

BOOK REVIEWS

Astronomy of the 20th Century. By Otto Struve and Velta Zeberg. 544 pp. Macmillan, New York, 1962. \$12.50.

Reviewed by **E. J. Öpik**, *Armagh Observatory and University of Maryland.*

A contribution to the history of astronomy, as well as a popular summary of astronomical research, written on the basis of his own scientific life, this is the swan song of Otto Struve, whose untimely death in April 1963 deprived the astronomical world of one of its greatest representatives. The compressed, vivid, and sometimes informal style is often in the first person, implying that the role of the two authors in producing the manuscript was far from being equal.

The work is not history in the rigid sense of the word; for that, it is too incomplete and selective. Also, it is primarily concerned with giving a popular account of the results achieved. To a great extent, it is a recollection of personal experience in research and human contacts, with a strong preference for branches in which Struve himself was active. Thus, stellar astronomy is given preference, and especially the physics of stellar envelopes, where he was a pioneer. Technical terms in physics and astronomy are explained currently in the text, to make them understandable to the lay reader, and a glossary is appended. With the same purpose,

an appendix—the only one—of 27 pages explains the principles of formation of stellar absorption lines which adumbrate the main theme of these astronomical memoirs. In contrast, the internal factors of stellar evolution are brought out but dimly. One of the greatest achievements of modern theory—the explanation of giant stars by way of thermonuclear evolution of unmixed stellar models—is not elucidated (a problem with which Eddington had grappled unsuccessfully), and the proton-proton reaction is not even mentioned. However, the factual evolution of the external observable parameters of the stars is described in detail. Planetary and interplanetary physics are intentionally and greatly neglected. Thus, the moon is given one page in the text, consisting of 8 lines referring to its atmosphere and the origin of its craters, the rest being filled with *curiosa*—the doubtful “eruption” in the crater Alphonsus, and an amusing letter from a Russian who in the 1920’s claimed to have been able to observe the hidden side of the moon. For water on Venus, “oceans” is still the verdict of one-time wishful thinking. These are a few examples, representative of a certain systematic trend of the book.

The senior author is an offspring

of an astronomical dynasty who left Russia as a political refugee in his early youth. The junior author, his assistant, is the daughter of a refugee astronomer who had to leave his Baltic home more recently. The historical side of the memoirs appears to be strongly influenced by the origin of the authors, prominence being given to Russian astronomy and political events that influenced the fate of astronomers there. On the other hand, many leading figures—to name only one, Banachiewicz of Poland—who were prominent in the history of astronomy—are not mentioned.

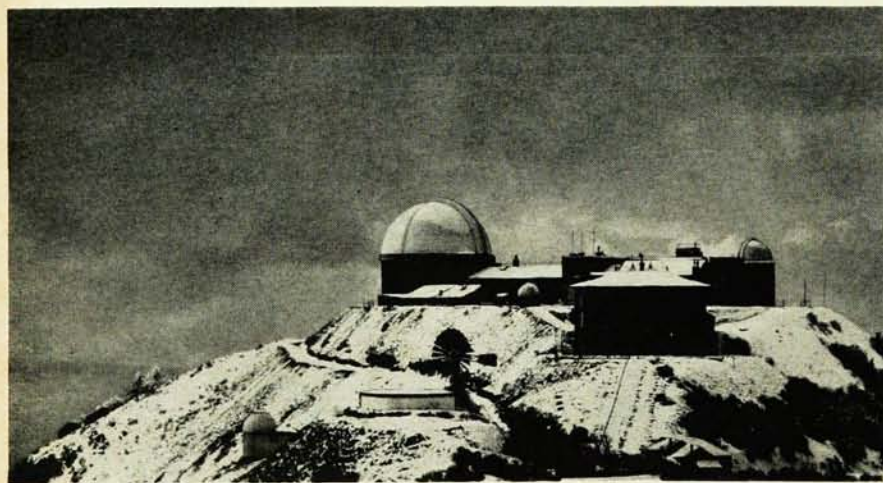
These remarks are not meant as a reproach to the authors; they are intended to point out to the reader, what he can, and what he cannot hope to find in the book. With its 239 excellent illustrations with pictures of 78 identified astronomers (out of modesty, Struve’s own picture is missing, however), it is a splendid laconic review of various branches of astronomical research, presented with authority in a popular style and a varying degree of detail. For astronomers, it is a human document of specific charm.

Space Flight. Vol. 2, Dynamics. By Krafft A. Ehricke. 1210 pp. Van Nostrand, Princeton, N. J., 1962. \$29.75.

Reviewed by **R. E. Street**, *University of Washington, Seattle, Washington.*

For one man to write three volumes on space flight is a tremendous undertaking, especially when the first two have already totaled more than 1700 pages. Only the author of this work, with his knowledge, enthusiasm, and persistence, could do so. Thus the present volume covers almost all of the aspects of the flight problem which are unique to man-made space vehicles, in contrast to the classical celestial mechanics and discussion of the solar system which was contained in the first volume (*Physics Today*, Oct. 1960, p. 62). Navigation, propulsion, rendezvous, touch-down, etc., are promised for the third volume.

The topic coverage is thorough. There is a discussion of free-flight bal-



The Lick Observatory in 1889 (from the book *Astronomy of the 20th Century*)