the approach which the rest of the book is to follow. Chapters 2 and 3, on "The plant world" and "Classification and naming of plants," are good ones to have at the beginning, for they allow teachers who want to start the course with field work—to familiarize students with plants and to teach them to see the world of plants in which they have been blindly living—to do so, with reading of these chapters assigned to complement and extend the laboratory work.

The authors, wisely, I think, discuss flowering plants in the next 12 chapters, enabling the teacher who uses the book to capitalize on the common interest of students in the plants that are conspicuous in their lives and clearly valuable to man. The illustrations are good, well selected, and sufficiently numerous so that it is not necessary for a student to make many drawings for himself in order to have some means of recalling what it is hoped he has had time to see in the laboratory. It would be most unfortunate, however, if a well-illustrated textbook were substituted for observation of living plants and for study of prepared slides of parts of them.

As might be expected, the rest of the book is a survey of the plant kingdom (including the viruses) and ends with a chapter on evolution. This portion of the book, although it contains a good deal of detail, is made more interesting for the student (I would think) than are similar surveys in many books. The importance of unfamiliar plants to man's activities is stressed. A teacher might skim over a few of the life-histories, which are diagramed, and use them only to put across the definite point that there are similarities and differences in the ways in which different kinds of plants maintain themselves. The descriptions and illustrations of the more common families of flowering plants would fit in with field work, which might well come in the spring of a year's course in botany.

In this revised edition, many of the errors noted in the first edition have been removed. A few remain, over which one could quibble, and a few have been introduced in the rewriting of portions to add new material. Some sentences still remain which are correct if a reader knows how to interpret them but which might mislead a student who is unfamiliar with the subject.

A final word must be said about the glossary and the index. Both are very complete. Furthermore, in the glossary, the language from which we have derived each term is noted, and the meaning of the word in that language is given. Thus, an interested student can develop a feel for botanical terminology and a competence in its use.

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Physical Techniques in Biological Research. vol. II, *Physical Chemical Techniques.* Gerald Oster and Arthur W. Pollister, Eds. Academic Press, New York, 1956. 502 pp. Illus. $12.80.

Physical Chemical Techniques, the second volume in this series, deals with select physicochemical techniques which are employed in elucidating the nature of molecular structures that occur in biological systems. Like its predecessor volume, it is composed of a series of essays, written by individual contributors who have made contributions to, and extensive application of, the methods described.

The first two chapters are devoted to the use of stable and radioactive isotopes as tracers for following the distribution and uptake of labeled compounds. Both sections introduce the subject with extensive surveys of radioactive phenomena *per se,* which would appear to be unnecessary for the advanced worker to whom the text is addressed. One would like to see the space devoted to a more extensive discussion of the methodology to specific biological problems.

It would appear from the nature of the bibliographies and from antiquated statements in the text that many of the sections were prepared 3 or 4 years prior to the publication of the book. Thus, in describing the mechanism of beta-decay, the neutrino is described as a mathematical concept invoked to conserve momentum. No mention is made of the convincing experimental evidence for the existence of this fundamental particle that has been established during the past 2 years with the aid of the large atomic piles as sources for these elusive particles.

In a description of autoradiographic techniques, the growth of fog with the aging of the recording medium is attributed to the cosmic radiation. While this is a contributing factor, particularly in laboratories located at high elevations, the major part of the noise originates from chemical and mechanical effects, often unwittingly increased by storage of the film in proximity to x-ray machines and radioactive sources.

The greater part of this volume is devoted to concise, highly informative treatments of sedimentation, diffusion, and viscosity as means for securing information about the nature of complex solutes. Other techniques for the *in vitro* study of protein systems are presented; these include the preparation of surface films, adsorption phenomena and chromatography, electrophoresis, the measurement of electric potentials originating at membranes and phase boundaries, and the use of x-ray diffraction methods in the study of large biomolecules, such as cellulose and the nucleic acids.

A rather unexpected and welcome addition is a section on magnetic methods applicable to biological materials that possess appreciable paramagnetic properties. At one time, this experimental approach was limited to select problems in mineralogy and inorganic chemistry, such as the separation of certain mineral grains from gangue, or in the analysis of rare-earth elements that possess distinctive magnetic susceptibilities. With the current availability of more powerful magnetic fields and more sensitive methods of measurement, it is now possible to secure information on the magnetochemical behavior of nucleic acid constituents, and paramagnetic resonance methods can be applied fruitfully to the study of the structure of hemoglobin and related metalloporphyrins.

The basic value of this volume resides in the presentation of the scope of diversified techniques, which, in this age of specialization, may not always be within the ken of the individual investigator. Its study may reward the reader with some new experimental approach that will contribute to the solution of the difficult analytic problems that are associated with biochemical research.

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Technical Aspects of Sound. vol. II, *Ultrasonic Range, Underwater Acoustics.* E. G. Richardson. Elsevier, Amsterdam, 1957 (distributed in the United States by Van Nostrand, Princeton, N.J.). 412 pp. Illus. $11.75.

This is the second volume of a very comprehensive work on various aspects of sound technology. It continues, in the fields of ultrasonic applications, underwater acoustics, and aircraft noise, the "handbook" treatment that was given airborne and sonic range acoustics in the first volume.

The second volume starts with a chapter by E. G. Richardson, who contrasts the propagation of sound in the air and in sea water and points out some of the fundamental mechanisms that determine the transmission of sound in large bodies of water. In division I are two chapters, by B. E. Noltingk and N. B. Terry, who discuss methods for producing ultrasonic vibrations in liquids and solids, and a very complete account of the uses for such vibrations. These include flaw detection, gaging, elastic property measurement, machining, cleaning and dispersion, and chemical and biological effects.

In division II are described the techniques of measurement and absorption of