rather than to an increase in the amount of moisture present. A Severn coracle is figured (p. 87), and the antiquities lead us on to the stone houses of the Cotteswolds, and the unrivalled half-timber villages of the Trias plain. The chestnut-tree growing from a tomb in Kempsey Church (p. 140) may puzzle the reader who has not seen it. G. A. J. C.

MATHEMATICAL AND PHYSICAL CHEMISTRY.

(1) *Theoretical Chemistry from the Standpoint of Avogadro's Rule and Thermodynamics.* By Prof. W. Nernst. Revised in accordance with the sixth German edition by H. T. Tizard. (London: Macmillan and Co., Ltd., 1911.) Price 15*s.* net.

(2) *Higher Mathematics for Chemical Students.* By J. R. Partington. Pp. v+272. (London: Methuen and Co., Ltd., 1911.) Price 5*s.*

(3) *Abhandlungen der Deutschen Bunsen-Gesellschaft für angewandte physikalische Chemie.* Zweiter Band, Nr. v., Messungen elektromotorische Krafte galvanischer Ketten, mit wasserigen Elektrolyten. By R. Abegg, Fr. Auerbach, and R. Luther. Pp. x+213. (Halle a. S.: W. Knapp, 1911.) Price 8.40 marks.

(1) PROF. NERNST'S text-book occupies a special position amongst text-books of physical chemistry, written as it is by an author of such eminence as a pioneer and investigator in the science, and of such remarkable powers of exposition. From the chemical point of view no better basis for a work of the kind can be adopted than that of Avogadro's rule, for one of the main practical problems of the chemist is the determination of molecular concentrations. Gas densities, osmotic pressures, freezing and boiling points of solutions, conductivity of electrolytic solutions, and electromotive forces are all measured with this primary object in view, and therefore Avogadro's rule is at the root of them all. On this sound chemical basis, then, with the aid of the two laws of thermodynamics, the author has built. His ideas are always clear cut, his expression of them is always ordered and concise, and his mathematical proofs are of special neatness and brevity. It is no wonder, then, that although the book is scarcely intended for beginners, it should have reached a sixth edition in German and a third in English. The advanced student and teacher will specially welcome in this latest edition a detailed account of Prof. Nernst's new thermodynamical theorem, of which so much has been recently heard.

It is a matter for regret that the original English translation of Prof. Nernst's work was far from satisfactory, and so to a considerable extent spoiled the vogue of the book. The present translation has been revised and partly rewritten, and has without doubt been thereby vastly improved. But nothing short of complete retranslation could do justice to the original. However, an occasional awkwardly turned phrase of a distinctly Teutonic flavour will probably not greatly incommode the average reader, and so to all those who desire acquaintance with the facts and theories of physical chemistry and an indication of the lines of progress of the science, this translation of Prof. Nernst's excellent and unique work can be unreservedly recommended.

(2) Of all the mathematical books intended for the use of chemical students which have come under the notice of the present writer, Mr. Partington's is the most serviceable. The author has had a clear notion of the practical problem to be solved, and has performed his task successfully. He does not attempt to teach too much, and strictly adheres to what will be practically useful to the student of physical chemistry. Brief explanations of the nature of the mathematical processes employed are given, and their application is at once shown by well-selected examples. Thus convergent series are illustrated by the two examples of the washing of precipitates, and extraction from aqueous solution by means of ether; maxima and minima by the rate of catalysis of methyl acetate by water; the compound interest law by the decay of radio-activity; and so on. Alike to the chemical student who has no previous knowledge of the differential and integral calculus, and to the student who has learnt the methods of the calculus, but is at a loss how to apply them, this little book will be of considerable value.

(3) The Bunsen-Gesellschaft deserves the gratitude of those who work on the subject of electromotive force for the issue of the volume under review. It consists of three parts: (1) a complete systematic and chronological bibliography of measurements of electromotive forces; (2) a selection of the most trustworthy measurements reduced to a uniform system; and (3) tables of the most probable values of single electrode potentials.

In the bibliographical section the nature of the electromotive combinations measured is given, but not the numerical values obtained. Only aqueous solutions are considered, and such combinations as involve an agency external to the cell are excluded, *e.g.* thermoelectric and photoelectric combinations, decomposition potentials, and the like. The arrangement is by elements according to the groups of the periodic table, both in the bibliographical and in the tabular sections; the single potentials are referred to the normal hydrogen electrode as zero.

With this book of reference at hand the worker at electromotive force can ascertain in the minimum of time what trustworthy work has already been done in his special branch, and see at a glance the most probable numerical values for any electromotive combination in which he may be interested. J. W.

OUR BOOK SHELF.

Field Note-book of Geological Illustrations. Arranged by Hilda D. Sharpe; containing 86 photographs and maps. Pp. 51. (Manchester: Flatters and Garnett, Ltd., n.d.) Price 3*s.* net.

THE idea of this book is a very happy one. Miss Sharpe has collected a number of photographs illustrating geological features, mainly from places in the British Isles, and Messrs. Flatters and Garnett are prepared to supply lantern-slides of most of them at 1*s.* each, or on hire at 1*s.* 3*d.* a dozen. Even as a supplement to the fine series issued by the British