theories. The essentials can be found in the text, the details can be followed up through the numerous, very complete references. Undoubtedly some readers, the reviewer included, would wish that the authors devoted more space to some of the more tricky and unsolved problems such as the electronic perturbations surrounding point defects at rest and in motion or to the incredibly low energies of formation of vacancies in certain intermetallic compounds. Admittedly satisfaction of all such personal preferences would result in a much less readable book.

Illustrations are on the whole very well chosen and numerous and the general style of writing is very lucid though concise. The only "quarrel" the reviewer has is the use of roman script in the mathematical formulae. To be sure the formulae themselves are clear and readable, but unfortunately a physical quantity or parameter is often represented by an italic letter in the text but by a roman letter in the adjoining formulae. The book is a most valuable text for anyone interested in solids.

Physics of Plant Environment. W. R. Van Wijk, ed. 382 pp. (North-Holland, Amsterdam) Interscience, New York, 1963. $12.50.
Reviewed by Joseph G. Hoffman, State University of New York at Buffalo.

An old joke about good plays that failed is that the audience laughed but at the wrong places. So, too, the physicist reading this book will find that a mixture of ineptitude, language difficulty, and naïveté makes some parts unintentionally funny. On page 99, for example, in a section about instruments for radiation measurements, contributors Van Wijk and Ubing observe that "The simplest instrument for measuring solar radiation is the Campbell-Stokes sunshine recorder. . . . It actually measures the duration of bright sunshine. The instrument consists of a glass sphere of approximately 9.5 cm diameter. An image of the sky is formed on a strip of heavy paper which shows a burning mark caused by the sun's image when the intensity of the direct solar beam surpasses a certain limiting value. The duration of bright sunshine is measured from the burned trace. Special instructions must be followed in measuring the trace length." From this description the reader has to imagine how the gadget measures solar radiation. Other methods are given, without mention of thermistors, along with a specious discussion of why "a certain photodiode (solar battery)" should not be used. Thermistors are mentioned in a later chapter by Van Wijk and Borghorst who quickly add that these techniques fall outside the scope of this book.

On units of illumination there is reference to a surface "brightness of 60 candelas per cm^2 or 60 stilb". According to this text luminous intensity is expressed in "candelas (c)". The stilb is not mentioned again. The reflection of surfaces is given in Table 3.7 by "reflection factors", yet in the text the earth's albedo is referred to as if it were something different from the reflection factor.

In the very first chapter one finds "tilth" and "tillage" of soil used interchangeably. Units of land are in ha which, I gather, means hectares. The heat capacity of soil is denoted "volumetric heat capacity"; this requires that the reader consult the Table of Definitions with care. One atmosphere is abbreviated as 1 atma. Steradiancy is defined by means of the unit sphere, but celestial coordinates are described on the "celestial globe" and not on the celestial sphere.

The absorption of infrared radiation by water, carbon-dioxide, and ozone in the atmosphere is shown by vertical sections through the graph of blackbody radiation (given by Planck's formula). This simplification is inexcusable at this late date because the absorption bands of these substances are commonplace.

The reader feels more assured in Chapters 4, 5, and 6 which deal respectively with periodic temperature variations in a homogeneous soil, general temperature variations in a homogenous soil, and sinusoidal temperature variation in a layered soil. These chapters are replete with complex numbers, partial differential equations, Fourier analyses, and Laplace transforms.

Rather self-consciously, the first chapter is called "The Physical Method", but the method is not consistently used. For example, when smoke pours out of a chimney and goes to the ground and then rises again it is "looping". If the smoke goes down and stays down it is "fumigating", but I still don't know how this differs from "downwash". Chapter 10 on atmospheric pollution by Schmidt describes these matters but gives no insight into the physics involved.

The Dynamics of Real Gases. By J. F. Clarke and M. McChesney. 419 pp. Butterworths, Washington, D.C., 1964. $17.50.
Reviewed by L. Talbot, University of California at Berkeley.

Twenty years ago the practicing aerodynamicist hardly would have thought that quantum mechanics, kinetic theory, statistical thermodynamics, and chemical kinetics were basic tools of his trade. Today he can hardly think otherwise. As flight speeds become progressively greater, high temperature "real gas" phenomena become more severe, and it is necessary to understand in detail the relationships connecting microscopic molecular processes and macroscopic flow phenomena.

The authors' purpose in writing this book is to give an outline of the physical and chemical theory basic to an understanding of real gas phenomena, and to illustrate the application of these theories to many current problems in gas dynamics. In the first five chapters of the book the fundamentals of wave mechanics, classical and statistical thermodynamics, chemical kinetics, and kinetic theory are presented. The foundations laid in these five chapters are then exploited in the two remaining chapters, on theoretical gas dynamics and the physics of gas dynamics, which together make up more than half the book.

To include within the covers of one volume a useful, nonsuperficial account of such diverse subject matter is obviously not an easy undertaking. Yet the authors have succeeded in doing just that. Some of the theoretical developments are necessarily brief, so that the reader needs considerably more than the information presented in order to carry out analysis himself. But basic physical ideas and the schemes of analysis are presented in