

in these materials has steadily grown since the outstanding studies of Baekeland at the beginning of the century. The interest in the technology of the resins during the early days of the phenolic resin industry far overshadowed interest in the chemistry involved or in the pure chemicals that might be obtained by proper control of the reaction conditions. However, as the resin technology developed and the applications of the resins became more specialized it became necessary to know more about the mode of formation, factors which determine resin properties, cure, etc. It is the latter considerations which are dealt with in Dr. R. W. Martin's book. The chemistry of the preparation and structure of the phenol-aldehyde reactions is discussed in detail. Other sections review the chemistry of the cure of phenolic resins, the joint reactions of phenols and aldehydes with an added reagent, the formation of cyclic products and the reactions of the phenol-aldehyde products, and the final chapter summarizes the results obtained from reaction-rate studies. The book presents for the first time under one cover the present-day chemistry of phenolic resins and related products, and although written mainly for the resin chemist the emphasis is always directed to the nature of the chemical process occurring rather than the application. The book is a valuable survey of the subject and will be most useful to resin chemists, technologists and others interested in the wider chemistry of polymers.

C. E. H. BAWN

ECONOMICS OF NUCLEAR ENERGY

The Economics of Nuclear Power including Administration and Law

Edited by J. Guéron, J. A. Lane, I. R. Maxwell and J. R. Menke. (Progress in Nuclear Energy, Series 8.) Vol. 1. Pp. xiii+513. (London: Pergamon Press, Ltd., 1956.) 120s. net.

THIS book, which is one of the series issued by the Pergamon Press on "Progress in Nuclear Energy", is well produced and well printed, and contains a mass of information. The book is divided into five sections, of unequal length. The first section, on the needs and resources of energy, occupies the first third of the book. The next three sections, on nuclear power economics, on nuclear fuel cycles, and on reactor programmes and reactor economic data, occupy the middle third of the book, while the last section on administration and law occupies the remainder of the book, together with an adequate index.

The first part of the book, on energy needs and resources, contains general papers dealing with fuel reserves, rates of growth of power requirements and possible uses of nuclear energy, and in addition there is a selection of papers summarizing the energy position in some countries. The general papers on this subject form a convenient source of reference information on the energy requirements of various countries. Similar information is available in other papers, but it is probably true to say that it is expressed as concisely here as anywhere.

In the middle section of the book, dealing with the economics of nuclear power stations, one gets on to ground which is much less firm. It is here that there is a shortage of facts, and a surfeit of predictions.

This, of course, is no fault of the book, but a natural consequence of the newness of the whole field of nuclear power. Not until more information is available from nuclear power stations that have actually operated will it be possible to decide which of the predictions are true, and which are not. The shortage of facts refers not only to the actual cost of reactors, but also to the costs of fabrication of fuel and all the other processes which go to make up the complete nuclear fuel cycle. This question of nuclear fuel cycles is well covered by the papers in the third section of this book.

The last section of the book, on administration and law, brings together a number of papers dealing with the various problems that have arisen, which are specific to the use of atomic energy. The papers given here illustrate the position which has been reached in the various countries actively concerned with the development of atomic energy. It is apparent from these papers that while every attempt is being made to produce codes of practice similar to those used in older and more established industries, this is proving a difficult problem.

Although the majority of the information in this book was given at the Geneva Conference in 1955, it is not for that reason particularly out of date, for whereas much more has been written on the subject since then, there has not been any significant change in the position. The prototypes of some forms of nuclear power reactors have now come, or are now coming into operation, but it is still too early to obtain a comprehensive picture of their true costs, and in any event these first models are prototypes and are not the same as the reactors which will be built for large-scale power generation.

C. A. RENNIE

DISTINGUISHED THERMODYNAMICS

Thermodynamics

An Advanced Treatment for Chemists and Physicists. By Prof. E. A. Guggenheim. Third edition. (Series in Physics.) Pp. xxiii+476. (Amsterdam: North-Holland Publishing Company, 1957.) 34.50 guilders.

THAT a third edition of Prof. E. A. Guggenheim's "Thermodynamics" has appeared barely eight years after publication of the first edition is proof that its unique merit as a comprehensive, logical, and coherent treatise is widely appreciated. The subject is presented as a mathematical system, starting from a few fundamental quantities, one of which is entropy. Entropy and absolute temperature are introduced together, and neither is defined in terms of anything supposedly simpler, for the author does "not admit the existence of any simpler thermodynamic quantities". This approach has logical advantages, but most beginners will need more help than is given here in relating entropy, at any rate, to more familiar physical quantities.

To those who already have some knowledge of thermodynamics, this book will be a treasure house of methods and results, invaluable to chemists particularly, but also to physicists. The topics dealt with include one-component systems, mixtures, including dilute solutions and solutions of electrolytes, chemical reactions, galvanic cells, systems in gravitational, electrostatic, and magnetic fields, and radia-