

Differential and Integral Calculus

By Prof. R. Courant. Translated by Prof. J. E. McShane. Vol. 2. Pp. x+682. (London, Glasgow and Bombay: Blackie and Son, Ltd., 1936.) 30s. net.

THE English edition of Vol. 1 of this work was briefly reviewed in NATURE of March 9, 1935, and the present volume is a translation, also by Prof. McShane, of the original German text which was published in Berlin in 1929. It is devoted to the more advanced parts of the calculus; chiefly to functions of several variables and their physical significance. As in the case of vol. 1, this edition differs in several respects from the German. It is indeed a much larger book, for there were only 360 pages in the original. Considerable additions have therefore been made, consisting mainly of an extended chapter on differential equations; new chapters on the calculus of variations and on the complex variable, whilst a supplement on real numbers and the concept of limit has been provided at the end. It may be remarked that it seems somewhat strange that the text of a modern book on advanced calculus should have to be amplified by a treatment of the complex variable.

The course, introduced by a chapter on the fundamentals of analytical geometry and vector analysis, embraces the usual topics generally considered as advanced calculus—derivatives of functions of several variables; multiple, line and surface integrals with the theorems of Gauss, Green and Stokes; differential equations with special reference to mechanical and physical problems, etc. Chapters ii-v are each followed by a useful appendix in which the relevant theory is further elaborated.

The needs of the student are well provided for, as the book not only abounds in copious exercises, but also devotes fifty-five pages at the end to answers and helpful hints. Mention should likewise be made of the very full and valuable summary of important theorems and formulæ. The text is well developed, clearly illustrated and excellently printed.

F. G. W. B.

The Birds of Tropical West Africa:

with Special Reference to those of the Gambia, Sierra Leone, the Gold Coast and Nigeria. By D. A. Bannerman. (Published under the authority of the Secretary of State for the Colonies.) Vol. 4. Pp. xl+459+14 plates. (London: Crown Agents for the Colonies, 1936.) 22s. 6d.

THE publication of Mr. Bannerman's six-volume work on West African birds has been suspended midway for nearly three years, owing to financial exigencies of the times which have affected the Colonial Governments supporting it. Happily, these difficulties have now been surmounted, and with the appearance of this volume there is prospect of the early completion of a valuable record which should place the ornithological study of the region in a strong position. The book, it may be repeated, admirably serves the double purpose of a summary of existing knowledge and an aid to further investigation. In the latter respect, great pains have been taken to assist the

observer in identification. As well as the detailed description of each form, there is at the beginning of the volume an illustrated key to the families and genera, and there is also for each family a further key to the genera and species. This useful feature was included in the earlier volumes, but it is especially welcome now that Mr. Bannerman is dealing with the huge and difficult order Passeres, the treatment of which will occupy the whole of the second half of his great work. In addition to text figures, the fourteen coloured plates beautifully depict sixty-five different species.

The Modern Dowser:

a Guide to the use of the Divining Rod and Pendulum. By Le Vicomte Henry de France. Translated by A. H. Bell. Pp. xvii+139. (London: G. Bell and Sons, Ltd., 1936.) 4s. 6d. net.

THE subject of dowsing is one to which a great deal of attention has been given in France in recent years, and its range of application has been extended in many directions, chiefly in the field of biology and medicine. This little book gives an excellent summary of the main facts, but its chief value lies in the instructions given which enable the reader to experiment for himself. Contrary to the practice of most of the best English dowsers, the author makes great use of the pendulum, and most of the instructions refer to this rather than the rod. As is usual in books on this subject, the physical explanation given could not be accepted by physicists in the form in which it is given, and when the author's account of the claims with regard to distinguishing wines, finding aeroplanes, and diagnosing disease are examined, the scientific imagination is stretched to the limit. However, there is no doubt of the enthusiasm with which the study of this curious, and in some sense genuine, human faculty is being carried on in France, and it is to be hoped that further experiment will throw some light on its physical nature.

Inorganic Preparations:

a Systematic Course of Experiments. By Alexander King. Pp. xi+164. (London: Thomas Murby and Co.; New York: D. Van Nostrand Co., 1936.) 5s. 6d. net.

THE present book contains detailed descriptions of 187 preparations, and sketches of almost as many additional preparations. The accounts of the experiments are sufficiently detailed to ensure success, and references to the literature are given. The text is arranged under the headings: physical state, elements, binary compounds, acids, bases and salts, complex salts, compounds of some rarer elements, and reactions which form the basis of some industrial processes. Many of the experiments are suitable for pupils in schools and the more difficult ones for university courses. They will form a valuable supplement to the courses in analysis, which fail to teach many important aspects of laboratory manipulation. The book may be warmly recommended, and it deserves to be widely used.