

## ABSTRACTS OF MEMOIRS

### RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

ARMSTRONG, F. A. J. & BOALCH, G. T., 1961. Ultra-violet absorption of sea water. *Nature, Lond.*, Vol. 192, pp. 858-9.

Absorbancies at  $220\text{ m}\mu$ , in a 10 cm cuvette, of filtered samples of sea water from a survey across the English Channel in April 1961 were compared with salinities. Water of low salinity and high ultra-violet absorption was found in the south-east corner of the area. On the English side there was an intrusion from the west, of higher salinity water of low ultra-violet absorption, possibly of Atlantic origin, which had displaced water of similar salinity but of high absorbancy, which had been found in the area in February. The displaced water, though indistinguishable by salinity, was evident as a band with high ultra-violet absorption in mid-channel.

F.A.J.A.

COOPER, L. H. N., 1961. Vertical and horizontal movements in the Ocean. *Publ. Amer. Assoc. Adv. Sci.*, No. 67: 'Oceanography', edited by M. SEARS, pp. 599-621.

The adverse effect of gusty winds upon assessment of depth of water samples and of precision of measurement is described.

Coating water-bottles with an epoxy-resin has eliminated faulty analyses of oxygen in the water, due to oxygen loss at corrosion spots.

Evidence for laminar structure of the deep water masses in the Bay of Biscay is presented. Some laminae are believed to be derived from boluses which have descended from the Iceland-Faeroe Ridge.

In recent years at one station large fluctuations in the oxygen content of the deep water have occurred. The age of water masses is discussed.

L.H.N.C.

DALES, R. P., 1961. The coelomic and peritoneal cell systems of some Sabellid Polychaetes. *Quart. J. micr. Sci.*, Vol. 102, pp. 327-46.

The growth and activity of the coelomic cells of *Sabella spallanzanii* are described, and both qualitative and quantitative determinations made throughout the year of the glycogen, oil and the pigments they contain. It is concluded from this study that these coelomic cells accumulate glycogen and oil which they take up from the coelomic fluid, and constitute a depot for the gametes which mature in the coelom. In some other sabellids there are few coelomic cells, but in them the peritoneum is expanded into villi which are also oil storing. Further work is in progress on the constitution of the coelomic fluid and its relation to these cells and to the peritoneum in these animals.

R.P.D.

MURRAY, R. W., 1961. The initiation of cutaneous nerve impulses in elasmobranch fishes. *J. Physiol., Lond.*, Vol. 159, pp. 546-70.

Diphasic action potentials can be recorded from the endings of cutaneous nerves with electrodes resting on the skin, on mechanical, thermal, chemical or electrical stimulation; adaptation is rapid. The first phase is positive, lasting 1-4 msec ( $Q_{10} = 1.6$ ); the latency varies inversely with temp. ( $Q_{10} = 2.1$ ) and stimulus strength (6-70 msec at threshold, 2.2-20 msec minimum). Antidromic impulses have the same diphasic

polarity as orthodromic. Impulses recorded from gill bar skin and from branchial nerve occur in 1:1 relationship. The results are interpreted as due to impulse initiation in the myelinated stem axon at a distance from the endings, with subsequent invasion of action potentials into the non-myelinated terminal branches.

R.W.M.

PARKE, M., 1961. Some remarks concerning the Class Chrysophyceae. *Brit. phyc. Bull.*, Vol. 2, pp. 47-55.

A summary of the present state of our knowledge of phylogenetic relationships between some members of the division Chrysophyta, using flagellum structure and scale structure as a guide, is given. It is suggested that there may be two distinct series grouped in the class Chrysophyceae, one series with affinities towards the diatoms and the other related more closely to some, if not to all, coccolithophorids.

M.P.

ROBSON, E. A., 1961. A comparison of the nervous systems of two sea-anemones, *Calliactis parasitica* and *Metridium senile*. *Quart. J. micr. Sci.*, Vol. 102, pp. 319-26.

The properties of the actinian nervous system are known mainly from physiological experiments on *Calliactis parasitica* (Couch), and from histological work on *Metridium senile* (L.). The structure of the nerve-net in the mesenteries of *Calliactis* is now shown to resemble in general that in *Metridium*. Methylene blue stains a network of bipolar cells over the retractor muscle, together with sense-cells, and unlike *Metridium*, multipolar nerve-cells. The nerve-net over the radial surface of the mesentery is similarly much sparser. The distribution of nerve-cells and sense-cells in the column also resembles that in *Metridium*.

