

the w -plane, then it is a constant." Apart from the obvious typographical error, we have to ask what kind of certain curve is meant? A simple closed curve? Any arc? A continuous curve? The student who knows the answer will not be misled, but then he has little need of the book in any case.

One can only regret that a really good text should be marred by such poor treatment. Perhaps the brightest feature of the situation is the well-justified modesty of the translator who chose to remain anonymous.

High Pressure Physics and Chemistry. R. S. Bradley, ed. Vol. 1, 444 pp. \$15.50; Vol. 2, 361 pp. \$12.50. Academic Press, New York, 1963.

Reviewed by Stuart A. Rice, University of Chicago.

Amongst the flood of review volumes, there occasionally appears a comprehensive treatise that is both timely and welcome. In my opinion, *High Pressure Physics and Chemistry* falls into this elite category. Following the pioneering work of Bridgman, there has been an enormous expansion in the use of high-pressure techniques for a variety of studies. To discover what has and has not been done, what is the current state of the art, etc., would require a survey of a large number of journals scattered over a great variety of disciplines, except for the existence of review volumes. Of the several treatises written since 1949, this two-volume work is the most comprehensive; extensive bibliographies at the end of each chapter cover the literature up to early 1963. Despite the large number of contributors, there is relatively little overlap and repetition among articles.

Several chapters describe experimental techniques, but only Chapter 2 is devoted exclusively to a discussion of the production and measurement of high pressures. Aside from the historical material in Chapter 1, all of Volume 1 is devoted to the properties of matter in the gaseous, liquid, and solid states. The topics surveyed include: properties of compressed gases, compressibility and equation of state for liquids and solids, phase changes, transport and electrical

properties of liquids and solids, and others. I have found the various articles almost uniformly good. In general, the exposition is clear, the references appropriate, and a fine balance is maintained between theory and experiment. Volume 2 contains material more directly of chemical interest. The contributions include surveys of high-pressure studies of geochemical interest, chemical equilibria and chemical kinetics, x-ray techniques, shock waves, and radio-frequency spectroscopy.

High Pressure Physics and Chemistry will be an indispensable reference tool for all investigators interested in the use of high-pressure techniques. As a bonus, the quality of the writing makes the text useful for beginning graduate students.

Atomes, Molécules, Noyaux. By Pierre Fleury and Jean-Paul Mathieu. Vol. 8 of *Physique generale et expérimentale*. 346 pp. Eyrolles, Paris, 1963. 68,05 NF.

Reviewed by Hans Bichsel, University of Southern California.

Some information about the whole series of which this is the last volume is contained in the last chapter "Remarques sur l'étude de la physique"; the material for a "first" study of physics is provided, presumably at the college level: "The arrangement is in the traditional sequence of topics, but indications of atomic and molecular structure are scattered throughout the series, while in contrast, nuclear physics and wave mechanics are taken up only in the last volume." The material in this last chapter should probably be read by the student at the beginning of his studies rather than at the end. Some of the remarks presented might be of interest to the teachers in the United States who are at present concerned with the reorganization of our physics curricula and books.

To get down to a discussion of Volume 8: In just about 300 pages of text (not counting the chapter mentioned above and miscellaneous tables and pages of glossy photographs) a profusion of material is offered. Not only the subjects indicated in the title are discussed but a description of the whole of modern physics is given. After a review of the

properties of particles and waves and the basis of quantum mechanics, chapters on atoms and molecules follow. A discussion of the properties of condensed substances, including some solid-state theory, and quantum statistics closes the first half. The second part of the book (about 120 pages), dealing with nuclear transmutations and structure, includes the standard subjects of nuclear physics, and, in addition, sections on cosmic rays, accelerators, and reactors.

The whole approach is quite different from the presentation in the average American textbook. One has an impression of a great conciseness of expression. Just as an example: the very first paragraph in the text reads, "Matter cannot be divided indefinitely; numerous experimental facts show that any chemical element is composed of identical *atoms*, and that these atoms can be in different states (neutral, excited, ionized) which will be discussed later, and also that there are for many elements several isotopic varieties (see paragraph 1-5) differing slightly in their masses, but very little in their other properties." The development of concepts progresses at a fantastic pace. For example, the fundamentals of a mass spectrograph are derived on about half a page (including a schematic drawing), while the *focusing* conditions are derived on the rest of the same page. On the following page, another two types of spectrographs are discussed, together with the mass spectrometer.

This same conciseness is also found in the extensive referrals to other sections of this volume and just as readily to all the rest of the series. There is hardly a page without one or several referrals to other volumes. Several original explanations, experiments, or illustrations have not come to my attention before; e.g., the idea of describing the creation of an electron and positron pair as the formation of a heap of sand from level ground—one has to dig a hole somewhere to produce the heap—can be worked out quantitatively; similarly, an experiment by Brumberg and Vavilov (no reference given) demonstrating unambiguously the quantum nature of light by visual observation sounds fascinating. It is interesting to

note that credit for the voltage multiplier is given to the Swiss Greinacher.

