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bility, annihilation, and the identification of positronium in gases, as well as the fine structure and the Zeeman effect in positronium. He also considers the formation of positronium in liquids and solids. The treatment gives preponderance to the experimental viewpoint although the theory is not neglected.

Another short chapter is devoted to x-ray production by heavy charged particles written by E. Merzbacher and H. W. Lewis. Most of this chapter is devoted to consideration of inner-shell ionization.

Ward Whaling has written a very very short contribution on the energy loss of charged particles in matter. After three pages of introduction, most of the contribution consists of tabular material.

The last contribution to this volume is by Robley D. Evans and gives a very fine and thorough discussion of the Compton Effect. It starts with a historical presentation of the discovery and of early developments. This introduction is followed by a very good discussion of the conservation laws and energy and angle relationships. Two sections are devoted to Klein-Nishina cross sections. The first of these is for polarized radiation, the second for unpolarized radiation. A well-documented section is devoted to Compton attenuation coefficients followed by a short treatment of Compton absorption coefficients. The last two sections are devoted to Compton scattering by bound electrons and by magnetically oriented electrons. This whole chapter is very up to date and an exhaustive presentation of this fascinating subject.

In the introduction of this review, I considered the organization of material in the various volumes. Now we consider the organization of the material in this volume. Individually very good chapters constitute this particular volume, but their grouping them together doesn't seem to me particularly fortunate. It looks almost as if the editor in chief had difficulties in assigning these chapters to other volumes and therefore he decided to put them together in a volume called *Corpuscles and Radiation in Matter II*. This is, of course, not very important from the viewpoint of library use of the book. From the point of view of the individual buyer, who has to decide which volume he wishes to acquire for his private library, it may be very important to know how closely knit are the contents. In this particular case, the subject choice is so wide that an individual buyer might not make use of a major fraction of the contents of the book.

The Russian Literature of Satellites, Part I. 181 pp. (State Technical & Theoretical Press, Moscow, 1957) Translated by International Physical Index, Inc., New York, 1958. Paperbound \$10.00. Reviewed by S. F. Singer, University of Maryland.

This volume contains six translated papers from *Progress in Physical Science*, Vol. 63 (*Uspekhi Fizicheskikh Nauk*) published by the USSR Academy of Sciences. The issue released in September 1957 is devoted to a series of special papers on the subject of

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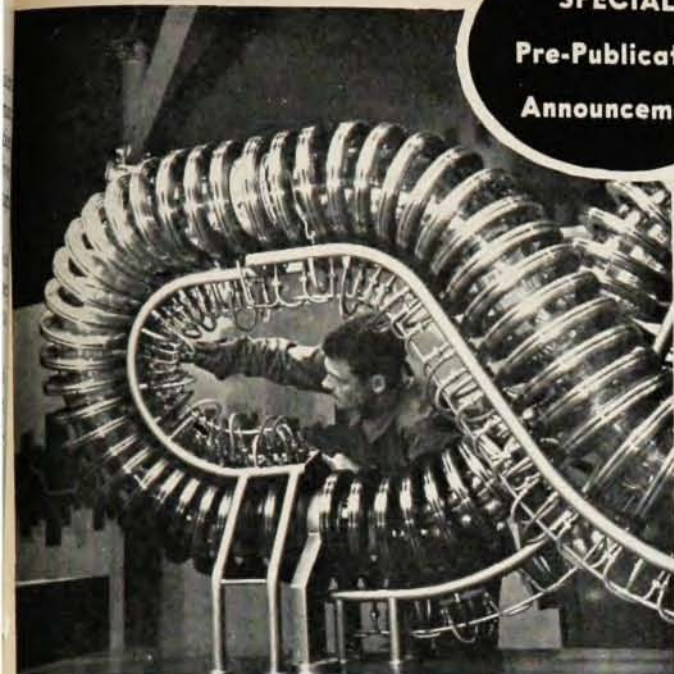
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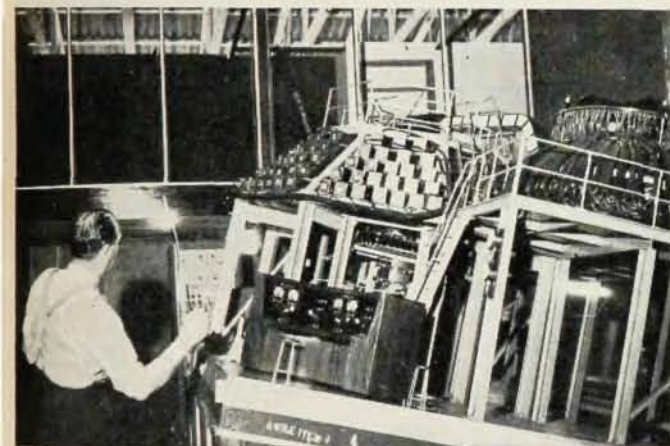


