

MARINE BIOLOGICAL RESEARCH

THE Marine Biological Association reports (*J. Mar. Biol. Assoc.*, 33, 3; 1954) the completion of the research vessel, *Sarsia*, and gives a photograph of this fine ship. Registered as ninety-five tons, she has two laboratories, a crew of sixteen, and accommodation for four scientists. An impressive account of work in progress is given in the report of the Council, and it is a pleasure to record an increase in membership of the Association of sixty-one, making a total of 770, and a satisfactory balance sheet.

In the present number, completing the thirty-third volume, there are sixteen papers, of which the most important are described below.

Dr. Vera Fretter and Prof. A. Graham, continuing their studies of small or aberrant gastropods, contribute an interesting account of the sand-burrowing *Acteon tornatilis*, a primitive British opisthobranch. This paper is illustrated by handsome drawings. In structure, *Acteon* forms a link between prosobranchs and opisthobranchs, and also exhibits more advanced and specialized characters.

Dr. Daphne Atkins has investigated the swimming habits of brachyuran megalopæ. Of the twenty-five species of crabs occurring at Plymouth, twenty-two swim in stream-lined fashion by tucking the chelipeds and first two pairs of pereopods beneath the body, the last two pairs being wrapped over the back, with the third pair looped around the eye-stalks. Three species fold all the legs beneath the body; these probably have a very short pelagic existence.

Dr. R. H. Millar contributes two papers on tunicates, one a description of a new genus and species, *Protostyela heterobranchia*, from west Scottish coasts. This is based on a single zooid, which is remarkable in possessing transverse stigmata. The second paper is an account of breeding and development in *Peloniaia corrugata*, an oviparous species, without pelagic larval stage.

Another interesting study from the Clyde area is a paper by Dr. R. B. Pike on the biology of *Spirontocaris liljeborgii*. Using methods similar to those in his work on *Pandalus*, Dr. Pike proves that this species of *Spirontocaris* is dioecious, the males living one or two years, the females two or three years, and breeding for the first time in the second year. Egg-laying occurs in November and hatching in March. Sexual characters appear in the larvæ within six months of hatching.

Dr. Alexandrowicz adds to his histological series an account of the innervation of the heart of *Marino-*

gammarus marinus. He found a local system, situated dorsally, paired connexions with the central nervous system, and nerves supplying the valves. There is an ancillary system to the alary muscles and wall of the pericardium.

Dr. R. Phillips Dales and Dr. G. Y. Kennedy have investigated the orange, brown and green pigments of *Nereis diversicolor*, and the relation between their predominance and sexual reproduction. The green colour, due to biliverdin, is formed by the breakdown of the hæmoglobin of the blood. Dr. Kennedy and Dr. H. G. Vevers studied porphyrins in British marine invertebrates. Of forty-eight species, only seven, belonging to the phyla Annelida, Mollusca and Echinodermata, possessed any form of porphyrin, and none was found in cœlenterates, Crustacea or tunicates.

Dr. L. R. Fisher, Dr. S. K. Kon and Dr. S. Y. Thompson have published their second paper on vitamin A and carotenoids in Crustacea, with special reference to seasonal variation. Present mainly in the eye in euphausiids, astaxanthin and vitamin A accumulate during the spring and autumn feeding periods, in association with diatom increases at those times. In brown shrimps and Norway lobsters there was no seasonal variation; but in the common lobster the highest concentration is in the spring. It is suggested that astaxanthin is a possible precursor of vitamin A. If this is so, euphausiids are unique among Crustacea in being able to produce vitamin A from the "ubiquitous crustacean pigment astaxanthin".

Dr. A. J. Matty discusses thyroid function in the dogfish, and the effects of injecting extracts of the gland into rats. His results are not conclusive; we wish him success in his visit to Barbados as Nuffield Fellow, in search of material from local fishes.

On the botanical side, Dr. Daphne Atkins contributes two papers on marine fungi belonging to the family Saprolegniaceae, affecting marine Crustacea and other invertebrates. The first species, *Leptolegnia marina*, attacks the body, eggs and embryos of *Pinnotheres pisum* and *P. veterum*, as well as two lamellibranchs, *Barnea candida* and *Cardium echinatum*. The second species, *Plectospira dubia*, attacks several kinds of Crustacea and is less pathogenic.

Two papers deal with oceanographical problems. Dr. J. N. Carruthers describes a penetrometer for use on submerged beaches, based on that used by road surveyors, and Mr. W. S. Preddy discusses the mixing of waters in the Thames estuary, with special reference to pollution.

EXPERIMENTAL EVIDENCE FOR THE COLLECTIVE NATURE OF THE CHARACTERISTIC ELECTRON-ENERGY LOSSES IN SOLIDS

By DR. D. GABOR and G. W. JULL

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IN a study extending over the past three years, we have been investigating the characteristic 'line' spectra of the energy losses of electrons in thin metal foils, first discovered by Ruthemann¹ and since confirmed by other workers². The apparatus used was a new electrostatic spectrograph, proposed by one of us³, in which the electrons describe helical trajectories. In the course of this work we were struck with the

erratic behaviour of the spectra, not reported by previous workers but evident enough from the wide discrepancies between their results. As in the case of most metals the variability might have been ascribed to chemical changes in the thin foils, we turned to gold, which at least gave clear evidence of a dependence of these spectra on structure, as distinct from chemical composition.