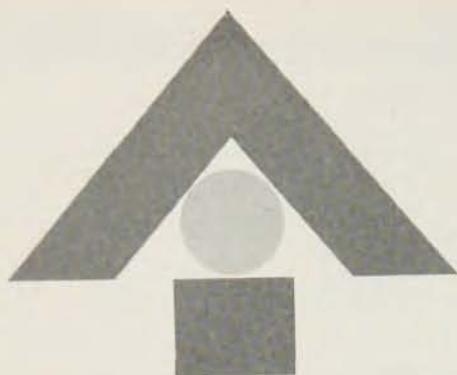




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Prize for Chemistry for their discovery of artificial radioactivity. Von Laue received the Nobel Prize for Physics in 1914 for his discovery of the diffraction of x rays by crystals, and C. T. R. Wilson in 1927 shared a similar prize with A. H. Compton for their contribution to the understanding of the scattering of high-energy photons. All three were among the outstanding physicists of the twentieth century, though it is of interest to note that Wilson, who was born in 1869, did some of his most notable work before 1900.

Vital statistics about celebrated intellectuals are always of interest. The average longevity of those whose biographies appear in this volume was 77. The youngest at death was 58 and the oldest 98. Eight lived to be over 80.

The biographies are of uneven length and quality. Some are extremely brief, while others, such as that of von Laue by P. P. Ewald, are extensive enough to give a vivid picture of the man's personality as well as a detailed review of the significance of his scientific work. All students of physics and science in general will find it worthwhile to dip into this collection.

Turbulence. Classic Papers on Statistical Theory. S. K. Friedlander and Leonard Topper, eds. 187 pp. Interscience Publishers, Inc., New York, 1961. \$6.00. *Reviewed by R. E. Street, University of Washington.*

AS the editors point out in their preface to this collection of reprints of twelve famous papers on the theory of turbulence, their intent was to present only those papers on isotropic turbulence which had their origins in the statistical theory of G. I. Taylor and had been published prior to 1950 by which time "our physical understanding of turbulence was already adequate for the study of many related scientific questions." In this way the size of the volume has been kept small enough so the price is reasonable and yet it seems that all of the best-known papers have been included. The number of authors is few, but include the pioneers in the field; thus, we have the first four parts of Taylor's papers on "Statistical Theory of Turbulence" as well as his 1921 paper on "Diffusion by Continuous Movements", with which his ideas started, and his 1938 paper on the spectrum. Three papers are by von Kármán and his co-workers, including the famous 1938 paper with Howarth and the 1949 paper with C. C. Lin which concludes the book. Also included is a paper by C. C. Lin on the law of decay, the excellent review article by H. L. Dryden of 1943 and Kolmogoroff's three 1941 papers.

Two of the papers are in the nature of review and this, together with Taylor's inimitable style, make most of them excellent reading. Only the three Kolmogoroff papers, although translated, can be said to lack expository style. Thus, the book can be recommended to anyone desirous of becoming acquainted with the classical statistical theory of isotropic turbulence through a study of some of the original papers. By not including papers since 1950 there are certainly gaps in the prog-

ress of the theory as presented, so the reader would be advised to proceed from this collection to some of the many references given as well as to a study of the many papers published since 1950.

Science in Space. Lloyd V. Berkner and Hugh Odishaw, eds. 458 pp. McGraw-Hill Book Co., Inc., New York, 1961. \$7.00. *Reviewed by T. Teichmann, General Atomic Division, General Dynamics Corporation.*

SINCE the publication five years ago of *Scientific Uses of Earth Satellites* (edited by J. Van Allen, University of Michigan Press) "space science" has developed into a major discipline, encompassing a great variety of topics, and offering tremendous scientific and practical potentiality. As a result of the information obtained even with the relatively limited experiments carried out so far, the main interest is no longer in details of instrumentation and experiment, many of which have already proven their worth, but in the content and organization of far-ranging scientific exploration of space.

Science in Space recounts the accomplishments to date and discusses some of the new avenues opened by the capability to venture into outer space. Also included is a description of some of the present and impending programs.

Following the introduction into the over-all problem, the book contains a valuable summary by Rossi and Jastrow of the results already obtained. It is of interest to note that the most significant discoveries so far, the radiation belts, were not anticipated in the early (pre-1958) discussions, which is a point to be borne in mind in considering present-day prognostications.

A major portion of the book deals with the earth and its environment. This includes the extensive discussion of radiation in space by Van Allen, Simpson, Parker, and Chamberlain; description of the geodetic and meteorological aspects by Woollard and Wexler, respectively; and of upper atmospheric research by Kellogg, Shapley, and Villard. Many of these topics have almost immediate practical interest in terms of weather forecasting, navigation, and communications.

The remainder of the book concerns larger-scale and more unknown domains, in which one may perhaps encounter spectacular surprises. Dicke describes a variety of experiments on gravity, which are now on the verge of being feasible, if not already practicable, while Urey describes what may be learned about the origin of the solar system and the universe from the moon and the planets. Goldberg and Dyer discuss solar and general astronomy, with particular reference to the effect of the vast increase in spectral range made available by extra-terrestrial observations. Finally, Lederberg and Hartline discuss "space biology" (relating to "man-in-space") and "exobiology" (concerned with possible life outside the earth).

The combined effect of these articles gives a full account of our present knowledge and main areas of interest, and it should also provide an interesting landmark to compare with results five or ten years hence.



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Edited by Simon Ramo, Thompson Ramo-Woolridge, Inc. 295 pages, \$6.95.

This remarkable volume brings together outstanding scientists, educators, politicians, and businessmen for an examination of the coming space age. Emphasizing the peacetime, non-military aspects of space technology, the book seeks to heighten public responsiveness to the full impact of science and technology in shaping our future. Contributors include: Leston Faneuf, J. H. Doolittle, Lloyd V. Berkner, Congressman Overton Brooks, Ralph J. Cordiner, Willard F. Libby, Vice Admiral John T. Hayward, Joseph Kaplan, Morris Neiburger, Brigadier General Don D. Flickinger, Leo Goldberg, Edward Teller, and Frederick R. Kappel.

■ SPACE ASTROPHYSICS

By William Liller, Harvard College Observatory. 272 pages, \$10.00.

This book is the product of a lecture series given at the University of Michigan Department of Astronomy during the 1959-60 academic year on the aspects of astronomy and astrophysics which are concerned with or can be studied from outer space. Many of these lectures by leading space scientists are made available to students and scientists here for the first time.

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