

Books

The Planets: Their Origin and Development. By Harold C. Urey. 245 pp. Yale University Press, New Haven, Connecticut, 1952. \$5.00.

This book is a presentation and compilation, in book form, of the substance of the Silliman Lectures, presented by Professor Urey at Yale during the spring of 1951. It is divided into six chapters entitled The Origin of the Solar System, The Moon, The Terrestrial Planets, Chemical Processes during the Formation of the Planets, The Heat Balance of the Earth, and The Abundances of the Elements and The Chemical Composition of the Solar System.

Professor Urey reviews the main astronomical evidence regarding the moon and the various planets as well as the geological and geochemical evidence regarding the earth. He discusses the several theories regarding the formation of the planetary system, and then shows how modern physical chemistry explains many of the presently observed properties of the earth and planets. He discusses in detail such problems as the changing equilibria during the planets' history, and the chemical exchanges between various components of the atmospheres of the planets, the water and carbon abundances, and such geophysical phenomena as limestone deposition.

His main conclusions, that the earth and terrestrial planets could have been formed at a lower temperature than had previously been assumed and that the iron in the earth was once more uniformly distributed than now, are both significant advances in our buildup of knowledge. To the discussion he brings his expert knowledge of the many and complex processes of physical chemistry.

It is perhaps not surprising that the book deals mainly with the earth. Certainly far more is known about the composition and the interior of the earth than about any other planet. The major planets are only briefly discussed.

One or two definitions and conclusions are rather startling. On page 5, the author flatly calls the solar system a double-star system, with Jupiter the secondary. One might disagree with this view by pointing out that a cold planet can hardly be regarded as a star unless we revise our definitions radically, and further that Saturn has almost the same right as Jupiter to be included if the definition is so rewritten. With reference to his conclusion that a substantial amount of iron phase exists on the moon, one wonders whether in this case the moon might not exhibit a larger magnetic mo-

ment than it does. It will be recalled that cosmic rays show neither a cut-off nor a twenty-seven day periodicity which might be expected if a substantial magnetic moment were associated with the moon.

The book is carefully written and is generally free from obvious errors and misprints (although on page 62 the text refers to Table 1, which should obviously read 4). The data and tables of material are well selected and show careful study, and the printing and general format are satisfactory.

The book should be of interest to all students of the solar system. It is indeed excellent intellectual exercise, and makes stimulating reading. Urey's writings have undoubtedly stimulated much new interest and respect in the science of geochemistry.

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The Aurorae. Volume I. By L. Harang. 166 pp. John Wiley and Sons, Inc., New York, 1952. \$4.50.

Dr. Harang's work, a review of the present knowledge about the aurorae, is divided into eight chapters: The Form and Appearance of Aurorae, The Positions in Space of the Aurorae, the Spectrum of the Aurorae, Other Light Effects in the Auroral Region, Earth-Magnetic Storms and the Aurorae, the Corpuscular Theory of the Aurorae, The Upper Atmosphere and the Aurorae, and the Ionosphere, Aurorae, and Earth-Magnetic Perturbations.

A good summary of the present knowledge, the book is suitable for undergraduate or graduate student collateral reading in a course on the upper atmosphere. The mathematical level presupposes calculus. The volume abounds in good charts and diagrams and the majority of the important features are well described and illustrated. Although it is clearly not intended to inform the specialist, even he will benefit from having so complete a bibliography and tables of data in one place. The book is well written, logically organized, and constitutes a useful addition to the available literature on this subject.

S. A. K.

Atomes, Spectres, Matière. By Yvette Cauchois. 636 pp. Éditions Albin Michel, Paris, France, 1952. 1.800 fr.

A fairly detailed text on atomic physics, the present volume starts out describing the atomic nature of matter, and proceeds to give a treatment of almost all phases of the subject, including thermodynamics, crystal structure and x-rays, the electronic charge and charge-to-mass ratio determinations, spectra, Bohr theory, resonance and fluorescence, introduction to wave mechanics, and the wave-particle duality. The level assumes calculus.

As a text for seniors and beginning graduate students, this book would be about right. It covers all the main points and most of the incidental ones, is well written and logically put together. One could wish that as good