnson, Prof. T.—"Observations on Phæozoosporeæ," Ann. Bot., v.

Johnson, Prof. T.—"The Callosities of *Nitophyllum versicolor*," Journ. Roy. Dublin Soc., 1892.

Minchin, E. A.—"Note on a Sieve-like Membrane across the Oscula of a Species of *Leucosolenia*," Quart. Journ. Micr. Sci., xxxiii, 251.

Ridewood, W. G.—"The Air-Bladder and Ear of British Clupeoid Fishes," Journ. Anat. Phys. (London), xxvi, 26.

Robinson, Miss M.—"On the Nauplius Eye persisting in some Decapoda," Quart. Journ. Micr. Sci., xxxiii, 283.

Weldon, Prof. W. F. R., F.R.S.—"The Renal Organs of Certain Decapod Crustacea," Quart. Journ. Micr. Sci., xxxii, 279.

Weldon, Prof. W. F. R., F.R.S.—"The Formation of the Germ-layers in *Crangon vulgaris*," Quart. Journ. Micr. Sci., xxxiii, 343.

An important prosecution, the first of its kind, we believe, to have been taken under the Sea Fisheries Regulation Act, 1888, was instituted in March last by the Kent and Essex Fishery Committee

of the County Council against the East and West India Dock Company, for depositing sludge dredged from the docks on ground alleged to be good trawling ground for flat-fish and shrimps, contrary to the Bye-laws of the Committee. The defendants were fined £10 and costs, and an application to the magistrates to state a case on the question of jurisdiction was granted.—G. H. F.

A TRAWL-NET which seems likely to prove useful to yachts, and to any vessels for which a beam-trawl is prohibited by its size and weight, has been brought to my notice by the patentee, Mr. John Thurlow, of 26, Cleves Road, Eastham. It consists essentially of the ordinary otter-trawl with the addition of a third otter-board, set so as to skid upwards and to keep the gape of the net open. It thus disposes of one of the objections to the ordinary otter-trawl, that the upper edge of the net being immediately over the foot-rope, fish can escape upwards (cf. Holdsworth, *Deep-sea Fishing and Fishing Boats*, p. 372), a possibility here prevented by the third otter-board coming as far forward as does a trawl-beam over the foot-rope. The inventor will supply specimens and models of the net if desired.—G. H. F.

Gadus esmarkii (Nilss.).—I took a female, about three parts ripe, from the stomach of a halibut, trawled on or about the 31st January on the south-western flat, a ground which lies due west of the coast of Northumberland, between long. 1° and 3° , but chiefly to the westward of long. $2^{\circ} 30'$, and thus within the British area as defined by Canon Norman (*Ann. and Mag. Nat. Hist.*, 1889, p. 345). The soundings are from 30 to 50 fathoms cable. Another halibut contained, on the same occasion, the remains of two small gadi, which were probably of the same species. The Norway pout has been shown by Dr. Günther (*Deep-water Fishes*, P. R. S. E., vol. xv, No. 127, p. 212) to be common enough in certain localities on the west coast of Scotland, and I have shown that it is by no means rare on the west of Ireland (*vide* *Scien. Proc.*, R. D. S., 1892, pt. 4). Its range must now be extended to the east coast of England.—E. W. L. H.

Phycis blennioides (Brünn).—Two fork-beards were received during March from the ground to the north-west of the Great Fisher Bank, lat. $57^{\circ} 40' N.$, long. $2^{\circ} 20' E.$, 40 fathoms, and lat. $57^{\circ} 45' N.$, 46 fathoms. The first was a female with ovaries but little advanced, containing slightly opaque ova, the largest .15 mm. in diameter. The other specimen had had its viscera removed by its captor, with a view to its better preservation. The fork-beard seems to be

rather rare on the North Sea grounds, since the Grimsby fishermen are quite unacquainted with it. The specimens I have alluded to were regarded as hybrids between a tusk and a haddock.—E. W. L. H.

A specimen $18\frac{1}{4}$ inches in length has also been received at Plymouth. It was taken on a whiting hook, 5 miles from shore on hard ground.—W. L. C.

Sebastes norvegicus (Ascan).—The Norway "haddock" seems to be rather common in the deep water about the Fisher Bank, but has no vernacular name amongst the Grimsby fishermen.

Crystallogobius Nilssonii (Düb. and Kor.).—Mr. Cunningham's remarks on the distribution of this form, in the last number of the Journal, will be remembered. I have recently been able to show that it is very generally distributed, at depths from 10 to 35 fathoms, along the west coast of Ireland (loc. cit., p. 284), and am now able to record it from the "Head" ground, 15 to 20 miles E.S.E. of Flamborough Head, 29 fathoms, having trawled a perfect specimen there on the 19th March. I have seen fragments, which I suppose to belong to the same species, adhering to the nets of boats returning from other grounds, and suspect that the use of suitable nets would show that it is pretty common. The fishermen told me that they considered such fish as my specimen to be young haddocks, but the resemblance to a young herring or sprat is more obvious.

E. W. L. H.

Arnoglossus laterna (Walb.).—I received a specimen from 35 miles off Flamborough Head, 33 fathoms, on the 20th February. The species does not seem to have been recorded from the east coast of England, though it occurs in Norwegian waters, and has been taken off the coast of Banffshire.—E. W. L. H.

