

final section on the theory of liquids deals with the problems of melting and of solutions of weak and strong electrolytes and more of solutions of macromolecules.

The book is distinguished by many recent references and by the inclusion of most of the significant modern work in this field. In particular, the author has given careful attention to the work of Kirkwood and his collaborators and has even included references to such an exotic item as Kirkwood's "Princeton notes of 1947". Great effort seems to have been made throughout to make the presentation both comprehensive and perspicuous and at the same time to avoid overwhelming the reader with inessential mathematical minutiae. The book has the excellent typographic format which the readers are led to expect from this series and is a worthy addition to the Springer collection.

Annual Review of Nuclear Science. Vol. 6. Edited by J. G. Beckerley, M. D. Kamen, L. I. Schiff. 471 pp. Annual Reviews, Inc., Palo Alto, Calif., 1956. \$7.00. Reviewed by S. F. Singer, University of Maryland.

The present volume is the sixth in the series and takes in nuclear physics from its astrophysical aspects to its biological aspects. The variations of primary cosmic rays are discussed by Sarabhai and Nerurkar with particular emphasis on the special interest of the authors, the solar diurnal variation. No universally accepted explanation exists, but the accumulation of data on the time variations, particularly during the forthcoming International Geophysical Year, should advance our understanding of their causes. The polarization of fast nucleons is discussed by Wolfenstein with emphasis in the region 100 to 400 Mev. The article develops a formalism which may be used in the analysis of experiments with polarized nucleons. Heydenburg and Temmer treat the Coulomb excitation or electric excitation due to a passing charged particle of low-lying nuclear excited states. Excitation by electrons is briefly touched upon but the main portion of the article is devoted to heavy particle excitation and includes a brief discussion of the theory as well as an account of experiments in the field. In particular the interpretation of the experiments in terms of the electric quadrupole moments of nuclei is described. Mack and Arroe give a brief discussion on the isotope shift in atomic spectra. Way, Kundu, McGinnis, and Lieshout have a lengthy paper on the properties of medium-weight nuclei giving much tabular material on their ground state, spins, magnetic moments, quadrupole moments, levels, and gamma-ray lifetimes. Horne, Coryell, and Goldring present a short paper on generalized acidity in radiochemical separations. Mattauch, Waldmann, Bieri, and Everling give a detailed discussion with much tabular material on the masses of light nuclides. Brooks gives a very topical and comprehensive paper on nuclear radiation effects in solids. It discusses the theory of atomic displacements and includes such items as thermal spikes due to intense heating in a region of atomic dimensions, phase changes, and cold working. The rest of the chapter

deals with particular materials, such as graphite, uranium. The final portion discusses damage to various solids: semiconductors, metals, valence crystals, and alkali halides. Taube discusses some applications of oxygen isotopes in chemical studies. Oxygen unfortunately has no radioactive isotopes which makes the problem rather difficult. Recent advances in low-level counting techniques is the subject treated by Anderson and Hayes and deals with advances in the techniques for beta counting (C^{14} and H^3), gamma-counting, double beta-decay, and the problem of detecting the neutrino. One of the longest chapters is on nuclear reactors for electric power generation by Davidson, Loeb, and Young. It discusses a great variety of power reactor designs, 27 of them. Of interest is the economic discussion at the end of the chapter which compares the cost per kilowatt for different installations. Values as low as \$250 per kilowatt are mentioned. The longest chapter is on cellular radiobiology by Gray. Over 380 papers are reviewed, most of them published in 1955, indicating the tremendous activity in this field. The review covers the radiobiology of the cell including the influence of various environmental factors and the genetic damage problem. The second part deals with the radiobiology of various tissues. O'Brien has a chapter on vertebrate radiobiology which deals with the effects of ionizing radiations on the embryonic development of fish, amphibia, birds, and mammals.

Relaxation Spectrometry. By E. G. Richardson. 140 pp. (North-Holland, Holland) Interscience Publishers, Inc., New York, 1957. \$5.75. Reviewed by J. G. Castle, Jr., Westinghouse Research Laboratories.

In this pleasant little book, printed on soft white paper, Professor Richardson surveys the experimental spectrometry of acoustical relaxation. His historical discussions of experimental work, including much of his own, serve to outline the bibliographies and to occasionally describe the cardinal sample configurations, but are not often detailed enough to support the author's conclusions. Certainly the discussions serve well to outline the work in the various areas.

After an appropriate introduction of concepts of relaxational behavior and their illustration by models, the author covers in order spectra in the infrasonic, sonic, and ultrasonic regions. He points out the use of analog simulation of the physical sample's relaxation processes as a considerable aid in the parametric interpretation of observed relaxation phenomena. Then under Dielectric Relaxation he describes the strong similarity between viscoelastic behavior and dielectric behavior, concluding with graphs showing the "concurrence" of the dielectric and acoustic relaxation spectra of glycerin at $-28^\circ C$. In the final chapter, on Spectrum Analysis, he points up some of the roadblocks and useful detours on the way toward resolution and shape studies on relaxation spectra.

The book was read without conscious inspection for accuracy because the reviewer is not an expert in the