

ABSTRACTS OF MEMOIRS

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

THE STRUCTURE AND CONDUCTION VELOCITY OF THE MEDULLATED NERVE FIBRES OF PRAWNS

By W. Holmes, R. J. Pumphrey and J. Z. Young

Journ. Exp. Biol., Vol. 18, 1941, pp. 50-4

A preliminary account is given of the structure of the nerve fibres of the prawn *Leander serratus*. These fibres resemble those of vertebrates and differ from those of most invertebrates in possessing a thick myelin sheath. Most of the larger fibres are provided with nodes similar to the nodes of Ranvier in vertebrate nerve: this fact suggests that nodes play an essential part in the process of impulse conduction in fibres which possess a thick lipid sheath. The relative thickness of the myelin sheath in prawn fibres of various sizes increases with decrease in the total diameter of the fibres along a curve similar to that found in vertebrates.

The conduction velocity of certain large nerve fibres in the ventral nerve cord was measured: these fibres have a mean axon diameter of 26μ and a total diameter of 35μ , and they conduct impulses at a mean rate of 20 m. per sec. They thus conduct at a rate much greater than that of the largest fibres in other crustacea, but less than that of the myelinated fibres of vertebrates.

W.H.

THE STRUCTURE AND FUNCTION OF THE ALIMENTARY CANAL OF *APLYSIA PUNCTATA*

By H. H. Howells

Quart. Journ. Micr. Sci., Vol. 83, 1942, pp. 357-97

The feeding process of *Aplysia* is adapted to the rapid intake of vegetable food. While the stomach is reduced the anterior gut consists of large dilations freely movable in the body cavity. It is here the food is subjected to the action of a strong amylase, together with sucrase, lactase, maltase, pectinase, lipase and proteases secreted by the digestive diverticula and salivary glands. No successive action of enzymes from different sources is possible. A cellulase is present but of extremely weak action. The gizzard, however, is efficient and almost entirely responsible for the exposure of the contents of the plant cells. The caecum is concerned solely with the elaboration of a faecal mass of material excreted from the digestive diverticula. The structure is also found in closely allied genera and the Thecosomatous Pteropods which share a

similar need for a means of avoiding the fouling of ciliary mechanisms in the neighbourhood of the anus in the absence of a spiral caecum which supplies a highly efficient cleansing organ in the mantle cavity of other tectibranchs.

H.H.H.

THE LIFE ACTIVITIES OF FORAMINIFERA IN RELATION TO MARINE ECOLOGY

By Earl H. Myers

Proc. Am. Phil. Soc., Vol. 86, 1943, pp. 428-58

Statistical and cytological data on the seasonal variations in the life activities of *Elphidium crispum* in Plymouth Sound are correlated with the varying food supply, temperature, salinity, nutrient salt content of the water, hydrogen ion concentration, oxygen tension, illumination, turbidity, turbulence and currents together with the influence of tidal variations upon these factors. Animal associates, parasites, and natural enemies are discussed. Additional data from the Mediterranean, Pacific and Java Sea are also presented.

E.H.M.

THE REPRODUCTIVE SYSTEM AND ASSOCIATED ORGANS OF THE BRITTLE-STAR *OPHIOTHRIX FRAGILIS*

By J. E. Smith

Quart. Journ. Micr. Sci., Vol. 82, 1940, pp. 267-309

A description is given of the morphology and histology of the gonads, gonoducts (here described for the first time as occurring in brittle-stars), genital bursae and axial organ complex of *Ophiothrix fragilis*.

The axial organ, within the substance of which the germ cells have their origin, is made up of two closely apposed parts; one part is believed to be derived as a proliferation of the wall of the left and the other of the right anterior coelom of the larva. These coelomic cavities persist to form a bipartite axial sinus; in the adult each cavity surrounds its own moiety of the axial organ.

The germ cells migrate along the genital rachis to the gonads, there to mature. In the female the ova are discharged periodically, probably at monthly intervals, from about March to October. Males may contain ripe sperm at all times of the year. The eggs are not discharged into the genital bursae nor do they develop there. Young animals which are found in the bursae of adults have attained that position only after a period of free-swimming larval life.

J.E.S.

THE GENUS *KUHNTIA* N.G. (TREMATODA: MONOGENEA). AN EXAMINATION OF THE VALUE OF SOME SPECIFIC CHARACTERS, INCLUDING FACTORS OF RELATIVE GROWTH

By Nora G. Sproston

Parasitology, Vol. 36, 1945, pp. 176-90

Kuhnia n.g. is created for the gill trematodes of mackerel, with *K. scombri* (Kuhn) as the type; *K. minor* (Goto) is re-described from some large forms from British waters. The clamps on the posterior end are newly interpreted as being formed of a continuous double cuticular loop with a middle, opposable piece (as in *Mazocraëns* also, but differing from that genus in the disposition of the genital armature and in the absence of a vagina). An alternation of sex phases in Monogenea is proved by the study of a large series of *K. scombri*, and other developmental changes indicate that neither the absolute size, nor the ratios of parts, alone, are of any diagnostic value. Comparison of differential growth characters shows that they may be utilized in forming a polytypic species concept, and may contribute to a synoptic picture of a genus.

N.G.S.

A NOTE ON THE COMPARATIVE ANATOMY OF THE CLAMPS IN THE SUPER-FAMILY DICLIDOPHOROIDEA (TREMATODA: MONOGENEA).

By Nora G. Sproston

Parasitology, Vol. 36, 1945, pp. 191-4

The homology of the clamp sclerites is traced throughout the Diclidophoroidea, and it is shown that the type of clamp is a useful basis for the classification of families. A probable phylogenetic sequence is traced from the most generalized mazocraeid clamp, with its unbroken double loop and middle, opposable piece and incompletely cuticularized median tendon; through the discocotylid, in which the dorsal loop is reduced, and the cuticularized tendon forms the spring tending to open the clamp, the parts of which are jointed; to, on the one hand, the most complex diclidophorid type, where the sclerites are further jointed and separated, and made asymmetrical by the tendency to develop a lateral sucker; and on the other hand, to the hexostomatid, extremely reduced type, where three sclerites are imbedded in a cuticular sucker.

N.G.S.