

From Leucippus to the AEC

Sourcebook on Atomic Energy. By Samuel Glasstone. Prepared under the direction of the Technical Information Service, Atomic Energy Commission. 546 pp. D. Van Nostrand Company, Inc., New York City, 1950. \$2.90.

Intended in the first instance as a sort of Baedeker for authors and editors of textbooks, this volume will unquestionably prove of immense value to persons, physicists or otherwise, who find need for immediate, reliable, and only moderately detailed information on any topic in the atomic energy field which one might readily bring to mind. While the Smyth Report has served reasonably well to satisfy this need in the past, it pretended to be little more than a terse history of the atomic energy project up to the summer of 1945. The present work, being longer, coming later, and having considerably more ambitious goals, is certain to be far more valuable as a general compendium of atomic energy lore than its predecessor or than any of the flood of How to Understand the Bomb books which have glutted the market since Hiroshima.

The author, British-born Samuel Glasstone, formerly professor of chemistry at Boston College and well known for his textbooks on physical chemistry, was employed as a special consultant and was persuaded to write the book by the Atomic Energy Commission, which previously had been persuaded by the American Textbook Publishers Institute that a comprehensive reference guide to atomic energy was sorely needed. Considering that the Sourcebook was a joint effort of the Publishers Institute and the Commission (and no doubt had to be examined, discussed, and approved by 10⁶ number of individuals, departments, and Offices) the final result must seem a pleasant one to all concerned.

It would be natural, and also quite correct, to describe the Sourcebook as a concise history of the atomic sciences. Within all reasonable limits, the story is told chronologically as a continuous intellectual struggle over centuries and decades to piece together bits of information and ideas to form a usable structure of knowledge about the smallest parts of the material and energetic universe. The history is detailed enough to provide information on significant ideas and factual discoveries (usually with quite adequate answers to who, how, why, and what) but never becomes sufficiently complex to frighten away persons having only a rudimentary scientific background. This is a great virtue, since it will make the volume useful to those popular science writers who have for the past several years had to struggle with the problem of explaining in some simple way to the public scientific complexities about which they themselves have had only the haziest conceptions. Many of them will think sadly back to the occasions during the past several years when they would have found great use for such a book, but they will no doubt find it valuable even at this late date.

It would not be surprising were teachers of high school and college science courses to find the volume ideally suited as a text or reference book. The low retail cost, which places the Sourcebook on about the same price level as

the average novel, will presumably be an encouragement.

Readers who are professional scientists will appreciate the Sourcebook as a sourcebook. The volume is well organized and integrated and the relative weighting of subject categories will be adequate for most reference purposes. The book is intelligently written and manages to capture a large share of the excitement of individual discoveries with a minimum of language. Definitions are crisp and to the point. The AEC, the Publishers Institute, the D. Van Nostrand Company, and especially the author are to be congratulated.

Light but Purposeful

Molecules in Motion. By T. G. Cowling. 183 pp. Hutchinson's University Library, London, and Longmans, Green and Company, Inc., New York, 1950. \$1.60.

T. G. Cowling, Professor of Applied Mathematics at the University of Leeds, has written a delightful account of the kinetic theory of gases in a relatively non-mathematical style. It is a pleasure to see how clearly a mathematician has portrayed the intricacies of a field which is often regarded as highly mathematical. This account of gases, wherein "nearly all of the volume is full of emptiness", is developed in a manner which lays emphasis upon physical concepts and processes and discloses the underlying reasoning that has provided the direction for mathematical analysis. Those who have labored through heavy treatises on kinetic theory would find pleasure, as your reviewer did, in resurveying from another point of vantage the ground so laboriously won. Those who have not yet ventured into the field because of its forbidding mathematical barriers may discover in Professor Cowling's refreshing monograph a simple Baedeker of Kinetic Theory.

The author lays stress on the continual interplay between theory and experiment. To him, "the proper line of approach is neither that of the mathematician working without contact with experiment, nor that of the experimenter carrying out measurements to a steadily increasing degree of accuracy without enlightenment as to their meaning, but a middle course in which theorist and experimenter cooperate in building up a fruitful conception of the way in which nature works". He treats of historical developments effectively, not pulling his punches over the clash between modernists and Aristotelians, nor giving more than just praise to some of those often credited with too much. His mathematical formulations rarely go beyond algebra and geometry, although the penetration of his arguments seems not to be seriously limited thereby. The account is timely and modern. If he uses such homely devices as "red and blue molecules" (otherwise completely similar) to describe the complex matter of self-diffusion, he should surely be excused! What physicist has not been tempted to endow his invisible particles with visible attributes to assist him in his thinking? Many of Cowling's physical pictures of molecular processes are beautifully drawn; but although he places considerable emphasis upon models, he warns the reader of the dangers and discrepancies that may easily arise if one follows models too slavishly.

The reader is likely to give a hearty cheer from time to time while reading *Molecules in Motion*, not only for the adroitness of Cowling's presentation of physical and mathematical ideas, but for the interpretative twist which he gives to his subject matter, and for his illuminating expressions about the growth of our knowledge in the field of