

Book Reviews

Science Education in Australia

An Introduction to Modern Physics (273 pp. \$5); **Space Physics and Radio Astronomy** (174 pp. \$4.25); and **The Universe and Its Origin** (147 pp. \$3.75). H. Messel and S. T. Butler, Eds. St. Martin's Press, New York, 1964. Illus.

During the past several years, there has been an enormous increase in the publication of low-priced semipopular books on science. Most of the books are intended for a mixed audience of educated laymen, beginning science students, and science teachers, and they reflect the sudden growth of special programs in science education during that period. Indeed, many are a direct outgrowth of such programs: for example, the Science Study Series is sponsored by the Physical Science Study Committee and the Momentum Books by the Commission on College Physics.

It is becoming clear that a similar ferment in science education is occurring outside the United States. These three books result from one of the new programs in Australia. A series of Nuclear Research Foundation Summer Schools have been held there to help bring teachers up-to-date on recent developments in science. At the summer schools participants attended talks by leading Australian scientists and distinguished visitors from outside the country. The lectures from the third summer school have been edited by H. Messel and S. T. Butler and are published in three volumes: *An Introduction to Modern Physics*; *Space Physics and Radio Astronomy*; and *The Universe and Its Origin*.

The books concentrate on current work in physics and astronomy. *An Introduction to Modern Physics* contains sections on atomic theory, nuclear physics, quantum mechanics, elementary particles, and solid state physics. *Space Physics and Radio Astronomy* discusses radio and visual astronomical tech-

niques, some problems in interplanetary physics, and an introduction to the physics of flight and artificial satellites. *The Universe and its Origin* consists of lectures on cosmology, stellar evolution, the origins of the solar system, and cosmic radiation. Since 15 lecturers contributed to the three volumes, the separate discussions frequently assume different scientific backgrounds. However, anyone with a good command of secondary school physics and chemistry can read and understand almost all of the material. Hopefully, this describes the original audience.

Messel and Butler themselves wrote the longest section of *An Introduction to Modern Physics*. It is a sound survey of the development of modern atomic and nuclear physics. An emphasis on historical background gives the nonprofessional reader insight into the profound philosophical revolution involved in the growth of modern physics. This is reinforced by three extremely well-prepared chapters on quantum mechanics, written by E. E. Salpeter. Salpeter faces up to the enormous difficulty of simplifying highly abstract ideas for an audience with limited mathematical backgrounds. "Some statements I will make, without the use of complex numbers, will be wrong in detail, but the general ideas will be correct." This may offend the purist, but the approach is followed effectively and with complete scientific integrity. In the next three chapters, C. B. A. McCusker gives a brief and straightforward summary of current research on elementary particles. In the last section W. Boas presents a rather disjointed but competent introduction to solid state physics.

Space Physics and Radio Astronomy begins with two sections on radio astronomy by E. G. Bowen and B. Y. Mills. R. G. Twiss discusses interferometry techniques in radio and optical work. W. G. Elford describes problems in meteor astronomy and its relationship to upper atmospheric studies. H. G.

Rathgeber gives a brief survey of recent information on the earth's radiation belts and speculates on their role in causing aurorae. In the last two sections, P. T. Fink presents an introduction to the principles of aeronautics and astronautics, and D. F. Martyn sketches briefly some problems in space physics. Perhaps because it contains the work of so many different lecturers, this is the least unified of the volumes.

The Universe and Its Origin contains a section on cosmology by G. Gamow, prepared in his characteristically clear style, and three chapters on stellar evolution by B. J. Bok. T. Gold reviews theories of the origins of the solar system. C. B. A. McCusker discusses cosmic radiation, stressing primarily the astrophysical significance of the problems of its origins.

All three books contain material that is sound and usually well written. Almost all the lectures are at an appropriate level for active science teachers and most of them will probably prove equally useful to beginning students and laymen with some previous background in the physical sciences. Indeed, many have been televised successfully to a more general audience throughout Australia. The lectures are fairly up-to-date (several references by different authors to colliding galaxies indicate that the lectures are at least 2 years old, but I wish the editors had stated the date of the summer school) and reflect well the scope of recent research in astronomy and physics. Messel and Butler deserve praise for organizing this effective contribution to Australian science education. The three volumes can be used profitably in the United States as well.

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Modern Chemistry

A History of Chemistry, vol 4. J. R. Partington. Macmillan, London; St. Martin's Press, New York, 1964. xxxii + 1007 pp. Illus. \$42.

In this final volume of his monumental *History of Chemistry* Partington has set himself a truly Herculean task. In 1000 closely printed pages he attempts to tell the story of the development of modern chemistry. The magnitude of the job can be dimly

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