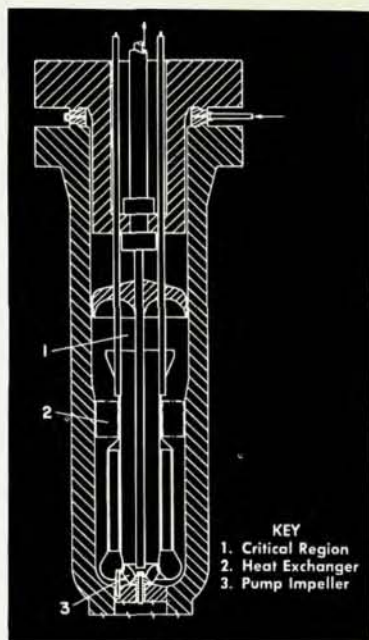


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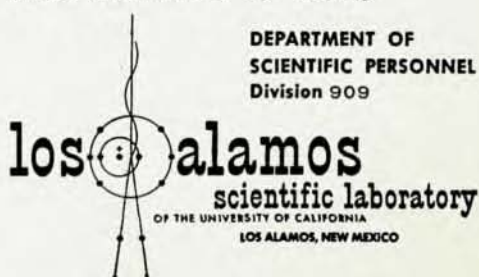


This simplified drawing of an experimental homogeneous type power reactor, now in the final assembly stage, shows one of five nuclear reactor projects currently under way at Los Alamos, where the world's first homogeneous reactor was designed and built and is still in operation.

Indicative of the importance of these experiments is the Laboratory's thirteen year record in active research, design and development in this major field of basic scientific interest.

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conductivity in view of the fact that these topics are discussed in detail elsewhere in the *Handbuch*. The close interrelation between different fields of physics makes it, of course, impossible to completely avoid any overlap in an encyclopedia of this size.

In the third article Blackman gives a comparatively short, but well-balanced, survey of the specific heat of crystals. Throughout the review Debye's theory plays a dominant role. It is interesting to notice that, though much better calculations of specific heats, derived from detailed vibrational spectra, are now available, the results are nearly always discussed in terms of deviations from the Debye curve.

The last article gives a comprehensive survey of the theory of lattice imperfections (Schottky and Frenkel defects, dislocations, etc.). The author states in the introduction that hardly any mention will be made of those imperfections which are mainly characterized by their electronic excitation; such centers will be treated in later volumes. In spite of this limitation, it is impossible to describe in a few words the enormous wealth of information and theoretical analysis contained in this article.

A double subject index (English-German and German-English) assists the reader considerably in finding his way in this important reference work.

Ionized Gases. By A. von Engel. 281 pp. Oxford U. Press, New York, 1955. \$6.75. Reviewed by S. F. Singer, *University of Maryland*.

Ionization and excitation phenomena in gases have become important in atomic physics, astrophysics, spectroscopy, and the physics of the atmosphere and of the solid state, but they do not generally form part of the undergraduate physics curriculum. Perhaps the present volume will change this trend. It is not to be compared to the earlier two-volume work by von Engel and Steenbeck; it is written on a much simpler level with a more limited choice of topics. The book stresses the fundamentals of ionization and excitation processes in gases, collision phenomena, and recombination, with only a small fraction devoted to glow and arc discharges. What makes the book especially valuable, also to research workers, are the many numerical tables of important physical parameters in gas discharges, and the many clear diagrams (144 of them), plus the many references.

Low Temperature Physics (4th Edition). By L. C. Jackson. 158 pp. (Methuen, London) John Wiley & Sons, Inc., New York, 1956. \$2.00. Reviewed by E. A. Lynton, *Rutgers University*.

The expansion of the areas of investigation and the techniques of low-temperature physics during the past decade has brought about not only a correspondingly large increase in interest in this field, but also rapid obsolescence of most general books on the subject. What a pleasure, therefore, to welcome a largely re-

vised and reasonably up-to-date fourth edition of Jackson's little classic. Once again one can recommend this monograph as a good introduction to low-temperature physics.

The publication date of a book is always deceptive—this volume appeared early in 1956, but went to press in the spring of 1954. Its most obvious shortcoming, therefore, and one clearly beyond the author's control, is that it does not cover the last two years. While this is inevitable, its effect is all the more noticeable because the book cites much quantitative and thus necessarily temporary information. As such a monograph can never be more than an introduction to a subject, to be supplemented by much additional reading, it would retain its pertinence much longer by treating most subjects more qualitatively, and with less reference to specific and rapidly obsolete results, than is done here.

Two further exceptions must be taken even in a brief review. One is the book's treatment of superconductivity as part of a chapter on electrical conductivity. The other is an almost complete lack of mention (except for one brief paragraph on Debye-Van Alphen effect measurements) of the various means used to obtain information on electronic effective mass, density of states, and band structure.

In spite of these and other less important shortcomings, the monograph is an important contribution to low-temperature literature and can be recommended as introductory reading.

Principles and Problems in Energetics. By J. N. Brønsted. Translated from Danish by R. P. Bell. 119 pp. Interscience Publishers, Inc., New York, 1955. \$3.50. Reviewed by R. W. Hellwarth, Hughes Aircraft Co.

It is commonly felt that classical thermodynamics represents a closed and rather unassailable body of physical knowledge. Among recent attempts by competent people to assess such matters have been a series of papers and two monographs by J. N. Brønsted written between 1936 and the author's death in 1946. In the course of his investigations Brønsted uncovered a number of logical difficulties in the classical presentations of thermodynamics which seem to have arisen naturally out of the historical nature of the subject's development. In order to resolve these difficulties and present the principles of thermodynamics in a more concise and didactically simpler fashion, Brønsted recast these principles into a form which he called "Energetics", since it deals with all macroscopic, static or quasi-static, energy transformations on a more or less symmetrical basis. Unfortunately most of the papers dealing with the subject have appeared in Danish and hence are somewhat inaccessible. However, there exists now this excellent English translation of the last of Brønsted's monographs, *Principles and Problems in Energetics*.

Briefly, here Brønsted replaces the first and second laws of thermodynamics with a principle which might

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