Experiments on *Metridium* show that as in *Calliactis*, the rate of conduction in the mesenteries is greater than in other parts of the anemone. The column, including the sphincter region, conducts more slowly. It is thus shown that the presence of a well developed nerve-net over the retractors is associated with the development of fast tracts in the through-conduction system, and of rapid, facilitated contractions of the retractor muscles, in both species of anemone.

E.A.R.

ROSS, D. M. & SUTTON, L., 1961. The response of the sea anemone *Calliactis parasitica* to shells of the hermit crab *Pagurus bernhardus*. *Proc. roy. Soc., B*, Vol. 155, pp. 266-81.

This paper continues the study of the association of *Calliactis parasitica* with *Pagurus bernhardus* based on the earlier observation that the anemone becomes attached to the shell without any help from the crab. Time lapse film records show five stages in the behaviour by which *Calliactis* transfers to *Pagurus* shells. The first stage is a clinging of the tentacles to the shell and this is a trigger for the whole behaviour pattern. This clinging response occurs in *Calliactis* already settled on other surfaces, but more consistently in *Calliactis* whose pedal discs are unattached.

Tests on the frequency and speed of the clinging response were carried out under various conditions. They showed that the clinging response depends on some molluscan 'shell factor'. Clean shells, dummy shells, plastic-coated shells, or clean shells re-occupied by crabs do not elicit the clinging response. Molluscan shells, especially those of *Buccinum* that have never been occupied by crabs, and pieces of periostracum removed from shells, are most effective in causing the clinging response. This molluscan shell factor may also be involved in the response which enables the foot to adhere to and settle on the shell in the fourth stage of the behaviour pattern.

Vertical incisions, even complete bisection, do not abolish clinging but merely slow down the orderly pattern of transfer to a shell. Complete horizontal section, including removal of the pedal disc alone, abolishes the clinging response and blocks the entire behaviour pattern. Stimulation experiments show features consistent with a five stage programme in which the completion of each stage is a trigger for the next. The neuromuscular requirements for co-ordinating this behaviour pattern are considered in relation to the known capacities and organization of the actinian neuromuscular system.

D.M.R.

SOUTHWARD, E. C., 1961. Pogonophora. *Siboga-Expéd.*, Monogr. 25, 3, 22 pp.

Material collected in the Borneo–New Guinea region in 1899–1900 contains fifteen species of Pogonophora. *Siboglinum weberi* Caullery is redescribed. Descriptions are given of three new species and one new variety of *Siboglinum*, a new species of *Polybrachia* and a new genus, *Sclerolinum*. Of the remaining seven species, two can be identified as belonging to the genus *Heptabrachia*, while the material of the others is too fragmentary for even generic identification.

E.C.S.

WICKSTEAD, J. H., 1961. A quantitative and qualitative study of some Indo-West-Pacific Plankton. *Fish. Publ., Lond.*, No. 16, 200 pp.

Plankton was collected from the Malacca Strait–Singapore Strait–South China Sea area. From Singapore Strait the plankton was sampled, both by day and by night, throughout 13 months. At the plankton stations in conjunction with the samples, and at other stations, records of some hydrographical and meteorological conditions were taken. Results are given in tables or graphs. Results from Singapore Strait are presented as graphs over the 13-month period.

Phytoplankton collections were incidental to the zooplankton, thus being very limited. The zooplankton is broken down into some fifty groups. From vertical samples, taken with a 50 cm 58 m.p.i. net and a 1 m Stramin net, each group is assessed in terms of number/m<sup>3</sup> by day and, if significantly different, by night. Results of a series of horizontal samples from Singapore Strait, with a 70 cm 74 m.p.i. net, taken in daylight, before sunset, after sunset and in darkness are shown as graphs and percentage depth distribution diagrams. This shows the variation in numbers during the four periods and the patterns, if any, of vertical migration. The importance of equating the no./m<sup>3</sup> with the vertical distribution is stressed. Specific analysis is limited to the easily recognised and/or ecologically important species.

The plankton as a community is discussed. Factors affecting vertical movements are discussed, with a possible explanation given of how light would affect different animals in different ways. Water movements and plankton indicators are discussed, with a suggested pattern of water movement for the area given. Comparisons with plankton from other areas are made, with particular reference to the copepods. The relationship between the plankton and fisheries is suggested.

J.H.W.