as is the modern practice, as secondary authorities to reinforce conclusions based on very different material. As evidence for the development of thought they are as valuable, or almost as valuable, as Plato and Aristotle.

W. H. S. JONES.

AN INTRODUCTION TO METEOROLOGY

Introduction to Meteorology

By Prof. Sverre Pettersen. Pp. ix+236. (New York and London: McGraw-Hill Book Co., Inc., 1941.) 17s. 6d.

THE author of this book is immediately faced by the problem of deciding how much knowledge of mathematics and physics he can assume his reader to possess, since meteorology is concerned with the physics and dynamics of the atmosphere. Dr. Pettersen has assumed that his reader has a knowledge of the elements of the differential calculus, and of rather more than the rudiments of the theory of heat. On this basis he has written a book which can certainly be added to the relatively short list of good books on the subject of meteorology. The general bias of the book is implicitly in the direction of applications to aviation.

Of the fifteen chapters into which the book is divided, Chapters 8-13 are directly concerned with the synoptic chart and its use, and the first seven chapters have been written with the aim of supplying the theoretical ideas underlying the use of synoptic charts for weather forecasting. The earlier chapters cover the consideration of evaporation and condensation, adiabatic changes, stability and instability, temperature changes and their relation to weather phenomena, and wind systems. These are all discussed rather briefly, but on the whole very clearly. The present reviewer was particularly impressed by those portions of the book which are devoted to types of precipitation, types and modes of formation of fog, the genesis of air masses, weather analysis and the steps in forecasting procedure, and the detailed discussion of examples of charts for western Europe and the eastern Atlantic. The parts of the book which deal with synoptic charts are, as might be expected from one who has taken an active part in the development of the Norwegian methods of forecasting, clear and full of matter of great interest to the student of weather forecasting.

The author's view of what constitutes an elementary treatment of meteorology does not accord with the popular view. His book will demand close attention on the part of the reader, as it is very much concentrated. It would probably have been beneficial, from the reader's point of view, to have amplified portions of the earlier chapters. For example, where the formula for the dry adiabatic lapse-rate is expressed as g/c_p , on p. 52, it is not explained that the specific heat at constant pressure is to be expressed in dynamical units, though the elementary reader would probably think of this quantity as expressed in heat units. The actual values of the constants used in the formulæ are not given, and it would be helpful to the reader to have these constants collected into a table, so that if required their values could be readily ascertained. The numerical value of the dry adiabatic lapse-rate is given, on p. 53, as

5.6° F. per 1,000 ft., instead of 5.4° F. per 1,000 ft., the value which the formula yields.

The last two chapters give Köppen's classification of the climates of the world, and a brief historical review of the development of meteorology as a science. Dr. Pettersen concludes his book with an optimistic view of the future of weather forecasting, but whether that view will be justified or not, it is safe to forecast that the book under review will have its part in the spread of knowledge of modern meteorological methods.

D. BRUNT.

ENGINEERING DATA

The Engineer's Year-Book of Formulæ, etc.

Originally compiled by H. R. Kempe and W. Hanford-Smith. 48th annual issue, revised under the direction of L. St. L. Pendred. Pp. xii+2852. (London: Morgan Brothers (Publishers), Ltd., 1942.) 35s. net.

SHOULD some future historian wish to write of engineering in 1942, he will find most, if not all, of the important facts in "Kempe". Practically every branch of engineering is represented, as the full title shows, the only notable absentee from the list being chemical engineering which, on the purely engineering side, may be said to derive from certain aspects of other sections—civil, mechanical, electrical and metallurgical—while on the chemical side it belongs to another branch of technology.

The present edition marks the occasion of the quinquennial revision, which is made the opportunity for a thorough overhaul of each of the forty-seven sections in which the information is presented. Obviously, of course, the great bulk of the book remains very largely as before, for much of it is fundamental and almost permanent, and the rest has been carefully selected and tested in previous years. The mining section is one of those that have undergone major treatment and the work of the late Dr. Henry Louis has been revised, considerably extended and brought up to date by Sir Richard Redmayne, whose authority in the world of mining gives assurance that this section is now fully in line with the most recent knowledge and standards.

Other sections which have received similar treatment include those on steam, hydraulics and hydraulic transmission of power, marine oil engines and aero engines. As a result, "Kempe" is not only a larger volume but also has made a definite advance in conformity with the manifold activities of the great body of engineers.

Besides the practical information relating to these numerous aspects of engineering operations and design, the earlier sections are devoted to the more fundamental data which are in constant demand both by the student and by the practising engineer. These include units of measurement and equivalents, the principles of mechanics, measurement of power, heat, optics, acoustics, vibration, noise, the properties of engineering materials and metering and mechanical testing appliances. Then again, in the building section, there is given an abstract of the provisions of the London Building Act, which for some time to come will be the principal guide to conventional and approved practice. By its comprehensive inclusion of engineering information, "Kempe" is equal for purposes of reference to quite an extensive library, and the information is more accessible and more easily applied.