or

Scientist shows visitor the experimental boiling water reactor which can provide up to 5,000 kw of electricity to help meet the world's anticipated power needs. (U.S. exhibit, 'Atoms For Peace' Conference, Geneva, Switzerland.)



Stellarator developed for producing controlled thermonuclear reaction. The exhibit demonstrates how to confine deuterium gas in tube. (U.S. exhibit, 'Atoms For Peace' Conference, Geneva, Switzerland.)



United Kingdom's fusion apparatus "Minni" displayed at "Atoms For Peace Conference" in Geneva. (U.K. Exhibit, 'Atoms For Peace' Conference, Geneva, Switzerland.)



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satellites and interplanetary flight in commemoration of the 100th anniversary of the birth of Tsiolkovskii, the Russian space flight pioneer. The first paper solves the variational problem associated with the launching of an artificial earth satellite under certain simplifying conditions. This problem received adequate attention in papers published in the United States and in England in the open literature but is of little practical importance since in practice staged rockets are used to launch satellites and coasting periods are introduced to attain higher release altitudes. The second paper investigates the lifetime of artificial earth satellites in the presence of an atmosphere. The authors also consider the simple perturbations due to the earth's equatorial bulge leading to the precession of the orbital plane. Here again there are a number of papers in the open literature going back as far as 1950 but they are not referred to.

The third paper covers material very similar in content to that of the second but again without references to any previously published papers.

The fourth paper by V. A. Egorov deals with problems of flight dynamics in the earth moon system, including hitting the moon and also lunar circumnavigation and return to the earth. This paper is excellent and quite comprehensive, containing a large number of new results which have not appeared in the open literature before. The paper is based on some analytical work as well as a large number of machine calculations to define classes of orbits. The paper is well referenced. (I understand that the author used it for his thesis.) The last paper by V. L. Ginzburg very briefly describes the use of artificial earth satellites for verifying the general relativity theory. This appears to be the restatement and condensation of a more extensive paper written by Ginzburg in 1956. The previous paper, however, did not include a practical method for eliminating first-order Doppler shifts.

Many of the papers dealing with physical measurements in satellites appear in Part 2 and not in the present volume.

Physical Optics. By R. A. Houstoun. 300 pp. Interscience Publishers, Inc., New York, 1958. \$6.25. Reviewed by James MacLachlan, Earl Haig Collegiate Institute.

Here is an intermediate text that makes a real distinction between *physical* optics and what might be called *mathematical* optics. The author does not avoid mathematics, but its role in the development of the subject is definitely secondary to that of physical intuition. The book is directed more to students in fields which depend on physics, in engineering, chemistry, and biology, than to the physics major. It lacks the expanse and depth of Strong's much larger recent text, or of the author's own classic, *A Treatise on Light*. But it is admirably suited to those whose major aim is to apply the principles of physical optics to practical working situations.

The aim of the book is to elucidate physical princi-