abbreviations used, especially as some of the rarer ones can scarcely be interpreted by the average reader, and the understanding of others is made more difficult by printers' errors.

So long as the compilation of such reviews remains the arduous task of busy research workers they will always have to choose between the two evils: of allowing a number of inconsistencies and errors to remain, or to delay publication with the risk that some of the material will already be out of date when the book appears; the only way out of this dilemma seems to be the preparation of such reviews by permanent staffs of professionals and, if possible, in an international organisation. Pending that, the very comprehensive and well-arranged bibliography given to us by Dr. Süe will be found most useful by all laboratories working on radioactive tracers. Nothing equivalent seems to exist yet in the Anglo-American literature, although the bibliography contained in Appendix 5 of the Fourth Semiannual Report of the U.S. Atomic Energy Commission, which lists all papers on isotope utilization that have recently come to the attention of its Isotopes Division, is similar in arrangement.

F. A. PANETH

LOW TEMPERATURE PHYSICS

Low Temperature Physics

By Dr. L. C. Jackson. (Methuen's Monographs on Physical Subjects.) Revised second edition. Pp. vii + 130. (London: Methuen and Co., Ltd., 1948.) 6s. net.

THE great attraction of low temperature physics as a field of research is that so many of the phenomena still lack any fundamental theory, so that the outcome of any new experiment is rarely a foregone conclusion. The outstanding phenomena at present requiring something deeper than 'phenomenological' theories are superconductivity and the properties of liquid helium, and other as yet unsuspected phenomena may come to light when the new range of low temperatures below 1° K. is properly exploited. The interest of these problems was beginning to be more widely recognized just before the War, and with the resumption of scientific work after the War there has been a great expansion, particularly in the United States, of the facilities necessary for research at temperatures within a few degrees of the absolute zero.

The appearance of a second edition of Dr. Jackson's excellent monograph is thus particularly timely, both because of this increased interest and of the considerable advances made since the first edition appeared in 1934. Dr. Jackson, who was a pupil of Kamerlingh Onnes at Leyden some twenty-five years ago and is at present in charge of cryogenic work at Bristol, writes with the authority of first-hand experience. The treatment (which is essentially the same as in the first edition, but brought up to date) combines very successfully an account of the general principles of each topic discussed with just sufficient practical detail and numerical data to make the description come alive; theoretical results are not usually derived in detail but enough is said to give a qualitative idea of where they come from, and references to more detailed treatments are indicated. In such a short book it is impossible to cover more than a selection of topics, and a wise choice has been made both of subjects which are of interest as topical

problems and those needed as a background to appreciate the significance of the latest work. After two introductory chapters on the production and measurement of low temperatures, the main headings are the properties of helium, specific heats in general, electrical conductivity (including superconductivity) and magnetism. Not only may the book be warmly recommended as an excellent introduction for the final honours student or the intending research student, but it may also be read with benefit as a well-balanced survey by those already working in the field.

D. SHOENBERG

AMERICAN WAR-TIME CONTRIBUTIONS TO STATISTICAL METHOD

Selected Techniques of Statistical Analysis for Scientific and Industrial Research and Production and Management Engineering

By the Statistical Research Group, Columbia University. Edited by Churchill Eisenhart, Millard W. Hastay and W. Allen Wallis. Pp. xiv + 473. (New York and London: McGraw-Hill Book Co., Inc., 1947.) 36s.

IN the United States, as in Great Britain, the value of statistical method and technique became especially recognized during the War. This was an inevitable outcome of need, but is perhaps also some tribute to the contributions of the comparatively few statistical workers. The Statistical Research Group of Columbia University worked for the Applied Mathematics Panel, Office of Scientific Research and Development. One of its major contributions to technique was sequential analysis, the subject of an independent monograph recently prepared by its principal creator, A. Wald. The editors of the volume under review had the rather difficult task of assembling other much more miscellaneous work, which arose as "almost a by-product of the responsible and co-operative handling of practical military, scientific, engineering, and production problems".

They have done this with a series of more or less self-contained and independently written chapters by various authors. These have been arranged in three parts: the first, on "Industrial Statistics", including two long chapters by W. Allen Wallis on the "Use of Variables in Acceptance Inspection for Percent Defective" and by Harold Hotelling on "Multivariate Quality Control, Illustrated by the Air Testing of Sample Bombsights"; the second, on "Planning Experiments"; and the third on "Techniques and Tables". Unfortunately this arrangement is at times extremely arbitrary; for example, it is not very obvious why two technical investigations by Churchill Eisenhart on the "Effects of Rounding or Grouping Data" and the "Inverse Sine Transformation of Proportions" should be allocated to different parts. The references to sequential analysis seem unsatisfactory, an elementary account by Wallis concluding the volume, whereas the first chapter includes a sequential problem of strictly more complex type.

Such limitations cannot, however, be entirely avoided in an *ad hoc* collection of this kind. Provided it is not regarded as a text-book, but as a record of miscellaneous work, it serves two purposes: (1) as a reference book (with some useful tables and charts, and an almost too exhaustive index); (2) as an indication of the potential value of such techniques, in