

ABSTRACTS OF MEMOIRS

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

THE OXIDATION OF L-AMINO ACIDS BY *MYTILUS EDULIS*

By H. Blaschko and D. B. Hope

Biochem. J., Vol. 62, 1956, pp. 335-9

The enzymic oxidation of amino acids by preparations of the digestive gland of *Mytilus edulis* was described some time ago. A study has now been carried out of the stereospecificity of the oxidase; it has been established that the enzyme is a L-amino acid oxidase. The enzyme acts upon a great number of L-amino acids. Methionine was the substrate most rapidly oxidized. The enzyme was found to be associated with insoluble tissue constituents; in sucrose homogenates the enzymic activity could be sedimented by centrifugation.

A similar but less active preparation was obtained from the digestive gland of *Cyprina islandica*. Earlier findings of a D-amino acid oxidase in the digestive gland of *Helix aspersa* were confirmed.

H.B.

EGG-CAPSULE PROTEINS OF SELACHIANS AND TROUT

By C. H. Brown

Quart. J. micr. Sci., Vol. 96, 1955, pp. 483-8

The material of the egg-capsules of selachians and the chorion of trout eggs has been examined by physical, chemical and histochemical methods. The material of the egg-capsules has been found to be a quinone-tanned protein. The chorion of trout eggs is not quinone tanned but its formation and chemical behaviour allies it with the invertebrate cuticular proteins rather than with the vertebrate keratins.

C.H.B.

ON THE HORMONAL CONTROL OF WATER BALANCE IN *CARCINUS*

By D. B. Carlisle

Publ. Staz. zool. Napoli, Vol. 27, 1955, pp. 227-31

Experiments on *Carcinus* indicate that the uptake of water at moulting and the water and osmotic balance throughout the rest of the moult cycle are under the control of a hormone secreted by the X organ-sinus gland complex. This factor appears to be distinct from the hormones controlling moulting and from the gonadotrophic hormone.

D.B.C.

MUSCLE MORPHOGENESIS IN PRIMITIVE GASTROPODS
AND ITS RELATION TO TORSION

By Doris R. Crofts

Proc. zool. Soc. Lond., Vol. 125, 1955, pp. 711-50

The retractor muscle of the pre-torsional larvae of the four primitive gastropods investigated is a single group of cells attached to the right side of the shell apex in *Haliotis*, *Patella* and *Patina*, but half-way along the right side in *Calliostoma*. The anterior attachments on the right side are retractors of the velum and mantle: those on the left belong to sickle-shaped cells curving over the gut and are retractors of the left side of the velum and foot rudiment.

The primary ontogenetic cause of torsion appears to be the asymmetry of this *single* pre-torsional muscle, which may have been an ancestral mutation, instead of asymmetry in *two* ancestral larval muscles, a left one related to the foot and a right one related to the head, as in Garstang's hypothesis (1929).

The first phase of torsion is rapid, but varies in time and extent in the genera. The main cause of the variation may be the position of shell attachment of the retractor, with other contributory factors. The second torsion phase is slow and is mainly due to differential growth. The pedal musculature of the right side begins development during this phase, and at the completion of 180° rotation its shell attachment on the definitive right side is roughly the same size as that of the original larval retractor, now on the left. The definitive right shell muscle, which, contrary to earlier supposition, becomes the columellar muscle of *Calliostoma* and the hypertrophied one of *Haliotis*, may be a pair to the pre-torsional retractor, delayed in development. The two muscles may represent the two ancestral retractor muscles of gastropods, whose scars were discovered by Knight (1947) in *Bellerophon* and *Simutites*.

D.R.C.

ENVIRONMENTAL FACTORS GOVERNING THE INFECTION OF MUSSELS,
MYTILUS EDULIS, BY *MYTILICOLA INTESTINALIS*

By B. T. Hepper

Fish. Invest., Lond., Ser. 2, Vol. 20, No. 3, 1956

The importance of *Mytilicola*, its spread to and around the shores of Britain, its method of dispersal, life history and hosts are briefly discussed.

A number of extensive field surveys produced evidence to show that mussels raised from the sea bed, or in fast moving water or at either end of an estuary are less heavily infected than bottom-dwelling mussels, those in slow moving water or those in the middle region of an estuary respectively. These conclusions are supported by the results of field trials.

