Most of us tend to think of the present as having always been with us, and our social intelligence is apt to be limited if not warped in consequence. Effective demonstration through the medium of motion pictures of the relative recency of most of our customs and beliefs should perforce tend to broaden perspective and tolerance among peoples. Finally, the barrier of language-differences could be surmounted in motion pictures (using sub-titles when necessary), thereby also enhancing social intercourse and understanding. In short, it is my contention that motion-talking pictures, intelligently utilized by the museum, could make the museum a great force for social as well as intellectual enlightenment.

The practical question of financing such an undertaking as proposed is probably the most serious obstacle in its path, whether an insurmountable one or not, I do not know.

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ELECTRODES SEALED IN GLASS TUBING

GARRETT, Hogge and Heiks[1] have noticed erratic potentials in the use of platinum electrodes sealed in glass tubing. The source of trouble was located at the glass-metal-solution interface. They did not mention the type of glass used. Some years ago I noticed that platinum electrodes sealed in Pyrex glass gave very poor results in the titration of ferrous sulfate with dichromate, or the reverse.[2] On finding that electrodes made with soft glass behaved satisfactorily, I abandoned the Pyrex and had no further trouble. While erratic behavior in some cells may be attributable to this cause, there is evidence that junctions of soft glass and platinum can at least sometimes be immersed in solutions without erratic results. For example, some lead-iodine cells in which platinum electrodes were sealed in soft glass by means of lead-glass seals and immersed in a paste of lead iodide, iodine and electrolyte were found unusually reproducible.[3] It seems that the immersion of a platinum-glass interface does not invariably lead to erratic results, and further light on the source of trouble and how to avoid it would be welcome.

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SCIENTIFIC BOOKS

PHYSICS

Classical and Modern Physics, A Descriptive Introduction. By HARVEY E. WHITE. 707 pp. New York: D. Van Nostrand and Company. 1940. $3.75.

IT is doubtless a truism that teaching is yet an art and the art of an individual teacher. Be the educational objective ever so clearly defined the good teacher must and will follow his own procedure, irrespective of whether others agree or can follow in his path or not. To anyone who has had recourse to the admirable pictorialization of the atoms and their spectra presented in White's "Introduction to Atomic Spectra" it will be obvious that in his more elementary presentations this author must employ to an even greater extent his very clear and vivid graphical and visual methods. The perfection of the text-book on review is thus the expression of the art of the author in his attempt to solve a teaching problem. The task set is not an easy one. The problem of presenting a stimulating one-semester survey course in physics of collegiate grade interesting alike to students who have or who have not taken high-school physics is no mean task.

The objectives which the author sets himself to accomplish are as follows: "First to start as nearly as possible at the beginning of each subject, second to develop each new concept or phenomenon so that a student with some knowledge of the simplest principles of algebra and plane geometry should have no difficulty in following; and third to adequately illustrate each subject and chapter with diagrams and photographs."

In each of these the author quite successfully accomplishes his mission. The presentation of the classical physics must in the nature of the objectives be brief, but the essentials are all there. The style is terse and crisp. The physics is excellent and the illustrations are adequate. The few equations presented are not too difficult and the numerical examples of solutions of these equations facilitate the student's understanding. At times one feels that unnecessarily many examples of some less important principles are given, (*e.g.*, optical illusions), but in general no example of an important principle capable of ready pictorialization has been omitted. In reading the book one wishes that there were a bit more discussion of the subjects in some of the earlier chapters and particularly that more attempts were made to correlate and connect the various chapters and sections. For in reality the whole of classical physics is bound together by the Newtonian system. The failure to do this gives the reader the impression that physics consists of a confusingly great number of relatively unrelated facts, which in a survey

[1] A. B. Garrett, E. Hogge and R. Heiks, SCIENCE, 92: 18, 1940.

[2] W. C. Vosburgh, *Jour. Am. Chem. Soc.*, 44: 2155, 1922.

