

The Fundamentals of Chemical Thermodynamics
By Dr. J. A. V. Butler. Part 1: Elementary Theory and Electrochemistry. Second edition. Pp. xv+253. (London: Macmillan and Co., Ltd., 1935.) 7s. 6d.

IN the second edition, the general plan of this book has been retained, but several chapters have been rearranged and partly rewritten. This revision has improved the utility of the book. About fifty pages of new material have also been added. These include a discussion of heterogeneous solid-gas equilibria, dealing with the carbon-oxygen reaction and its participation in the blast furnace; the methods of electrometric hydrogen ion determination and potentiometric titrations, which are very briefly dealt with; oxidation-reduction indicators, which are briefly but clearly explained; and a section on electrolysis which includes a discussion of over-voltage from the modern point of view.

It is doubtful whether the treatment of freezing point depression on p. 76 has any advantage over the usual one, in which the thermal properties of the solution are eliminated, since no proof of the validity of the second equation is given. The name 'isochore' applied to an equation for constant pressure (p. 98) seems misplaced. The author adopts the American definition of free energy and introduces the term 'net work' for its diminution, that is, the actual work minus the work done against external pressure, which seems a useful procedure. The book is clearly and accurately written, and the new edition is likely to increase its popularity and usefulness.

The Discovery of Specific and Latent Heats

By Dr. Douglas McKie and Niels H. de V. Heathcote. Pp. 155+6 plates. (London: Edward Arnold and Co., 1935.) 6s. net.

THIS scholarly treatise emanates from the School of History, Methods and Principles of Science at University College, London, and its authors must surely have devoted many hours of patient study and research among the original eighteenth century works in order to obtain the material for their book. As Prof. E. N. da C. Andrade, in his eulogistic preface points out, the subject of the book is no less than the very foundation of the modern science of heat. Most of the writings to which reference has been made have been consulted in the original languages, including the Swedish of Wileke. The authors have established by these studies that his work, while independent of Black's, was "both later and less satisfactory". The credit for the discovery of specific and latent heat may therefore be fully attributed to Black.

Portraits of the leading figures are reproduced; some of the lesser-known ones have only been secured after much trouble. A valuable feature of the book is the inclusion of extracts from the originals, showing the care and trouble with which these early experiments were carried out. It has often been urged that present-day students should study the early masters, and this book provides a convenient means so far as the subject of heat is concerned. H. R. L.

Research: the Pathfinder of Science and Industry
By T. A. Boyd. Pp. xvi+319. (New York and London: D. Appleton-Century Co., Inc., 1935.) 10s. 6d. net.

IN this volume the author tells in a pleasing way just what research is, and what the ordinary research worker does. The book is divided into five parts. In the first, the distinction between pure and applied research is explained; in the second the organisation of modern research and the general lines followed are discussed, including useful sections on the financing of the projects and the selling of the results. The third and fourth sections, "Men" and "Qualifications", contain information which must prove of value not only to those responsible for appointing the staffs of laboratories but also to those anticipating scientific research as a career. Part V, "Achievement", should prove a fruitful source of replies to those who doubt the wisdom of spending time and money on research. Part VI consists of miscellaneous essays.

The reading is apt to be a little discontinuous owing to the continual introduction of anecdotes and quotations, some of which are repeated more than once. *Bons mots* uttered by certain leading American directors of research laboratories are also liberally sprinkled throughout the book. The value of these excellent essays might have been enhanced had the author included information and facts concerning present-day research in countries other than America; it would have been of value to read in such a book some of the important pronouncements of a few of the leading European directors of research, alongside those of their American contemporaries. H. R. L.

Principles of Mechanism

By Prof. C. E. Pearce. Pp. ix+283. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1934.) 21s. 6d. net.

INTENDED to be used as a textbook in classes entering upon the study of mechanisms and having little familiarity with the details or operation of machinery in general, Prof. Pearce's "Principles of Mechanism" provides a useful elementary survey of the subject. The matter is much more on the practical side than the title suggests, and the arrangement is designed to lead up to the general principles through a detailed discussion of a number of the more important and representative applications such as: friction, toothed and screw gearing; belt, rope and chain drives; intermittent motions; ordinary and epicyclic wheel trains. Then, after explaining in detail and by numerous examples the method of analysis by centro or virtual centre, the author concludes with linkages, cams, and the geometrical problems involved in straight line motions, motor-car steering gears, etc.

While the book as a whole deals with matter which is not new, the author has succeeded, by his arrangement of the subject, the explanatory text and the examples chosen, in putting it before his readers attractively and convincingly. A valuable feature for the student is the comprehensive range of problems presented for solution. J. A. C.