

## OUR BOOK SHELF.

*The Calculus for Beginners.* By J. W. Mercer. Pp. xiv+440. (Cambridge: University Press.) Price 6s.

STUDENTS of ordinary endowment form the habit of observing things before words. The author of this work has therefore wisely begun with the notions of velocity and gradient of a curve before introducing  $dy/dx$  as the instrument for measuring them. The purely mathematical aspect of a limit is not omitted, but it is subordinated; the need for it precedes its introduction. For many purposes, and at any rate for initial study, this course is quite satisfactory; and the author will find most teachers in agreement with him in thinking it is also wise even for those who are to proceed to the more severe and formal study of the calculus. While he doubtless recognises that physicists, engineers, and chemists would benefit by finally surmounting the difficulties of the notion of a limit, he does not make it his business in this book to give the first importance to the difficulties of analysis presented by his subject.

The ground is covered slowly at first; some 250 pages are devoted to the case of  $x^n$  in all its bearings before  $\sin x$ ,  $\cos x$ ,  $a^x$ ,  $\log x$ , &c., are discussed, even the rules for the differentiation of a product and quotient being postponed until the student is well on with the subject. Those who think that this is a large allowance of pages to the earlier part of the calculus should remember that the shortest account of a mathematical doctrine is not necessarily the one which occupies the fewest pages. An excellent feature of the treatment is the introduction of integration under the heading, "Given  $dy/dx$ , find  $y$ ." The student cannot have it impressed upon him too soon that the determination of a function is often most easily carried out by first finding the rate of variation of the function. In his graphical work he has probably often observed this rate of variation, so that the notion has more chance of appearing *exact* than that of the limit of a sum, and he has at the same time the advantage of getting the most out of the newer ideas with which he has become acquainted. The introduction of  $e^x$  graphically is the necessary outcome of the author's whole method, and will give a conviction that seldom if ever results at first from the complete algebraic treatment.

The work, which is well supplied with diagrams, is certain to be used by many teachers, who will find it well adapted to meet the requirements of those for whom it is written.

*A Text-Book of Organic Chemistry.* By Prof. A. F. Holleman. Edited by Dr. A. Jamieson Walker, assisted by Owen E. Mott. Third English edition, partly rewritten. Pp. xx+599. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1910.) Price 2.50 dollars.

THE first edition of this book was reviewed in the columns of NATURE in 1903, and we were impressed with it as being a most useful addition to the books in English on organic chemistry. Since then we have recommended it to students, who have found its study both interesting and useful. Evidently the book has filled a want in the country, as a second edition was published in 1907, and now we have before us the third edition.

Considerable additions have been made in this issue owing to the advances in organic chemistry which have taken place. The chapter on proteins has, for example, been rewritten, and is now incorporated with the general scheme of the book, whereas in the first two editions the proteins were placed in the appendix. Furthermore, the translator has introduced the protein

classification adopted by the Chemical Society, which, of course, is a great advantage to English readers. Another chapter which has been enlarged and completely rewritten is that on pyrrole.

In reading through the book one continually comes across small alterations, sometimes considerable alterations, where recent advances have shown the necessity for revision or additions. For the purpose of review, it is not necessary to direct attention to each alteration or addition; it is more to the point to remark that the book has been carefully revised and brought up-to-date, and that the high standard of the work has been maintained in the third edition. It is to be thoroughly recommended as putting in a succinct and readable manner the salient facts of organic chemistry. The book is not exhaustive, but the student who has carefully studied it will be in a position to read with understanding and discrimination larger works on the subject, which, without the previous knowledge obtained from this work would be beyond him.

F. M. P.

*A Popular Guide to the Heavens.* By Sir Robert S. Ball, F.R.S. Pp. xii+96+83 plates. (London: G. Philip and Son, Ltd., 1910.) Price 15s. net.

THERE appears to be little difference between the present book and the second edition, issued in 1905, and reviewed in NATURE of March 9 of that year (vol. lxxi., p. 437). The number of plates and descriptive text is the same, but a frontispiece has been added, giving reproductions of drawings of the miner's comet (1910a) and Halley's comet.

We must express astonishment that this "Popular Guide to the Heavens" should contain no reproductions of the remarkable photographs of solar faculae and flocculi taken by Hale, Deslandres, and others in recent years. These pictures are among the most striking illustrations of celestial phenomena ever produced; yet no notice is taken of them in plate or text. The sun is represented by two plates, one showing a large sun-spot and the other some great prominences. We suggest that it would be far better not to illustrate solar phenomena at all than to let these two plates be considered to represent the most interesting pictures of modern solar physics.

The book contains many beautiful pictures and valuable maps, and is altogether an attractive volume, but there is no reason why people who possess the second edition should purchase the new issue with the view of finding further illustrations of astronomical progress.

*Catalogue of Hardy Trees and Shrubs Growing in the Grounds of Syon House, Brentford.* By A. B. Jackson. Pp. x+38. (London: West Newman and Co., 1910.)

THE unique collection of trees and shrubs in the grounds of Syon House, Brentford, the Middlesex seat of the Duke of Northumberland, has not been catalogued within the last sixty years, during which time there have been many changes, as specimens have died off and new species have been introduced. The chief interest lies in the fine old trees, some of which are the best representatives of their kind in the kingdom. Two black poplars, estimated to be 128 feet high, are the tallest, and an elm is about 9 feet shorter. More unique are a specimen of *Liquidambar styraciflua* that exceeds 91 feet, and a *Catalpa kaempferi* approximating to 58 feet in height. The collection of deciduous cypresses, *Taxodium distichum*, showing the so-called knees, are famous, and have been frequently described; some fine specimens of *Zelkova crenata* (Urticacæ) are remarkable. The items of information consist, so far as is possible, of popular