that the AEC, having virtually realized its civilian power and weapons development missions, is passing through "a visible climacteric of spirit and purpose." From this assumption follow some very provocative comments on the issues involved, often supported by penetrating but unattributed quotations.

"What is the proper role of government laboratories . . . in the improvement of civilian technology . . .?" he asks. And again, "Is the time fast approaching when the Congress should define more broadly the proper function of designated agencies and of their laboratories, in the realm of civilian technology?" To accomplish an expanded role, Orlans believes the AEC requires a revised charter . . . "An accommodation under which the scope of the AEC is broadened (into, let us say, an Energy Development Agency) and, in exchange for this enlargement of its powers, the Joint Committee on Atomic Energy is bifurcated and reconstituted to include representatives of conventional fuel areas, while the AEC, in turn, is bifurcated into a regulatory commission and an operating agency with a single administrator."

There are many other interesting suggestions in the book, including one to give over control of the Cambridge, Penn-Princeton and Stanford accelerators to the National Science Foundation. These and other comments have already been praised and condemned by Congress and scientists, depending on one's viewpoint, and make for highly stimulating reading.

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The reviewer usually edits the State and Society department of PHYSICS TODAY. *A profile of him appears on page 13 of this issue.*

Crystals with x rays

X-RAY DIFFRACTION METHODS. By E. W. Nuffield. 409 pp. Wiley, New York, 1966. $12.50

by Gerald G. Johnson Jr

The author gives a nonmathematical survey of the methods and techniques used in modern x-ray-diffraction laboratories. There is little advanced mathematical derivation of equations on theory, but the analysis of the presently used methods makes the work useful to the professional crystallographer as well as the student with an interest in crystallography.

The book includes discussions of the five major methods of analysis—the powder, Laue, rotation-oscillation, Weissenberg and precession methods. Each technique is given in sufficient detail that the professor and the student both will find it of value. The instruction on the use of each technique is also quite detailed.

The methods of orienting a crystal and orientation photographs are of extreme value. Not only are aligned photographs shown, but, more importantly to the student, orientation photographs of improperly aligned crystals are given with the methods of correction. Geometries of various methods and other figures in the work make the text very useful. The author is to be congratulated on the excellent figures—a point that some authors seem to avoid!

The text is certainly unusual in the sense that the concept of the reciprocal lattice is not introduced until the second half of the book. The recent wide use of Guinier cameras for powder diffraction is mentioned, but the increased accuracy of these cameras could not be concluded from the author's description.

This book probably could not be used for a course text without an additional text for selected problems in crystallography. It is, however, an excellent reference on the many methods of modern crystallography without the depth of detail that is found in other various specialized texts on the subject. The work certainly fills a need for one small single book to cover the methods of crystallography.

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The reviewer is an assistant professor at the Pennsylvania State University and a consultant to the Joint Committee on Powder Diffraction Standards.

BCS, Bogoliubov, etc.

SUPERCONDUCTIVITY OF METALS AND ALLOYS. By P. G. DeGennes. Trans. by P. A. Pincus. 274 pp. W. A. Benjamin, New York, 1966. $12.50

by Howard Chang

A decade has elapsed since the appearance of the epochal papers of Bardeen, Cooper and Schrieffer in which the microscopic theory of superconductivity was promulgated. During this fruitful and active period, the BCS theory has been applied to explain an ever increasing range of cryogenic phenomena and found to be correct in its essential details. The number of physicists working in this exciting field and the number of papers they have published have increased exponentially with time. Happily, this has resulted in several very significant experimental discoveries and achievements such as a wide variety of tunneling effects, type-II superconducting behavior, the fabrication of loss-free, high-field electromagnets using type-II superconductors (SC) and the beautiful and precise experiments verifying flux quantization.

To be sure, there has been no dearth of monographs explaining the BCS theory, and among these the best is probably Tinkham's tutorial on superconductivity published in the 1961 Les Houches lecture notes. During the past two years, there have been six books published on superconductivity to update the pre-1957 books by London and Schoenberg in which the macroscopic theory was presented. De Gennes's book is the lecture notes of a course he gave at Orsay during 1962–63. The author is a well known expert in cryogenics and is in charge of a group that has made notable contributions to both theory and experiment. The translation from the French by P. A. Pincus is a competent and commendable job.

In Chapter 1, the basic experimental situation is surveyed in a concise and lucid manner. The London theory is used to discuss the zero-dc electric resistivity of metals at the critical temperature, the destruction of superconductivity by strong magnetic fields, the Meissner effect, the energy gap and the natural division of SC into