subject at first. The author's use of the term "measure formula" for "dimensions", and his continual reminders that an equation must be true in any consistent units, are two of the many small but helpful devices which make for clarity; and he is careful to point out that the successful use of the process of analysis demands intelligence and a close study of the physics of the problem concerned. G. R. NOAKES

PROGRESS IN NUCLEAR PHYSICS

Progress in Nuclear Physics

Vol. 3. Edited by Prof. O. R. Frisch. (Progress Series.) Pp. vii+279+4 plates. (London: Pergamon Press, Ltd., 1953.) 63s. net.

THE third volume of "Progress in Nuclear Physics", edited by Prof. O. R. Frisch, and published annually, contains articles on subjects of current interest which will appeal to nuclear physicists in general. As in former volumes, both technical and theoretical advances are represented, and the topics chosen are treated at a level which strikes a useful mean between the fully detailed monograph and the shorter text-book account.

Four articles deal in part with instruments for the detection of nuclear particles. The diffusion cloud chamber, described by M. Snowden, has already shown its possibilities in detecting artificially produced V^0 -particles and will be much used in the future. D. West describes the construction and application of the precision proportional counter, which has been used in studies of low-energy β -, X- and γ -radiations, and has important advantages in resolution over the scintillation counter. F. C. Champion contributes an account of the crystal conduction counter, in which he gives a reminder that the counting properties of diamond may throw light on the solid state, even if they find no great application in nuclear physics. Čerenkov radiation is treated in an exhaustive article by J. V. Jelley. Many will be interested in his account of the early experiments and in his exposition of the theory; the article goes on to describe the application of Čerenkov counters to cosmic-ray work and to the high-energy field in general.

Although improved methods of detection enable good use to be made of the relatively small beams available from high-energy accelerators, it is still important for these beams to be increased. The problems of providing an intense beam of ions for acceleration are ably discussed in an article by P. C. Thonemann, who was himself responsible for stimulating interest in the popular radio-frequency ion source.

The remaining articles are devoted primarily to exposition and interpretation of experimental results. R. J. Blin-Stoyle, M. A. Grace and H. Halban review the progress made in orientating nuclear systems and show what nuclear information can be obtained from observations of radiation patterns and polarizations. A remarkable contribution to an understanding of electromagnetic interactions has resulted from the discovery of positronium, the bound positron-electron system, by M. Deutsch; in an article in this volume, he reviews in a masterly way the whole subject of annihilation of positrons in matter. Nuclear dynamics is represented by contributions on deuteron stripping reactions and on the collisions of nucleons with deuterons. In the former article, R. Huby discusses the assumptions

of stripping theory and gives numerous examples of the application of the theory to the determination of spins and parities of nuclear states. In the concluding article, H. S. W. Massey shows how measurements of total and differential cross-sections for the scattering of nucleons by deuterons can yield information on nuclear forces, including the force between two neutrons.

The articles in this volume are well balanced and informative. Some readers may complain of omissions; but these are inevitable in reports on rapidly expanding subjects. There are few textual errors, and the printing and production are excellent.

W. E. BURCHAM

CHEMISTRY AND TECHNOLOGY OF FOOD

The Chemistry and Technology of Food and Food Products

Second Completely Revised and Augmented Edition. Prepared by a Group of Specialists under the Editorship of Dr. Morris B. Jacobs. Vol. 1, pp. xxv+832; Vol. 2, pp. xxvi+833-1770; Vol. 3, pp. xxx+1771-2580. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1951.) Vol. 1, 12 dollars; Vols. 2 and 3, 15 dollars each.

THESE three volumes have been compiled by thirty-nine experts, many of them famous in their particular fields. In theory, a treatise such as this should be beyond criticism, but in practice it has obvious limitations: the expert is normally a very busy man; he usually postpones the writing of his contribution until a time limit has been set by the editor and then he rushes it through; he is restricted to so many words; and finally most experts are particularly resistant to criticism of what they have written. The editor of this work—now in its second edition—Dr. Morris Jacobs, has obviously come up against these difficulties. He writes in his preface, "In a collaborative effort, it is always difficult to avoid duplication"; and again, "Several contributors of the first edition were not able to revise their chapters on time".

To the British reader the book at first glance is almost exasperating in its completeness; nothing appears to have been overlooked. Half of Vol. 1 is devoted to fundamentals, including the chemistry of proteins, lipoids, carbohydrates, colouring matters, enzymes and vitamins; there are in addition two excellent chapters dealing with digestion and food spoilage. The rest of this volume deals with unit operations and processes (there is a subtle difference) and with sanitary control. Vol. 2 deals mainly with the history and chemistry of foods, and Vol. 3 with their production and preservation. The scheme as between Vols. 2 and 3 is not very clear, and in fact in Chapter 24, dealing with cereal grains, we are reminded by Prof. W. F. Geddes that this chapter is closely allied to Chapter 39 in Vol. 3. The dividing line between chemistry and technology is always a matter of opinion.

It is easy for a reviewer who has worked in one or more fields of food science to suggest defects or omissions in the sections covering work with which he is familiar. Since, however, none of us can claim authority in all the fields covered, this would scarcely be fair. There is, however, one omission which is