

discounted by the author's experiment of making five large holes in the back of a violin. Three of these holes were of 75 mm. diameter each and the other two of 48 mm. diameter each! After cutting these holes, the two lower strings were of poor quality, but the two upper strings were not noticeably changed in tone or power.

The book is illustrated throughout and makes a notable contribution to the treatment of the violin on somewhat novel lines. It will well repay careful study by all interested in the violin or the other bowed instruments.

E. H. B.

### Our Bookshelf.

*Elements of Storage Batteries.* By Prof. Cyril M. Jansky and Prof. Harry P. Wood. (Industrial Education Series.) Pp. x+241. (London: McGraw-Hill Publishing Co., Ltd., 1923.) 12s. 6d.

STORAGE batteries are now used for many and varied purposes, and the methods employed for their maintenance have altered appreciably of recent years. There is therefore a demand for a simple account of these methods and for descriptions of the best types of batteries. So far as the non-technical reader is concerned we can recommend this book. The descriptions are clear and the recapitulations given at the end of each chapter are very useful, as they help the reader to remember the facts. The examination questions are simple and instructive, and will assist the student to test his knowledge. The authors lay stress on the fact that the cause of the bad working of a storage cell cannot in general be determined by making a few simple tests. It is necessary to know the conditions of service and the rates of charge and discharge at which the battery has been working before a correct diagnosis can be made. As a rule most battery troubles can be avoided if the cells are kept fully charged and if an overcharge is occasionally given to them. Full descriptions and working rules are given for the nickel-iron-alkaline cell, and the data and tray dimensions of the various types of Edison storage batteries are shown in tabular form.

*Bacteriology: a Study of Micro-organisms and their Relation to Human Welfare.* By Dr. H. W. Conn and Dr. Harold J. Conn. Pp. 441. (Baltimore, Md.: Williams and Wilkins Co., 1923.) 4 dollars.

THIS work has been designed to give an account of bacteriology and its applications to industry and medicine. Intended primarily "for college classes composed of students, some of whom intend to specialise later, and others who desire a general knowledge of the subject," the book can be strongly recommended as one suited to the needs of the educated public, giving as it does a survey of the subject without technicalities. Divided into four parts, Part I. deals with the history of bacteriology and with the activities of micro-organisms in general. In Part II. an excellent account is given of dairy, soil, and industrial bacteriology; and in Part III. the disease-producing organisms are

described—human, animal, and plant—with brief descriptions of vaccines, antitoxins, and immunity, together with the bacteriology of water and sewage. An appendix (Part IV.) contains a short account of culture, staining, and other methods employed in the study of micro-organisms. Save for an occasional slip, the information is accurate and the book most readable. It is illustrated with 48 figures, which are adequate, though several of them are rather crude in execution.

*Biologie der Tiere Deutschlands.* Herausgegeben von Prof. Dr. Paul Schulze. Lieferung 2. Pp. 28+10+17. 8d. Lieferung 3. Pp. 29-97. 1s. 4d. Lieferung 4. Pp. 37+39. 1s. 8d. Lieferung 5. Pp. 12+40. 9d. Lieferung 6. Pp. 64. 1s. 2d. (Berlin: Gebrüder Borntraeger, 1923.)

THE first part of this useful and well-written elementary account of animal biology, based on the German fauna, dealt with the sponges and coelenterates. Those now noticed include the Turbellaria, Gastrotricha, leaf-mining insect larvæ, thrips, flies, mites, spiders, and fishes. The treatment follows closely that of the first part. The central idea underlying the work is to give a simple account of the relations between the animals and their environment, their rôle in the economy of Nature, and only so much of their internal structure as will help to elucidate their ecology. Each section is pagged separately, so that, while the parts are appearing when ready, it will be possible to bind the whole work in zoological sequence later. The book is well illustrated by clearly reproduced diagrams and half-tones, not stinted as to number. The work is admirably suited for use by school teachers in Great Britain, for the German fauna is largely represented in the British fauna, often by identical species, at any rate by all the groups covered by this book.

*Revision Arithmetic and Mensuration.* By Dr. Terry Thomas and J. J. P. Kent. Third edition, revised. Pp. vii+128. (London: Mills and Boon, Ltd., 1924.) 3s. 6d. net.

IT is refreshing to find a book, frankly produced for examination work, with some educational merits. The object of this little revision arithmetic is to prepare candidates for the Army and Navy entrance examinations, but the authors have succeeded in avoiding the artificial atmosphere usually associated with such tests, by a selection of examples never far removed from the practical problems of life. The conditions of income tax relief, for example, are explained in detail, and any student who works out completely the set of examples provided, should be a match for any income tax assessor.

*Mathematical Principles of Finance.* By Prof. Frederick Charles Kent. Pp. xi+253. (London: McGraw-Hill Publishing Co., Ltd., 1924.) 15s.

THIS book is not a mathematical analysis of the monetary and banking systems, but merely a very comprehensive treatment of the algebra and arithmetic of interest and insurance calculations, with copious examples suitable for students of commerce and business administration.