BOOK REVIEWS

Selection of books for review is based on the editors' opinions regarding possible reader interest and on the availability of the book to the editors. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

WELL PRESERVED

Title Radiation Preservation of Foods

Editor Robert F. Gould

Publisher American Chemical Society

Pages v + 184

Price $7.00

Reviewer E. C. Maxie

The title of the book, although technically appropriate, is unfortunate because several other books or monographs bearing the same title have appeared.

Publishing compilations of symposia papers in book form usually results in a disjointed presentation of subject matter, and this book suffers from this affliction. Even so, it is a valuable addition to the literature of a rapidly developing technology in food preservation.

The most glaring deficiency of the book is the absence of information on the safety and wholesomeness of irradiated foods. It is difficult to imagine a symposium on food irradiation without one or more papers concerned with safety and wholesomeness.

The book will be a valuable resource document for persons interested in irradiation of meats. The chapters on this subject are generally good and include much worthwhile information. The chapters concerned with fruits are less valuable, for there is no information on the effects of irradiation on the pathogens that attack fruits. Further, much good information on irradiation effects on fruits and fruit pathogens that was available in 1965 has not been touched.

The quality of the illustrations in the book is excellent. The text material is well written and easy to read. Persons interested in food preservation will find the book of value, and those interested in food irradiation should consider it a must volume for their technical library.

E. C. Maxie is Professor of Pomology at the Davis Campus of the University of California, where he does research and teaches in the fields of postharvest biochemistry and physiology of fruits, with special emphasis on irradiation effects. His PhD (1953, Plant Physiology) is from Purdue.

