

a means of condensed expression of various important relations which frequently occur in mathematical physics. In his elementary volume, Prof. Weatherburn dealt with vector algebra and differentiation with respect to one scalar variable, showing how vectors may be usefully applied to geometry and mechanics. The volume now noticed begins with partial differentiation of a vector-function of several variables and introduces right at the outset the gradient of a scalar point-function and the divergence and curl of a vector-function. Four chapters are given to the machinery of vector-analysis and the rest of the book contains a fairly complete introduction to mathematical physics. The subjects treated include, so far as vector analysis bears on them, potential theory, conduction of heat, hydrodynamics of both frictionless and viscous fluids, theory of central quadric surfaces, statical strains and stresses, and electricity and magnetism. Naturally, many students of applied mathematics will only be interested in one or two of these sections. The final chapter, on the Lorentz-Einstein transformation and relativity, is, to a reader acquainted with the methods of vector analysis, much more illuminating than most recent semi-popular expositions of this subject.

W. E. H. B.

*A List of Official Chemical Appointments, compiled, by direction of the Council of the Institute of Chemistry and under the supervision of the Publications Committee, by the Registrar of the Institute.* Fifth edition, revised and enlarged. Pp. 311. (London: Institute of Chemistry, 1924.) n.p.

THIS is the fifth edition, on the same general lines as previously, of the well-known publication issued by the Institute of Chemistry, with the primary object of providing a list of official chemical appointments in Great Britain and the Colonies. The previous edition was published so far back as February 1912, the production of the present and now up-to-date publication having been delayed by the War.

The list includes in great detail all the professional and teaching appointments relating to chemistry in the service of the government, county and borough councils, universities, colleges, technical institutions, medical, agricultural, and veterinary colleges, public and secondary schools, and the book is obviously invaluable for reference purposes. Further, there is a list of chemical and allied societies.

The Institute of Chemistry, as expressed in the preface, is optimistic concerning the increased demand for chemists in government and municipal administration, but it seems to us that further opportunities for industrial chemists would be much more important, especially in view of the scores of chemists out of work and the hundreds that continue to be turned out by the Universities.

*Calculus for Schools.* By R. C. Fawdry and C. V. Durell. Pp. viii + 300 + xx. (London: E. Arnold and Co., 1923.) 6s. 6d. net.

MESSRS. FAWDRY and DURELL have written a book eminently suitable for the class of pupil they have in mind. It contains a very good course, and has one advantage over some other books in that an attempt is made to deal with the exponential and logarithmic functions in a manner that the student

might really understand. The emphasis laid on the practical convenience of the logarithms to base  $e$  is misleading; it is rather theoretical convenience that dictates the use of base  $e$ . Also, one cannot help wondering whether any pupil is ever impressed by such an example as finding the limit of  $(x^2 - 4)/(x - 2)$  as  $x \rightarrow 2$ : if so, he must be a particularly innocent pupil who takes a delight in thinking as he is told. Ex. 13 on p. 47 would perhaps amaze an architect, and there is a bad misprint on p. 168. Further, is it really essential to say that the value 2.30 for  $\log_e 10$  leads to 0.435 for  $\log_{10} e$ ? There is danger that the student may thus learn something that he will have to unlearn with much heart-burning later on. There is a bad misprint on p. 195. But these small faults do not detract from the value of the book, which we can heartily recommend.

*Index to Volumes 1-50 (1872-1921) "Indian Antiquary."* Compiled by Lavinia Mary Anstey. Part 1: Authors' Index. Pp. ii + 50. 2 rupees to subscribers to the *Indian Antiquary*; 4 rupees to non-subscribers. Part 2: Subject Index; Part 3: Illustrations. Pp. ii + 88 + ii + 10. 4 rupees to subscribers to the *Indian Antiquary*; 5 rupees to non-subscribers. (Bombay: British India Press, Mazgaon; London: Bernard Quaritch, Ltd., n.d.)

THE *Indian Antiquary* was founded in 1872 by Dr. James Burgess, who acted as editor until it was taken over in 1885 by Dr. J. F. Fleet and Sir (then Captain) Richard C. Temple. The latter has thus been editor for more than thirty-seven years. The completion of the fiftieth year of issue in 1921 has been marked by the publication of an index of the whole compiled by Miss L. M. Anstey, to whom the thanks of all students of things Indian are due. The *Indian Antiquary* has covered a wide field, and this index will prove invaluable to future research in the epigraphy, history, and anthropology of India.

The author-index includes all the most distinguished names in Indian studies during the last half-century; while the subject index, especially in the list of books reviewed, might well be held to constitute a survey of progress in these studies during that period. The entries relating to inscriptions, and the eras and dynasties with which they are concerned, will be found especially valuable. Miss Anstey has carried out a laborious task with marked success.

*Clouds and Smokes: the Properties of Disperse Systems in Gases and their Practical Applications.* By Dr. William E. Gibbs. (Text-Books of Chemical Research and Engineering.) Pp. xiii + 240. (London: J. and A. Churchill, 1923.) 10s. 6d. net.

IN a foreword to this monograph on "Clouds and Smokes," Sir Oliver Lodge directs attention to this "rather out-of-the-way subject, which, nevertheless, is of considerable practical importance." The reviewer would emphasise not only the vital importance of the subject, but also the commendation given of the way in which Dr. Gibbs has carried out his task. Few people have given to the question of dust in air the attention it deserves, and it may be well to recall the pioneer work carried out by Dr. John Aitken and by Sir Oliver Lodge himself.