Radiation Detectors

Nuclear Instruments and Their Uses. vol. 1, *Ionization Detectors, Scintillators, Cerenkov Counters, Amplifiers: Assay, Dosimetry, Health Physics.* Arthur H. Snell, Ed. Wiley, New York, 1962. viii + 494 pp. Illus. $7.50.

It is often difficult to deduce the contents of a novel by its title, but this is not usually the case with technical books. Therefore, readers should be warned that this fine volume is not a book on nuclear instrumentation, although its title is probably indicative of the intentions of the Instruments and Techniques Subcommittee of the National Research Council.

The book is a compilation of seven articles dealing with four types of radiation detectors (ionization chambers, proportional counters, scintillation counters, and Cerenkov counters), electrometers and amplifiers, radioactivity assay, dosimetry, and health physics.

In the opening section Franzen and Cochran discuss ion-pair formation and associated statistics as well as ion collection and losses for various geometries. They include a review of experimental determinations of W (electron volts per ion pair) that will be useful, although refined values have been published in the literature.

The treatment of proportional counters gives useful information on pulse profile and the statistics of proportional multiplication.

In its treatment of the ion chamber and the proportional counter, the book suffers because it does not have an elementary qualitative discussion of the operating principles that will provide uninitiated readers with an overall picture before they plunge into the mass of detail concerned with these detectors.

Murray's section on scintillation counters is loaded with valuable information from the voluminous literature. Murray discusses the mechanism of the scintillation process and presents data on the nonlinearities that have received considerable attention in recent years. The scintillators discussed include inorganic crystals, organic crystals and plastics, organic liquids, loaded liquid scintillators, and noble gas scintillators. Photomultipliers and scintillator counter assemblies are described, including assemblies for high-resolution gamma ray spectroscopy and for neutron spectroscopy.

Cerenkov radiation and Cerenkov counter techniques are lucidly discussed by Moyer. The optical systems and factors controlling efficiency and resolution are considered.

Fairstein's paper on electrometers and amplifiers combines sophisticated analysis with useful "cookbook" data. Optimization of signal-to-noise ratio is discussed in detail.

In the final three sections the contributors draw on their extensive experience to review the general problems and techniques in radioactivity assay, dosimetry, and health physics.

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Pteridophyta

The Morphology of Pteridophytes. The structure of ferns and allied plants. K. R. Sporne. Hutchinson, London; Hillary House, New York, 1962. 192 pp. Illus. $2.50.

This small text, one of the Hutchinson University Library series, is primarily intended for British university students. Despite certain limitations, it does seem to meet a need for an inexpensive current summary of the subject. Each main group of the Pteridophyta is discussed in some detail, in terms of its principal members, and the important features are illustrated with line drawings. The work generally follows the classification of Reimers (Engler's Syllabus, ed. 12) and recognizes five groups—Psilophytopsida, Psilotopsida, Lycopsida, Sphenopsida and Pteropsida. Unfortunately there is no discussion of the morphological bases of other contemporary classifications or of their relative merits.

The limitations of the treatment raise the question of what can reasonably be expected of a textbook. Sporne's treatment is somewhat restricted in its scope, and in some ways he does not present a currently accurate account of the subject. The implicit promises made in the preface of "a reappraisal of the old theories in the light of recent knowledge" and of the presentation of "the many important advances . . . made . . . in the last decade" are not wholly fulfilled. The application of the telome theory is discussed at length but it is not really assessed (except to exclude the Lycopsida from its scope). The field of experimental morphology is not exploited, nor is it evaluated in terms of classical morphology. This is rather surprising when one considers that British botanists have been among the most active leaders in this field and that much of the work has been done on the pteridophytes.

Although recent advances in paleobotany have been integrated into the text, the same cannot be said for recent information about the living ferns. The systematic literature has not been sufficiently explored, although it contains much pertinent morphological information. I noted a few erroneous or confusing statements—the stems of *Equisetum giganteum* to "13 m." long (they are to 5 m. tall); the fronds of *Todea barbarea* "once-pinnate" (they are bipinnate); the fronds of most species [of Cyatheaceae] "several times pinnate" (they are mostly less than tripinnate). There is grave confusion in the discussion of apogamy. The cytological basis of the phenomenon is not presented accurately, and it is at least partly confused with that of apospory.

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Evolution for the Masses

Evolution. Ruth Moore and the editors of *Life*. Time, Inc., New York, 1962. 192 pp. $3.95.

This volume is an addition to the Life Nature Library. As one might expect, it is superbly illustrated, and the text material is handled (to its detriment) with typical journalistic fervor. Each of the book's eight sections consists of a discussion followed by one or more "pictorial studies." The book begins with Darwin and passes through Mendel to DNA. Then it surveys "A half billion years of creation" and eventually arrives at "The emergence of *Homo sapiens*." The choice of material is reasonable, and the presentation is well balanced. Unfortunately, there are many distortions. Generally these are a consequence either of exaggeration or of oversimplification. They do not occur too frequently in the text itself, but they do appear with