

known relating to his subject. The glossary of technical terms which follows the preface will be useful, and there is also a comprehensive introduction of upwards of thirty pages in which the structure is fully described, and clearly illustrated by diagrams. These are points which are frequently too much neglected by entomological authors, but which are of real practical importance. Besides general remarks and a section on structure, the introduction deals with larvæ, vocal organs, sexual dimorphism, food and habits, and classification. The Lamellicornia beetles are mostly vegetable feeders, or dung or carrion beetles, and some of them, like our own cockchafers, are very destructive to grass in the larval stage, and to leaves of trees when mature. Some, chiefly belonging to the groups described in the present volume, inhabit the nests of ants and termites in the larval stage, and are tended by these insects for the sake of their secretions, while the dung and carrion beetles are general scavengers.

The Lamellicornia, as their name implies, are distinguished by their short lamellated antennæ, which may be observed in a well-developed and characteristic form in our common cockchafers. Mr. Arrow recognises three main families, the Scarabæidæ, Passalidæ, and Lucanidæ. The Passalidæ are not European; the Lucanidæ are the stag-beetles. The Scarabæidæ are divided into two smaller divisions, the Pleurosticti, with four subfamilies represented in the Indian fauna, and the Lparosticti, with eight.

The general arrangement of the volume is similar to that adopted in previous volumes of the "Fauna of India," and need not be further commented on here. Eight species are represented on each of the coloured plates.

We congratulate Mr. Arrow on the completion of an excellent piece of work, and hope that entomologists may have reason to be grateful to him for a long series of equally excellent volumes.

W. F. K.

ELECTRIC MOTORS.

Electric Motors. Continuous, Polyphase, and Single-phase Motors: Their Theory and Construction. By Henry M. Hobart. Second edition, entirely rewritten, revised, and enlarged. Pp. xxiv+748. (London: Whittaker and Co., 1910.) Price 18s. net.

THE first edition of this work appeared in 1904. Since then remarkable advances have been made in electrical engineering. A foremost place in this progress must be given to electric motors, and more especially to that class employing commutators, in connection with both single- and poly-phase alternating currents. Indeed, the electrification of railways has made the variable-speed single-phase motor with a good starting torque indispensable, for at present the single-phase system alone seems to fulfil the requirements of main line electric traction. Also the poly-phase induction motor is no longer to retain the great disadvantage in the matter of speed regulation, which makes it inferior to the continuous-current shunt motor, for successful means are now known whereby

the speed may be varied economically over a wide range.

Both these problems are discussed in the present edition, and form part of the new material contained therein, but we find the treatment is mainly descriptive and too general to be of much use to anyone seriously engaged in the design or manufacture of these machines. Admittedly the subject is a difficult one, at any rate, more difficult than the design of ordinary continuous-current and induction motors. Nevertheless, in a book on the theory and construction of electric motors room ought to be made for a proper scientific study of these recent developments.

Coming to the other and major part of the book dealing with more or less *standard* motors, we do not find much improvement on the first edition. To a scientific engineer the author's style is too roundabout, illogical, and non-mathematical. A German engineer would probably call it "unpedagogisch." For instance, the author treats the principles of design by means of examples. Surely the classical way of developing formulæ from the theory, followed by practical details, and illustrated by examples, is far better. Nor—to judge from his examples—does the author appear to have kept pace with the times. We can only think that many of the designs, both of continuous- and alternating-current motors, have long since been repudiated by their respective firms.

The methods of calculation advocated by the author are often open to objection, but to cite instances would take us too far, as the list before us is really too long to choose from. We think enough has been said, however, to show that, while appreciating the immense amount of information the writer has collected, we cannot agree he has produced a book which can be regarded as a standard treatise on the theory and construction of electric motors for the use of students or scientifically-trained engineers.

STANLEY P. SMITH.

THE GEOLOGY OF GERMANY.

- (1) *Lehrbuch der Geologie von Deutschland. Eine Einführung in die erklärende Landschaftskunde für Lehrende und Lernende.* By Prof. J. Walther. Pp. xv+358. (Leipzig: Quelle and Meyer, 1910.) Price 7.60 marks.
- (2) *Geologie von Deutschland und den angrenzenden Gebieten.* By Prof. R. Lepsius. Zweiter Teil, Lief. ii., Das nördliche und östliche Deutschland. Pp. vi+247-548. (Leipzig: W. Engelmann, 1910.) Price 10 marks.
- (3) *Geologie von Ostpreussen.* By Prof. A. Tornquist. Pp. vii+231. (Berlin: Gebrüder Borntraeger, 1910.) Price 10 marks.

(1) PROF. WALTHER has been fortunately compelled to write an account of the geology of Germany, in furtherance of the scheme to which he stands committed. He is one of those educational leaders who believe that knowledge of literature and of cosmopolitan science is insufficient for the citizen. The Fatherland itself, *solum patriæ*, must be understood in order to be loved. We must not begin and end with arranging minerals in cabinets and pointing