CLEAR PERSPECTIVE

Title Science, Government and the Universities

Introduction Frederick Seitz

Publisher University of Washington Press, 1966

Pages vii + 116

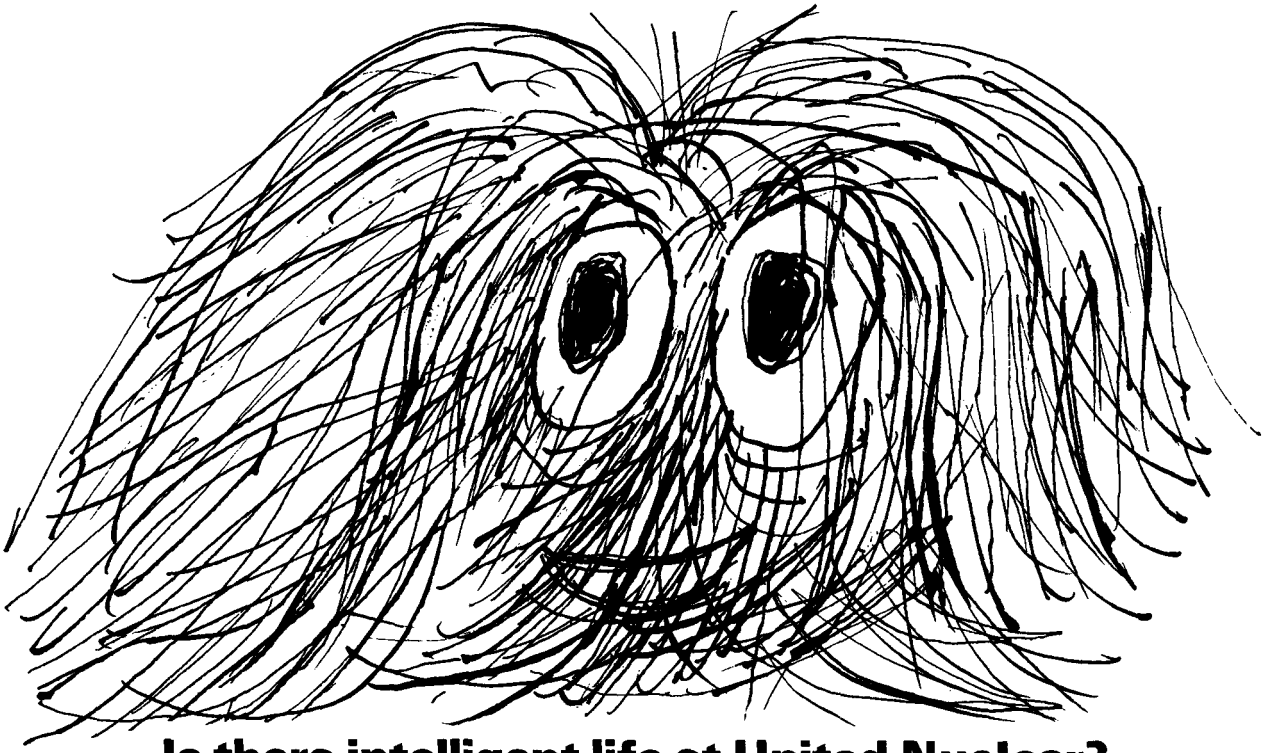
Price $4.95

Reviewer Ernest F. Johnson

The autumn meeting of the National Academy of Science in 1965, held at the University of Washington in Seattle, included a symposium on the relationship between the universities and the federal government in the field of scientific research and development. Contributions to that symposium plus two relevant addresses delivered at the meeting have been assembled into an attractive and timely little book. Much has been written and spoken in recent years about the interactions between government and universities, but it would be difficult to find a clearer perspective than is afforded by the book reviewed here. Each author has a pivotal position in the scientific community, or in the university, or in the government, and each identifies quite specifically what he believes should be done and what he expects will be done.

Despite the diversity of background and of responsibility of the authors, their views by and large are either concordant or complementary. The plea of the medieval historian, who is also a university president, for more humanistic emphasis in higher education, is echoed by the professor of biochemistry, who is also board chairman of the National Science Foundation, and who observes that science is the most liberalizing of the liberal arts. The concern of the Special Assistant to the President for Science and Technology that scientific excellence in universities be preserved and extended is reflected in the particular views of the Directors of NIH and NSF and the late Deputy Director of NASA.

For the reader who would like to know the likely trends in the relations between the federal government and institutions of higher learning in



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It's a challenging new, rapidly expanding field in which there are exciting career growth opportunities, with rewards for talented people who can contribute initiative and imagination. Among the immediate openings are:

IRRADIATION TEST ENGINEERS or Scientists... for studies of nuclear reactor irradiations of fuels. Responsibilities involve conceptual design of experiment, specification of materials and assembly procedures, liaison with detail design team, direct supervision of rig assembly, liaison with test reactor, interpretation of data, liaison with hot cell examination.

METALLURGISTS—LIQUID METALS. Requires liquid metals experimental background, to design and construct thermal convection and pumped loops. Assignments will include experimental work on liquid metal systems involving corrosion, mass transfer and instrument development.

HEALTH PHYSICIST . . . to provide radiation monitoring control and inspection services; design and write safeguard control procedures. B.S. degree in Engineering or Science, or equivalent education required, plus two years' experience as an operating health physicist in industry or governmental laboratory operation.

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ELECTRICAL ENGINEERS. B.S. degree in Electrical Engineering required, plus five years' experience in electrical systems design and analysis for nuclear power plants.

MECHANICAL ENGINEERS . . . for advanced work in stress analysis, testing, specification writing and computer codes for nuclear fuel development programs. B.S.M.E. required, with minimum of five years' applicable experience.

MECHANICAL ENGINEERS with heat transfer and/or fluid flow experience, to perform, design and analyze the engineering of fluid systems for nuclear power plants. B.S. in Mechanical Engineering plus five years' experience required.

WELDING ENGINEERS experienced in welding materials used in all types of nuclear reactor construction, including fuel rods, fuel element structure, high alloy castings and heavy wall pressure vessels. A knowledge of methods, procedures, configurations, inspection and quality control is essential. Materials include stainless steels, Inconel, zirconium alloys, etc. B.S. or M.S. in Engineering or Metallurgy required, plus 8 years' experience in the nuclear industry, preferably in nuclear fuel.

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engineering and science, this very readable book will provide insights from the minds of the individuals who are most able to affect those relations.

Dr. Ernest F. Johnson is professor of Chemical Engineering at Princeton University. From 1962 to 1966 he was Associate Dean of the Faculty with special responsiblity for physical and academic planning, particularly in science and engineering. Since 1962 he has been a member of the Board of Trustees of Associated Universities, the corporation that operates Brookhaven National Laboratory and the National Radio Astronomy Observatory, and since 1965 he has been Chairman of the Board and Chairman of the Executive Committee of that corporation.

