RADIATION PROTECTION INSTRUMENTATION AND ITS APPLICATION. ICRU Report #20. International Commission on Radiation Units and Measurements. Washington, D.C., 1971, 60 pp, $3.50.

The measurement of the radiation dose from electromagnetic and corpuscular radiations is the topic of this recent ICRU publication. At present neutrons and heavy charged particles are of concern only to those few nuclear medicine departments with a particle accelerator such as a cyclotron. Nevertheless, this ICRU Report should be studied by the nuclear medicine physician and technologist who is responsible for the radiation safety of patients to whom radioactive material is administered and all personnel either in contact with those patients or working in the laboratory with radioactive sources.

The report starts with a brief review of radiation quantities and units which are the topic of another recent ICRU Report. The assessment of dose equivalent is discussed together with the specific problems arising for protection measurements with different types of radiations.

Section II contains a detailed description of the characteristics of all kinds of radiation detectors that can be applied for either absorbed-dose, kerma, or exposure measurements. Only the calorimeter is not mentioned in this report although it is the basic instrument for absorbed-dose measurements but obviously not suitable for protection measurements. The advantages and limitations of each of the ionization chamber instruments, gas-proportional and Geiger-Müller counters, scintillation counters, photographic devices as well as solid-state and activation devices are presented for different kinds of radiations, radiation intensities, and energy ranges.

The choice and use of instruments for surveying, area, environmental, and individual monitoring are discussed in Section III. Here the short part dealing with air, liquid, and surface monitoring of unsealed sources should be of particular concern to any nuclear medicine laboratory. The use of film and solid-state devices such as radiophotoluminescent glass dosimeters and thermoluminescent detectors are of particular interest for individual monitoring.

The final section on calibration of instruments should be studied very carefully. This is an area of general confusion and the report stresses that "the conditions of calibration should always be stated clearly. For example, although personnel monitoring film could be calibrated free in air, it is more appropriate for radiation-protection purposes to calibrate it on a phantom which produces the same spectral changes and surface backscatter as a human body." Obviously, a calibration can be meaningful only if it is carried out also for the type of radiation and the energy range for which it should be applied. Nevertheless the user of an instrument often trusts "the" calibration without knowing the conditions for which it has been obtained.

In summary, the report covers a wide field in a very concise form; it is a well-written, up-to-date review of instrumentation for radiation-dose measurements. The subject index together with ample references throughout the report should guide the reader to find quickly any information as far as it is available somewhere.

GERALD J. HINE
Veterans Administration Central Office
Washington, D.C.