Book Reviews

Nuclear Energy in Industry. By J. G. CROWTHER. Newnes, London, 1956. 168 pp., $3.95, 17s.6d.

This book is basically a digest for the layman of the Proceedings of the First International Conference on the Peaceful Uses of Atomic Energy, and the only information available regarding the author is that he attended the Conference as a representative of George Newnes Ltd. After emphasizing the impending shortage of cheap fossil fuels, Mr. Crowther explains the fission process, describes the various types of reactors—particularly, power reactors—discusses the industrial applications of isotopes, and summarizes the mining, processing and metallurgy of uranium and other reactor materials.

Insofar as imparting the spirit of nuclear energy to the layman, the author has done an acceptable job. Chapter II, "What is Nuclear Energy?" gently leads the reader through the early scientific discoveries of radiation and the fundamental particles, to a simple explanation of the chain reaction and the principles of a reactor. If anything the discussion is oversimplified. The chapters on actual research and power reactors are replete with interesting photographs and design data, but are heavily oriented toward British practice. Mr. Crowther devotes 8½ pages to the USSR power reactor, 15 pages to Calder Hall, but only 15 pages to *all* the US power reactors combined (PWR, BWR, SGR, SRE, LMFR, HRT, etc.)

As a general reference, the book suffers from obsolesence (mid-1955) and from some inaccuracies, such as the following:

The recent McKinney Report estimates world energy resources higher than Crowther by a factor of 4 and the total world energy consumption in the year 2000 higher by a factor of 2. There are some loose statements like, "Millions of millions of neutrons may cross each centimetre of the core every second, forming a neutron gas or neutron flame within the core in which the fissile material is burnt up, like the coal-dust burnt in the flame inside the furnace of a coal-fired boiler." The reason for selecting gas cooling for Calder Hall is quoted as: "for in case of accident, should the gas escape, the reactivity in the core would die down, like the collapse of a tyre after being punctured."

This reviewer thinks the chapter on isotopes is by far the outstanding feature of the book, one which covers the subject adequately and interestingly and best befits the title of the book.

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(Editor's Note: Mr. LeClair has long been known as a leader in the development of nuclear power for central station generation of electricity. Formerly Manager of Research and Development at Commonwealth Edison and operating chairman of the Nuclear Power Group, Inc., which co-sponsored the Dresden nuclear power plant at Joliet, Illinois, he has also served in advisory capacities to the Atomic Energy Commission and Joint Congressional Committee on Atomic Energy. Mr. LeClair is presently Manager of Nuclear Power Applications for General Dynamics' General Atomic Division and is responsible for the commercial applications of its advanced power reactor systems.)

Radiation Hazards and Protection. By D. E. BAINES AND DENIS TAYLOR. Newnes, London, 1958. 178 pp., 51 figs., 30 shillings.

The authors have attempted a somewhat condensed presentation of the problem of radiation hazard and protection. In an endeavor to provide some background for the specialist, as well as the nonspecialist, and particularly the latter, the book appears to reach its objective.

Many people in technical administration find themselves confronted with the necessity of having to cope with a radiation management problem that appears to be quite separate from the other normal objectives of the organization. There is an inclination toward intolerance on the part of some of the individuals toward the seemingly large number of detailed matters that have to be considered. For such individuals this book is good medicine.

The first six chapters deal primarily with the biomedical aspects of the radiation problem. Enough detail is given to develop the nature of the problem and to point out the many facets involved in shielding man from radiation. One would hardly be able to set up a protection program on the basis of this information but he would certainly obtain a good idea of the problem.

Much of the remainder of the book deals with the various aspects of radiation measurement and instrumentation. The chapter on Radiation Output presents some useful formulation for computing dose rates for different geometries and for radioactive material deposited in tissue. This provides a useful introduction to the broad problem. Laboratory and shielding design information has been given. This appears to relate particularly to larger installations, such as those in which the authors have had experience. There is no need for such information for the small user. General discussions of instruments by type and purpose have been presented.

The discussion of instrumentation could not possibly be complete and the authors' selection has been a reasonable one. It is natural that the instrumentation discussion relates largely to British equipment. Reference is made, however, to sources of similar information in other countries.

It is unfortunate that in a few spots the book is already dated. In 1958 when it was first published, present day concepts regarding radiation dosimetry and units were already available. These do not appear anywhere in the book. Similarly, at that time some rather radical changes had been made in the concepts of radiation protection standards and these also do not seem to be reflected. It makes one wonder whether some other parts of the material discussed, but with which the writer is less familiar, may also be some-