ORGANICS INTERNATIONAL

Title Organic Liquids as Reactor Coolants and Moderators

Publisher International Atomic Energy Agency, 1967

Pages 148

Price $3.50

Reviewer Robert O. Bolt

Duplication of research is difficult to prevent in a single country and impossible to prevent in multicountry programs. Such is the case with work on organics as reactor coolants and moderators, involving, as it does, many countries with several different objectives and no possibility of direct coordination. Much overlap is evident, even to the novice, on reading this panel report. Discussion of the research, a step in making duplication known, was a major purpose for which the IAEA convened a panel of 15 participants and observers from seven countries and Euratom.

Status reports from Euratom, Canada, France, Hungary, India, Spain, and the United States are presented. Topical summaries of the five technical sessions, based on individual technical papers, are also included. The summaries deal with measurement of physical properties of organic compounds, stability, heat transfer and fouling, reclamation and purification, and analytical techniques. Abstracts of 24 individual technical papers are also included.

The topical summaries, each five to ten pages in length, are all in English, and are generally well written with appropriate conclusions and recommendations. The status reports range from a single page for the Canadian and French contributions to 26 pages for Spain. This disparity does not reflect the size of individual programs, but rather, the availability of current information in other publications and the inclination of the author to emphasize detail. The reports from Euratom and France are in French; the others are in English.

Each technical paper abstract is only about one page long. All are in English and about three-fourths also have additional abstracts either in French or Spanish.

As is evident from the report, anyone interested in complex problems can have his fill with the organic reactor. There is an interplay of radiolysis and pyrolysis on coolant consumption with the prevalence of temperatures of 300 to 400°C in a damaging radiation environment. Even the measurement of components of this environment is difficult. Fouling of vital heat transfer surfaces is affected by impurities such as chlorides, oxygen (and oxidized organics), and water, and yet some water must be present to avoid hydriding the zirconium fuel element cladding. Means of detecting precursors to damaging effects are important to the economic success of the reactor system. Factors such as these, together with more fundamental knowledge of chemical mechanisms, must be tied together in a neat package if the organic reactor concept is to succeed. The progress made by this panel in arranging this package leaves a good overall impression.

However, as is inevitable with publications without editors, some conflicting data, mostly minor, are cited in the report. The naiveté of some of the work is evident to anyone in the field. This emphasizes the lack of communication between countries and/or the deliberate ignoring of past work for the sake of gaining experience. Either case represents a loss to science. The detail of presentation is tiresome in several instances. Such detail is of interest only to those actively engaged in the organic reactor program, and their ranks have been thinned recently by the demise of the United States on-again off-again program and the termination of the work in Spain.

People in radiation chemistry will find valuable the work on the terphenyls and some of their hydrogenated derivatives. However, the research is quite engineering-oriented in that high temperatures and high radiation doses in reactors were generally used. Information on analytical techniques, highly developed in many instances, will also be of interest to radiation chemists.

Robert O. Bolt is a senior research associate at the Chevron Research Company. For over 15 years he was involved with radiation effects on organic fluids, including oils, greases, organic fuels, and reactor coolant-moderators. An author and an editor of the book, "Radiation Effects on Organic Materials" (USAEC 1963), and since 1953 a member of several advisory groups on radiation damage, he received his BS (1939) from James Millikin University, and his MS (1942) and PhD (1944) degrees from Purdue.

BOOK ANNOUNCEMENTS

Although the following books will not be reviewed, they may be of interest to some of our readers:

Irradiation of Polymers, Robert F. Gould, Ed., American Chemical Society, 1967, v + 275, $8.00

All of the remaining books were published by the International Atomic Energy Agency (1967):

Solid-State Dosimetry, 143 pp, $3.00
Radiosterilization of Medical Products, Pharmaceuticals and Bioproducts, 94 pp, $2.00
Alkali Metal Coolants, 786 pp, $16.00
Standardization of Radionuclides, 744 pp, $15.00
Regulations for the Safe Transport of Radioactive Materials, 117 pp, $2.50
Processing of Low-Grade Uranium Ores, 247 pp, $5.00
Nuclear Data for Reactors, Vol. I, 576 pp, $12.00; Vol. II, 437 pp, $9.00