

ABSTRACTS OF MEMOIRS

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

BLOOD CELL FORMATION IN CERTAIN TELEOST FISHES

By W. T. Catton

Journ. Hematology, Vol. 6, 1951, pp. 39-60

The blood cells of brown trout (*Salmo trutta*) and common roach (*Rutilus rutilus*) are described, and some comparisons are made with the blood cells of the marine teleosts, *Ctenolabrus rupestris* and *Trigla cuculus*. Confirming previous authors, the sites of blood-cell formation in these teleost fishes are chiefly in the intertubular tissue of the kidneys. The structure of the intertubular tissue is described as that of a 'spongework' of reticular cells, with scattered endothelial elements, and enclosing in the meshes large numbers of blood-cell precursor elements in various stages of development. Vascular connexion with the peritubular capillaries is described. On the basis of histological study of the primitive blood-forming cells, a monophyletic scheme of development is proposed, in which the stem cell, derived from a reticular cell, is regarded as a large cell of lymphoid character ('large lymphoid haemoblast'). From cells of this type, the blood granulocytes develop by a process of differentiation. Blood erythrocytes and thrombocytes develop from small lymphoid cells of the same general character ('small lymphoid haemoblasts'). These small lymphoid cells may be derived from the larger cells by mitotic divisions, which are frequently seen. Alternatively, the small lymphoid cells may be derived from endothelial elements of the haematopoietic tissues. On this latter supposition, a close analogy may be drawn with the scheme of blood-cell formation in mammals, according to the work of Doan, Cunningham and Sabin. No evidence of such derivation of the small lymphoid cells could be observed.

W.T.C.

NOTES ON SOME LARVAL DECAPODS (CRUSTACEA) FROM BERMUDA. II

By Marie V. Lebour

Proc. Zool. Soc. Lond., Vol. 120, 1951, pp. 743-7

These notes add to our knowledge of the larval decapods of Bermuda. New facts are given as regards *Amphion* and it is shown that a very late stage brings it nearer to the adult form, which is probably *Amphionides* as Gurney has suggested. A late larva of *Anchistioides antiguensis* (Schmitt) was found in deep-water plankton, and is of great interest as only the first and second

larvae are so far known. It is here shown that there is a first larval stage in the hippolytid *Trachycaris*, which corresponds exactly with a similar stage in most other carids, having the eyes covered and the supra-orbital spines still under the skin. M.V.L.

GIANT AXONS AND SYNERGIC CONTRACTIONS IN *BRANCHIOMMA VESICULOSUM*

By J. A. Colin Nicol

Journ. Exp. Biol., Vol. 28, 1951, pp. 22-31

The giant axons of the sabellid worm *Branchiomma vesiculosum* mediate quick synergic contractions of the longitudinal musculature. The neuromuscular functioning of this system was investigated by means of electrical stimulation (condenser discharges) and graphical recording. Single muscle-twitches occur at stimulation frequencies up to 2 per second, above which clonus, and finally tetanus result. At high rates of stimulation fatigue rapidly sets in; this fatigue is reversible. Maximal tension is developed about 255 msec. after the beginning of contraction, and relaxation occupies about 1.8 sec. With an isometric lever it has been shown that under repetitive stimulation maximal tension is developed initially, and there is no evidence for the existence of peripheral facilitation. The paper concludes with a discussion of the results in terms of the natural habits of the animal. J.A.C.N.

ON A GIANT SQUID, *OMMASTREPES CAROLI* FURTADO, STRANDED AT LOOE, CORNWALL

By W. J. Rees

Bull. Brit. Mus. (Nat. Hist.), Zool., Vol. 1, 1950, pp. 31-41

A large specimen of the giant squid, *Ommastrephes caroli* Furtado, was stranded in live condition in November 1940. Standard measurements are given, together with a detailed account of the dentition of the sucker rings. Female specimens only are known. Most strandings occur along the east coast of Britain, with main strandings at Scarborough, the Dunbar-North Berwick area and at Buckie.

