

## ABSTRACTS OF MEMOIRS

### RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

ACARA, A., 1961. Poor water masses in the North Pacific Ocean. The description of the water. Parts I and II. *Hidrobiologi*, Ser. B, Vol. 5, pp. 97-128.

In Part I, two types of water, abnormal phosphate-poor and normal phosphate-rich, have been distinguished in the North Pacific Ocean.

Abnormal poor water means, water with an abnormally low phosphate content at the depth of the minimum oxygen layer. Normal and abnormal waters are found in all regions of the North Pacific Ocean. Phosphate-rich water and phosphate-poor water may have the same temperature and salinity and cannot be distinguished on the basis of their T-S relationship as the different water types.

In Part II, the vertical distributions of normal rich and abnormal poor water masses have been studied near the United States and Canadian coasts and the Japanese coasts, in the Central North Pacific Ocean and in the Bering Sea for the  $\sigma_t$  interval 27.30-27.50 in which the oxygen minimum layer is found.

There are very deep waters which originate from the Antarctic which also contain little phosphate.

The low phosphate values have been observed at similar latitude in the North Atlantic (Cooper, 1955) and in the North Pacific.

A. A.

COOPER, L. H. N., JONES, P. G. W. & LEE, A. J., 1960. Hydrographical conditions along the 14° W meridian south-west of Ireland, July 1960. *Ann. Biol.*, Vol. 17, pp. 73-6.

Observations closely spaced in depth were made south-west of Ireland along the meridian 14° W. At around 1850 m depth there was a layer of relatively low salinity and low temperature believed to have originated as an overflow over the ridge between Greenland and Scotland. Associated with this was a layer of water in neutral adiabatic equilibrium centred on a depth of 1815 m.

In the layer of Gibraltar water between 800 and 1000 m depth at two stations, the distribution of high salinity water was bicuspid and associated with two distinct isothermal layers.

Evidence is given for a current following the contours of the Porcupine Bank at first flowing from north to south but turning to flow eastwards where the authors examined it. This current blankets most of the slope down to 1100 m and probably to 1900 m depth. To seaward of this current and between 850 and 1100 m Gibraltar water was moving west and north.

L. H. N. C.

HILL, M. N. & MASON, C. S., 1962. Diurnal variation of the earth's magnetic field at sea. *Nature, Lond.*, Vol. 195, pp. 365-6.

Experiments are described in which the daily variation of the Earth's magnetic field was measured in buoys moored in four different positions between the continental shelf edge and deep water at the Western Approaches to the English Channel. These variations were compared with measurements made simultaneously with an identical instrument set up ashore near Plymouth. The results indicated that the variations ashore were closely correlated with those at sea; there was, however, a relatively

large semidiurnal variation superposed on the observations at sea. This is presumably correlated with tidal streams; whether or not it is confined to the continental boundary is not yet known. No screening effect of the ordinary daily variation due to the conductivity of seawater was observed.

M. N. H.

NELSON, T. C., 1960. The feeding mechanism of the oyster. II. On the gills and palps of *Ostrea edulis*, *Crassostrea virginica* and *C. angulata*. *J. Morph.*, Vol. 107, pp. 163-91.

Additional morphological evidence is presented supporting restriction of the genus *Gryphaea* to fossil oysters only.

Gross and microscopic anatomy of gills and palps of common oysters *Ostrea edulis*, *Crassostrea virginica* and *C. angulata* are illustrated and described.

Differences in structure of gills and palps are shown to be correlated with ability of these oysters to cope with turbid water. Explanation is offered for greater success of greening in French clairs of *angulata* than of *edulis*.

Evidence is presented toward resolving controversy of Kellogg and Grave in 1916 relative to ability of oysters to feed in muddy water. Rejection of sand and other undesirable materials is accomplished not through reversal of cilia as suggested by Grave but by muscular co-ordination bringing into play opposing tracts of cilia which reject such materials.

Proof is presented that oysters can continue feeding in nature in waters of high turbidity or in dense plankton swarms. Stress is laid upon adverse effects of external metabolites of laboratory cultures in reducing feeding activity apart from influence of density of plankton.

While volume primarily determines acceptance or rejection of collected materials the oyster shows some power of discrimination as demonstrated by Loosanoff and Engle, and Loosanoff, in which an oyster is shown to reject the sulphur bacterium *Chromatium* and yeast cells while accepting at the same time diatoms, other unicellular algae, and flagellates.

Emphasis is laid upon the role of mucus secreted in large amounts around sand, silt and sharp spined diatoms, thus rendering these materials bulky, hence destined for prompt elimination from gills or palps. In contrast food organisms stimulate relatively little mucus, hence are in the main accepted. Mucous cells behave as independent thigmo- and chemo-receptors.

AUTHOR'S SUMMARY

SOUTHWARD, E. C., 1962. A new species of *Galathealimum* (Pogonophora) from the Canadian Arctic. *Canad. J. Zool.* Vol. 40, pp. 385-9.

A description is given of *Galathealimum arcticum* sp.nov., collected at Thetis Bay, Herschell Island, Yukon, from a depth of 36 m.

WOOTTON, J. A. M. & WRIGHT, L. D., 1962. A comparative study of sterol biosynthesis in Annelida. *Comp. Biochem. Physiol.*, Vol. 5, pp. 253-64.

The mode of sterol biosynthesis in species of Annelida was studied with mevalonic acid as substrate. Solutions of this well known precursor of cholesterol were injected into the intracoelomic cavity of various groups of worms. A rapid evolution of  $^{14}\text{CO}_2$  noted after the administration of  $1\text{-}^{14}\text{C}$  mevalonic acid to specimens of *Nereis diversicolor* was a good indication that the normal pathway of sterol formation exists in these

invertebrate animals. Radioactive cholesterol isolated by alumina column chromatography and subsequent purification by the dibromide procedure was obtained from other groups of this species given 2-<sup>14</sup>C mevalonic acid. Pretreatment with antibiotics and sulphanilamide to minimize symbiotic activity had little effect on the rate of sterol biosynthesis in *Nereis diversicolor*, but drastically limited the formation of radioactive non-saponifiable material in the sedentary polychaete *Arenicola marina*. <sup>14</sup>C digitonin-precipitable sterols were also recovered from *Nereis virens* and *Amphitrite ornata* following injections of the 2-<sup>14</sup>C-labelled substrate. Conversion of mevalonic acid to sterols was quite efficient in all the normal marine worms which were tested. However, in contrast to the rapid incorporation noted in mammals (1 h), maximum sterol synthesis took 3–4 days at room temperature.

The ability of polychaetes to biosynthesize sterols differs from that of the oligochaete *Lumbricus terrestris*. No labelled  $\beta$ -hydroxy sterols were detected in this terrestrial annelid, although a large quantity of radioactive squalene was isolated. Apparently this species is unable to cyclize the hydrocarbon intermediate to sterol.

J. A. M. W.