

NEW BOOKS.

INTERNAL ENERGY. A METHOD PROPOSED FOR THE CALCULATION OF ENERGY STORED IN MATTER. BY JOHN V. V. BOORAEM. New York : McGraw Publishing Company, 1906, 16 × 24 cm. pp. 144. Cloth, price, \$2.10.

The purpose of this book as expressed by the author is to suggest a simple working hypothesis whereby the amount of chemical energy stored within a body may be estimated. The general idea underlying the attempt is a consideration of the relation between heat on the one hand, and cohesion as manifested by ultimate tensile strength (determined by rupture tests), melting-points, and the expansion of bodies with change of temperature, on the other. The author evidently uses some of his terms in a somewhat different sense from that ordinarily attached to them, and so makes it rather difficult for the reader to follow his ideas. So, for instance, on p. 11 he speaks of cohesion as equal to zero at the melting point. The usual distinction between the total and free energy of a body is not made.

The author apparently considers it possible to determine the total energy content of a body from a study of the changes of rupture stresses and volumes with varying temperatures, a view which is clearly quite at variance with those commonly entertained at present. The following quotation from the introduction may serve to give an idea as to how the author expects his book to be received by the public :—

“The writer feels that each reader of these pages will regard them with a different amount of skepticism, for each one will naturally be guided by his own personal experiences. Hence he fears that the results to be obtained can only be of variable character for the present. He trusts, however, that eventually the paper will meet with the approval of some who will give it earnest attention, for it can only be accepted through the efforts of this latter class.”

L. KAHLBERG.

THE DYNAMICS OF LIVING MATTER. BY JACQUES LOEB. Columbia University, Biological Series, VIII. New York : The Macmillan Company. 1906. 233 pp. \$3.00.

The unique experience and distinguished record of Professor Jacques Loeb in the study of the phenomena of living matter lead one to anticipate the appearance of a new volume by him with interest. The reader of *The Dynamics of Living Matter* will not be disappointed. The book is characterized by the same novelty of view-points, originality of interpretation, and wealth of pertinent illustration which have formed the instructive features of the author's earlier work. In the present instance an attempt is made to examine the chemical character of life phenomena and the physical make-up of living matter — to analyze the features of development, self-preservation and reproduction from a physicochemical

point of view. Living organisms are considered as chemical machines consisting essentially of colloid material endowed with the functions just referred to. Accordingly some of the distinctive features and reactions of colloids are examined in the light of more recent knowledge. The special opportunity for this is afforded in chapters on the general physical constitution of living matter and some physical manifestations of life. The significance and actions of enzymes is touched upon rather briefly ; but the chapter on oxidations and oxidases is presented in an unusually suggestive way. In discussing the rôle of electrolytes in animals and plants, the author has had an opportunity to summarize many of his own important experimental contributions ; and while the deductions from the data available may at times seem somewhat too general, the critique which they arouse serves no useless end. Professor Loeb remarks : "It is neither our intention nor is it possible for us to give an exhaustive analysis, and we shall only go far enough to satisfy ourselves that no variables are found in the chemical dynamics of living matter which cannot be found also in the chemistry of inanimate nature."

In the chapters on tropisms the author expands his well known views involving the different behavior of symmetrical and asymmetrical structures towards external forces. Many of the so-called "instincts" of animals are resolved into various tropisms which can be analyzed from physical and chemico-physical points of view instead of metaphysical considerations. Additional chapters are devoted to Fertilization, Heredity and Regeneration, with particular reference to the part which chemical reactions in the cell play in connection with fundamental facts.

It is a distinct merit of these lectures, originally delivered at Columbia University in 1902, that they indicate some of the problems as well as the facts of experimental biology. They cannot fail to renew the interest which this field of science has awakened in recent years.

LAFAYETTE B. MENDEL.

CASEIN : ITS PREPARATION AND TECHNICAL UTILIZATION. BY ROBERT SCHERER.
Translated by Chas. Salter, New York. D. Van Nostrand Co., 1906. 15 + 163 pp.

This book is extremely interesting to those who have not kept informed about the use of casein in the arts because it is a revelation in what a marvellous variety of forms casein is utilized. The chapter on the "Composition and Properties of Casein" is a distinct disappointment to any one looking for a thorough treatment of the subject ; perhaps no more could be expected in a book intended to treat of the technical uses of casein.

The general character of the information given is well indicated by the chapter headings : Casein paints, technics of casein paintings, casein adhesives and putties, the preparation of plastic masses from casein, uses