

in this particular field, and who has himself contributed much to the advances made in the subject, is undoubtedly one of the few people well qualified to write such a book. The first edition of his book on temperature measurement appeared in 1917, was quickly exhausted and for four years was unobtainable. In 1925, the second edition, a substantial improvement on the first, was published, and now, after an interval in which the second edition also has been out of print, a completely revised and re-set version has been issued. Both earlier editions were widely accepted, a clear indication that the author succeeded admirably in his task of presenting his material in a form acceptable and useful to those engaged in industry and research.

The second and third editions, superficially, appear to be little different. The chapter and sectional divisions, including their headings, are essentially the same. The illustrations and diagrams, though slightly fewer in number in the new edition, are exactly as before, and, in spite of an interval of twelve years, only minor corrections and additions have had to be made to the numerical tables. A closer examination of the text, however, reveals that the author has made a careful revision in accordance with his own practical experience, and that of others. For example, Chapter 3, on the resistance thermometer, by omitting discussion of the Smith's difference bridge, finds space for the constructional details of the standard resistance thermometers in use at the National Physical Laboratory, and in Chapter 4, on the thermocouple, brief references to thermo-elements suitable for temperature measurements of liquid steels, in gases, and of the cylinder walls of engines, have been added.

In 1927, the International Temperature Scale was provisionally adopted, and due importance is given to this scale by the reproduction, in an appendix, of the specification finally accepted. The composition of temperature-indicating points, and a table of the agreed melting-points of the elements, form two other new appendices.

The new edition is very well produced, and the reader will find that the larger type now used makes the book easier for reference and more pleasant to use. One minor blemish is that, although the references at the ends of the several chapters have been brought up to date and arranged in chronological order, care has not always been taken to give the complete reference, or to be consistent in the form and abbreviations used.

S. WEINROUB

## METEOROLOGY FOR THE PROFESSIONAL METEOROLOGIST

### Meteorology

Theoretical and Applied. By Dr. E. Wendell Hewson and Richard W. Longley. Pp. xii+468. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1944.) 4.75 dollars.

THE writers of this book have been ambitious; they have attempted, within their 450 pages, 8½ in. × 5½ in., to provide the physicist with an adequate text on all those parts of meteorology which are likely to be of concern to him in practising his profession in, say, one of the national meteorological services of the world. Whether they can be said to have been successful depends largely upon one's like or dislike of the plan they have adopted, which is

to divide the subject somewhat arbitrarily into the two parts indicated by the title, and to make each part more or less self-contained, so that the 'practical' aspects of the subject can, if required, be read separately from the basic theory on which the applications depend. Thus, following an introductory chapter outlining the broad features of observations over the globe, Part 1 on theoretical meteorology comprises chapters on subjects of the expected kind (statics, thermodynamics, radiation, dynamics, etc.), but also one on the principles of meteorological statistics—a rather happy inclusion. Part 2 on applied meteorology deals with instruments and observations; the general circulation; vertical stability, air masses, weather systems and winds; fog, cloud, precipitation and aircraft icing; climatology; chart analysis and weather forecasting; and meteorology in relation to human activities. Rigour is claimed for the treatment in Part 1, to which the reader is referred for the derivation of results used in Part 2, which is more sparing of mathematics than Part 1.

Such a structure has no great appeal to the reviewer, for the content of much of Part 2 is as genuinely theoretical as Part 1, and the student coming to the subject for the first time is liable to get an unbalanced view. It is true that a more formal treatment can result in a lack of knowing 'what the subject is all about'; but that is readily avoided by bringing theory into relation with observation at every possible stage so as to provide the student with a coherent view of atmospheric processes. The writers of the book under review have certainly tackled very successfully the relation between theory or fundamental physical principles and observation in a number of cases, at the expense, however, of an irritating accumulation of cross-references and the loss of logical development in the exposition.

Aspects of the book which appeal to the reviewer are the treatment of instability; the nature, causes and occurrence of fog, cloud and precipitation (within the bounds of existing knowledge); and the application of climatological factors to an understanding of weather and its variations at particular places—one rather regrets, however, the limited definitions of the content of climatology. The rigour claimed for the treatment in Part 1 is not always evident; this is sometimes due to problems being incompletely specified, for example, the transfer of heat and matter by turbulence. There is a frequent insistence that a geostrophic wind field implies a stationary pressure field, but no mention of the fact that this derives from the neglect of the variation of the Coriolis parameter with latitude; on the other hand, there is frequent reference to vertical motion with north-south geostrophic flow—the relation of vertical motion and the equation of continuity to pressure change needs far more careful handling. Occasional looseness in definitions is also evident, as in confusing thermal conductivity with diffusivity and frequency with wave-number.

The book is, however, mainly workmanlike and within its structure attractive. If a second edition is called for, many blemishes can be removed, and the reviewer hopes that the writers will then reconsider their policy of omitting references from the text—a few are given in chapter bibliographies at present. He also hopes they will omit the existing diagram showing the high atmosphere to be composed of helium, unless, of course, some evidence accrues for this in the meantime. P. A. SHEPPARD