[3] W. C. Vosburgh and V. H. Dibeler, *Jour. Am. Chem. Soc.*, 61: 2522–2523, 1939.

course is most unfortunate. It is in this respect that the reviewer most questions the value of the purely pictorial mode of approach. In part, of course, this lack of coordination is the consequence of the necessary condensation of the topic. Perhaps the weakest chapters are those on electrical phenomena, owing undoubtedly to the great difficulty which one has in depicting the involved nature of electrical phenomena especially without adequate space in which to develop the concepts. Both this section and that on light suffer in that they tend to stress the *applications* of the phenomena perhaps too much at the expense of the fundamental concepts.

Concerning the presentation of the modern physics the author states as follows: "The treatment of modern physics here is given more or less in its historical development. Wherever feasible the presentation of each new subject includes first a brief historical account of the discovery, second an experimental demonstration of the phenomenon, third a discussion of practical applications accompanied by one or more experiments, and fourth a brief account of the accepted theory and its experimental confirmation." In this later procedure the author is far more successful in the second half of the book than in the first, for more space is allotted to the development of each topic. For a book of this type the text is remarkably free from the dogmatism that can so readily creep into such a text.

The drawings are exceptionally fine, and the make-up and printing of the book are excellent. The short biographical sketches of the various contributors to physics appearing as footnotes are a most fortunate addition. As a whole the book is conventional enough to be widely used in survey courses, while its original and vivid, yet dignified pictorialization lends it an air differing quite markedly from the usual college texts.

LEONARD B. LOEB

SMASHING ATOMS

Why Smash Atoms? By ARTHUR K. SOLOMON. 174 pp. Cambridge: Harvard University Press. 1940. $2.50.

OF the many books attempting to popularize modern physical advances this book presents an interesting innovation: In the first place it confines itself to a limited field, *viz.*, atomic disintegration. In the second place it strives to lay an adequate scientific background for the discussion before attempting it. In clear, simple and elegant English it develops a layman's picture of the atom and its constituents, proceeding in a logical and somewhat historical manner. This being accomplished in the first fifty pages, the author then proceeds to discuss nuclear transmutations and smashing devices, as well as the detecting instruments used. In the third portion of the book in some 30 pages the results of nuclear reactions, including uranium fission, are presented. The applications of the nuclear disintegrations to medicine and other fields are also briefly given. The presentation of the principles of high energy particle production, as well as the difficulties of cyclotron operation with which the author is familiar, are particularly good. The author must, however, be congratulated in general for the facility of presentation of scientific material to the lay public which is in evidence throughout.

To the reviewer who grew up with the development of this subject and who, together with Marsden in 1919, was the first to check the artificial disintegration of N by α-particles in Rutherford's laboratory before the results were published, the liberties taken by the author with scientific history are particularly irritating. In a measure some of these difficulties are to be ascribed to the author's avowed policy, "I have deliberately omitted the names of many whose work is fundamental to nuclear physics, not because I do not appreciate the nature of their contributions, but for the more practical reason that too many names would confuse the reader." Whether this confusion would result or not were more names included is in itself highly debatable. Leaving this aside, however, there is no justification whatsoever for bringing Franklin's name preeminently into the fundamentals of the early discoveries of static electricity. Much as we revere our Franklin, his contributions to the subject were negligible except for proposing the single fluid theory of electricity. The implication to an uninstructed public that these advances were due to Franklin is most misleading. Either *no* names should have been mentioned or *more* names should have been mentioned. Misconceptions of this character are frequently invoked in sections of the book. There are other errors of omission equally annoying, such as the omission of all mention that prior to Moseley in 1913 the concept of nuclear charge and atomic number had clearly been put forward by Van den Broek, Soddy and Fajans on the basis of the chemistry of the radio elements. The descriptions in the first portion of the book are clarified through the use of simple but unnecessarily crude line drawings. One wonders, however, why the dignity of an otherwise good lay presentation of a scientific subject must be marred by irrelevant animal cartoons such as the black and white birds on page 37, representing α and β-particles supposedly emitted in the uranium series. On the other hand, the photographs of the various sources of high energy particles as well as those of cloud tracks are among the best so far reproduced in texts. It would, however, have been better for the reader if more accurate descriptions of these figures could have been embodied in and correlated