Raia alba (Lacép.).—On the 29th of February, when looking over a very large "take" of skates landed on the Plymouth Barbican, I was fortunate enough to notice a fair-sized specimen of this our largest, though seldom observed, British species. It measured 6 feet $2\frac{1}{2}$ inches extreme length, and 5 feet 1 inch across the wings. The colour in the dorsal surface was a dull brownish grey. The ventral surface was a dead white on every part except where the extreme margin of the fins showed a translucent red. The specimen was a female, but had the characteristic sharp teeth seen in both sexes of this species. On the under side, from the level of the mouth to the tip of the snout, there was a thick covering of spines, and fully half-

way from the tip of the snout to the outer angle of the wings ran a band of spines embedded in the flesh, the points projecting inwards as do the spines seen on the dorsal surfaces of the wings of male skates generally. This band was about 2 inches broad. The body was extremely thick, being to the grey skate what the body of a halibut is to that of a turbot. The tail was not long in proportion to the body, and was provided with spines in a somewhat unusual manner. Starting from the body, three rows were visible, but the outer one rapidly developed into a band similar to, though narrower than, that described for the anterior margin of the wings. These spines were, however, not embedded in the flesh of the tail. The skin of the back was not so smooth as in *R. batis*, nor so rough and shagreen-like as in *R. macrorhynchus*.

Raia alba, the white skate, is mentioned in Couch under the names Burton skate and Bordered ray. The latter name arises on account of the appearance of the young.

About ten days after noticing the large example, the fisherman of the Association brought in a young specimen. The name bordered ray would be appropriate in this case. The spines are again present between the region of the mouth and the snout and down the anterior margin of the wings, but on the tail are three rows of large spines only, a central row of fifteen, and on each side a marginal row of eleven, much curved and pointing directly backwards. The colour of the back is a light olive-brown, of the under side white centrally, shading through yellow into a broad dirty brown-coloured border. The under surface of the tail is also like the border to the wings. These young bordered rays were said by Thompson to be plentiful in Portland Roads. The adult skate is recorded on the south coast, from Weymouth (Goose), Lyme Regis (Jarrell), off Cornwall and Plymouth (Day). It appears only to frequent deep water, but must deposit its eggs in shallower water, the young being found in this situation.—W. L. C.

Young Lobsters.—On the 30th March I received from Mr. Dunn, of Mevagissey, an associate member of the Association, three lobsters of a very interesting size. They were all alive, and measured as follows:—9.6 cm., a male; 11.5 cm., a female; 13.1 cm., a female, the measurements in each case being from the tip of the rostrum to the end of the telson.

I am not aware that anyone has ever recorded the capture of a lobster of adult form so small as 9.6 cm., or roughly 3½ inches long.—W. L. C.

A New British Nemertine.—On March 22nd a nemertine worm was

trawled off Stoke Point in about 25 fathoms, which corresponds to the description given by Hubrecht* of *Carinella polymorpha*.

Hubrecht's description is as follows:—"Differing from the foregoing species (*C. annulata*) by the form of the head, which is still wider and more hammer-shaped, as well as by colour, which is always a uniform reddish or orange-brown."

This species is synonymous with *Valencinia splendida* of de Quatrefages, and *Tubulanus polymorpha* of Renier. It has never, I believe, been found before on the British coasts. Its geographical extension, as given by Joubin,† is Banyuls, Roscoff, Bréhat (de Quatrefages), Naples (Hubrecht), Adriatic (Dewoletzky), ocean and Mediterranean (Vaillant). McIntosh, in his monograph, describes a worm from the island of Herm, which is perhaps identical with this species, but which he regards as a variety of *Carinella annulata*.

Neither Hubrecht nor Joubin mentions the existence of extremely faint lines, which are quite similar in position to those of *C. annulata*, except that the median ventral line seems absent. They are so faint that it is with great difficulty that they can be seen at all, and they in no wise interfere with the uniformity of the orange-brown colour, which seems, except on very minute inspection, to be uninterrupted. In the *Carinella* from the island of Herm, McIntosh mentions the existence of a pale lateral line on each side, and faint traces of transverse bars on the dorsum.—T. H. R.

Culture of Sea Fish.—From the Annual Report of the Newfoundland Fisheries Commission for the year 1891, presented to the Legislature March, 1892, the following interesting extracts are taken. Speaking of the Dildo hatchery, the Report says:—"By July 25th there were 616 codfish in the wells. The total number of ova stripped from these fish was 78,950,000. Of these, 39,650,000 were rejected, and 39,650,000 were hatched and planted in a healthy condition. This gave the satisfactory yield of 50·2 per cent. During the month of December an important improvement, which had been in contemplation from the first, was carried out at Dildo—namely, the construction of a salt-water pond, in which the codfish will be placed to spawn in the natural way, instead of undergoing the process of stripping. This pond is 47 feet in length and 23 in breadth, and is most substantially built of stone and Portland cement. There is a specially constructed collector and other apparatus to gather up the ova as they are extruded from the fish, and fertilized;

* Hubrecht, *The Genera of European Nemerteans*, Notes from the Leyden Museum, No. 4, vol. i.

† Joubin, *Sur les Turbellaires des Côtes de France*, Arch. Zool. Exp., 2 ser., vol. viii.

and they are then conveyed to the hatchery. Mr. Neilsen anticipates that he will be able to hatch 70 to 90 per cent. of the ova, instead of 50 per cent. as at present, by this improved method. Such results have been recently attained at Flödevig hatchery in Norway, where, partly through Mr. Neilsen's recommendation, it was adopted two years ago. . . . The total number of lobster ova obtained was 18,505,600 ; and of these 10,274,300 were hatched and planted." This is the most extensive hatching of sea fish yet accomplished.—
W. L. C.