

graduate taken on by university libraries, with reasonable prospects of promotion. He mentioned that very few science graduates were coming forward as candidates for librarian posts, and during the discussion it was pointed out that a science graduate is perhaps not likely to be attracted by a salary of £350 when he can probably command more than that immediately upon taking his degree. Some scientific libraries seem willing to take graduates in other than scientific subjects.

The programme also included an address by Dr. H. W. Meikle, chairman of the Edinburgh University Library Committee, who gave a historical account of the libraries of Edinburgh; and a paper on the present condition and organisation of some of the libraries of northern Italy was read by Dr. W. Bonser, librarian of the University of Birmingham. Dr. Douglas Guthrie, lecturer on the history of medicine in the University of Edinburgh, spoke to the Medical Section on the evolution of medical studies in Scotland.

An important discussion on the future policy of the Section and its role within the Library Association was keenly followed by members present. Visits were paid to the National Library of Scotland, the Signet Library, the University Library, the City Library, and the Libraries of New College and the Royal Society of Edinburgh. The Medical Section inspected the University Medical Library and the Royal College of Physicians, while another party went to the Commonwealth Bureau of Animal Breeding and Genetics, and the small but pleasantly designed library of the Zoological Department of the University. This strenuous but interesting week-end was completed by a brief visit to Glasgow to inspect the University Library and the Royal Faculty of Physicians and Surgeons.

MARINE BIOLOGY

THE first number of Volume 28 of the *Journal of the Marine Biological Association* contains twelve papers of interest to varied workers in this field.

Dr. N. Gross and Prof. J. Raymont describe two aspects of the results of fertilizing Loch Craigin, an experiment which has been going on now for seven years. The records show considerable fluctuation, and even with small quantities of added fertilizer there is a disturbance in the natural balance of organisms, which may, over a period of years, affect the fauna detrimentally from the human point of view. Some of these results are unexpected. Thus, growth in size of the invertebrate population may be stimulated to such an extent that there is not sufficient small food available for young or for small-mouthed fishes such as the Pleuronectids. Prof. Raymont reports at least a hundred per cent increase in the bottom fauna; but does not find evidence of decrease in availability as fish food. The fish records, on the other hand, were disappointing, and Dr. Gross considers that unfavourable hydrographic conditions reduced the growth-rate, despite favourable feeding conditions. This led him to the conclusion that sexual maturity in flounders is correlated with size, not with age.

Five papers on the biology of marine organisms deal with *Tubularia*, copepods, *Asterias*, flagellates and sand eels. Those who have seen the handsome colonies of *Tubularia larynx* settled on rafts moored in the Firth of Clyde, in connexion with research on

anti-fouling at the Millport Marine Biological Station, will welcome the interesting account by Messrs. Pyefinch and Downing of the biology of this species. The rapidity of settlement of the actinula larva after extrusion from the gonophore of the parent, and the production of actinulae from the settled polyp, twenty-four days after settlement, account for the crowded colonies of this beautiful Cœlenterate.

Dr. Sheina Marshall continues her work on copepods by a study of seven species occurring in Loch Striven. All produce successive broods throughout the summer and, with the exception of *Microcalanus pygmaeus*, show a seasonal vertical migration. The food of the copepods was studied, and it was found that *Centropages* and *Temora* are not dependent on diatoms entirely, but feed on small animals as well, while *Microcalanus* and *Oithona* subsist largely on flagellates. These feeding habits will affect the relative distribution of the species at different times of the year.

The cannibalistic habits and tenacity of life of starfish, their rate of growth and the correlation between food and breeding rather than between size and breeding were worked out by Mr. H. G. VEVERS. It is not possible to determine the age of a starfish.

Dr. Mary Parke describes the specific characters and life-histories of the six minute flagellates used as food for oyster larvae in the Port Erin oyster-rearing experiments, and her paper is illustrated by coloured plates.

Messrs. P. G. Corbin and Vidya Vati have worked out the post-larval stages of the three common sand eels, and have added a fourth from the Plymouth area, to which at present they give no name. Adult *Gymnammodytes semisquamatus* have been found in the region, but not, so far, the young.

A systematic study of the marine and brackish water rotifera of Plymouth has been made by Mr. E. D. Hollowday. There must be many biologists who have found rotifers in the plankton or among weed, and have been unable to identify them. Now there is no excuse, so far as these six species, illustrated by fine drawings, are concerned.

An ecological survey of the Exe Estuary is described by Mr. N. A. Holme. The erosion of Dawlish Warren is shown by aerial photographs taken in August 1945 and April 1946, and even in the short period of eight months a considerable portion of the sand-bank known as Warren Point has been washed away, causing redistribution of the sand, but with little effect on the physical conditions or the estuarine fauna. The species of plants and animals are listed relatively to the substratum of pure sand, muddy sand, and mud with *Zostera*. Mr. Holme concludes that soil drainage affects the fauna more than any other factor.

Mr. G. Chapman contributes a biophysical paper on the thixotropy of a marine soil, in relation to the burrowing speed of *Arenicola marina* L. on the Whitstable flats (see *Nature*, December 4, 1948, p. 894). Dr. H. W. Harvey has estimated the amount of manganese available in sea-water off Plymouth at about 1.0 mgm. manganese/m.³, and off the Isle of Man at more than 2.0 mgm./m.³, the latter area being capable, therefore, of supporting a much richer summer population of flagellates. In fresh-waters the amount is still higher and may attain 40 mgm./m.³ in agricultural areas.

Finally, Dr. J. P. Harding describes how probability paper can be used for the graphical analysis of polymodal frequency distributions, a useful contribution for statistical biologists.