tion, in the latter, one resulting from the least possible removal of vegetation. Both of these could then be compared with other plant covers that had been used or treated in various ways under controlled conditions as well as under the existing land-use practices of to-day. From this we could in time obtain a series of values and so arrange a scale, for example, with bare soil as zero, then somewhat higher, the heavily-grazed type, and near the upper end, the standard types just mentioned.

In time such values would afford a basis for recommendations regarding sound land-use practices. How can we determine better the part that physical factors —drought, for instance—play and the part that destruction of vegetation (including disturbance caused by man) plays than by attempting to reproduce, through experiment, the effects we see and believe we understand? However, to achieve this there must be some standard for comparison.

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THE MUSEUM AS A POTENTIAL FORCE FOR SOCIAL ENLIGHTENMENT

ONE of the primary functions of the museum is that of education. Thus the schools usually have their children visit the museum more or less regularly, and the public at large is generally also permitted this privilege without charge. Considering the adult population primarily, several questions come to mind. First, assuming that a fair proportion of the adult community has been to the museum once, one wonders how many of this group *revisit* the exhibits and at what intervals? Second, what do the visitors actually see when visiting the museum, and how much of what is seen is remembered? And third, of what significance does it all seem to the general run of visitors?

I am not acquainted with the literature on museum administration, and research based on the above queries may already be available. In any case, my own observations (and the response of a number of other individuals with whom the subject has been discussed support these views), point to the following conditions: (1) Relatively very few in the community visit the museum (*i.e.*, the exhibits) more than once a year, if that often. (2) When the museum is visited, the usual thing is to try and see everything, and since observing all the exhibits in even a single hall in a large museum is physically fatiguing, an excursion through the whole museum is generally an exhausting experience. Indeed, as a result of these latter two considerations, the usual visit to the museum can scarcely be more than a superficial survey, at best. (3) With respect to significance of the exhibits, the attitude of the vast majority of the visitors would probably be that they were all curious and very interesting—but little more.

If the above observations are substantially correct, it seems to me difficult to escape the conclusion that the museums have in large measure failed to make any considerable or lasting impression on the thought or mores of the community at large.

It is not my purpose to belittle the cultural advantages of the modern museum of natural history. On the contrary, this note is prompted by the belief that the museum can and should be a definite and potent influence for tolerance and understanding among peoples, and the following suggestions are proposed with that end in mind.

In order to get the people, and by people I mean folk from all walks of life, not merely the "educated" groups, to come to the museum often and regularly, the exhibits should be imbued with *movement,* which tends to attract and hold the interest. Thus, the fascinating story of man's biological history, his ethnological and cultural differentiation, and the like, could be told by means of moving and talking pictures, in serial fashion, just as the modern planetarium each month relates a different chapter in the story of the heavens. As in the planetarium, also, the visitors would be seated comfortably for the "show," and the factor of fatigue would be eliminated. The latter, as well as the fact that attention would be focused on one exhibit story, and over a long period of time, should be conducive to retention of what was seen and heard. Perhaps of most importance, however, is that each science thus presented, and especially the anthropological and social sciences, could and must be intelligently related to the present, everyday world of the people witnessing the exhibits: otherwise, as now, the response would probably be mere esoteric interest. For example, combined with the exhibits and explanation of the material or social culture of the American Indian would also be an account of their contributions to our present mode of living, and what is more, how similar the fundamental drives and sanctions were for them as for us to-day, albeit expressed more or less differently as a result of another day and culture, a discrepancy which should also be noted with reference to our own behavior in the course of time.

It should also be noted that our great museums serve the large urban centers primarily. True, in these days of relatively easy travel, many persons from all over the country get to visit the large cities at one time or another, and these may go to the museum. However, there are probably millions of others in our rural sections of the country who have never had the opportunity of attending a good museum even once. Yet the cultural treasures of the greatest museums could be brought to all the people, in rural as well as in urban communities, by means of motion pictures.

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.