

Soviet Elektron and Proton spacecraft.

As sold by the US Government Printing Office for \$3.00, *Scientific Satellites* is surely the bargain of the year in terms of information per dollar for readers interested in finding out how actually to do scientific research in space. Unfortunately, just as with long streams of data received from a satellite, occasional bit errors have crept into the transmission. Thus, while the ISIS X (International Satellite for Ionosphere Studies) launch consisted of two spacecraft, a Direct Measurement Explorer and a Canadian Alouette, later members of the ISIS series will be single spacecraft carrying both US and Canadian experiments, not repeats of the X mission as listed in the Appendix. Similarly the description given in Chapter 10 of NASA's method of experiment selection, while correct in general is not exact in detail. Firm selections of experiments are made by the Associate Administrator for Space Science and Applications after the detailed evaluation of proposals by the Space Science Steering Committee and its Subcommittees, not tentative selections to be reconsidered after a year of development, as Corliss mistakenly states. Since the book was written, the Space Science Steering Committee has been broadened to the Space Science and Applications Steering Committee, and disciplinary Subcommittees in Communications, Geodesy and Cartography, Meteorology, Navigation, Earth Resources Survey and Planetary Biology have been added to those in Astronomy, Ionospheres and Radio Physics, Particles and Fields, Planetary Atmospheres, Planetology, Solar Physics and Bioscience. The open competition and review by the qualified peers system will now also be used in selecting experiments in the Applications disciplines.

On the whole, Corliss has provided a good account of the broad field of spacecraft engineering and of the scientific instrumentation used to make measurements in space. His book should be very useful to spacecraft engineers and to experimental scientists who want to make measurements in the space environment.

* * *

George F. Pieper made a number of measurements of particle fluxes in space in the early 1960's. He is now Assistant Director for Space Sciences of NASA's Goddard Space Flight Center.

Nonquantal basic structure

PRINCIPLES OF ATOMIC SPECTRA.
By Bruce W. Shore, Donald H. Menzel. 538 pp. Wiley, New York, 1968. \$18.95

by Richard B. Zipin

This new volume in the Wiley Series in Pure and Applied Spectroscopy will well serve its stated purpose. Its



AUTHOR'S DRAWING from *Principles of Atomic Spectra*. Menzel is having a one-man show in Denver next November.

authors tell us in their preface that they wrote the book to provide a self-contained introduction to the basic principles of atomic structure and atomic spectroscopy, including the tools of Racah algebra, without requiring any previous introduction to quantum mechanics. It is a textbook and treats its subject in an elementary but rigorous manner. The book reads well and moves along at a good pace, developing the mathematics required as the needs arise.

The exposition is essentially in three main sections, each of which is significantly longer than the one preceding it. This division, while mentioned in the preface, is not indicated in the table of contents. The first section discusses the basic observations of atomic spectroscopy and then uses them to develop the Bohr-Sommerfeld vector model of the atom. Next, the reader studies the theoretical foundations of quantum theory, and finally, the mathematical tools developed in the second part of the book are used in a reexamination and extension of the model developed in the first part. The

many tables and diagrams appearing throughout the book add greatly to its usefulness as both a text and a reference work. Lists of cited references that are found at the end of most subsections are also valuable. The extensive bibliography following the final chapter is always welcome in a book of this type, and together with the two indexes it comprises more than 6% of the volume.

For a book with so many equations, it is commendably free from typographical errors; at least I noted none on a first reading. One complaint that must be made is that the book does not include problems for use in college courses.

If the charming illustration on the dust jacket, of photons interacting with an atom, is any indication, then Donald Menzel, who is probably known to most physicists by his work and writings, might have had a successful career as a cartoonist if he had been so inclined.

While this excellent book should, and most certainly will, find its way to, and be quite useful on, the desks of research workers, its potential audience of advanced undergraduates who will be using it as a text may find its high cost an inconvenience.

* * *

The reviewer is responsible for the application of optics to advanced dimensional measurement systems at The Automation and Measurement Division of The Bendix Corporation in Dayton, Ohio.

A dedicated humanist

THE COSMOS OF ARTHUR HOLLY COMPTON. Marjorie Johnston, ed. 484 pp. Alfred A. Knopf, New York, 1968. \$10.00

by Robert S. Shankland

This is a remarkable collection of writings and speeches of a truly remarkable man. Arthur Compton was not only one of the great scientists of our time, but was also a philosopher, administrator and a man of affairs. To those who knew him best the philosophical basis for all his thinking and action was his dominant characteristic, as this selection of his works clearly demonstrates. He was not, however, the type of philosopher who becomes lost in systems of philosophy; rather his entire outlook and actions were determined by basic attitudes and convictions that were always with him. His personal charm, deep insights and