

chæta; Dr. H. E. Jordan gives an account of the structure of the striped muscle of *Limulus*, and also traces the embryonic history of the germ-cells of the loggerhead turtle from the emigration of the primordial germ-cells from the yolk-sac endoderm to their arrival in their final positions.

RESEARCH PAPERS FROM THE UNIVERSITY OF SYDNEY.

THE University of Sydney has recently issued (for private circulation) several volumes of reprints of papers by members of its staff and by its research students during the period 1909-16. It is clear that the University is doing its duty in contributing to scientific progress, and in training its best students in the methods of research. Thus in vol. A we have a list of upwards of sixty papers (twenty of which are included in this volume) ranging over the subjects of mathematics, physics, chemistry, agriculture, and engineering; and although, of course, they are of unequal value in the eyes of an expert, they are all concerned with genuine scientific problems, the solution of which means something more than a mere class exercise. One paper is of an exceptional kind, as dealing with a chapter of mathematical history. This is Prof. H. S. Carslaw's Napier commemorative lecture, which gives a clear and interesting account of what Napier's logarithms were (even yet this is often wrongly stated), and of the way in which they were calculated. The other papers are technical, and we must content ourselves with noting those in the complete list which obviously deal with specially Australian matters. These are: (1) Two papers on superannuation and pension funds; (2) one on the teaching of mathematics in Australia; (3) one on Australian coalfields and collieries; (4) one on the Hargreaves goldfield, N.S.W. None of these, however, appear in this volume, probably because the stock has been exhausted.

An interesting record of the activities in research of the anatomists and biologists of the University is contained in vol. i., series B. Unfortunately the volume is by no means complete, for of the fifty-seven papers which have actually been published during the period covered (1909-16) only twenty-eight are represented. This, however, is five more than we are led to expect from the table of contents, which is to that extent inaccurate. These papers represent the original research of a dozen different authors, and naturally range over a wide field, from pathological anatomy to zoogeography. The most distinctively Australian contributions are those dealing with the fauna of the great island-continent. The botanical side of biological science is but slightly represented, though we may expect to see a great advance in this direction now that a separate department of botany has been established in the University. A good many of the papers were originally published in English journals, and are already well known to workers in this country. Of the remainder, the Proceedings of the Linnean Society of New South Wales furnish a very large proportion. We may direct special attention to Mr. E. F. Hallmann's "Revision of the Monaxonid Sponges described as new in Lendenfeld's Catalogue of Sponges in the Australian Museum." Such a revision was greatly needed, for the catalogue in question is a singularly unsatisfactory piece of work. Mr. R. J. Tillyard's papers on dragonflies constitute a conspicuous feature of the volume and a very notable contribution to the study of this group of insects, which is dealt with from the different points of view of systematic zoology, geographical distribution, and physiology. We note that Messrs. Hallmann and Tillyard are, or were, both

Linnean Mackay fellows in zoology. These fellowships have done much to promote the study of zoology in a country where an immense amount of work still remains to be done before our knowledge of the fauna can be placed upon a really satisfactory footing. The issue of this volume coincides with the retirement of Prof. Haswell from the chair of zoology, which he has so long held. He himself contributes four memoirs to the collection, and we hope that his valuable researches in Australian zoology will long be continued.

Series B, vol. ii., is concerned with geology, pathology, and physiology, the first-named science occupying by far the greatest portion. The papers include a series by W. N. Benson on the "Great Serpentine Belt of New South Wales," where the perennial subject of the connection between radiolarian cherts and pillow-lavas comes up for discussion in the case of rocks of Middle Devonian age. The association of frequent casts of *Lepidodendron* with radiolaria has raised interesting physiographic questions. The alluvial deposits of Copeton, N.S.W., containing tinstone and diamonds, have been worked since 1873, and Mr. L. A. Cotton has recorded (1914) a diamond in a quartz-dolerite of the district. He regards the basic magma as the true matrix, and does not suggest a derivation from underlying rocks. Prof. Edgeworth David has stimulated so much of the geological work in the University of Sydney that his address to the Australasian Association in 1913 seems very fittingly included in this volume. It deals with the influence of an Antarctic continent, varying in dimensions in geological time, on the climate of Australia, and attributes the cold Permo-Carboniferous conditions to the immense extension of land in the south of the southern hemisphere. Among the physiological papers is one of importance to chemists, by Mr. H. Wardlaw, on "The Accuracy of Neumann's Method for the Estimation of Phosphorus." Though this author's work has been largely concerned with milk, of human or other origin, he has found time for a specially Australian study on the variations of temperature in *Echidna*.

THE SURVEY OF INDIA.

THE Indian Survey Report for 1915-16 contains nothing of special interest either in the department of exploration or in that of science, but it is a good record of solid work carried out under the direction of Sir Sidney Burrard, curtailed in certain branches by the exigencies of war service, but on the whole a most satisfactory report. The progress made in the topographical mapping of the huge area of India in the ten years preceding 1916 shows that between one-fourth and one-fifth of that area has been completed on various scales and by various methods up to date, but one is left in doubt as to the comparative values of the revision necessary in the mapping of an older date than 1905. The whole of India (or very nearly the whole) must have been mapped by then, on scales which are much the same as those now adopted for various classes of land area. Surely very little revision is necessary in those barren areas (within the frontier) that were mapped on the smaller scales. On the other hand, much of the 1 in. per mile mapping must have required actual re-survey. The area remaining to be mapped amounts to 1,382,767 square miles (or thereabouts?), so the Survey of India has still a career before it.

It is worthy of note that thirty-six "Imperial" officers have been withdrawn for active service, and that of that number no fewer than seven have already laid down their lives for their country. A survey party has been attached to the forces in Mesopotamia, and the result of its work will be of special interest, but otherwise no trans-frontier geo-