

ABSTRACTS OF MEMOIRS

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

DALES, R. P., 1964. The coelomocytes of the terebellid polychaete *Amphitrite johnstoni*. *Quart. J. micr. Sci.*, Vol. 105, pt. 2, pp. 263-79.

The coelomocytes of the terebellid polychaete *Amphitrite johnstoni* contain oil, glycogen and β -carotene and are actively phagocytic. They also contain haemoglobin and this is transformed to haematin by ageing cells. The dark colour of older worms is due to the haematin derived from spent coelomocytes. The number of coelomocytes increases in summer during early growth of the gametes and decreases before spawning. Measurement of the quantities of coelomocytes and gametes and quantitative determinations of the oil and glycogen in each at different seasons confirm that the principal function of the coelomocytes is the supply of nutrients to the gametes.

R. P. D.

HOLME, N. A., 1964. Benthos in Antarctic waters. *Biologie Antarctique: C. R. Ier Symp., S.C.A.R., Paris, Sept. 1962*, pp. 319-322. (Ed. by Carrick, R., Holdgate, M. & Prévost, J.) Paris: Hermann.

Around the Antarctic continent the sea bed slopes rather steeply to deep water, so that a continental shelf is virtually absent. Such shallow-water faunas as exist are separated from the nearest shallow-water forms in lower latitudes by many hundreds, or thousands, of miles of deep water. This isolation results in a higher proportion of endemic species and genera than in the Arctic. The Antarctic fauna is surprisingly rich in species, with a high proportion of echinoderms and sponges in particular, although decapod Crustacea are poorly represented.

Our knowledge of the fauna is based on dredgings carried out as circumstances permitted during past expeditions, but more recently a start has been made on more quantitative investigations, using grabs and underwater cameras, by Bullivant in New Zealand, and in the productivity studies which were the subject of Dr Tressler's paper at this meeting.

The importance of the benthos in the economy of the sea is very roughly inversely proportional to depth. It is unlikely that the abyssal fauna of the Antarctic, although of great zoological interest, plays any significant part in the economy of the area. The only region in southern latitudes where a shallow shelf fauna plays any significant role in the economy is on the Patagonian Shelf, some 600 miles long and 250 miles wide, which was surveyed by Gunther and written up by Hart in a *Discovery* report.

N.A.H.

KEARN, G. C., 1963. The attachment of the monogenean *Entobdella soleae* to the skin of the common sole. *Parasitology*, Vol. 54, pp. 327-335.

The muscular saucer-shaped haptor of the monogenean parasite *Entobdella soleae* is attached to the skin of its host *Solea solea* by means of a suction pressure generated within the sea-water-filled cavity enclosed between the cup-shaped haptor and the skin of the fish. The suction pressure is produced by the action of a pair of extrinsic muscles which are situated in the body of the parasite. Each extrinsic muscle communicates with the haptor by means of a long tendon which passes through a fair-

lead in a prop-like accessory sclerite and is inserted on the end of a girder-like anterior hamulus embedded in the roof of the concavity of the haptor. The pull exerted by the muscles lifts the girders and the roof of the suction cup in which they are embedded relative to the props, thereby producing a suction pressure.

An electron microscope was used to investigate the ultra-structure of the tendon, which was found to consist largely of unbranched banded fibrils which differed from the collagen fibrils of vertebrate tendon in their diameter and periodicity. G.C.K.

LOCKWOOD, A. P. M., 1964. Activation of the sodium uptake system at high blood concentrations in the amphipod *Gammarus duebeni*. *J. exp. Biol.*, Vol. 41, pp. 447-58.

On the basis of experiments carried out on freshwater animals it has come to be accepted that the rate at which sodium is actively taken up from the medium is related to the concentration of the blood. The present work shows that, in a brackish-water amphipod, transfer from a high salinity to de-ionized water results in a large increase in the rate of uptake on subsequent transfer to dilute NaCl, even if the blood concentration has not been lowered to a level at which even a small increase in the rate of uptake would be expected. Transfer from a high salinity to 50% sea water or sucrose isotonic to 50% sea water does not stimulate increased uptake on subsequent loading in dilute NaCl. The rate of uptake of sodium of *Gammarus duebeni* is therefore not determined solely by the level of the blood concentration. Other possible factors concerned in regulating the rate of sodium uptake are discussed. A. P. M. L.

