likes to present the issues as a series of personal anecdotes; the experiences of about 120 people appear in this book. These anecdotes, generally quite interesting, are grouped in sets of one to three in a sequence of 53 untitled chapters, presented in rough time sequence.

The book begins on Sept. 17, 1942 with the appointment of Brig. Gen. Leslie R. Groves as head of the Manhattan District of the Army Corps of Engineers, the executive organization for all of the manifold scientific, industrial, and governmental aspects of the Manhattan Project. The author employs a flashback technique to point out basic discoveries and earlier projects for collecting fissionable material. Most of the developments are presented as seen through Gen. Groves' eyes at the times of needed production decision. He was a hard-driving, indefatigable man of enormous capacity for detail, never lacking in self-confidence, who contributed greatly to the achievement of Project goals. However, it was by no means easy to work under him. The book overly glorifies the general as a benign and ever-cheerful boss, a super-whizz of an industrialist among industrialist whizzes.

The book is good on people, but presents the Project as a set of industrial ventures. It gives much more personalized pictures of decision-making (but fair ones) than does the official Project history, "The New World 1939/1946" by R. G. Hewlett and O. E. Sanderson, Jr. (Pennsylvania State University Press, 1962). It also ends abruptly with the wartime bombs on Hiroshima and Nagasaki, with no attention whatsoever to broad scientific, industrial, military, or international implications of atomic energy, or to the United States Atomic Energy Commission that followed the Manhattan Project on Dec. 31, 1946. The book is good as far as it goes, but does not give, as its subtitle promises, much previously untold technical information.

Charles D. Coryell, professor of chemistry at M.I.T. since 1946 (PhD, Caltech., 1935), led fission-product chemistry work for the Plutonium Project at the University of Chicago and at what is now Oak Ridge, starting in May 1942, well before the Army formed the Manhattan Project. Three years' residency at Munich, Rehovoth, and Paris plus numerous trips abroad and a warm spirit that is contagious have won him thousands of loyal friends all over the world. Consultantships to three national laboratories and several companies attest to the respect in which he is held in the scientific community. Coeditor, with Nathan Sugarman, of the 2100-page record of wartime research: "Radiochemical Studies: The Fission Products," National Nuclear Energy Series, McGraw-Hill, 1951, Professor Coryell remains very active in nuclear chemistry and radiochemistry.

PRACTICAL NUCLEAR KILOWATTS

Title Nuclear Power Plant Technology

Author J. George Wills

Publisher John Wiley & Sons, Inc., 1967

Pages xi + 323

Price $16.50

Reviewer Edward C. Pandorf

The author, Mr. J. George Wills, is an engineer and writer by training and experience, currently with the Mobil Oil Corporation Research Department. In his Preface, Mr. Wills says that the idea for the book was conceived within the Mobil research organization, presumably for making available a review of the fundamentals of nuclear power and a current "state-of-the-art" report on the nuclear power industry for use both within the Corporation and by the technically oriented segment of the reading public.

Nuclear Power Plant Technology is an easily readable book, requiring a modest technical background and interest in nuclear physics and power plant engineering. Its emphasis is on practical applications rather than design details, but the author is thorough enough in the coverage of specific processes, components, and systems, to give the reader a fairly comprehensive view. The reasons why some things must be done and the choices where alternatives are available are given in such examples as the selection of reactor systems, fuels, moderators, coolants, controls, shielding, siting, and waste disposal.

In my opinion, the author is to be congratulated for resisting the temptation to touch on *every* aspect of nuclear power in this one volume. The descriptions of hardware, systems, and design philosophies are interesting and informative. No attempt is made to document operating experience, except in very specific areas of interest; and economic considerations are omitted almost entirely, because these could easily double the size of the volume.

The book includes a wealth of diagrams, tables, schematics, and photographs to expand on the text and to illustrate details ranging from simple components to cutaway perspectives of Dresden-1, Harwell, Hinkley Point, Piqua, and Indian Point-1. It contains tabulations of the elements, uranium ores, properties of coolants and moderators, radiation dose units and exposure limits, shielding compositions, and worldwide nuclear power plants—operating, under construction, and planned.

The last two chapters of the book cover radiation effects on petroleum products and lubrication recommendations. I found these fascinating since they cover lubrication aspects of nuclear power plant components more thoroughly than any previous exposure I had in this field.

The book concludes with a glossary of nuclear technology which is handy for reference by a part-time nuclear engineer who may occasionally get rusty on terms, definitions, or constants.

