# ABSTRACTS OF MEMOIRS

## RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

ATKINS, D., 1959. The growth stages of the lophophore and loop of the brachiopod *Terebratalia transversa* (Sowerby). *J. Morph.*, Vol. 105, pp. 401–26.

The growth stages of the lophophore and loop from the early schizolophe to the adult plectolophe are described for the first time. The descending branches of the loop grow from both crura and septum to meet and fuse; the bearing of this on the taxonomic position of the species is discussed. Characteristic of the early growth stages is the presence of conspicuous flanges on the hood: these gradually become reduced in size and disappear about the time the ascending branches become free from the septum. The flanges are compared with accessory brachial structures in other terebratellaceans. The structure of the adult lophophore is described. The ciliary feeding mechanism is essentially similar to that already described by the author in other brachiopods with plectolophous lophophores.

D. A.

BONE, Q., 1959. The central nervous system in larval acraniates. *Quart. J. micr. Sci.*, Vol. 100, pp. 509–27.

A part of the organization of the spinal cord of acraniate larvae is described, chief attention being directed toward those tracts and cell groups which are probably concerned with the control of the swimming pattern. The first section deals with the arrangement of the fibre tracts in the cord, and of the cell bodies giving rise to these fibres. The form and connexions of the giant Rohde cells are then described, it is shown that these cells possess peripheral processes passing out of the dorsal root nerves, and are thus similar to the Rohon-Beard cells of craniate embryos. It is concluded that at present, it is not safe to homologize these two cell types, for the acraniate Rohde cells differ in several respects from the craniate Rohon-Beard cells. The innervation of the gill musculature is described, it is shown that it is asymmetrical, and that this asymmetry is not related to changes in symmetry at metamorphosis.

Finally, the arrangement of the whole system is discussed in relation to the systems found in the larval stages of primitive craniates.

Q. B.

CARLISLE, D. B., 1960. Sexual differentiation in Crustacea Malacostraca. *Mem. Soc. Endocrin.*, Vol. 7, pp. 9–15.

A summary of the present state of our knowledge of the endocrine control of sexual differentiation in the higher Crustacea, drawing attention to the role of the vas deferens gland and the X organ–sinus gland complex. The paper includes a classification and terminology of the various types of successive hermaphroditism.

D. B. C.

JEWELL, B. R., 1959. The nature of the phasic and the tonic responses of the anterior byssal retractor muscle of *Mytilus*. *J. Physiol.*, Vol. 149, pp. 154–77.

In this paper a further attempt has been made to elucidate the nature of the phasic and the tonic responses that are produced by many lamellibranch muscles. Experiments involving release techniques have shown that two quite distinct states of contraction are possible in the anterior byssal retractor muscle of *Mytilus*: there is an

'active' state which bears a strong qualitative resemblance to that found in vertebrate skeletal muscle, and a 'fused' state which appears to be peculiar to lamellibranch muscle in that it allows considerable tensions to be maintained with a very low expenditure of energy. A theory has been put forward in which it is postulated that all types of excitatory stimuli produce an 'active' state which gives way to a 'fused' state when stimulation ceases, and it is supposed that inhibitory stimuli act by abolishing the 'fused' state. By means of this hypothesis it is possible to explain many of the curious properties that are characteristic of lamellibranch muscle. B. R. J.

JONES, W. C., 1959. Spicule growth rates in *Leucosolenia variabilis*. *Quart. J. micr. Sci.*, Vol. 100, pp. 557–70.

The growth of triradiate spicules was investigated by photographing at intervals three pieces of the wall of the oscular tubes. The basal rays grew faster than the paired rays at first, but for both types of ray the growth rate increased to a steady level as the rays lengthened. When their length exceeded 25 $\mu$, the basal and paired rays grew at similar rates, regardless of the different relationships between the axis of the rays and the orientation of the optic axis of the mineral constituent. The average rates for rays exceeding 25 $\mu$ on the three pieces were respectively 2·50 (18–21° C), 1·64 (18° C) and 1·29 (17° C) $\mu$ per hour. W. C. J.

NICHOLS, D., 1959. The histology and activities of the tube-feet of *Echinocyamus pusillus*. *Quart. J. micr. Sci.*, Vol. 100, pp. 539–55.

The histological structure of the tube-feet of this clypeasteroid sea-urchin is interpreted functionally. Each suckered tube-foot possesses a special set of levator muscles within its lumen to raise the centre of the disk for attachment. The disk is probably raised further by contraction of a ring of short muscles embedded in the disk itself; these muscles are also active in detachment, pulling the edge of the disk away from the substratum relative to the disk centre. There are four columns of retractor muscles in the tube-foot stem for postural movement. The buccal sensory tube-feet have a ring of cilia, probably tactile, round the edge of the disc and a nervous pad, probably chemoreceptive, in its centre. Circulation of oxygenated water round the respiratory tube-feet is maintained by patches of external cilia and the tall thin shape is maintained by cross-connexion internally. D. N.

WELLS, G. P., 1960. The genera of Arenicolidae (Polychaeta). *Proc. zool. Soc. Lond.*, Vol. 133, pp. 301–14.

It is argued that the species currently grouped as *Arenicola* Lamarck should be distributed between *Arenicola*, *Arenicolides* Mesnil and *Abarenicola* gen.nov. Formal diagnoses of the family and its constituent genera are given and suggestions are made as to the most convenient characters for referring arenicolid worms to their genera. The forms found at Plymouth are *Arenicola marina*, *Arenicolides ecaudata* and *Arenicolides branchialis*. G. P. W.