This is a very intriguing and easily understandable book mainly teaching the experimentalist (relatively little theory is given). The fact that it is written in French is not a serious detriment if one has a fair understanding of physics and just a vague idea of French.

The MKS system is used throughout, and some sensible abbreviations are used. The cps is replaced by the Hz (after Hertz, and long in use in Europe) and the weber/m² (= 10 000 gauss) is called a tesla, which should satisfy many an otherwise ardent fan of cgs units. A word of caution: the French word "rayon" has the two meanings "ray" and "radius" and caused me no little confusion (Section 5-10 "rayons ioniques" means "ionic radii", while in Chapter 10 "rayons cosmiques" means "cosmic rays").

While the book on the whole is an admirable creation, there are many small faults. First of all, the whole quality of materials and typography is seriously inferior to American books, at a superior price (about \$14). Next there are very many misprints, omissions, and other errors to be found. While this may not be very serious for a person thoroughly familiar with physics and the language, it will make the reading more difficult for others. The discovery of the neutron is placed in 1939 on page 33; on page 25 the atomic number of the last of the actinides is not given; the curie is defined as 3.71×10^{-10} decays per second. Nevertheless, I would recommend this book highly to any student of physics who wants to get a different point of view.

Contemporary Models of the Atomic Nucleus. By P. E. Nemirowskii. Translated from Russian by S. and M. Nikolic. Transl. edited by Bernard T. Feld. 332 pp. (Pergamon, Oxford) Macmillan, New York, 1963. \$15.00.
Reviewed by Ernest M. Henley, University of Washington.

This book, translated from the Russian into rather nonfluent English, is a curious combination of material. It consists, in part, of a relatively up-to-date survey of nuclear models, and,

in part, of an advanced treatise on special topics. The text begins with a short description of static nuclear properties, followed by a longer survey of the shell and collective models. In these chapters explanations are often totally absent, assertions are made without justification (e.g., that certain terms in an equation may be disregarded), and material is used without being introduced (e.g., the density matrix).

In Chapters 4 and 5, the author presents discussions, based in large part on his own work, of the optical and shell models. In contrast to the first few chapters, complicated details and lengthy derivations are introduced. However, even in these chapters, judgments are made without adequate reason. For example, on page 241 it is stated that, in the Born approximation treatment of the stripping reaction, "It is *logical* to assume the potential of the neutron-proton interaction to be of the form $V_0 \delta(|\mathbf{r}_p - \mathbf{r}_n|)$." (Italics are the reviewer's.)

It is not clear to this reviewer whether the book is aimed at the student who is beginning to learn nuclear physics, or at the more advanced student and research physicist. It is difficult to recommend the book to either group because of the lack of explanations in the first part, and the one-sided presentation in the latter part. The value of the book is not enhanced by the lack of an index, by common misspelling of references, and by its exorbitant price.

Mathematical Theory of Elastic Equilibrium. Recent Results. By Giuseppe Grioli. 168 pp. (Springer-Verlag, Berlin) Academic Press, New York, 1962. Paper \$7.25.

Reviewed by E. H. Dill, University of Washington.

This is a brief monograph of interest only to the advanced scholar specializing in the theory of elasticity. Some thermodynamic potentials of the exact theory are reviewed. Successive approximations to the exact equations, uniqueness, and existence of solutions to the linear theory are studied by regarding the solution as depending on a single parameter. Methods of determining upper and lower bounds on the

stress and displacement at a point are presented for the linear theory. Plane stress, plane strain, and hypoelasticity are reviewed. Lastly, the equations of elasticity with nonsymmetric stress tensor are considered.

Renewed interest in the theory of elasticity in the last twenty years has resulted in several well-written books. This is not one of them. The presentation of the fundamental relations is poorly written and can best be studied elsewhere. Nevertheless, the author seems to be quite capable and all results are correct.

Once the reader has overcome the natural annoyance incurred by the frustration of trying to comprehend the author's nonexplanations, several interesting new results will be noticed. The chapters on inequalities for the linear theory and on integration of the basic equations of the linear theory, which comprise thirty per cent of the book, are well worth the effort required to study them.

Perhaps one of the most important virtues of this monograph is that it makes available the recent work written in Italian. About half of the 160 references are to the Italian literature and over half of the references have been published since 1950.

Theoretical Electromagnetism. By R. H. Atkin. 260 pp. Wiley, New York, 1962. \$9.00.

Reviewed by Harold Mendlowitz, National Bureau of Standards, Washington, D.C.

Nowadays many intermediate texts in physics are basically geared toward the goal of preparing the student for a course in quantum mechanics. When this happens, the subjects taught at the intermediate level are used as examples of the various techniques to be mastered before one is able to handle the mathematical tools necessary for a course in quantum mechanics. Of course, one can sometimes gain a great deal of insight into the subject matter of the intermediate-level course although the choice of topics to be treated depends somewhat upon the needs of another course.

Theoretical electromagnetism is treated by the present author as an end in itself. The treatment follows