OCKELMANN, K. W., 1964. *Turtonia minuta* (Fabricius), a neotenous Veneracean Bivalve. *Ophelia*, Vol. 1, pp. 121-46.

The systematic position of *Turtonia minuta* has till now remained uncertain. However, as demonstrated in a series of comparisons, it exhibits strong affinities with the Veneracea. Similarity is particularly close with the spat of *Venerupis*, so that *Turtonia* may be said to resemble a juvenile of *Venerupis* which has become sexually mature just before formation of the inhalant siphon and the outer demibranchs. *Turtonia* should, therefore, be included in the Veneracea and given a systematic position close to *Venerupis*.

Specialized features in *Turtonia* are related largely to its attached mode of life in the intertidal zone and very shallow water, and also to its mode of reproduction. The main steps in the formation of its egg-capsules, which were found to be attached to modified byssus threads, are deduced from preserved material. An account of relevant information provides evidence that, in contrast to current views, the typical bivalve mantle inner fold has become duplicated in the Veneracea.

The possible conditions leading to the evolution of *Turtonia* are discussed. It is concluded that the species has evolved from a *Venerupis*-like ancestor by a process of neoteny. Further, it is concluded that evolution probably took place in response to conditions which rendered normal dispersal of the progeny of the ancestral species disadvantageous. This brought about the mode of reproduction now found in *Turtonia*. This in turn contributed to the success of *Turtonia* in an intertidal environment and, secondarily, allowed it to become more widespread than any other recent veneracean. K. W. O.

OLDFIELD, E., 1964. The reproduction and development of some members of the Erycinidae and Montacutidae (Mollusca, Eulamellibranchiata). *Proc. malac. Soc. Lond.*, Vol. 36, pp. 79-120.

The embryology of *Lasaea rubra*, excluding details of cleavage, is described, and its life history compared and contrasted with that of *Kellia suborbicularis*, *Montacuta ferruginosa*, *M. substriata* and *Turtonia minuta*. With the exception of *T. minuta*, all these forms incubate their young within the gills. The secretion of the egg capsule by *T. minuta* is described. There is a progressive series from the production of many small eggs by *Kellia* and *Montacuta*, to that of a few large eggs by *Turtonia* and *Lasaea*. Correspondingly, there is a tendency to delay the liberation of the young; *Kellia* and *Montacuta* release bivalved veliger larvae, whereas in *Turtonia* and *Lasaea* the free veliger stage is suppressed and the young are released as miniature adults.

As a result of the large yolk content of the egg, and the suppression of the free veliger stage, the development of *Lasaea* is modified. Cleavage is holoblastic, but the blastocoel is reduced, and gastrulation is effected mainly by epiboly. A large cephalic mass, the sole function of which is the passive storage of yolk, replaces the velum. A deep cerebral invagination precedes the development of the cerebro-pleural ganglia. There is no shell gland invagination nor are there protonephridia.

When the young individual of *L. rubra* is released from the parent, most of its organs are in the adult condition, or nearly so. Although the life-history of *L. rubra*, with its direct development, is less hazardous than one which involves the free-swimming veliger stage, it lacks an important factor, that of the dispersal of the species.

E.O.

POTTS, W. T. W. & PARRY, G., 1964. Sodium and chloride balance in the prawn, *Palaemonetes varians*. *J. exp. Biol.*, Vol. 41, pp. 591-601.

The exchanges of sodium and bromide (for chloride) ions between the brackish-water prawn *Palaemonetes varians* and its environment are described. In an isosmotic medium the exchange of sodium and chloride ions takes place by passive diffusion. In full-strength sea water sodium ions are actively removed extrarenally while the potential difference produced by the active extrusion of sodium ions maintains the chloride ions in passive equilibrium. There is some evidence of an increased flux of ions in hyperosmotic sea water associated with water-swallowing to obtain water for water balance as in the marine teleosts. In 2% sea water chloride ions are actively absorbed, the potential produced by this active uptake helping to maintain sodium balance; but some active sodium uptake also occurs. In salinities below 2% uptake of ions declines and the animals can no longer maintain equilibrium.

W. T. W. P.