perturbed from thermal equilibrium by supplying energy to one of the degrees of freedom. Chapter 2 gives the basic analysis which shows how measurements of the absorption and dispersion of sound waves by a gas can yield data on relaxation times. Chapter 3 describes the ultrasonic techniques by which most of the data so far has been obtained. Other experimental methods are briefly discussed in Chapter 4, including shock-wave techniques and those exciting rotational and vibrational degrees of freedom instead of that of translation.

Chapter 5 is an extremely useful compilation of relaxation data on a large number of gases, accompanied by a commentary on the experimental conditions, accuracy and reliability of the data. This chapter, and the following one on the theory, are the two main topics dealt with and take up nearly half the book.

Chapter 6 is about the theory; it is mainly concerned with simplified treatments of the complex process of energy transfer during the collision of an atom with a diatomic molecule. It requires the reader to have an elementary knowledge of quantum mechanics. The authors have aimed at keeping a good physical picture in their theoretical discussion, avoiding more rigorous theoretical treatments and refinements which can be obtained from the recent book by Herzfeld and Litovitz (*Absorption and Dispersion of Ultrasonic Waves*, Academic Press, New York and London 1959) on the subject, or from the literature.

The authors have justified the general title of the book by introducing the reader in their last chapter to the more complicated subject of energy transfer between the gas molecules involving electronically excited states which arise from irradiation or chemical reaction. The discussion of this aspect of the subject is, however, limited.

The book is an excellent introduction to the research which has been done on the subject of energy transfer between molecules in low-lying energy states, and is suitable for reading and reference by chemists, engineers and physicists alike. It is written in the style of a review of the subject, with frequent reference to the literature. It is well printed, except for some slight blemishes on pages 68-72 of the reviewer's copy.

P. L. Davies

Thermal Properties of Dispersed Materials: A. F. Chudnovsky. M., Fizmatgiz, 1962, 456 pp., 1*r*. 68*kop*. (In Russian).

Tremendous achievements in engineering urge the growing necessity to accumulate and systematize available data on thermal properties of materials and, in the first place, on thermal conductivity, temperature diffusivity and thermal capacity. Knowledge of these properties and their temperature relations is required for engineering calculations of various apparatuses and processing operations based on the solution of heat- and mass-transfer equations.

At present many authors usually give numerical data of thermal properties as Appendices to the works discussing not only heat- and mass-transfer problems but those indirectly connected with them.

However, there are a few works devoted solely to thermal properties. The book under review is such a work

While various manuals often present only numerical data, Chudnovsky pays great attention to heat conduction processes, describing methods of thermal properties determination and of their accuracy estimation.

This is the main advantageous difference of this book from usual handbooks and therefore it may be of great help for an engineer to justify his calculations.

The book consists of three parts.

The first part "The Mechanism of Physical Processes in Dispersed Materials" contains basic notions and relationships of the heat conduction theory, discussions of the processes manifesting effective character of thermal properties of dispersed materials (convection, radiation, moisture transport, etc.), a description of the contact heat conduction process, estimations of the dependence of thermal properties on voidage fraction, volume weight, moisture content and temperature.

The second part "Methods and Instruments for Determining Properties of Dispersed Materials" deals with the methods developed in this country and abroad for determination of heat capacity, stationary technique for thermal conductivity measuring, the methods based on regular thermal regime and also quasistationary and non-stationary methods for thermal properties determination of dispersed materials.

In the third part "Thermal Properties of Various Dispersed Materials" vast material is presented concerning the measurement technique and (which is of extreme importance) results of measuring thermal properties of various dispersed materials: bound materials of solid structure, as well as non-bound, fibrous, heat resistant ones.

Special chapters deal with thermal properties of semiconductors, soils, grounds, rocks and low temperatures. Various factors affecting thermal properties of the dispersed materials of the types considered are estimated.

A list of references is given after each part.

The book contains many tables, diagrams, calculations and formulae which will be certainly of great value for engineers in various fields.

A. G. Shashkov

Flow Measurement in Closed Conduits. Department of Scientific and Industrial Research. Her Majesty's Stationery Office, Edinburgh, 2 Vols. 767 pp., 84*s*.

The basic principles of flow measurement are usually dealt with in the earlier years of an engineering education, for they are simple and easily understood. However, the details of their application in engineering work, and the assessment of the accuracy gained under operational conditions has given many lifetimes of experience to those in industry and research. Indeed it is fair to say that most advanced processes at research or production stage depend heavily on accurate flow measurements using