The two botanical strips, which are well done, depend largely upon drawings and diagrams to present the facts and the concepts. Some of the figures appear in the text, some have been redrawn to change the presentation, and some do not appear in the book at all. The third, on life through the ages, is largely material that does not appear in the text. Each film is designated to accompany a specific chapter or chapters in the book.

It is hoped that more of these visual aids will become available, and it is presumed they will if the present three are well accepted. Debate will flourish over the merits of a film strip compared to individual projection slides. Yet the story to be told follows a logical sequence, and there are the added advantages of lower price and ease in handling. The reviewer recommends that the readers see these film strips to learn what can be done at relatively little cost to him.

I. B. HANSEN

The George Washington University

Scientists starred 1903-1943 in "American Men of Science": a study of collegiate and doctoral training, birthplace, distribution, backgrounds, and developmental influences. Stephen Sargent Visher. Baltimore: Johns Hopkins Press, 1947. Pp. xxiii + 556. (Illustrated.) $4.50.

This book possesses significance and guidance value for the postwar era of science and higher education. It is a study which should, for example, be taken into account in connection with two current proposals: (1) recommendations by the President's Commission on Higher Education to double by 1960 the Nation's present collegiate enrollment, subsidized largely on the basis of the financial need of applicants; and (2) proposed legislation to create a National Science Foundation to grant Federal collegiate scholarships and graduate fellowships in science upon the basis of competitive tests. Pertinent considerations with respect to such action are supplied in Prof. Visher's analysis of the background and training of 2,607 distinguished scientists whose work has been a vital factor in the achievements of American science during the past four decades and more.

The 2,607 scientists are the total of those listed with asterisks in the 7 editions of the directory, *American men of science*, published from 1906 to 1944. The creator of the directory was the late J. McKeen Cattell, eminent psychologist, educator, and editor of *Science*.

In the first edition, which included approximately 4,000 scientists, Cattell starred one-fourth of them as outstanding in accordance with the judgment of leading research scientists in 12 sciences, as of 1903. This system of voting by scientific peers was continued in subsequent editions. Dr. Visher does not overlook the shortcomings of the Cattell system in the light of the development of other scientific fields beyond the original 12 or of the increasing number of scientists in proportion to those starred. Nevertheless, the starred scientists do form "the largest highly and impartially selected group," and, as such, there is importance in this extensive study of their collegiate and doctoral training, their birthplaces, their distribution, their backgrounds, and their developmental influences.

Out of the wealth of deductions from the evidence Dr. Visher has assembled, the following are a few:

"It is impossible to conclude how much is biological heredity and how much is social environmental heredity." Enthusiasm for research is the one common characteristic of the group. "In other respects they differ widely. . . . Many have been highly trained, often in famous institutions; others have attended only little known and perhaps relatively weak institutions."

"Large classes and student body are unfavorable to the production of future scientists." Science students "must have intimate contact with stimulating teachers."

Qualities which the starred scientists themselves considered most significant are "perseverance, curiosity, mental alertness, initiative and critical insight."

RAYMOND WALTERS

University of Cincinnati

The scientists speak. Warren Weaver. (Ed.) New York: Boni & Gaer, 1947. Pp. xiii + 369. $3.75.

In all probability, the reader of this review heard several of the intermission science talks broadcast on the Philharmonic Symphony program during recent years. Unless he were especially unlucky, he heard good talks—sound, clear, informative, and interesting ones and, often, containing a bit of inspiration. These talks, collected in a volume, have lost none of their appeal. They constitute an impressive survey of scientific knowledge and a remarkable exhibit of science exposition.

Most authors have not been content to parade their facts but have also given some glimpse of procedures or reasoning or implications, or of the attitudes that guide a good scientist or the manner in which he operates. The "springs" of science thus lie outlined through its upholstery of accumulated information. This is rare and good in science popularization. Little is accomplished by making the public gape at faintly adumbrated wonders achieved by a modern medicine man; much, by helping people understand the importance of expertness, the power of rational experimentation, the compulsion of evidence, the dedication to impersonal ends.

The editor has given the volume continuity in two ways. First, he has grouped the 81 talks into 14 chapters, e.g. "The Science of the Earth," "Atoms and Molecules," "Science and Health," "Science and the War," "The Long-term Values," some of which are surprisingly coherent and all of which gain perspective by introductory notes. Second, he has supplied a prefatory chapter, "Science and Complexity," which outlines the history of scientific thought and method in a manner hard to surpass. Dr. Weaver presents the sequence of: "problems of simplicity," involving two or few variables, solved by the classical physical approach before this century; "problems of disorganized complexity," solved by probability theory and statistical mechanics dealing with large numbers, solved mainly after 1900; and "problems of organized complexity," those of a large but limited number of variables which interact as part of an organic