

and Tototremata, together with a new order, Palæotremata, are placed in the Pygocaulia. The Tototremata are said to be derived from the Gastrocaulia through the Palæotremata and the Protremata, the former order including primitive, calcareous forms lacking articulation. Beecher, on the other hand, claimed that the Protremata were derived from the Neotremata, and that the Tototremata were derived from the Atremata. Further corroboration from the study of living Brachiopoda is required before this classification can be generally adopted.

The volume contains a list of papers dealing with the Brachiopoda of different regions, and it should prove a useful book of reference, not only to the specialist, but also to the student of zoology. Considering the somewhat high price of the book, it is regrettable that the two plates have been printed back to back, and that their reproduction is not more distinct.

*The Essentials of Transformer Practice: Theory, Design, and Operation.* By Emerson G. Reed. Second edition, revised and enlarged. Pp. xii + 401. (London: Chapman and Hall, Ltd., 1927.) 21s. net.

THE maximum temperature rise of the conductors and of the insulating materials in electrical apparatus when working is usually the factor which determines their capacity. Electrical engineers, therefore, have had to study closely the theory of heat. Serious research in this direction began about twenty-five years ago, and the volume of work goes on increasing every year. There are now several well-known formulæ in connexion with the heating of buried cables which are used in practical design.

These researches have been successful in saving manufacturers many hundreds of thousands of pounds every year. Glazebrook, Russell, and others were pioneers in this direction. Most of the important problems had been already solved more than a hundred years ago in Fourier's work on the theory of the conduction of heat, one of the most brilliant books ever written. It is somewhat of a shock to find, therefore, that electrical engineers (p. 184) seem to think that the temperature rise is based on "Ohm's law for heat." This is stated to be that the resultant heat flow expressed in watts is equal to the temperature rise divided by the thermal resistivity. It is not easy to see what connexion Ohm has with this law. Numerical values of the thermal resistance are given, and also of the thermal resistivity, but it is not quite clear in what units these are measured.

The ever-growing demand for electrical energy has now made it necessary to use very high voltages. Much research, therefore, has been carried out on the brush discharges which take place from overhead cables (generally called the corona) and on the methods of grading underground cables so as to enable them to resist very high pressures. A good and interesting account of some of these researches is given in this volume. The many types of apparatus and the special devices used

for obviating dangerous current and pressure rises are well described. We can recommend this book for advanced students at technical colleges and universities.

*Erblichkeitsforschung an Pflanzen: ein Abriss ihrer Entwicklung in den letzten 15 Jahren.* Von Prof. Dr. Friedrich Oehlkers. (Wissenschaftliche Forschungsberichte, Naturwissenschaftliche Reihe, herausgegeben von Dr. Raphael Ed. Liesegang, Band 18.) Pp. viii + 203. (Dresden und Leipzig: Theodor Steinkopff, 1927.) 13 gold marks.

THE subject of inheritance is growing so rapidly that text-books dealing with it are not only in constant need of revision but also can scarcely cover the ground, in an adequate manner, in one volume. There is therefore an increasing tendency to compile more specialised text-books than formerly. Thus the present work deals with recent advances in the study of inheritance in plants. A brief summary of Mendel's work is followed by a concise account of modern research under the headings: stages of development, nucleus and inheritance, chromosomes and inheritance, Morgan's theory (of linkage and crossing over) in botany, protoplasm and inheritance, sterility and lethality, sexuality, and research on mutations. The section on sterility and lethality is especially useful, as this subject is rarely treated adequately in works on inheritance. The author keeps strictly to his subject of plant-life, but usefully directs attention to the difficulties of correlating some of the conclusions reached by geneticists working on animal life with facts emerging from plant breeding.

*New Zealand Empididæ: based on Material in the British Museum (Natural History).* By J. E. Collin. Pp. viii + 110. (London: British Museum (Natural History), 1928.) 7s. 6d.

THIS work is a specialised monograph on species of flies of the family Empididæ and is based largely upon extensive collections made in New Zealand by Mr. T. R. Harris, who presented the specimens to the British Museum. Material from other private collectors has also been drawn upon, and the result of Mr. Collin's study of these several collections is to raise the number of known New Zealand species of the family from 23 to a total of 102. This, indeed, is a very satisfactory result, and indicates how much there still remains to be done before the Diptera of that country are adequately known.

In view of the remarkable and archaic elements found in the New Zealand fauna, it appeared likely that the smaller Diptera would yield species of considerable interest and importance. This has evidently proved to be the case, particularly with respect to the discovery of seven genera of Empididæ, previously only known from South America. Mr. Collin is to be congratulated on the evident care and thoroughness with which he has carried out his task. Like all British Museum publications, the book is well printed and clearly illustrated.

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