into two parts: a little over half is devoted to basic principles, and the remainder applies the principles to particular kinds of situations. Thus, the first half is mainly concerned with properties of the ground, with atmospheric turbulence, and with radiation; the second half considers air flow, temperature, and moisture over bare ground, plants, water surfaces, and cities. Special sections are devoted to mountain-valley flow, sea breezes, and air pollution.

The book is most successful in its purely descriptive second part. In the first, largely theoretical part, it suffers from the necessity of having to cover difficult material in little space. The space problem is aggravated by the fact that terms familiar to meteorologists had to be explained to scientists in other fields. Thus most of the theoretical arguments are extremely brief and must appear rather mysterious to the uninitiated reader. Further, many of the arguments are inexact, and, on rare occasions, incorrect. The book is well written and printed, and unusually free from typographical errors.

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Irreversible Processes

Kinetic Equations of Gases and Plasmas. TA-YOU WU. Addison-Wesley, Reading, Mass., 1966. 304 pp., illus. $12.50.

A kinetic equation for a gas of classical point particles is generally understood to be an equation for advancing the one-body distribution function f_1 $(\mathbf{x},\mathbf{v},t)$ in time, according to the relation

$$\partial f_1/\partial t = F(f_1),$$

where $F(f_1)$ is some functional, generally nonlinear, of f_1. The example everyone knows is Boltzmann's equation, usually met for the first time in elementary statistical mechanics courses.

If one wants to improve, in any direction, upon the elementary intuitive picture of Boltzmann, the subject rapidly becomes more mathematical, and intuition must be used only with restraint. Even to derive kinetic equations (apart from the much harder problem of solving them) has been a problem upon which much energy has been expended since 1946. In one form or another, the starting place is usually assumed to be Liouville's equation and nonequilibrium ensemble theory. Wu's book is a collection of a large portion of the calculations which have been done along these lines.

The three physical limits which have received most attention are those of dilute gases (Boltzmann), weakly interacting gases (Fokker-Planck), and ionized gases (the "plasma" case). The plasma case has perhaps been the most tractable, partially because the linearized Vlasov equation (the low-density or high-temperature limit of plasma dynamics) is unique in being solvable by elementary means. The book being reviewed here reflects this emphasis in being devoted to a large extent to the plasma case.

Considerable space is devoted to the work done by Choh and Uhlenbeck, Guernsey, and others on the basis of the Bogolyubov "functional assumption." There is a presentation at some length of the Frieman-Sandri multiple-time-scale method (a generalization of the Krylov-Bogolyubov methods of nonlinear mechanics). There is an introduction to the Prigogine-Balescu diagrammatic perturbation theory. Some attention is given to the contributions of Cohen, Green, Dupree, and others. Finally, some connections are established between kinetic theory and macroscopic fluid dynamics.

The book is a useful one, designed for specialists. It contains a large amount of material. Particularly valuable is the rather comprehensive presentation of the important thesis of Guernsey, never published and now difficult to obtain. Some criticisms, however, must be added to these plaudits.

First, the book is more likely to be of use to someone who already has a fair grasp of the material than to a student in search of information. Insufficient attention has been paid to reordering and organizing the material to make clear which equations (among the—quite literally—thousands) the author regards as fundamental and which as peripheral: all are given approximately equal weight. Second, there is little indication that the quantities being calculated bear or should bear any relation to laboratory numbers. This is no real fault of the author's, in one sense: the increasingly refined calculations of transport coefficients which have preoccupied kinetic theorists of neutral gases for over a generation seem to have little relevance to the present rough-and-ready state of experimental plasma physics. But it seems that one ought at least to pay lip service to some happy future time when it will be possible to find more plasma quantities that are simultaneously measurable and calculable to better than order-of-magnitude accuracy. On this possibility the continued existence of plasma physics as a research area seems increasingly to depend.

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A British Physician

Dr. Thomas Sydenham (1624–1689). His Life and Original Writings. KENNETH DEWHURST, Ed. University of California Press, Berkeley, 1966. 201 pp. illus., $6.

As an outstanding figure in the evolution of British medicine, Thomas Sydenham has naturally received much attention from historians of medicine and science. Since the end of the 19th century there have appeared at least four biographies (Picard, 1889; J. F. Payne, 1900; Newman, 1924; Riesman, 1926). To these may now be added this edition of the original writings of Sydenham together with a biography prepared by Kenneth Dewhurst.

Primarily this volume is intended to present Sydenham's extant English writings. The fact is that his works were translated into Latin by various friends, and the subsequent English versions are retranslations into a smoother, less robust language than Sydenham had himself employed. To the original English versions of these items Dewhurst has added the extant letters. Payne referred to five letters; Dewhurst reprints 11 letters by Sydenham, as well as several letters and documents about him. The writings and correspondence comprise the second part of this book.

The first part is a brief biography which offers a background for the writings. Dewhurst has made use of the Lovelace collection of Locke's papers, incorporating some new material in his biography. Although he does not materially alter the picture of Sydenham's life presented by earlier writers, he does enrich our knowledge of various aspects, particularly Sydenham's medical practice and his relations with Locke. Furthermore, Dewhurst shows quite clearly that Sydenham