concepts of the algebra of logic which Piaget has applied to the analysis of the intellectual activities of the child.

The book makes a further contribution to the study of the application of logical techniques to psychological facts, and especially to the thought structures found at different levels of intellectual development.

Man and Number

By Donald Smeltzer. Pp. viii+114. (London: Adam and Charles Black, Ltd., 1953.) 7*s*. 6*d*.

THE book gives an interesting account of the development of man's use of number and of the social and practical influences which have affected that development; it shows how early man acquired a sense of number and the gesture and spoken languages of number; it traces the evolution of the written language of number with early methods of recording numerical information and carrying out calculations to the wonderful inventions of modern calculation—the Arabic notation, decimal fractions and logarithms. The final pages of the book deal with inconsistencies and disadvantages in our present number system and how they might have been avoided by scientific planning. There is a useful bibliography but no index.

The appearance of such a book is a welcome addition to the small number of books on the history of mathematics of appeal to the general reader who is interested in human customs and their evolution, and to pupils in secondary schools. To the teacher of elementary mathematics the book will serve as an introduction to the more detailed works of Smith, Cajori and Rouse Ball, and as a source of material for inclusion in classroom lessons.

Earth Science

By Gustav L. Fletcher and Caleb Wroe Wolfe. Third edition. Pp. viii+556. (Boston, Mass.: D. C. Heath and Company; London: George G. Harrap and Co., Ltd., 1953.) 21*s*.

THIS book is primarily designed for teaching the background of physical geography and geology to students of, possibly, rather unequal attainments. Each chapter is conveniently paragraphed on the decimal system and followed by exercises. It is adequately illustrated by diagrams and photographs; examples are nearly all taken from the North American continent. The style of writing is simple and direct, with suitable typography; so from the students' point of view it is easy to read. Of the thirty-four chapters, twenty-one are devoted to geological subjects, four to astronomy, and seven to the atmosphere. These are followed by appendixes, a bibliography, and index.

Students of physical geology and geography must be presumed to have had a grounding in simple physics and chemistry; but the book includes some irrelevant, trivial and very elementary matter which makes it of uneven quality, and it contains several statements which are inaccurate or insufficient: for example, the assurance (p. 396) that "you are not likely to be struck by lightning if standing under a tree".

The list of books recommended for reading with each subject could well be extended, but deserves careful grading from elementary to highly advanced. The authorities cited are mainly American with a sprinkling of British, and there are some notable omissions from both sides. Much of the geological material and principles was anticipated in that little old classic, W. W. Watts's "Geology for Beginners", which surely ought not to have escaped the notice of the authors.

"Earth Science" is a compendium of useful information presented in a form easy to assimilate and to memorize; but it attempts both the formality of a text-book and the naïveté of a children's encyclopædia, and merits a careful pruning.

D. W. Bishopp

The Oxidation States of the Elements and their Potentials in Aqueous Solutions

By Prof. Wendell M. Latimer. (Prentice-Hall Chemistry Series.) Second edition. Pp. xvii+392. (New York: Prentice-Hall, Inc.; London: Constable and Co., Ltd., 1952.) 42*s*. net.

THE first edition was published in 1938 and had 352 pages. In it the author not only assembled the scattered mass of free-energy data, but he also expounded methods of combining these data for the determination of the thermodynamic properties of ions in solution and for the interpretation generally of chemical behaviour. The value of his work as a thorough survey of this important field was soon recognized. Prof. Latimer has now extended his tabulation so that for each element the heats of formation, free energies of formation and entropies have been given for all important compounds. Also, he has added potential diagrams for all elements having more than one oxidation state; he has treated reaction mechanism more deeply; and has inserted the chemistry of the actinide elements.

Of the four old appendixes, 2 and 3, summarizing free energies of formation and equilibrium constants respectively, have been incorporated in the text. A new appendix (3) discusses methods of making accurate estimations of entropy values; finally, a new appendix (4) contains a set of questions and problems for study. The book has already established itself as a standard work and the extension and revision have enhanced its usefulness.

G. Fowles

Small-scale Inorganic Qualitative Analysis

By Dr. J. T. Stock and P. Heath. Pp. iv+96. (London: University Tutorial Press, Ltd., 1953.) 4*s*. 6*d*.

WRITTEN by experienced teachers and entirely devoted to practical work, this is a complete book of small-scale analysis for students taking examinations of the British first-year university level. The introductory section of four chapters on apparatus, materials and techniques is extraordinarily well done. The descriptions of essential pieces of apparatus, such as the teat-pipette, the centrifuge, the micro-slide and the special hydrogen sulphide reservoir, are given with a clearness and directness that could come only from a first-hand knowledge of small-scale analysis and long experience of its teaching. Where circumstances may not permit of the acquisition of the recommended pattern of apparatus the authors often describe simple home-made substitutes. Chapters 5–18 describe a scheme for the analysis of simple mixtures of customary acidic and basic radicals using the detailed small-scale procedure. In the scheme the authors employ the excellent zirconium method for the removal of phosphate, make sparing use of organic compounds, and generally adhere to well-tried methods of separation and identification. A summary of the scheme