

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

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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.