Mr. Wills has made a contribution in the intermediate level of nuclear technology which can assist power engineers in obtaining a nuclear orientation, and which may help electric utility companies in their information programs for governmental regulatory agencies and the general public

Edward C. Pandorf has spent 30 years as a mechanical engineer with The Cincinnati Gas & Electric Company, over half of which has involved nuclear power. In 1951 he went to KAPL for one year as a consultant on the prototype power plant for the submarine "Seawolf." In 1952-54 he

worked at The Detroit Edison Company on early studies for the Enrico Fermi Fast Breeder Reactor, and still serves on the PRDC Technical and Engineering Committee. In 1964 he was instrumental in organizing the ANS Technical Group for Power, and as the first chairman, saw it through to its present status as the ANS Power Division. Mr. Pandorf also serves his company as a specialist on codes and standards and, among many assignments in this field, is the current chairman of USA Standard B31 Code for Pressure Piping. He is a Fellow of ASME and Vice-President of the Ohio Society of Professional Engineers.

FUTURE RESEARCH REACTORS

Title Research Applications of Nuclear Pulsed Systems

Author IAEA

Publisher Natl Agcy for Intl Publ Inc., 1967

Pages 234 pp, 134 figs

Price $5.00

Reviewer Robert E. Chrien

It was fitting that a panel meeting on the research applications of repetitively pulsed neutron sources was held at Dubna, U.S.S.R. in July, 1966. At Dubna the Russians built the world's first (and to date, only) repetitively pulsed reactor, and organized an imaginative and impressive research program which has been operative since 1961.

A book comprised of papers presented at this panel meeting, *Research Applications of Nuclear Pulsed Systems*, has been issued by the IAEA. It is especially timely since several proposals to build high intensity pulsed sources are currently being considered in the United States, Canada, and Europe. Eighteen papers covering various topics are included. These cover possible applications of time-of-flight methods to the study of the static and dynamic properties of solid and liquid structures, and to nuclear physics. Proposed facilities such as the SORA reactor at Ispra, the Canadian Intense Neutron Generator, and the Harwell Super Booster are also described. Neutron time-of-flight studies at Dubna and at various other installations are covered.

As might be anticipated, the collection is notable for unevenness in quality and redundancy of material. Like many such books, the material is of interest mainly to the specialist. Within these limitations, it forms a valuable source for time-of-flight methods, particularly as applied to solid-state problems. Several of the papers present excellent summaries of this specialized area; the paper of R. M. Brugger on "Neutron Diffraction Studies of Samples at High Pressures," and that of P. A. Egelstaff on "Pulsed Neutron Sources in Solid and Liquid State Physics," in particular, are well written. Redundancy is sometimes a virtue; for example, the discussion of Buras's work on diffraction studies by time-of-flight is presented much more clearly in Brugger's paper than it is in Buras's own paper.

Professor I. M. Frank presents an impressive account of the research program at the Dubna pulsed reactor. Especially notable is the Russian work on resonance (n, α) reactions, and polarized neutron reaction studies. The balance of the papers presented by the U.S.S.R. delegation is less notable. One wonders why the general level of Russian report writing is not better; the diagrams and figures are uniformly poor.

On the whole, the book makes a convincing case for the usefulness of pulsed-neutron sources in solid-state physics. The continuous reactors are clearly approaching their limit as intense neutron sources, and the next generation of research instruments will no doubt be pulsed systems. This book is a valuable reference for those specialists who will be working in this field.

Robert E. Chrien is a research physicist at Brookhaven National Laboratory. As a graduate of Rensselaer Polytechnic Institute and Case Institute of Technology, he came to BNL in 1957 to work with the late Donald J. Hughes. He has been active in the measurement of total neutron cross sections, resonance parameters, and more recently, in the study of neutron-capture gamma rays in the resonance region. A pioneer in the use of on-line computers in neutron physics, he, R. Spinrad, and S. Rankowitz designed the first time-shared, on-line computer system for nuclear physics applications.

NEOTERIC OLD FRIEND

Title Sourcebook on Atomic Energy

Author Samuel Glasstone

Publisher D. Van Nostrand Company, Inc., 1967

Pages v + 883

Price $9.25

Edition Third

Reviewer Marvin H. Wilkening

This third edition of Dr. Glasstone's monumental work will be welcomed by its old friends because of the updating on the sections on nuclear structure, nuclear reactors, controlled fusion, cosmic rays, and the synthetic elements, plus a new chapter on elementary particles. At a time when power production from nuclear reactors is expanding rapidly, and the whole field of nuclear applications is receiving new impetus in such widely varying areas as industry, medicine, biology, agriculture, law enforcement, archeology, and cosmology, this edition that treats advances in all of these fields is especially appropriate. The addition of a list of books and articles for further reading at the end of each chapter will greatly enhance the value of the book to the student and to the research scholar outside of atomic and nuclear science.

Although the new edition has been expanded considerably,—883 pages compared with 546 pages in the first edition,—the organization of the subject matter remains essentially the same. The first five chapters constitute a delightful compilation of the history of atomic theory beginning with origin of the atomic concept by Leucippus in the 5th century, B.C. and continuing through that golden era of atomic discovery from the early 1890's to the beginning of World War I. This part of the book