while others have been left in the original type, which is confusing on a first reading. The figures, also, have not been clearly reproduced.

The book will be of interest to those familiar with basic waveguide theory and concerned with the more advanced aspects of the theory. Throughout the book the general mathematics of the different problems are considered first and then the application of the theory to more practical situations. The book may also be of interest for comparing the separate development of this type of problem in Germany and in Great Britain and the United States during the war years.

The translation of foreign works into English is to be encouraged so that developments abroad are readily accessible to English-speaking readers. It would be unfortunate if the deficiencies in mechanical processes used should lead to a more limited use of these translations than might otherwise occur.

P. A. MATTHEWS

SAFETY IN NUCLEAR ENGINEERING

Technology, Engineering and Safety

Edited by C. M. Nicholls. Vol. 3: Pp. viii + 448 + xii. 105s. net. Vol. 4: Pp. viii + 523. 140s. net. (Progress in Nuclear Energy Series, Series 4.) (London and New York: Pergamon Press, 1960 and 1961.)

IN reviewing the two latest volumes in the series edited by C. M. Nicholls and comparing the contents with those of Volume 2, published in 1960, one is struck by the considerable reduction in the number of reactor types which are discussed. Thus, the later volumes concentrate predominantly on gas- and water-cooled systems and there is only occasional mention of other coolants. This trend is not unexpected or, indeed, unwelcome, since the large majority of power reactors being developed or constructed are either gas-cooled ('*Magnox*', '*A.G.R.*', '*H.T.R.*') or water-cooled ('*P.W.R.*', '*B.W.R.*' and variants).

Volume 3 is divided into four chapters under the headings of engineering, technology, nuclear safety-criticality and nuclear safety-reactor safety. The 15 articles comprising these chapters are all written by experts in their respective fields and generally reach a high standard. An article on steam as a reactor coolant is of particular interest at the present time. It forms a valuable introduction to the subject and highlights some of the problems to be overcome before successful superheating reactors can be commercially exploited. Rather more than half the book is devoted to various aspects of safety and there are five articles on criticality, some of which make fascinating, if sobering, reading.

Volume 4, the latest in the series, follows the same general layout as its predecessors. There is a chapter under the heading process technology, containing four articles reporting American experience on the gas-solid and liquid-liquid chemical engineering operations involved in uranium processing and the reprocessing of nuclear fuels. Other noteworthy contributions include reviews on various aspects of high-temperature gas-cooled reactor technology. This subject is particularly appropriate at a time when widespread attention is being given to the ultimate development of the gas-cooled reactor, from Calder Hall on one hand, to the *Dragon* Project

at Winfrith in Dorset and similar high-temperature reactor projects in the United States and Germany, on the other. Water-cooled reactor technology is covered by an article on the important subject of boiling stability and by an informed discussion on recent developments in zirconium alloy corrosion. There is also an article in the reactor safety section on recent developments in the study of metal-water reactions. This is still an open subject, but the present review goes a long way towards clarifying the issues involved.

The chief criticism of this series is that it attempts to cover too wide a range of subjects; for example, the various aspects of safety could well be the basis of a separate series. With this reservation, the present books constitute a valuable fund of information, well presented and indexed, which should be of special interest to those already having some experience in this field. Some of the articles contain a wealth of references (one in Volume 4 has 241 and another 136) which the reader will find of considerable assistance in following up subjects in which he has a particular interest.

D. ENGLISH

INFORMATION THEORY

Information Theory

Papers read at a Symposium on Information Theory held at the Royal Institution, London, August 29th to September 2nd, 1960. Edited by Colin Cherry. Pp. xi + 476. (London: Butterworth and Co. (Publishers), Ltd., 1961.) 95s.

THIS volume contains the thirty-six papers and discussion presented at the fourth London Symposium on Information Theory. The expositions extend beyond pure information theory and are classified under the headings of: coding and detection theory and statistical theory; telecommunication systems; human reaction to information; sensory information and biological models; learning mechanisms and other artefacts; classification theory, syntactics and semantics. The papers were presented by active research workers, and the subjects range from mathematics (for example, the ten papers under the first two headings) to experimental psychology (such as most of the eleven papers under the third and fourth headings).

A general comment on the content of the symposium may be of interest. The former, fairly well defined, boundaries of such traditional subjects as applied mathematics, psychology, physiology and information handling (documentation, bibliography and general library procedures) are rapidly being swept away, and concepts and methods of one discipline are making deep inroads into neighbouring territory. This process is nowhere illustrated better than in the present volume on information theory. The successful research workers in this field will, in future, find it necessary to be able to speak with the psychologist, physiologist and librarian on his own territory, and this will particularly apply to the applied mathematician who sets out to contribute to one or more aspects of the subject. This, it is clear, is likely to have a profound effect on the structure and content of undergraduate courses in the universities. It will not be enough for the applied mathematician to learn only about the applicable parts of pure mathematics and their use in physics and engineering; nor will the psychologist and physiologist be able to forego