

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.



AS SEEN FROM A QUANDARY

Title Nuclear Energy for Water Desalination

Publisher International Atomic Energy Agency

Pages 133

Price \$3.00

Reviewer I. Dostrovsky

By sending me *Nuclear Energy for Water Desalination* for review, you have put me in a quandary as I am very critical of the value of publishing the reports of IAEA meetings in this form and even more of the value of reviewing such publications. I daresay a record of the meeting has to be made, but apart from that I feel interest in such a record is limited and of very short life.

Most of the material in this booklet has been published before in identical or very similar form. In addition, many of the contributions are represented by abstracts only. Another defect is the repetitiousness of the papers. This necessarily results from the international aspect of the Panel's operation, but does not add to the value of the publication.

Israel Dostrovsky has been with the Weizmann Institute of Science since 1948. He headed the Isotope Research Department there until 1965. He is at present the Director General of the Israel Atomic Energy Commission and a member of it. He also is one of the Directors of the National Council for Research and Development with the specific duty of coordinating desalination research in Israel. He has published extensively in British and American journals, in the fields of physical and nuclear chemistry. His Ph.D. is from London University.

TRUE LEADERSHIP

Title Science and the University

Editor Boyd R. Keenan

Publisher Columbia University Press, 1966

Pages 207

Price \$5.95

Reviewer W. F. Libby

This book is the outgrowth of a decision in 1964 by Purdue University to develop a special program in science and public policy. The Editor is Boyd R. Keenan, Chairman of Purdue's Department of Political Science. Its contributors include some of the leading scientific administrators and determiners of public policy in the support of science, in general, as well as at universities. It is particularly interesting to read the thoughts of these leaders and to see what they believe to be most important in this vital matter.

Edward Teller argues for PhD's in applied science; Leland Haworth pleads for the devoted teacher-scholar (or teacher-researcher); Sir Eric Ashby speaks of the English scene and how the University Grants Committee giving funds to the University as a whole has to be supplemented by the Research Councils who give to the individual scientist; two midwestern Congressmen, J. Edward Roush and John Brademas, plead for more money for their areas.

The whole collection of remarks is illustrative of the problem facing the world today: How can science be managed? Everyone agrees it to be of extreme importance. The question is "How?" No one knows very well, apparently. In our American way we spend money, but the question for us really is — Will money do it?

As one of the money-givers for five years (1954-1959 for the AEC), the reviewer noticed with interest that only brief and passing reference is made in this book to what seems undoubtedly the greatest single factor in scientific success—great and unusual ability — scientific genius. It would seem that scientific management should take this as point number one — How do you find the young Enrico Fermi, Gilbert Lewis, or Otto Hahn before he is well known, and then how do you maximize his productivity? How can diversion to other fields be avoided? These would seem to be very important questions for the main subject.

Considering the history of science, in contrast to technology and engineering, the course and rate of development both were determined by a few individuals. In our day, we have to think of teams a great deal, but no one doubts that the real breakouts and smashing new things will be due to single individuals. Thus our best effort should be to help such genius grow and develop, and our management policy should center on this.

The only true leadership must come from the select few and the whole question of relationship between science and society would seem to turn on the relationship between them and society. It probably is no less true now than in Leonardo's day.

Our fellowship programs and our postdoctoral policies all are most helpful but there is still enormous risk in the haphazard discovery process — this finding of the little Enrico while he still is a poor peasant's son in the south of Italy.

So it would seem to this reviewer that the book is incomplete. More should have been said about the great individual. The forms are important but the substance of science — the great and original idea — is more so. Perhaps another

book should be written just to this point?

