

Grundriss der allgemeinen Zoologie: für Studierende.
Von Prof. Dr. Alfred Kühn. Zweite, verbesserte und vermehrte Auflage. Pp. viii + 261. (Leipzig: Georg Thieme, 1926.) 13.20 gold marks.

In the first 84 pages the author gives an account, necessarily very condensed, of the various phyla. It is difficult to estimate whether some of the sections, e.g. one page of text for the sponges, about ten lines for the Ctenophora, six lines for the Bryozoa and for the Myriapoda respectively, will serve to convey to the student an adequate idea of the groups concerned. The author may depend largely on the laboratory instruction for the building up of the student's knowledge of structure, and the brief accounts may be intended chiefly for purposes of revision. The second part of the work (about 70 pages) deals with physiology—food and its transportation in the body, production of energy, respiration, excretion, animal heat, chemical relations between the organs, movement, reactions to stimuli. The final section of about 80 pages is devoted to embryology, heredity, and the origin of species. The figures are diagrammatic and clear; there is a list of works of reference and an adequate index.

Special Biological Studies.

Evolution im Lichte der Bastardierung betrachtet.
Von J. P. Lotsy. Aus dem Englischen übersetzt von H. N. Kooiman. (Separat Abdruck aus *Genetica*, 7.) Pp. iii + 365-470. (Haag: Martinus Nijhoff, 1926.) 4 guilders.

EARLY in 1925, Dr. J. P. Lotsy, at the invitation of the university colleges of New Zealand, delivered there three lectures on "Evolution considered in the Light of Hybridisation." These were afterwards published by Canterbury College, together with an introduction and an appendix by Dr. L. Cockayne, giving a list of more than 200 supposed wild hybrids in the New Zealand flora. These lectures have now been translated into German by Dr. H. N. Kooiman. The original edition was illustrated by eleven photographs of *Mirabilis* hybrids. These are replaced in the German edition by a coloured plate illustrating the remarkable range of fruit types obtained in the F_2 and F_3 generations from a cross between two varieties of pumpkin or squash.

So early as 1921, Dr. Cockayne had observed natural hybrids of *Nothofagus* and other genera growing wild in profusion, and he gives reasons why New Zealand is a particularly suitable place for their evolutionary study. Nevertheless, if natural species-hybrids are so abundant in the New Zealand flora, they must be of common occurrence elsewhere. In polymorphic genera, such as *Rubus*, *Cratægus*, *Rosa*, and *Hieracium*, the polymorphism is now, as the result particularly of cytological work, generally recognised to have arisen in connexion with crossing, and the number of such cases will no doubt be much extended.

Dr. Lotsy in his lectures has brought together many new and interesting data bearing on the subject. The statement of his views is less extreme

than formerly, but he still leans very heavily upon the hybridisation hypothesis in places where it seems unnecessary. Although he admits that real mutations may take place, yet he invents terms such as 'sub-haploid' and 'super-haploid' hybridisation for processes with which geneticists have long been familiar as germinal changes, e.g. various processes by which new chromosome numbers arise. Why he assumes that such changes can only occur in Nature as a result of crossing it is difficult to see, since it is well known that some of them at least can be produced experimentally by changes in the conditions. Dr. Lotsy's view appears at its weakest in dealing with adaptations. Thus he suggests that the leafless Cacti and Euphorbiae may have arisen by the crossing of leafy succulent forms, the leafless offspring afterwards finding their way into the desert.

We think the author would strengthen his case if instead of trying to make hybridisation a universal evolutionary factor, he recognised it as merely one of the conditions under which the evolution of sexual organisms has taken place. He thinks evolution was made possible by sexuality, but he makes no attempt to explain the evolution of non-sexual organisms.

R. R. G.

Der Formwechsel der Protistenkerne: eine vergleichend-morphologische Studie. Von Dr. Karl Bëlar. (Sonderabdruck aus *Ergebnisse und Fortschritte der Zoologie*, Band 6.) Pp. 420. (Jena: Gustav Fischer, 1926.) 22 gold marks.

THE author has made a thorough study not only of the literature of the Protozoan nucleus, but also of numerous specimens in various phases of nuclear activity. As he remarks, the newest developments of research in heredity have brought the nuclear changes in the Metazoa into the very centre of interest, but in the Protozoa genetical studies are only beginning, and much remains to be accomplished in this and in other connexions in the study of their nuclei. It is well, therefore, that the known facts have been brought together in such an accurate and orderly manner, for the limitations of our knowledge and the directions in which further investigations are required are more readily realised.

After a survey of the 'resting' nucleus, the author passes to the consideration of the various forms of mitosis and amitosis. He points out that amitotic nuclear division, formerly believed to be widespread in the Protozoa, appears normally to occur in the macronucleus of the Ciliata and in a few other cases only, and most of the latter are doubtful. The more interesting examples are carefully described.

The account of the behaviour of the nucleus preparatory to and during fertilisation includes a summary of present knowledge of the meiotic phase. A list is given of the number of chromosomes in nearly one hundred Protozoa, in some twenty of which the diploid and haploid numbers are stated. The nuclear changes which take place during the vegetative period are traced, the rela-