

is sure of a warm welcome, the more so as it is not merely a translation but a thorough revision which places at the command of English readers the more important results which appeared in Classen's *Ausgewählte Methoden der Analytischen Chemie* (1902), as well as in recent publications by other authors.

The first part, comprising half the book, is devoted to the presentation of the theory and to a description of apparatus and laboratory arrangements. The treatment of the theory is brief (54 pp.), goes directly to the point and is as clear as so condensed a statement can be made. The necessary apparatus is very fully and completely described with the aid of a liberal number of illustrations. The description of the electrical installation of the laboratory at Aix contains many suggestions likely to prove of interest and value to those concerned in introducing new equipment for similar laboratories in this country.

The second part of the book treats of the determination and separation of the metals and halogens. In connection with each topic, references to the literature are given, which, while by no means exhaustive, are sufficiently full for practical purposes. A series of examples are brought together showing the mode of applying electrochemical methods to the analysis of a considerable number of alloys, copper ores, cinnabar, molybdenite, etc.

The labor of the translator is excellently well done, no trace of the German original appearing in the style. A slip, which may be a mere printer's error, occurs in the foot-note on page 281, where "the practical value *in* these examples" is referred to, the author doubtless intending to say *of*. Another typographical error, of which there are not many, is to be found on page 4, where the name of J. B. Hannay is printed *Haunay*. A full index, separated after the German fashion into authors and subject, concludes the book, which is one that can not well be dispensed with in any analytical laboratory.

LAUNCELOT W. ANDREWS.

PHYSICAL CHEMISTRY FOR PHYSICIANS AND BIOLOGISTS. BY DR. ERNST COHEN, Professor of General and Inorganic Chemistry in the University of Utrecht. Authorized translation from the German by MARTIN H. FISCHER, M.D., Instructor on Physiology in the University of California. New York: Henry Holt & Co. 1903. 343 pp.

The book consists essentially of seventeen lectures delivered by Professor Cohen in Amsterdam before a gathering of physicians. The original German edition appeared in 1901 from the press of

Wilhelm Engelmann, Leipzig, and has met with universal favor both at home and abroad.

According to the author: "These lectures are in no way a text-book of physical chemistry." He says further: "I have merely endeavored to show in them the close relation that exists between this new branch of chemistry and the biological sciences, and also, in response to the wishes of my hearers, to describe in some detail the more important methods of physical chemistry."

The treatise does, however, come fully as near satisfying the requirements of such a text-book as do a number of the more pretentious volumes at present available, and may be heartily recommended to a much wider class of readers than is indicated in its title. The theoretical treatment throughout is as rigorous as can fairly be expected in a book of its scope. The author has made free use of the nomenclature of the calculus in the lectures on reaction velocity but the verbal explanations accompanying the formulas make clear in concrete form, the gist of the mathematical processes without burdening the reader with the details of their derivation, and should serve to rob such symbols, when met with in the larger texts or current literature, of much of the mystical element which they too often possess in the eyes of the chemist and biologist. Sufficient of laboratory detail has been introduced to give a strongly objective background to the theoretical part.

The subjects treated in the individual lectures are respectively: 1, Reaction velocity; 2, the inversion of cane-sugar and catalyses in general; 3, the action of ferments; 4, the influence of temperature upon reaction velocity; 5, 6, and 7, equilibrium; 8, the friction of liquids; 9, osmotic pressure; 10, the determination of molecular weight of dissolved substances; 11 and 12, the theory of electrolytic dissociation; 13, 14, and 15, applications; 16, electromotive force; 17, the theory of galvanic elements.

The scope of the applications may be judged from the sub-heads of 13 to 15 which are: The field of hygiene; disinfection in the light of the theory of electrolytic dissociation; the field of pharmacology; the field of physiology; the osmotic pressure of animal fluids; the osmotic pressure between mother and child; osmotic analysis; poisonous effects. The translator has done his work well, preserving both the form and spirit of the original without unpleasantly warping the English.

It is certainly gratifying to see with what readiness the medical

profession and the general biologist are adopting the methods and results of physico-chemical inquiry. The time seems to have really arrived when it is as necessary to point out the present limitations and tentative character of our methods and conclusions as to urge their more rapid extension to wider fields. The outsider who dips into physical chemistry for cut-and-dried methods to solve his own problems is dangerously apt to carry off a mere shell of formulas without realizing how highly specialized are the "simplifying conditions" upon which they are based. It is far too easy to overlook with what care the particular illustrations in our standard texts have been selected. The physico-chemical problems of biology and medicine are for the most part of a far more complicated character than any as yet systematically investigated in pure chemistry, and we must not be too easily satisfied with superficial analogies. It seems to be a trait of human nature to place most confidence in the results of those studies of which we know the least. Professor Cohen's book should certainly do much toward correcting this tendency in the field with which it deals. There seems at present a great need for just such border-line treatises as the book before us and particularly for those of perhaps even a more pointedly conservative standpoint. The impetus to the new movement has been well given; what it most needs now is careful guidance.

F. G. COTTRELL.

TRAITÉ DE CHIMIE PHYSIQUE. LES PRINCIPES. BY JEAN PERRIN.  
Paris: Librairie Gauthier-Villars. Price, 15 francs.

M. Perrin's book is not by any means what the chemist would expect to find under such a title. Its guiding idea is better suggested by the opening phrase of the preface: "I have gathered together in this first volume the principles whose study and discussion seem to me to form a natural introduction to the different physical sciences." It is not surprising, then, to find that the first half of the book is really a treatise on mechanics and heat, made up largely of what we are accustomed to call mathematical physics, with here and there a paragraph on the chemical aspects of the matter in hand.

As suggested by the quotation above, the author promises more to follow. But he warns us against concluding that the succeeding volumes will be as abstract as the present one. The second is to treat of the application of the phase rule to pure substances and to