By nearly any standard, Professor W. F. Libby deserves to be ranked as one of the outstanding scientists living today. He has been associated with the University of California, Los Angeles, since receiving his PhD at Berkeley in 1933, with interruptions to serve as professor at the Enrico Fermi Institute of Nuclear Studies in Chicago (1945-54), as a research associate at the Geophysical Laboratory of the Carnegie Institution (1954-59), and as a US Atomic Energy Commissioner (1954). His awards and honorary degrees are numerous; of most significance to our readers are the Albert Einstein medal award (1959), and the Nobel prize in Chemistry (1960). His special fields of interest are physical, inorganic, and nuclear chemistry and radiochemistry. He is presently Professor of Chemistry at UCLA, a post he has held since 1959.

SACRED COWS ATTACKED

Title Manual on Environmental Monitoring (Safety Series No. 16)

Consultants R. Garner and D. Mecheli

Publisher International Atomic Energy Agency, 1966

Pages 70

Price \$1.50

Reviewer Andrew P. Hull

So many reports of routine environmental monitoring programs are published annually that it might be assumed that this aspect of radiation protection requires no further elaboration. However, as a perusal of some of these reports soon reveals, it is in fact beset with a considerable confusion of basic principles. In the main text of this IAEA manual, consideration is given to them. Its stated aim is "to show how a survey adequate for purposes

of radiological control, can be carried out with limited resources of trained manpower and equipment." Although, in my opinion, this aim is not completely achieved, the manual does contain many worthwhile suggestions for a reader who is faced with the problem of establishing a new program and one who is (or should be) reviewing an on-going one.

The main text of the manual starts with a discussion of the objectives of environmental monitoring. It makes a helpful distinction between the primary objectives of environmental monitoring, radiation control, and others, such as scientific investigation and public relations. The following section, which deals with the planning of environmental monitoring programs, argues that "if the objective of a monitoring program is to insure that acceptable doses are not exceeded, then measurements intended to achieve this objective must be capable of yielding information which will allow tissue doses to be calculated," and goes on to state that these measurements should most profitably be made on the materials that provide a direct source of exposure, whether air, water, or food.

The manual does not hesitate to attack sacred cows. For example, it questions the value of pre-operational measurements other than training staff in sampling and analytical techniques. It also suggests that except under special circumstances, analysis for gross activity is unsatisfactory because it does not lend itself to dose calculations, because natural background may make such measurements incapable of detecting significant increases of hazardous isotopes, and because it does not suggest the source of perturbations.

The next section considers some details of programs with relation to discharges to the atmosphere, to bodies of water, and to the ground. It, too, contains many sensible observations. Among these is a suggestion that, in many cases, the dominant hazard from discharges to the atmosphere will be from contaminated food (rather than inhalation); and that sampling sites should

be situated where air concentrations or ground deposition is likely to be highest. With regard to discharges to bodies of water, a table of many indirect pathways with potential concentrating mechanisms supports the argument that "it could be quite wrong to use criteria applicable to drinking water for radiological control under all circumstances." It is even suggested in this section that as experience accumulates it may be possible to rely entirely on control by monitoring waste at the discharge point.

Following the main text, examples are given of five routine environmental monitoring programs currently in use in specific establishments in different countries. Perhaps it would have been impossible to find examples in which a clearcut distinction between the radiological control and other objectives is made. At any rate, like my own program, most of those cited seem to go far "above and beyond" this primary requirement.

The manual contains few specific recommendations or data and no bibliography. It must therefore be read in conjunction with other publications in the IAEA Safety Series to obtain the full story of what is involved in the day-to-day operation of an environmental monitoring program. In my opinion, a reader wishing a full treatment would encounter less repetition in one of the recently published texts, of which Eisenbud's "Environmental Radioactivity" (McGraw-Hill, 1963) is perhaps the most complete.

Andrew P. Hull is now Supervisor of Environmental Monitoring at Brookhaven National Laboratory. He was a 1956-57 AEC Fellow in Radiological Physics at Vanderbilt University (MS, 1961). Since that time he has been associated with radiation protection programs at reactor facilities, first at Oak Ridge National Laboratory and then at Industrial Reactor Laboratories before joining the Health Physics Division at Brookhaven in 1961. He has published several papers on environmental monitoring of ¹³¹I.