of review has therefore been assigned by default to invited papers presented at symposia. Unfortunately, most such are presented by project managers who have very partisan points of view. The general result is that it is difficult to find summary articles on practical topics in nuclear science and engineering that are complete and professionally unbiased.

The series of *Advances* was started with the avowed intention of filling this functional gap. At first it did not do so. Earlier volumes were flawed by articles whose chief value lay in official sponsorship of the topics presented, or by articles that presented topics of parochial interest. The series has now grown up.

It is a pleasure to report that this volume of review articles is a worthy addition to the professional literature of nuclear energy. The articles are of uniformly high quality and, for the most part, are timely. They will be treated one at a time in the review that follows.

The first article, "Quasi-Exponential Decay of Neutron Fields" by Noel Corngold, is definitive of its topic. Corngold's papers are always clear and complete, and this is no exception. I can pick one bone, only, with it. The topic of neutron pulses and neutron waves, with which this paper is concerned, has actually been a rather sterile one as to its practical contribution to nuclear energy. I hope that the fact that not everything is yet understood about it is not taken as an invitation to continued concentrated effort on this subject, an effort that the paper's epilogue seems to encourage.

The second paper, "Integral Experiments in Fast Zero Power Facilities" by Edgar Kiefhaber, is a comprehensive summary of both experiments and their interpretation by one of the leading physicists of the Karlsruhe group. The 167 references are a comprehensive checklist of the important material on the subject, and the conclusion that future experiments will be justified on technical rather than scientific grounds is supported by the text material.

"Evaluated Nuclear Data Files" by S. Pearlstein is less a review than it is an introduction to the topic. The author, a leader of the Brookhaven group, has chosen to describe rather than to evaluate the various compilation activities throughout the world. The chief virtue of the article is in its references to the documentation that accompanies each of the data files covered.

"The Management of Fission Products and Long-Lived Alpha Wastes" is by J. P. Olivier of the OECD Nuclear Energy Agency. It is basically a summary report, with some interpretation, on the Paris Symposium on Management of Radioactive Wastes from Fuel Reprocessing held in Paris in 1972. The status of the topic as reported then was, and remains now, "scientifically under control, some experiments needed, no surprises expected." This article is recommended for study by nuclear engineers who wish to respond to the waste management "issue." This red herring has been cynically publicized by scientists opposed to nuclear energy who have deliberately obfuscated the scientific facts involved.

"Finite Element Methods in Reactor Physics Analysis" by K. R. Hansen and C. M. Kang of the Massachusetts Institute of Technology is a good presentation of an important topic. As an empirical theorist, I discovered on reading the article that I have been using the finite element throughout my career without realizing it! The article is long and makes up for a somewhat inadequate biblography by treating the topic at several levels: heuristically, by suggestion, by theorem, and by illustration.

The final article, "Coated Nuclear Fuel Particles" by N. Piccinini of the Turin Polytechnic Institute (Italy), is essentially a textbook chapter on the topic. The review is by exhaustive bibliography, while the text is explanation. It is quite possible that this is the preferred way of presenting this subject, since much of the literature is "best-foot-forward" revelation of proprietary data, and basic understanding is the key to its interpretation.

This book is recommended for purchase by any nuclear engineer who has specific interest in the topic of at least one article and general interest in reviewing the status of subjects that are important to the profession as a whole.

B. I. Spinrad (BS, MS, PhD, physical chemistry, Yale University) has worked in the field of nuclear energy since 1946. He has worked at Oak Ridge National Laboratory, Argonne National Laboratory, and with the International Atomic Energy Agency, and has taught at the University of Illinois, the University of Wisconsin at Parkside, and the International Institute of Nuclear Science and Engineering at Argonne, Illinois. Since 1972 he has been professor of nuclear engineering at Oregon State University. Spinrad is the author of more than 70 technical publications, including major works on computing methods, experimental physics simulation of large reactors, fuel lifetime in power reactors, basic reactor physics laws, and novel reactor concepts.

Radioactivity in the Marine Environment

(Panel on Radioactivity in the Marine Environment of the Committee of Oceanography, National Research Council)

Publisher	National Academy of Sciences (1971)
Pages	272
Reviewer	John A. Wethington, Jr.

In trying to review this book, I really was not sure what to do. Its 272 pages—$8\frac{1}{2} \times 11$ in.—contain a wealth of information, and therein lies the trouble. No reviewer can possibly read and understand the entire ten chapters, which were written by 31 persons from 23 organizations.

The flavor of this volume is best understood by presenting the history of the publication. In 1957, the National Academy of Sciences—National Research Council published "Effects of Atomic Radiation on Oceanography and Fisheries," a 137-page report, which summarized knowledge at that time and suggested future research programs. In the late 1960's the now-disbanded U.S. Atomic Energy Commission requested that the Academy undertake a second comprehensive review of this area, and the task was assigned to the Panel of Radioactivity in the Marine Environment of the Committee of Oceanography. Work was started in 1967, and the material was

constantly updated until mid-1969. The publication date was 1971.

A list of chapter titles might help a prospective purchaser decide whether or not he wants the book, for certainly, no person is going to read the entire volume.

Chapter	*Title*
1	Introduction
2	Sources of Radioactivity and Their Characteristics
3	Oceanic Distributions of Radionuclides from Nuclear Explosions
4	Physical Processes of Water Movement and Mixing
5	Marine Chemistry
6	Marine Sediments and Radioactivity
7	Accumulation and Redistribution of Radionuclides by Marine Organisms
8	Ecological Interactions of Marine Radioactivity
9	Radiation Effects
10	Evaluation of Human Radiation Exposure

Each chapter contains numerous tables and figures, which the specialist in that particular subject area will find definitive; however, the general reader will be hopelessly confused. This is a *reference* book for specialists, not for general readers. A copy should be in every reference library.

John A. Wethington, Jr. is a professor of nuclear engineering at the University of Florida. Leaves-of-absence have been spent at Oak Ridge National Laboratory, Puerto Rico Nuclear Center, and Lawrence Livermore Laboratory. His current research efforts are directed toward uranium recovery and radium-radon releases from the Florida phosphate industry. Besides science, his other interests are jogging and flying.