outside the field of low temperature/solid state, or for those who would like a convenient review or introduction to the discipline.

Jackson's book covers the topic, "physics of low temperatures", at some length in chapters 1 and 2 and devotes the other four to the physical properties of matter at low temperatures, covering liquid and solid helium and magnetic, electrical, and thermodynamic properties of solids. It was first published in November 1934 and has been modified and updated with the passage of time. Ideally suited as a refresher or as a general introduction to the field, it attempts to cram an entire discipline—without simplification—into a small book. The author has succeeded in this aim but at the cost of making a highly interesting subject seem cut and dried.

The Les Houches lectures, on the other hand, are meant for the specialist and to a lesser degree for the graduate working in a field related to that covered in a particular lecture.

The lectures cover current studies in a variety of fields, and in many cases the connection with low temperatures is somewhat tenuous. In fact, to quote J. Friedel (Défauts ponctuels et irradiation), "The study . . . at low temperatures is only a pretext to include this lecture in the series." More precisely, the 1961 session of the summer school was devoted to recent progress in physics at low temperatures and to the solid state. Dr. Pippard (Dynamics of Conduction Electrons) shows how—with hindsight—it is possible to use "classical" physics and arrive at a correct explanation of much of solid-state phenomena due to electrons. This is the longest lecture and covers its subject in great detail. Various aspects of superconductivity are covered in two separate lectures, while four are devoted to the magnetic properties of matter. Lectures on the properties of helium and the Mössbauer effect and its application to the study of internal fields (by Abragam) round out the collection.

Many of the works and papers in the journals now are narrow as to discipline and dry as to presentation; this certainly is not true of a lecture—or it shouldn't be—and the editors have been ultracareful here not to allow any of the liveliness to escape. Theoreticians and experimentalists will both profit from perusing this highly readable book. Between the covers of the two books reviewed here, the subject matter listed by J. G. Daunt in "Cryogenics" [Physics Today, April 1962, p. 26.] is quite adequately covered.

Non-Equilibrium Thermodynamics. By S. R. de Groot and P. Mazur. 510 pp. (North-Holland, Amsterdam) John Wiley & Sons, Inc., New York, 1962. *Reviewed by Sangil Choi, Institute for the Study of Metals, University of Chicago.*

It is indeed a pleasure to read an excellent text written by two experts in the field. The book is divided into two parts. In Part A, the authors discuss the general theory of irreversible thermodynamics incorporating the entropy balance equation and the Onsager-Casimir theorem. A refreshing feature of this part of the text is the discussion of the basic postulates of the macroscopic theory in terms of the theory of stochastic processes and the kinetic theory. Chapter 8 is devoted to the Weiner-Khinchin theorem, the Kramers-Kronig relations, and the fluctuation-dissipation theorem, while Chapter 9 contains a discussion of the entropy balance equation and the Onsager relations within the framework of the Enskog solution of the Boltzmann equation as well as the consideration of the entropy production of an ensemble of Brownian particles based on a Fokker-Planck equation.

Part B is entirely devoted to the applications of the general theory to various irreversible processes. Irreversible phenomena are classified into groups according to their tensorial characters and a chapter is assigned to each group. Irreversible phenomena associated with electromagnetic forces are included in two separate chapters, and the last chapter is devoted to discontinuous systems. Part B really is an extensive survey of the applications of the general theory to irreversible phenomena including chemical reactions and their effects on various transport phenomena in continuous and discontinuous systems.

The various discussions of material are presented in a logical order and are easy to follow. A large number of problems are given at the end of the book. This reviewer considers the book to be an excellent and indispensable source for any student of irreversible phenomena.

Nonequilibrium Thermodynamics. A Phenomenological Theory of Irreversible Processes in Fluid Systems. By Donald D. Fitts. 173 pp. McGraw-Hill Book Co., Inc., New York, 1962. $7.95. *Reviewed by R. B. Lindsay, Brown University.*

CLASSICAL thermodynamics is limited to the study of systems in equilibrium. This still permits consideration of processes in which the system passes through nonequilibrium states, as long as in the initial and final states the system is in equilibrium. However, when it is desired to describe transport processes in which diffusion, viscosity, and thermal conductivity play a role, classical thermodynamics must be modified, and is replaced by what is variously termed nonequilibrium thermodynamics, irreversible thermodynamics, phenomenological theory of transport processes, etc. It is the aim of the author of this book to present a review of the basic principles of the subject suitable for advanced graduate students of chemistry and physics. Considering the relatively small size of the book, his success has been considerable, even though the treatment has been limited to fluids.

To the physicist, accustomed to the conventional treatment of transport processes by the method of statistical mechanics, it will come somewhat as a revelation to see how much can be done in the practical study of such processes by phenomenological means. The