

moment, and cannot be said to affect adversely in any degree the purpose that the volumes were intended to fulfil. If to what has already been said in their favour, it is added that they are illustrated with fifteen lithographic plates containing over one thousand figures, it will be evident that Dr. Chyzer and Prof. Kulczyński have produced a work which will take rank as one of the most important contributions to our knowledge of European spiders that has appeared this century.

R. I. POCKOCK.

OUR BOOK SHELF.

Electrodynamics: The Direct Current Motor. By C. A. Carus-Wilson, M.A., late Professor of Electrical Engineering, McGill University, Montreal. Pp. 298. (London: Longmans, Green and Co., 1898.)

IN no department of applied science has advance in the last few years been more striking than in the application of the continuous current motor to traction purposes. This rapid advance has, however, until quite recently been rather in the United States, in Canada, and on the Continent, than in our own country. The appearance of this book by Prof. Carus-Wilson, of the McGill University, dealing with those problems which face the electrical engineer when deciding upon the choice of motors, is therefore singularly opportune.

The growth of our great towns has brought about an ever-increasing demand for rapid transit combined with frequent stoppages. In all the new schemes for underground electric railways in London an attempt is being made to combine these two opposing requirements. The starting torque or accelerating power of a motor is its most important merit from the traction engineer's point of view. Prof. Carus-Wilson lays considerable stress on the properties of series and shunt wound motors at rest before proceeding to treat of his subject in a more general way. His graphical methods of attacking the various mechanical problems are very carefully worked out, and the book is illustrated throughout by a remarkable series of very neat and clear diagrams—some theoretically obtained, and others the result of experiments on the tractive force and acceleration of actual electric locomotives.

The author makes use of many new terms, the meaning of which one does not fully appreciate on a first reading. Many expressions are used in quite an unusual sense, as, for example, "magnetisation curve," meaning a curve of distribution of magnetic flux. The term "acceleration curve" is also applied where one would be inclined to say "curve of velocity." These differences of language are, however, no doubt inseparable from the originality of the author's methods.

The book, though not a large one, is yet undoubtedly an important contribution to technical literature.

D. K. M.

A Trip to Venus. By John Munro. Pp. 254. (London: Jarrold and Sons, 1897.)

THE apparent similarity between the physical conditions of the planet Mars and those which exist upon the earth have furnished several writers with material upon which to exercise their imaginations. Many considerations point, however, to the earth's twin sister, Venus, as possessing conditions of habitability more closely resembling those enjoyed by us than would be found on Mars, which fact has given Mr. Munro a text for this novel.

The prescription for a story on extra-terrestrial affairs appears to contain as essential constituents a description of a flying machine in which "a new force" is utilised,

a modicum of astronomical information, a few sentimental episodes, and some representations of wonderful forms of organic life observed in the "other world" with which the narrative is concerned. Mr. Munro departs but very slightly from this formula. The actors in his little drama are a gentleman who represents the mind of the average man and tells the story, an astronomer who speaks like a text-book, an inventor who constructs a flying machine of marvellous efficiency, and a young lady whose presence naturally introduces into the narrative the vein of sentiment without which no novel is complete. This is the company which makes the trip to Venus and Mercury, and brings back information as to the inhabitants of those planets and on various other objects and phenomena which, unfortunately, astronomers have to actually observe from the bottom of a restless atmospheric sea.

It is perhaps a doubtful compliment to say that a work of fiction is instructive, but we cannot resist paying it in the present case. As a story Mr. Munro's novel is but of indifferent quality, but as a series of short disquisitions upon astronomical matters, more or less worked into a narrative, the book is worth reading, especially as it possesses the merit of correctness so far as it goes.

The idea of the supposed inhabitants of Mars signalling to the earth by burning different elements, which are subjected to spectroscopic analysis by the astronomer of the party, is noteworthy, and it is a pity that the author did not make more of it. The description of the meeting of the Royal Astronomical Society, given in the last chapter, is a disappointing and unnecessary epilogue of the story.

A Dictionary of Bird Notes, &c. By C. L. Hett. Pp. 138. (Brigg: Jackson, 1898.)

THIS little volume is obviously intended for the field-observer, being bound with the corners rounded off and blank pages for notes opposite the pages of letter-press. The author has secured the co-operation of a number of fellow bird-lovers; and their joint labours have resulted in the production of a syllabic reproduction of the notes of every British bird, which it may be hoped will prove satisfactory not only to themselves but to ornithologists in general. Judging from his preface, the author himself appears to be confident that he has achieved complete success, but we fear that many persons would require a supplemental education before they are capable of appreciating the merits of his scheme. The correctness of many of the notes are self-apparent, but some are decidedly difficult of pronunciation by the uninitiated, and it is to be hoped that many of his readers are unfamiliar with the precise tone of "the snore of a drunken man," which is given as one of the notes of the chaffinch.

The glossary of popular, local, and old-fashioned names of British birds, which forms one of the appendices, will certainly prove useful to young ornithologists dwelling in the provinces, and may sometimes even be a help to their more experienced brethren.

R. J.

Chemical Analysis, Qualitative and Quantitative. By W. Briggs, M.A., and R. W. Stewart, D.Sc. Pp. x + 128. (London: W. B. Clive.)

THE pupil who uses this book ought to obtain an intelligent grasp of the principles of chemical analysis. A chapter on simple experiments in manipulation leads to chapters on the reactions of the various groups of metals and the acids, and these are followed by instructions for systematic analysis, analysis of mixtures, and volumetric work. The instructions are clear and concise, but, as might be expected from the nature of the subject, the book departs but little from the style of others of the same kind.