

until the second, and the problem of the relations of substance to substance, about which we still know very little, is relegated to the third and last division.

The first part, or chemical dynamics, which is now available in German and in French, treats the subject under the two general heads of *Chemical Equilibrium* and *Reaction Velocity*. We have the physical and chemical equilibria in a homogeneous substance, between two substances, between three substances, between four substances; chemical equilibrium from the molecular-mechanical standpoint; homogeneous and heterogeneous equilibria; the law of reaction velocity; reaction velocity and equilibrium; reaction velocity and affinity; mono-, bi- and tri-molecular reactions; effect of the surroundings and medium on reaction velocity; effect of temperature on the reaction velocity; effect of pressure on the reaction velocity.

The translation of this, a part of Van't Hoff's work, before the appearance of the remainder, is indicative of that esteem in which he is so justly held, not only at home, but in foreign lands. The translation into French seems to have been very carefully done, and the French edition is an inviting one, barring an occasional typographical error.

It is a matter of delight to all who are interested in physical chemistry that books are appearing simultaneously on the same chapter of their subject, from the pens of two of the great leaders in this field of work. As is well known, that portion of Ostwald's *Lehrbuch* which deals with the broad subject of *Verwandtschaftslehre* is now available in part. These two works admirably illustrate the difference in method of these two master minds, and each is enhanced in value by the other.

HARRY C. JONES.

Laboratory Directions for Beginners in Bacteriology. By VERANUS A. MOORE.

This book of ninety pages contains the outlines of an introductory laboratory course divided into sixty lessons, and aims to impart a technical and working knowledge of the more essential bacteriological methods and to develop a definite knowledge of a few important species of bacteria. The book is not intended to re-

place the text-book on bacteriology, but to be a manual for use at the laboratory desk in which through a series of carefully selected exercises the student, without waste of time, will cover the necessary ground.

A manual such as this represents strongly in its selections and in the amount of time allotted to each subject the personal opinions of its author, yet we believe on the whole the judgment of the writer will be approved by teachers.

This book will be found very useful by teachers who have not the time to prepare and print their own outlines. Even those who are compelled to give a course much shorter than that sketched in this book can easily, without serious harm, reduce the length of the course by omitting the practical work in some of the chapters and shortening it in others. The classification of the bacteria upon the system of Migula seems to us a mistake, for it necessitates many changes in the accustomed nomenclature; thus the name bacillus is limited to motile rod-shaped organisms to which the flagella are attached to all parts of the body. A bacillus with polar flagella becomes a pseudo-monas and one without any flagella a bacterium. As this book is intended to be used along with various text-books on bacteriology, it would seem wiser to have omitted any elaborate and unusual classification which, however valuable, must of necessity frequently clash with that used in the text-book, and thus tend to confuse the student.

WM. H. PARK.

GENERAL.

THE U. S. Department of Agriculture has issued a bulletin on Fish as Food (*Farmers' Bulletin*, No. 85), by Dr. C. F. Langworthy, of the Office of Experiment Stations, in which the results of investigations on the nutritive value of various kinds of sea food have been summed up for the general reader. The chemical composition of a considerable number of fresh and preserved fishes, mollusks, crustaceans, etc., are given; the relative cost of protein and energy in fish and other food material is shown; the place of fish in the diet is discussed, and some sample menus are given to show how fish may be combined with other food materials to make a well-balanced dietary. The popular notion