Book Reviews

Man's Role in Changing the Face of the Earth. William L. Thomas, Jr., Ed. University of Chicago Press, Chicago, Ill., 1956. 1193 pp. Illus. $12.50.

This weighty volume (actually 5 pounds 9 ounces) contains the background papers for, and summaries of, the discussions which took place in June 1955 at Princeton, N.J., during an international symposium made possible by funds from the Wenner-Gren Foundation for Anthropological Research, Inc., the printing of the proceedings being aided by a grant from the National Science Foundation of the United States of America.

It is dedicated to George Perkins Marsh (1801–82), American statesman and scholar who in 1864 wrote of the need for caution in large-scale operations which modify the surface of the earth and suggested the importance of improvement of waste and exhausted regions (*Man and Nature*; or, *Physical Geography as Modified by Human Action*).

The symposium met at two sessions each of 6 days and was organized to consider, first, man's tenure of the earth, the subsistence economies, commercial economies, and the industrial revolution with the developing urban dominance; then, environmental changes through forces independent of man, man's effects on the waters of the earth, alteration of climatic elements, changes in soils through human use, modifications of biotic communities, ecology of wastes, and urban-industrial demands on land; followed by limits, as to materials and ideas, man's self-transformation, and the unstable equilibrium of man in nature; ending with a session for summary remarks by the three collaboration editors.

The magnitude and range of the work may be judged from the fact that 53 authors contributed background papers and 70 took part in the symposium. These were selected as thinking individuals from some 24 disciplines and ten countries.

A short review of such a wide-ranging work cannot do justice to any part of it, but reference may be made to a few selected points which leap to the eye. Only about ten generations separate us from the beginning of the scientific revolution, but in this short space of time man has wrought such changes and has engendered such conditions that they challenge his continued existence. The so-called "Western world" is made up almost wholly of urbanized individuals who regard natural resources as exploitative and expendable in an era of "expanding prosperity," with little or no thought for responsibility in the rapidly closing frontiers of the world. It was recalled that Putnam, in his *Future of Energy* said that half of the coal which has been burned in the whole history of the world has been burned in the United States in the last 30 years. Undoubtedly fossil fuels, after this century, will cease to exist in a practical sense.

It was a good thing to have some members of older civilizations from maybe so-called "underdeveloped countries" take part in the symposium to provide a balance to some of the more mechanical, technologic ideas prevalent in our own lands. Naturally there is some variation in the quality of the papers, but the general standard is high, and the volume as a whole is so full of up-to-date and thought-provoking material that it will be an essential reference in every institution of learning.

B. T. Dickson

Canberra, Australia

Engineering as a Career. Ralph J. Smith. McGraw-Hill, New York, 1956. 365 pp. Illus. $4.75.

This book, designed to serve as a guide for a two-unit orientation course of approximately 32 meetings for freshmen engineering students, is organized in three parts: "The engineering profession," "College training of the engineer," and "The engineering sciences." It is also suitable for a three-unit course in which more emphasis is placed on problems, many of which are listed in nearly every chapter. For a one-unit course the author suggests minimizing or omitting the treatment of the engineering sciences.

It is my hope that no orientation course based on this book will completely omit the four chapters in this section, which give the student previews of engineering materials and mechanics, steam power, internal combustion engines and refrigeration, electric circuits and machines, electronics, and engineering economy. This material should be very helpful in alleviating the common complaint of engineering freshmen that they "are not getting any engineering."

In the first five chapters of part one Ralph Smith develops and discusses definitions of *engineering* and *engineer* and gives an excellent brief history of engineering, a thoughtful discussion of engineering as a *profession*, and well-written descriptions of the major fields of engineering.

There follows a chapter, which is believed to be unique among orientation textbooks, devoted to a discussion of the *functions* of engineering. The author points out that, while *fields* of engineering (civil, electrical, chemical, and so forth) appeal to the engineer's *interests*, the *functions* of engineering (research, design, production, and so forth) are more closely related to his *aptitudes* and, hence, are "more meaningful from the standpoint of career planning." He then lists "in order of decreasing scientific emphasis" the major engineering functions of research, development, design, construction, production, operation and maintenance, application and sales, industrial, and management. He cautions that in industry various combinations of these functions are frequently found in the same department, or even in the same person. He then defines each function, discusses it in detail with illustrative examples, and lists desirable personal qualifications and type of training.

Included is a discussion of the "engineering spectrum," with a diagram indicating the relative extent to which each major function depends on each of the four major factors involved in engineering—namely, ideas (abstract scientific concepts and principles), things (machines, materials, structures, circuits), men (employees, associates, superiors, customers), and money (financing, costs, prices, profits).

This chapter should prove highly valuable to anyone who is responsible for the guidance of engineering students, but it seems regrettable that no mention is made of engineering teaching, a field of great and growing importance.

Also worthy of special mention are Chapter 7, which discusses the relative roles of the scientist, the engineer, and the technician as members of "the technical team," and Chapter 15 on the engineering method of problem solution. This chapter could well be used much earlier in the course than is indicated by its position in the book, especially if much use is to be made of problems.

The chapters on the economic status of