

It is the aim of this forty-second monograph of the World Health Organization to provide the basic information for government officials and health administrators who face this challenge. The monograph is essentially a practical handbook for civil and sanitary engineers, medical officers of health and public health administrators, and it describes in a clear and concise manner the ways and means of organizing rural water-supply in order to satisfy basic personal hygiene. Methods of installing various types of water-supply systems from both underground and surface water sources are detailed, together with a consideration of treatment under rural conditions and problems of distribution and use. The monograph concludes with a section on the management of water-supply schemes and a lengthy list of appendixes dealing with a wide variety of topics of value to the engineer working in remote areas.

It seems fairly clear from experience already gained that in most small communities in under-developed areas more health benefits can be gained from money spent on a water-supply programme than in any other way. The supply, however, must be adequate in both quantity and quality and not prohibitive in cost if the hygienic standard of the community is to be raised to a new level. There is, in fact, a remarkable degree of correlation in many communities between standards of living and consumption of water *per caput* per day. This new monograph should help materially in raising the water consumption, hygienic conditions and standards of living of many small communities at present held back by poverty-stricken conditions, high incidence of disease and death, and lack of knowledge.

W. G. V. BALCHIN

REACTIVE METALS

Reactive Metals

Edited by W. R. Clough. (Metallurgical Society Conference, Vol. 2.) Pp. xiv+610. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1959.) 113s.

THIS book presents the papers and discussion from the third Reactive Metals Conference of the American Institute of Mechanical Engineers in 1958. We have grown accustomed to the reporting of conferences in the United States, and this one follows standard practice. There is no visible sign of any theme or thread of continuity in the papers, except the commonly accepted classification of reactive metals, which here includes the transition metals of Groups IV, V and VI A of the Periodic System, together with uranium. The papers are grouped under properties and applications, titanium alloys, nuclear, consolidation, powder techniques, melting and refining; physical metallurgy, temperature effects, phase relationships, interstitial effects; metal processing and fabrication. As a summary of recent American work in very specific fields, such a collection may be of interest to large research and development organizations, but is more likely to be a reference book for the library than resident on the shelves of an individual.

A light-hearted discourse characterizes some of the papers, and, as so frequently happens, the bibliography does not include appropriate European work. The odd references to British papers are

occasionally obscure ones (for example, U.K. Atomic Energy Authority Technical Notes) considering that the same work has often been published in the journal of a learned society. Two contributions on vanadium alloys, by Karl F. Smith and R. J. Van Thyne, discuss the requirements of fuel cladding materials in fast fission reactors. The argument follows very closely that published in Britain some three years ago, and seems to contradict the previous American point of view expressed at the Geneva conference later in 1958.

The most interesting work described is that on titanium alloys and the physical metallurgy of molybdenum, vanadium and niobium. It is a great pity that the Americans still persist in referring to 'columbium' in spite of international agreement to the contrary. There is also a strange reference on p. 7, in the keynote address by D. J. McPherson, to the use of 'columbium' in one U.S. reactor and its planned use in one British reactor. So far as I am aware the use of niobium in the Dounreay fast reactor was first suggested in 1953 and was fixed by early 1956, some years before the Conference to which this book relates.

C. R. TORTLE

PLUTONIUM AND ITS ALLOYS

Extractive and Physical Metallurgy of Plutonium and Its Alloys

Edited by W. D. Wilkinson. (Based on a Symposium held in San Francisco, California, February 16-17, 1959.) Pp. x+314. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1960.) 79s.

ANY information on plutonium is welcome, and the freedom of discussion noticeable since the first Geneva Conference on the Peaceful Uses of Atomic Energy has led to many more symposia of the type presented in this book.

The contents are classified as the title suggests: but an introductory first chapter summarizes, very neatly, the properties of the six allotropic forms, the necessary safety precautions in handling, and discusses the solid state of the plutonium atom.

Six papers on extraction metallurgy cover a wide field, from conversion of salts to metal to removal of fission products by liquation. One American paper reports work between 1943 and 1946, and, in contrast, a French contribution refers to 1956. Detailed results are quoted for extraction coefficients in the distribution of plutonium and impurity elements between nitrate solutions and tri-butyl phosphate. This section on extraction processes will be of value to the chemical engineer working in this field, although one imagines that perhaps some of the information is already well known to those receiving security guarded reports.

The physical metallurgy papers are extremely interesting for metallurgists. A general treatment of the alloying potential of the metal is followed by articles on plutonium alloys containing cerium and zinc. The metallographic techniques required and the transformation characteristics are also referred to with respect to the metal and its alloys. References are given at the end of each paper, and an annotated bibliography and subject-index at the end of the book.