

BRITISH MARINE WORMS.

Ray Society: A Monograph of the British Annelids.
By Prof. W. C. McIntosh, F.R.S. Vol. ii., part ii.
Polychæta. Syllidæ to Ariciidæ. Pp. 233-524+23
plates. (London: Dulau and Co., Ltd., 1910.)
Price 25s. net.

THIS volume constitutes a further instalment of Prof. McIntosh's large monograph of British Polychæts, and its publication raises the hope that the entire work will be completed in a few years. The families described are amongst the most interesting and the most familiar to naturalists, yet they have probably never received such detailed treatment as is here accorded, with the result that we now have such a survey as Huxley first planned when he undertook professional work. The variety and beauty of this section of the British fauna will be a surprise to most naturalists.

The most interesting points in the volume are the assumption of the "epitokous" stage among the Nereids, and the phenomenon known as "Palolo."

During their asexual or "atokous" stage, Nereids are provided with similar lobes and bristles on every segment, but when the breeding season ensues many species of this family undergo a metamorphosis. The head and eyes enlarge, the posterior two-thirds of the body grows out segmentally into new lamellar feet, and these in turn develop long swimming bristles. In this "hetero-neris" or "epitokous" phase, the two sexes often differ in colour and in habits, and in at least one species there are again two castes of males. The behaviour no less than the appearance of these animals now finds a new expression. Up to this period, Nereis has lived a sluggish life in a burrow. Now as hetero-neris, he or she strikes out for the open sea, swimming easily and gracefully by rhythmical contractions of the paddles, and discharging broadsides of ova or of milt into the water. This effort is probably the final act of a career, for, carried away by the act of discharge, these pelagic Nereids may rupture and die.

On this subject the veteran naturalist of St. Andrews has gathered together his own vast stores of information and also those of his fellow-workers. He traces the development of this metamorphosis in all available instances, and collates a great amount of information, not only as to British, but concerning all Polychæts that exhibit this phenomenon.

With regard to palolo, this Fijian word has reference to a peculiar swarming of Polychæts at the surface of the sea. At Amboina, round Japan, on the coast of Florida and Samoa, swarms of Eunicid worms suddenly appear at definite times and disappear as suddenly as they came. The interest of their advent is increased by its coincidence with a certain phase of the moon in two months of the year, October and November in some places, March and April in others. Several genera exhibit this habit of swarming on two or three definitely fixed nights if the weather be clear. By the following morning not a trace of them is to be seen.

Still more remarkable are the details of the process. During the preceding twelve months these Annelids

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have led a sedentary life, hiding as far as is known in crannies or burrows in rock and coral. No sooner, however, is the moon at full in March or in October, as the case may be, than these Eunicids turn round in their burrows, twist off their tails, and send them wriggling on to the surface, the head end meanwhile remaining in the burrow. The whole mature population simultaneously perform the act, with the result that the neighbouring water acquires an appearance not unlike that of vermicelli. These severed tail ends are provided with special ocelli, and swim away laden with ova or with milt, which they discharge with every contraction. In a few minutes disruption is complete, and hence by sunrise the act is over. Meanwhile the head-ends, ensconced in their burrows, are already making scar-tissue, and in time regenerate the missing portion.

Such in brief, though, of course, subject to local modifications, is the meaning of this expression, and we now ask is there a British palolo, or have we anything of this nature on our coasts? The monograph before us gives no certain answer. True, there is a British *Lysidice punctata* at Guernsey, closely allied to a species that acts palolo elsewhere, but at present such swarming, if it occurs, has escaped observation. As to this and many other features of habits, coloration, and development, there is still a wide field for research amongst Polychæts. We trust that the publication of this monograph will stimulate to fresh observations on this interesting group.

Rather unwillingly, a word of criticism must be added, and it is to repeat a request made in the review of the preceding section that appeared in this journal in 1908. It was there urged that the family name of each species should be placed as a headline to one of the two facing pages, preferably the left, and we would also ask for an outline classification in each part as issued. For working purposes the absence of these two simple devices creates an extraordinary amount of trouble, and the reviewer is, after careful search, still far from clear as to the classification of, for example, the Eunicidæ.

In conclusion, the magnificent plates of coloured figures reflect the greatest credit on everyone concerned in their production. Plate liii., for instance, representing *Nereis virens* in all its three feet of beauty is a wonderful picture. Prof. McIntosh is to be heartily congratulated on the completion of such a large section of this great work.

F. W. GAMBLE.

CHEMISTRY FOR MINERS.

Elementary Chemistry for Coal-mining Students. By Prof. L. T. O'Shea. Pp. ix+319. (London: Longmans, Green, and Co., 1911.) Price 6s. net.

THE object of this little book is to furnish coal-miners with a knowledge of as much of the science of chemistry and of its applications as they are likely to find useful in their everyday work. Its contents are thus naturally divisible into two sections, the first giving an outline of chemical principles, and the second a rather more detailed account of such portions of the subject of coal-mining as depend more especially upon the above principles.