Our last hope of calculating the wall-friction and heat transfer in a rocket nozzle has now vanished. Though this hope may revive when, in Yuan's chapter, we find once more the differential equation based on the Prandtl hypothesis, the temperature–velocity relationship for a compressible fluid, and the appropriate integral expressions, it is soon dashed; for these expressions are only evaluated for the case of zero Mach number and isothermal flow.

This account of an unsuccessful journey through the book should not be read as a complaint: perhaps the problem which the reviewer chose was not one to which the authors attach importance; and probably other engineering problems could have been chosen which the book would have been more helpful in solving. However it seems fair to draw certain incidental conclusions about the nature of the book. Thus, it will have been remarked that there is considerable overlapping between the contributions of the various authors. This is to be expected; indeed it is to be desired. However anyone who has never tackled such a job will be tempted to say that the editor might have arranged for more cross-referencing and greater uniformity of treatment.

It will also be apparent that notable gaps remain; in particular, the book fails to present the important advances which have been made in recent years in the study of compressible boundary layers with pressure gradients, diffusion and chemical reaction. Even in those areas which are treated, the value of the book would have been greatly increased if reasonably extensive tables had been included of the more important and useful functions [(e.g. $c_f(Re_\theta, M, T_w/T_e, \rho_w v_w/\rho_e u_e)$].

Finally, the very length of this review will have indicated that this volume contains plenty to get one's teeth into. It will be indispensable for several years to everyone concerned with aeronautical heat transfer problems. This reviewer welcomes its appearance heartily.

D. B. Spalding

Evaporation and Droplet Growth in Gaseous Media. N. A. Fuchs. Pergamon Press, London, 1959, 67 pp. 30*s*.

This short book (67 pages) is a translation from the Russian of a scholarly and thorough literature review by an author who himself has made early and notable contributions to the field. Apart from a brief and non-theoretical mention of the work of Godsave, processes involving chemical reaction are excluded. Vaporization is given the greater attention and the author presents the quasi-steady theory for spherical and ellipsoidal droplets in stagnant media and media in relative motion, with discussion of the effects of surface tension and large mean free path; unsteady effects are dealt with in a short final chapter. Wherever possible the author adduces experimental data, describes the experimental method and critically examines their accuracy; he is not afraid to state on occasions that the experimenters must have made a mistake of measurement or calculation.

The English translation by J. M. Pratt is excellent, and the setting, though non-letterpress, admirably clear. Though the price is high, research workers concerned with the subject will find it entirely worth while.

D. B. Spalding

Tables of Thermodynamic and Transport Properties of Air, Argon, Carbon Dioxide, Carbon Monoxide, Hydrogen, Nitrogen, Oxygen and Steam. Pergamon Press, Oxford, 1960. pp. 478 + xiii, 140*s*.

This book contains a collection of tables which was first published in 1955 by the United States Department of Commerce as National Bureau of Standards Circular No. 564, under the title: "Tables of Thermal Properties of Gases". The tables give values of gas constant, compressibility factor, density, specific heat, specific enthalpy, specific entropy, specific-heat ratio, sound velocity, viscosity, thermal conductivity, Prandtl number, ideal-gas thermodynamic functions and coefficients for the equation of state for the gases listed; in addition vapour-pressure data for the pure substances are included. Broadly the range of pressure covered is 0·01 atm to 100 atm and the range of temperature 50 to 5000°K. Each group of tables is preceded by discussions on the sources, the correlation and the reliability of the data; the bibliography is extensive.

The present edition appears to have been produced from the original by a photo-copying process. In general reproduction is good; the only defect worthy of mention is the rather poor definition of the grid on a few of the graphs.

This book is published as a revised edition. The revisions noted are some minor typographical corrections and the omission of ten pages of unit conversion tables from the appendix. The latter change is not a serious one since the conversion factors relevant to each group of tables have been retained in the main text.

The tables represent an important contribution to the property data required in the fields of heat transfer and mass transfer. The publication of revised editions of data books, outside the country of origin, increases the the availability of the data and is to be welcomed in general. In the case of this British edition, however, this advantage is somewhat offset by its very high price.

E. H. Cole

Conduction de la Chaleur en Régime Variable. G. Ribaud, Gauthier-Villars, Paris, 1960, 90 pp. $3.78.

This monograph is intended for young physicists and engineers who are studying the problems of conduction of heat in the unsteady state for the first time.

The first chapter deals with steady-state conduction, as an introduction to the main body of the work, developing the equations from Fourier's law in the usual fashion. Several unfortunate features mar the treatment. When dealing with variable thermal conductivity a mean conductivity is defined rather than allowing the mean value to define itself by straightforward integration of the

Fourier equation. Also, when dealing with heat transfer between two slabs with a gas layer between, the radiation term is given incorrectly.

In chapter 2 the general differential equation for conduction in the unsteady state is derived in Cartesian, cylindrical and spherical co-ordinates.

The third chapter deals with solutions of the general equation (in one space dimension) of the form $\phi(t) f[x\psi(t)]$. Illustrations of this form of solution are derived for the infinite and semi-infinite solid. The more difficult solutions are, quite reasonably, quoted and not derived.

Cases where surface temperature varies sinusoidally are treated in chapter 4, and solutions which can be represented in the general form $\phi(t) . \psi(x)$ are covered in the fifth chapter.

Chapters 6, 7 and 8 deal briefly with solutions in cylindrical and spherical co-ordinates, allowances for internal heat sources, and the Laplace transform method of solution.

The ninth and final chapter constitutes a rather sad ending to an otherwise reasonable development. It deals with numerical solutions of the conduction equation by the finite difference technique but unfortunately undue stress is laid on graphical methods of solution. Only the simplest "Schmidt-type" replacement is used for all problems and no mention is made of more accurate replacements with their attendant difficulties of instability. The extension of the method to the case where thermal properties vary is also omitted, a problem which is a striking example of the power of the numerical technique, as no analytical solutions are possible. The reviewer shudders to think of the poor young physicists and engineers attempting to apply graphical solutions to problems involving variable thermal properties and three space dimensions.

R. G. SIDDALL