Book Reviews

Atomic Quest. Arthur H. Compton. Oxford University Press, New York, 1956. xix + 370 pp. Illus. $5.

This book is a personal history of the release of the atom's energy. The author was a central figure in this great drama, and the meticulous care and wisdom with which he conducted his own scientific research is reflected fully in his writing in this book. It is without doubt the most authoritative source available on many aspects of the atomic bomb project. Men who worked from the beginning learn new facts about the early decisions and motivations behind those decisions.

Better than in most histories the real factors underlying one of mankind's most important developments are set forth in this work. The author's understanding of the essentials of scientific research and development, as well as his deep human feeling and perception, qualify him ideally to write this story. The more technical points in the essential fabric are described with clarity and brevity. One is given a feeling for the significance of fast neutron cross sections and the relation between these numbers and the critical mass of fissionable material. One learns the awful truth—that two harmless looking pieces of metal, when put together, rapidly can release enormous quantities of energy.

The story is a personal one, which is fortunate. It gives the book a Churchillian authenticity which otherwise could not exist. For those of us who know Arthur Compton, the reading of the book becomes a very pleasant personal experience. His wide acquaintance with scientists and his breadth of interests make it possible for him to move throughout most of the story in his personal manner. One has a feeling it will be a long time before the world again sees a congregation of men as capable and attuned to their opportunities and responsibilities as were the guiding scientists in the project. Most of the story can now be told, for sufficient material has been declassified. There are still gaps, however, and it may be that they will be filled before the memory of living men who can relate these experiences fades away. It is to be hoped that this will be so, in order that the great drama which Compton's book sets forth in principle and in considerable detail can finally be complete. No historian will ever dare to neglect this volume in writing the history of World War II. It is beautifully written, carefully documented, and thoroughly interesting from cover to cover.

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Kernmomente. H. Kopfermann. Akademische Verlagsgesellschaft, Frankfurt, 1956. 462 pp. Illus.

Among the increasing number of books on nuclear moments, Kopfermann's second edition of his earlier *Kernmomente* represents a particularly valuable addition. As he states in the preface, great progress has been made in this field during the 15 years since the first edition and, although it was before a special branch of optics, engaging only a small group of physicists, it is now the object of vastly ramified research in many laboratories. Kopfermann is not only one of the outstanding pioneers in the work on nuclear moments but also one of those who have contributed toward its further progress in recent years. It is, no doubt, this rare combination that has enabled him to give a comprehensive account in which the perplexing multiplicity of aspects is woven into a single unit.

Rather than being chosen according to the very different methods employed, the chapters of the book are characterized by the objects under investigation. Dealing with the simplest objects—that is, with free atoms—it is logical that most of the basic considerations appear in the first chapter. This chapter contains the discussion of those investigations which were historically the first —that is, those of optical hyperfine structures and of atomic beams. Nevertheless, it accounts also for more recent investigations on free atoms, such as those of Kastler, Brossel, and Bitter, based upon the simultaneous use of optical and high-frequency resonances. Besides the description of the experimental methods and the interpretation of the data, this chapter contains also the necessary theoretical considerations which lead to the values of nuclear spins, magnetic dipole moments, and electric quadrupole moments. Although all the necessary formulas are given, this is done without an overburdening mathematical apparatus; the derivations are, as far as possible, based on correspondence arguments, and quantum-mechanical proofs, where necessary, are merely indicated. Proper attention is also given to the isotope effect and to the conclusions which it permits.

The second chapter deals with free molecules as the next more complicated objects, introducing in particular those features which arise from their rotation and, among the newer methods for their investigation, that of microwave spectroscopy. Although free neutrons are even simpler than atoms and can hardly be labeled as molecules, the determination of their magnetic moment is likewise mentioned in this chapter.

The investigations of nuclear moments in bulk matter, notably in liquids and crystals, are treated in the third chapter. In view of the specific character of the methods, due emphasis is given to the various electronic arrangements which have been employed. Nevertheless, it is gratifying to see that the presentation of their basic features is not overshadowed by the discussion of circuits. Nuclear magnetic and quadrupole resonances are discussed as well as paramagnetic resonances insofar as they have a bearing on nuclear moments.

The last chapter contains a brief discussion of the relation between nuclear moments and the models of the nucleus.

Not only does the book give a most helpful introduction into the subject, but it should also be of great value to those working in the field, insofar as it is a guide through the vast literature, mentioned in ten pages of references.

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Automation. A report of the technical trends and their impact on management and labor. Department of Scientific and Industrial Research. H. M. Stationery Office, London, 1956 (order from British Information Service, 30 Rockefeller Plaza, New York, N.Y.). 196 pp. $1.08.

Within its self-imposed limitations, this little booklet is the best general introduction to the subject that has yet been published. Written in admirably clear and simple prose, it presents a balanced picture of our experience so far with respect to automation. The conclu-