cludes the page number of the description. To date the format of treatment has been kept fairly consistent, despite the fact that several collaborators have contributed to the work.

Although this series of volumes will be of the greatest utility to Coleoptera specialists and amateurs and will be a classic in future years, it should also be widely used by identifiers, ecologists, and zoogeographers.

JOHN M. KINGSOLVER
Entomology Research Division, U.S. Department of Agriculture

Modern Lunar Research

A Fundamental Survey of the Moon (McGraw-Hill, New York, 1965. 157 pp., $4.95), by R. B. Baldwin, is the second volume of the McGraw-Hill series in astronomy; the series is intended to supply new material to undergraduate majors in astronomy, physics, and space science. The volume is also Baldwin's third book on the moon.

His first book, *Face of the Moon* (1949), made a deep and lasting impression on our thinking about the origin of the lunar craters and dark maria, establishing for the first time satisfactory qualitative and quantitative correlations between these features and their postulated terrestrial counterparts. Baldwin did not originate the meteoritic impact theory, but he certainly made it very respectable. His *Measure of the Moon* (1963) is an updated and amplified version of the earlier book.

The two earlier works are mentioned to make clear Baldwin's position in lunar research and because he has drawn on them for materials and mode of exposition. The latter is perhaps a little unfortunate, since the propagandist tendencies, appropriate enough in these earlier works, are rather out of place in a text for undergraduates.

The book includes well-organized chapters on the lunar orbit, the tides, tidal friction and the shape of the moon, the major surface features, the origin of the lunar craters, the origin of the maria, the birth of a meteoritic crater, the surface temperatures, the optical characteristics of the surface, changes on the moon, the lunar atmosphere, and the Ranger photographs. I could find no discussion of the moon's thermal history, a topic that certainly belongs in a book of this kind. The bias mentioned above appears only in those chapters that bear on the mode of origin of the surface features. Because the author's principal tenets are generally accepted, I do not consider this occasional subjectiveness a real drawback.

The chapter on the moon's origin is excellent even if, as dictated by the present state of our knowledge, it does not lead to a definite conclusion. I wish that the discussion of the moon's figure had been written in the same vein, since contrary to Baldwin's ideas, we still do not know how the moon acquired its shape. Baldwin's identification of the earthward elongation of the moon as a fossil tide will not do, since the known ratio of the differences of the moments of inertia is not consistent with the solidification of the moon as a synchronous satellite of the earth.

Each chapter closes with a short list of problems for the reader. There is a useful eight-page glossary which, however, is not flawless. The definition of *maria* may be correct but is needlessly subjective. The *limb* of a celestial object is the edge of its image, rather than the edge of the object itself. The index is adequate for a book of this scope. The line diagrams are clear and relevant. There are eight photographic views of the lunar surface, and one of these is a Ranger VII picture.

Despite the above criticisms, this book comes close to its stated purpose, for it presents the student with a very readable account of modern lunar research.

D. W. G. ARTHUR
Lunar and Planetary Laboratory, University of Arizona, Tucson

Stars and Stellar Systems

Galactic Structure, edited by A. Blaauw and M. Schmidt (University of Chicago Press, Chicago, 1965. 626 pp., $15), is volume 5 (and the sixth volume published) in the nine-volume compendium of astronomy and astrophysics, "Stars and Stellar Systems," which is being published under the general editorship of Gerard P. Kuiper and Barbara M. Middlehurst. The editors have felt, and rightly so, that this volume more than others of the compendium, should help to fill the gap caused by the lack of a good textbook on this most important domain of modern astronomy. The price is so low, thanks to the National Science Foundation, that all graduate students in astronomy can afford the book, and it should be closely and carefully studied by them. Volume 7, *Nebulae and Interstellar Matter*, is now in the galley proof stage; it too should be of special importance, and for the same reason.

Our present picture of the structure of the galaxy is remarkably different from the picture that we had only 15 years ago. Spiral arms have been identified and traced, still in rather hazy fashion, out to distances far beyond the galactic center. This hidden center has been observed and pinpointed by radio observations to within a few minutes of arc, and its remarkable nature has been investigated in a preliminary sort of way. A very thin disk of neutral hydrogen is amazingly flat to distances of 200 million billion kilometers from the center and, at greater distances, is systematically distorted from the galactic plane—which it defines—along a line in the direction of the Magellanic Clouds.

Remnants of many old supernova explosions have been located close to the galactic equator; but recently a number of high-velocity, neutral, hydrogen clouds have been discovered far from the plane, and there undoubtedly are many more such. The interstellar gas, magnetic fields, and cosmic rays are dynamically coupled in ways that are still little understood. A gigantic corona of radio radiation and faint blue stars surrounds the galaxy and may extend to nearby galaxies. We have discovered a few dozen nearby subdwarf stars which have orbits "plunging" into the galactic nuclear bulge. The number of stellar population types has grown from Baade's original two to five—or perhaps more. Stars that were once thought to be all of one chemical composition are now known to be widely different in their chemistry, and those differences are correlated with their kinematics and their ages.

Most of the 23 chapters in this volume are significant contributions to the literature; I will comment on only two of them. In chapter 6 Olin Eggen reviews the evidence for a number of moving groups of stars, a subject that he has made peculiarly his own. A moving group of stars, like a moving cluster, presumably has a common origin in time and place and nearly identical space velocities. In a moving group, however, there is a non-negligible dispersion of the velocity components perpendicular to the galactic plane. Identification of group membership is made from the identical velocity components *in* the plane (within observa-