All authenticated records of this and other giant squids (*O. pteropus* and *Architeuthis* spp.) have been collected and plotted on maps. It appears that these species are oceanic forms which occasionally migrate into the North Sea and become enfeebled by unfavourable conditions during the winter months. The scanty evidence we now possess suggests that the adult squids inhabit the continental slope beyond the 100-fathom line. Two excellent photographs by Dr D. P. Wilson are included in the report. W.J.R.

ON THE BEHAVIOUR OF *SABELLA*

By G. P. Wells

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Proc. Roy. Soc., B, Vol. 138, 1951, pp. 278-99

The water currents which *Sabella spallanzanii* and *S. pavonina* drive through their tubes vary with time according to definite and characteristic patterns. These are described in detail, and the bearing of the results on the general physiology of the worms is considered.

In either species, the tube consists of a stiff stem and a more flexible root, and is open at both ends. The opening of the stem (anterior opening) is always well above the substratum. That of the root (posterior opening) was found to be above the surface of the substratum in *S. spallanzanii* but embedded in the mud in *S. pavonina*. This means that the tube can easily be irrigated in either direction in *S. spallanzanii* but tailwards only in *S. pavonina*.

Both species irrigate their tubes vigorously, whether the crown is expanded or withdrawn. In *S. spallanzanii*, pauses are brief and rare; the direction and velocity of irrigation often change and certain characteristic patterns are constantly reproduced. In *S. pavonina* there may be pauses of over an hour's duration and irrigation is tailwards only. The fact that the former species irrigates in either direction and the latter in one direction only is clearly correlated with the difference in form of their tubes. As the worms were studied under identical mechanical conditions, the behaviour difference is inherent.

Decapitation (removal of crown, collar and part or all of the thorax) has very little effect on the irrigation behaviour of either species. This suggests that the crown is unimportant as a respiratory organ.

A worm may still be very active, even though its crown is withdrawn into its tube. The suggestion is made that feeding may occur from the irrigation current when the crown is withdrawn. G.P.W.

THE INTEGRATION OF ACTIVITY CYCLES IN THE BEHAVIOUR OF
ARENICOLA MARINA L.

By G. P. Wells and Elinor B. Albrecht

Journ. Exp. Biol., Vol. 28, 1951, pp. 41-50

Two distinct cyclic behaviour patterns are known to be important in the normal life of the lugworm: the feeding cycle of period about 6-7 min., originating in the oesophageal wall (*f* cycle), and the irrigation-defaecation cycle of period usually about 40 min., and probably originating in the nerve cord (*i-d* cycle). The integration of these two patterns was studied in a series

of dissected preparations. Neither pacemaker directly affects the rhythm of the other. The integration of the activities which they determine depends on variation in the extent to which their influences spread through the neuromuscular system. They appear to compete for territory. If they happen to discharge outbursts simultaneously, the *i-d* pacemaker dominates over most of the body wall, and the *f* pacemaker over the proboscis and mouth region.
G.P.W.

THE ROLE OF OESOPHAGEAL RHYTHMS IN THE BEHAVIOUR OF
ARENICOLA ECAUDATA JOHNSTON

By G. P. Wells and Elinor B. Albrecht

Journ. Exp. Biol., Vol. 28, 1951, pp. 51-6

The brainless isolated extrovert of *A. ecaudata* traces a continuous, or nearly continuous, background of activity, upon which prominent spells of vigorous rhythmic contraction appear at intervals of the order of 30-40 min. Similar spells are sometimes shown by the corresponding preparation from *A. marina*, whose characteristic *f* cycle can be regarded as produced by the organization of the background activity of *ecaudata* into vigorous and regularly spaced outbursts. There is little evidence of a pacemaker role of the oesophagus in *ecaudata*.
G.P.W.