Selected Readings in Astronomy

Astronomy. Samuel Rapport and Helen Wright, Eds. New York University Press, New York, 1964. xiv + 354 pp. Illus. $4.95.

This is the sixth volume in the New York University Library of Science, a proposed series of 16 books designed for the general reader. The 23 chapters in this book are culled from the literature and include works by some of the greatest astronomers and interpreters of astronomy, both past and present. The editors have done their work well; the book is, for the most part, very good reading indeed. The editorial insertions that precede each chapter not only tell something of the author but also serve to connect the chapters and put them in proper perspective.

The five chapters of the first section deal with the lives and works of Copernicus, Galileo, Brahe, Kepler, and Newton. The second section deals with telescopes (especially the early history of Palomar), radio telescopes, and balloon astronomy. The five chapters of the third section, on the solar system, consider the discovery of Neptune, the coming exploration of the Moon, and the Mariner flyby of Venus. The fourth section has five chapters on the Sun and other stars, and the last section contains five contributions on galaxies, cosmology, and relativity.

The stated purpose of the book is to bring to the layman a brief introduction to a fascinating field, and I think this purpose has been admirably fulfilled. However, I wish the editors had included excerpts on Bessel's first measurement of a star's distance, the Shapley shift from a heliocentric to a galactocentric universe, the Hubble breakthrough into the realm of the nebula, and the discovery (and non-discovery!) of Pluto, as well as something more on rocket astronomy, stellar motions, binary stars, supernovae, and the red shift. The Crab nebula, a most exotic object that has been well written up in the literature, also deserves a spot in a book of this sort.

The selections are so good that it is with some difficulty that I pick my three favorite excerpts. These are Galileo on his telescopic observations (from *The Sidereal Messenger*); Spencer Jones' account of John Couch Adams and the discovery of Neptune; and Allan Sandage's *Birth and Death of a Star*. Galileo, in briefly describing his telescope, makes the following understatement: "Perchance, other discoveries still more excellent will be made from time to time by me or by other observers, with the assistance of a similar instrument. . . ." Sandage, in predicting the sun's greatly increased brightness some six billion years hence says: "Life will have ceased [on the Earth] . . . the oceans will have boiled away, and conditions will be miserable."

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Philosophy of Science: An Elementary Approach

The Philosophy of Science. A systematic account. Peter Caws. Van Nostrand, Princeton, N.J., 1965. xii + 354 pp. Illus. $6.75.

Students in the various branches of science who want to learn something about the philosophy of science often are discouraged from doing so by the fact that courses in and books on that subject tend to presuppose considerable previous training in philosophy itself, a training that the science major usually has neither the time nor inclination to get. There is therefore need for a book on the philosophy of science which goes over the relevant ground informatively and accurately, but in a way that is accessible to the science student who does not wish to specialize in philosophy. The present book, by Peter Caws, aims to fulfill that need. In four tightly organized parts, containing 44 brief essays that vary between five and ten pages in length, Caws attempts to provide the student with the material needed to understand the main problems in the philosophy of science and with an explanation of what these problems are, together with an indication of the kinds of modest "solutions" that are available.

A book so broad in scope, which touches briefly, albeit systematically, on so many topics, is likely only to whet the appetites of those who crave a fuller and more intensive treatment of individual problems. In particular, it seems to me that a student who has had no previous acquaintance with philosophical problems is not going to be able to understand, merely on the basis of Caws' account, just why some of the matters Caws discusses are regarded as *problems*. To make the issues of the philosophy of science come alive to students, an instructor who adopts Caws' book may have to provide considerable supplementary material, not only in the form of illustrations from the various sciences, but also in the form of further readings in philosophy. Caws himself suggests appropriate methods of supplementing his expositions (pp. 344 and following).

Perhaps the least satisfactory chapters in the book, in this respect, are the opening ones on the general topics —for example, the chapters entitled "Knowledge," "Perception," "Thought," and "Language." That this is so, however, does not much impair the usefulness of the book, because the later chapters, which are also more central to the subject matter, contain enough content to engage the reader's interest, and it is in these chapters that Caws' admirably clear writing comes through to best effect. At the same time one wonders what is accomplished by impressing a student with conclusions like the following:

> . . . There is very little point in gambling on the principle of induction; the best attitude to it, as in the earlier cases of causality and simplicity, is to make it the subject of a resolve: in the absence of any better guide to future behavior, we shall use the lessons of past experience (p. 265).

That what has happened in the past is, roughly speaking, our best guide to what will happen in the future, since we have no other, is a matter that is hardly subject for a "resolve," since we cannot help but believe it. However, a student who is acquainted with the rich and precise knowledge that we have in any of the developed sciences today is apt to wonder how such a paltry "resolve" could be the foundation of it all. The philosophy of science mistakes its task, surely, if it conceives itself as providing an *excuse* for pursuing science or calling it "knowledge."

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