ever held on taphonomy, the book is of considerable intrinsic interest. But what does it tell us of the state of taphonomy today? Glaringly apparent is the lack of critical review and synthesis. Olson, in his historical overview, fails to provide the former and despairs of achieving the latter. In his opinion, each taphocoenosis represents a "singular historical event" with unique characteristics. Surely the fact that one can compare the taphonomic mode of an American Jurassic deposit (Morrison Formation) with an African Pleistocene one (Koobi Fora) and contrast both with a Canadian Cretaceous formation (Oldman) and one from the Pakistani Miocene (Siwalik Series) offers hope that, at the appropriate level of generality, taphonomic features will be seen to transcend accidents of time and space. We are told that the grand synthesis must await the collection of still more facts—but is this really the structure of scientific progress? In fact the danger is that taphonomy will collapse under the weight of "sheer phenomenology." There will always be room in taphonomy for thoughtful controlled observation. Hill, however, epitomizes taphonomists who collect facts—in this case 13 pages of raw uncontrolled data—from which almost no useful conclusion is drawn. Good taphonomy, in common with all good science, necessarily involves the formulation of resolvable questions so that focused observations are used to support or eliminate competing hypotheses.

The editors proclaim the book the first comprehensive bibliography of vertebrate taphonomy and paleoecology. With the reservation that the papers do not reflect work done since 1976, it comes commendably close to being comprehensive. The essays lack abstracts, in default of which good summaries should have been required. The book is well indexed by author and poorly by subject. It is printed from double-spaced typescript, but here is one case in which the price clearly justifies the inexpensive appearance. The University of Chicago Press and the senior editor, who did much of the tedious editorial work herself, are greatly to be commended.

The book should be read by those interested in the ecology of the modern fauna of East and South Africa and in its fossil antecedents and by those interested in the methodology of taphonomy—but a critical mind is recommended.

PETER DODSON
School of Veterinary Medicine, University of Pennsylvania, Philadelphia 19104

Star Charts

The Sky Explored. Celestial Cartography 1500–1800. DEBORAH J. WARNER. Liss, New York, and Theatrum Orbis Terrarum, Amsterdam, 1979. xviii, 294 pp., illus. $70.

When Alessandro Piccolomini (1508–1579) wrote his modest book *De le Stelle Fissi Libro Uno* in 1540, he wrote in Italian in a vernacular style, in order to bring his science from ecclesiastical and university confines out to the people. (He also advocated higher education for women.) Today his book is a landmark because it contained the first printed star atlas: 48 woodcut star maps, one for each Ptolemaic constellation. Piccolomini is just one of the nearly 200 entries in *The Sky Explored: Celestial Cartography 1500–1800*. This encyclopedic work lists alphabetically each author of a star map during this period and gives a few facts concerning his life, details of the publications and of the science contained on the charts, the antecedents of the work, and a bibliography. It does not make for easy reading, but for students of celestial globes, charts, and atlases it is a gold mine of information and a joy to peruse or to study.

The casual student of maps may know of the two beautiful sky hemispheres (1515) of the Nuremberg artist-mathematician Albrecht Dürer but will now know that the maps were the result of a three-man collaboration of Johann Stabius, who drew the coordinates, Conrad Heinfogel, who positioned the stars, and Dürer, who drew the constellation figures and cut the wood blocks. And the work of Bayer, the Amsterdam Blaeus (father and son), and the London Senex may be familiar. But there is much more to be learned among the unfamiliar. In 1733 Christoph Semler, a Protestant clergyman in Halle, published *Coelum Stellatum*, an atlas of 35 maps showing white stars on black sky. We learn that the copy of Semler's atlas at the Library of Congress has the penciled notion "Given to Whitney Warren . . . 1913 and used in designing the ceiling of the New York Central Terminal."

To lovers of old books, collectors, and students of star maps, this is almost as much fun as locating an old star map. It joins two earlier works on the subject, both now collectors' items (but each recently reprinted): E. L. Stevenson's *Terrestrial and Celestial Globes* (published for the Hispanic Society of America by Yale University Press, New Haven, 1921) and Basil Brown's *Astronomical Atlases, Maps and Charts* (Search Publishing Co., London, 1937). *The Sky Explored* is expensive, the quality of some of the many reproductions is poor, and, sadly, none are in color. Sources for all reproductions are given, however, and the serious reader could spend many delightful hours searching out the originals in the Library of Congress or in other major collections. But let the reader beware: the search for old globes and star charts is habit-forming.

VERA RUBIN
Department of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, D.C. 20015

Atomic Collision Physics

Coherence and Correlation in Atomic Collisions. Papers from a workshop. H. KLEINPOPPEN and J. F. WILLIAMS, Eds. Plenum, New York, 1980. xiv, 706 pp., illus. $59.50. Physics of Atoms and Molecules.

In 1978, at age 70, Harrie Massey, who personifies atomic collision physics, was honored in London by an international workshop on coherence and correlation in atomic collision physics. The editors of this handsome volume, the fourth in the publisher's series on the physics of atoms and molecules, have produced more than a routine collection of conference reports or dedicatory essays. The 55 papers in the book (almost half from Germany, a third from the United States) present a comprehensive, up-to-date review of a very active field and contain a reasonable amount of experimental detail, with theoretical advances, admittedly not as impressive, given less weight.

The term "correlation" has several different technical meanings in physics, but as it is used in the book it mostly refers to the measurement of angular and polarization correlations, although correlations of a related but more conceptual kind, such as the effects of the inclusion of interactions among electrons in describing atomic structure, are also discussed.

In an atomic collision experiment, a beam of particles (positive or negative electrons or ions, or photons) is directed at a gaseous or solid target, and some or all of the collision products are observed. In the early days, nothing more was measured than the attenuation of the incident beam as it penetrated a thickness of target material, and inferences were drawn about the overall efficaciousness (total integrated cross section) of the collisional interaction. Great advances in beam, detection, and data-col-