It is concluded that control of the parasite is possible by using culture methods similar to those practised in France and Italy on stakes, fences or ropes. By growing mussels on selected sites in fast moving water or at the brackish-water end of an estuary, good quality mussels may be cultured on the flat. In addition to restricting the level of infection, such culture methods appear to provide conditions which enable the mussels to withstand parasitization without serious loss of condition.

B.T.H.

THE NERVOUS SYSTEM OF THE EPHYRA LARVA OF
AURELLIA AURITA

By G. A. Horridge

Quart. J. micr. Sci., Vol. 97, 1956, pp. 59-74

Methylene-blue preparations of living ephyra larvae show two nerve nets, of which one, of bipolar cells, overlies only the radial and circular muscle sheets and is identified with the giant fibre net (Shäfer's nerve net) of the adult. The other net, which consists of smaller, multipolar cells, spreads over both surfaces of the animal: it is identified with the physiological conducting system which co-ordinates the movement of a single arm with the directed pointing of the mouth in the feeding reaction. It is called 'the diffuse nerve net'. The 'spasm', in which the animal folds up, stops beating, and sinks through the water, is considered to be an extension of the feeding reaction round the disc, and is shown to be co-ordinated by the diffuse net. The independence of the locomotory beat from the feeding responses and from the spasm is thus explained by the dual histological arrangement. A double innervation of the muscle is also suggested. Both nerve nets connect with the marginal ganglia, where four types of nerve cell have been described. A partial explanation of the action of the ganglion is possible, with an input of excitation from the diffuse net (which affects the rate of the rhythm) and an output to the giant fibre net which initiates the beat. This scheme gives a histological foundation for Romanes's old experiments, in which he demonstrated the difference between 'excitational' and 'contractional' continuity across the bell of the adult, and in which he found an indirect action on the rhythm following stimulation at points far from the marginal ganglia.

G.A.H.

INACTIVATION ENZYMATIQUE D'UNE SUBSTANCE CHROMACTIVE
DES INSECTES ET DES CRUSTACÉS

By Francis Knowles, David Carlisle and Marie Dupont-Raabe

C.R. Acad. Sci., Paris, Vol. 242, 1956, p. 825

Enzymic studies on the A substance of the eye-stalk of *Leander* suggest that this may be a polypeptide.

D.B.C.

EXPERIMENTAL FEEDING OF THE COPEPOD *CALANUS FINMARCHICUS*
(GUNNER) ON PHYTOPLANKTON CULTURES LABELLED WITH
RADIO-ACTIVE CARBON (^{14}C).

By S. M. Marshall and A. P. Orr

Pap. Mar. Biol. Oceanogr., Deep-Sea Res., suppl. to Vol. 3, 1955, pp. 110-14

Cultures of the diatom *Skeletonema costatum* and the flagellates *Cryptomonas* sp. and *Syracosphaera carterae* were grown using ^{14}C as carbonate in the culture medium. The cultures were then used in feeding experiments on female *Calanus* in order to measure the uptake and percentage assimilated. The volume filtered varied from less than 1 to about 40 ml. in 24 h. and the amount of ^{14}C assimilated from 53-78%. The results are in agreement with those from similar experiments done with ^{32}P .

S.M.M., A.P.O.

COMPARISON OF THE LEVEL OF CHLORIDE REGULATION BY *NEREIS*
DIVERSICOLOR IN DIFFERENT PARTS OF ITS GEOGRAPHICAL RANGE

By R. I. Smith

Biol. Bull., Woods Hole, Vol. 109, 1955, pp. 453-74]

This paper summarizes data obtained on the level of coelomic-fluid chloride in *Nereis diversicolor* adapted to a series of dilutions of sea water and to fresh water. The populations studied have been collected in marine-dominated habitats (Millport and Kingsbridge Estuary), regions of stable low salinity (Gulf of Finland and the Isefjord, Denmark), and from typically estuarine conditions of variable and low salinity (River Tamar). Ecological findings have been reported in the *Journal of the Marine Biological Association* and elsewhere. Despite the wide differences in salinity and its pattern of variation in the several habitats studied, populations of *N. diversicolor* from different areas were found to show no significant differences in the level of coelomic chloride regulation after adaptation to low salinities. This level is thus not diagnostic of physiologically distinct races of *N. diversicolor*, although the ability to tolerate fresh water or sudden salinity changes may, upon further study, prove to differ in populations from regions of unlike salinity. R.I.S.