The original edition of Herrmann and Wagener's book appeared in 1944 and propounded the semiconductor theory, while emphasizing that surface effects and differences between the behaviour of single crystals and aggregates might introduce quite considerable modifications. In translation, the literature up to the beginning of 1950 has been surveyed, so that the reader is informed of the most important developments; but the authors wisely attempt no final decision between the theories. This must await further experiments.

Vol. 1 collects most of the information vital to an understanding of the technical preparation and manufacture of oxide cathodes. Vol. 2 is devoted to the theory. It summarizes the statistical theory of emission from metals, gives the basis of the theory of ionic solids and compares the observed behaviour of cathodes with the theoretical expectation. Allied phenomena, such as secondary emission and photo-emission, which give valuable information on the behaviour of oxides, are dismissed very curtly. The advent of an unbiased and authoritative survey of the field is most timely, and the book should be widely read.

RESEARCHES IN APPLIED MECHANICS

Advances in Applied Mechanics

Edited by Richard von Mises and Theodore von Kármán. Vol. 2. Pp. x+233. (New York: Academic Press, Inc., 1951.) 6.50 dollars.

THIS is the second volume of the series edited by R. von Mises and T. von Kármán, and entitled "Advances in Fluid Mechanics". The present volume contains five contributions, which deal respectively with the statistical theory of isotropic turbulence, by von Kármán; the laminar boundary-layer in compressible flow, by Kuerti; bending of curved tubes, by Clark and Reissner; recent developments in inverse and semi-inverse methods in the mechanics of continua, by Neményi; and the theory of filtration of liquids in porous media, by Polubarinova-Kochina.

The first contribution, which occupies only nineteen pages, is nevertheless one of the most important, as it gives a critical survey of recent developments of the theory of turbulence, including the work of Heisenberg and Kolmogoroff and Batchelor.

The survey of boundary-layer theory given by Kuerti provides a most valuable account of the work which has been done in this field in the United States, Great Britain and Germany. It is an invaluable survey for the research worker in this field.

The article on the bending of curved tubes deals with an elastic problem of considerable practical importance; but it is very surprising to find no reference whatever to the pioneer investigation of Brasier, who was the first to point out the flattening of a circular tube during the process of bending.

The use of inverse and semi-inverse methods in the mechanics of continua has led to results of considerable importance in the theory of fluid motion, including the effects of compressibility and viscosity, and also in the theory of elasticity and plasticity. It was, of course, in St. Venant's original researches on the theory of elastic rods that the theory of inverse methods was first introduced. In this article, Neményi

gives an account of recent developments, and provides a most useful summary of the important results which have been obtained in various branches of mathematical physics.

Lastly, we have a long and important article on the theory of filtration, which is especially valuable as it makes available for English-speaking readers a considerable volume of research which has been conducted in the U.S.S.R. on this subject. Most of the research is concerned with finding exact solutions of the basic equations of filtration.

There is no doubt whatever that this series of volumes is of very great value for all who are interested in recent developments of applied mechanics, and it is very much to be hoped that succeeding volumes will appear at shorter intervals.

VITAMIN METHODS

Vitamin Methods

Edited by Dr. Paul György. Vol. 2. Pp. xi+740. (New York: Academic Press, Inc., 1951.) 14.50 dollars.

THIS second volume of Dr. Paul György's "Vitamin Methods" keeps well up to the high standard and reputation set by Vol. 1 (see *Nature*, 166, 364; 1950). The first volume was devoted to an account of the physical, chemical, microchemical and microbiological techniques commonly used in determining the vitamins, so Vol. 2 deals with those alternative procedures that are based on biological methods of assay. Sections are also included on the clinical and laboratory appraisal of human vitamin deficiencies, as well as on the statistical methods used in vitamin research. Nor is that all: so unrelenting has been the progress of knowledge that Dr. György has found it necessary to add a supplement, covering the more recent literature, and thereby bring up to date the account of the physical, chemical and microbiological methods previously given in Vol. 1. Specially valuable is the attention here given to the microbiological determination of vitamin B₁₂.

The team of authors is the same as in Vol. 1. A preliminary chapter on "General Aspects of Small Animal Experimentation" is by N. B. Guerrant. The main section of the book, on "Animal Vitamin Assays", is jointly by C. I. Bliss and Dr. György, and deals in turn with vitamins A, D, E, K, B₁, riboflavin, nicotinamide, pyridoxin, pantothenic acid, biotin, folic acid, vitamin B₁₂, and vitamin C. "The Laboratory Diagnosis of Human Vitamin Deficiencies" is in the hands of J. H. Jones; and the chapter on "Clinical Signs of Malnutrition" is by N. Joliffe. C. I. Bliss contributes the general section on "Statistical Methods in Vitamin Research".

Throughout the book the accounts of the principal methods described are sufficiently full and explicit to be used as working directions. Also, the underlying theory, and often the historical background as well, are adequately sketched in. The statistical basis, and the method of calculating and of presenting the result, are always clearly set out; and the value of the book is further enhanced by a remarkably full and internationally representative bibliography.

It is not enough to claim that this book is the best of its kind available—it is, in fact, the only book of its kind available.

LESLIE J. HARRIS