

raised about whether *Homo sapiens* is a rational creature at all, or, as might be inferred from Freud and his school, an irrational one driven by impulses of mainly sexual origin. The author points out that the question whether the scientific findings of our age give a true picture of human nature is not an academic one but is "practical and necessary because, in the last resort, our attitude to all human questions depends on our idea of human nature."

The first section of the book—entitled "Science and the Individual"—reports what modern science has revealed about life as a chemical phenomenon, about the machinery of reproduction and evolution, about the conception of man as an automaton, and about the problem of mind and matter.

Equipped with the necessary stock of scientific knowledge, the reader is led in the second section of the book—"Science and Human Society"—into the field of humanities, where the author turns out to be a humanist himself, crossing the border from science to practical philosophy. While no full and definite answer can be given to the questions put in the introduction, the author explains clearly the great complexity of human nature. Considerations are given thereby to practically important questions such as, for instance, the problem of human values, the lack of correlation between living standard and true happiness, and the responsibility of statesmen in our age in which means of global self-destruction are available.

A bibliography is added to the volume, in which, regrettably, the works by Butler's American colleague, the biochemist Roger Williams, are lacking. Williams' findings of the great differences between human individuals make important contributions to the very subject of Butler's book. Certainly Butler cannot be blamed for having overlooked Williams' work, in view of the vastness of the book market. Still, a closer cooperation between scientists working in the important field of "humanics" is desirable.

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Histoire Générale des Sciences. vol. I, *La Science Antiquie et Médiévale*. (Des origines à 1450). René Taton, Ed. Presses Universitaires de France, Paris, 1957. 627 pp. Illus.

The first volume of the new series of *Histoire Générale des Sciences*, under the editorship of René Taton, is the most complete and up-to-date survey of the science of these periods in any language. It is of course a collection of studies by experts in the different periods and cul-

tures covered by this volume. But, surprisingly enough, the editor has managed to achieve a stylistic unity that is rather remarkable. As the title indicates, the volume includes science in antiquity and the Middle Ages. It contains three parts. The first part is devoted to pre-Greek science, more specifically, the science of Egypt, Mesopotamia, Phoenicia, Israel, ancient India, and ancient China. The second part is a study of science in the Greco-Roman world, covering, first, the science up to and through the time of Aristotle and, next, Hellenistic and Roman science. The third part includes science of the Middle Ages and, more particularly, that of Islam, India, China, Byzantium, and western Europe.

I think that the best thing about this volume is the fact that it reflects recent research more directly than any other survey volume of which I know. Obviously, with such a broad coverage, it cannot replace some of the standard single-volume studies of shorter periods. For example, the student and reader will still want to consult Neugebauer's brilliant survey of mathematics and astronomy in his *Exact Sciences in Antiquity*. It might be thought at first that the present volume would not completely displace the excellent single volume of Brunet and Mieli covering the ancient period, for that latter work contained a good number of source readings. Still, as the reader examines this volume more closely, and particularly the excellent section on Greek science, he will find woven into the context many fairly long representative passages from the original authors. I think that the reader who is coming to this field fresh, without much previous training, might perhaps do well to read this single volume and to accompany it with a reading of Cohen and Drabkin, *Source Book in Greek Science*—the best single collection of documents on Greek science.

Painfully small and inadequate is the description of the content of Arabic exact sciences. Thus, astronomy is brushed off in only two pages, mechanics and optics are virtually untreated. The chapter on the science of western Europe in the Middle Ages is, in my opinion, very good indeed, although I would like to have seen more space devoted to it (with some of the peripheral material, like that on Phoenician science, Hebraic science, and so on, dropped).

There are, of course, matters of detail I would quarrel about. The author gives the impression that the medieval source of Hero's formula for the area of a triangle in terms of its sides is the *Liber Embadorum* of Savasorda. It had already been stated in the material of the *Agri-mensores*. The first time it appeared in Latin with a proof was in the *Verba Filiorum* of the Banu Musa, translated

by Gerard of Cremona. The medieval section of the volume is quite up-to-date and gives a brief and accurate picture of the main movements in the high and late Middle Ages, but the account of early Latin medieval science, such as it is, is very brief and inadequate.

The volume includes 48 quite handsome plates, and the editor and the Presses Universitaires are to be congratulated on the volume's fine appearance.

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Roots of Scientific Thought. A cultural perspective. Philip P. Wiener and Aaron Noland, Eds. Basic Books, New York, 1957. x + 677 pp. \$8.

Aside from prefatory matter, illuminating in its own right, which the editors have provided, the body of this volume consists of 33 papers (by 29 scholars) which first appeared as integral articles in *The Journal of the History of Ideas*. At least a dozen of them are acknowledged as classics in their kind. They have been arranged in roughly chronological order and range in subject matter from early Greek science to recent cosmology, though the heaviest concentration is on the 16th and 17th centuries. There are studies of individual scientists and scientific experiments, of philosophies of science, and of institutions, organizations, and ideas whose influence upon the development of science was more than peripheral. Yet this is not merely an anthology, nor is it only a guide for the antiquarian whose interest happens to be, *per accidens*, the scientific past. For each of the writers is in some measure concerned with the broader lines of interpenetration between science and the other components of culture—philosophy, industry, commerce, religion, and art; and the general theme, which each article has been chosen to illustrate, is that the *idea* of science has cultural roots. To be sure, the idea of science may be in principle distinguished from the positive discoveries and theories of science *per se*, but the two cannot be held asunder if we wish to comprehend the history of either. No one can read the papers of Moody, Koyré, Randall, and Zilsel and still suppose that the history of science may be written simply as the chronicle of discoveries. But neither can anyone suppose that a simple theory of historical (or cultural) causation can account for these. This double lesson is, perhaps, the chief contribution this volume makes, over and above the particular contributions of each of its remarkable chapters. It is these, of course, which are the most rewarding, and they can be read with fascination and profit quite in-