theory of liquid helium in its earliest form had just been proposed, second sound, although predicted, had not yet been discovered experimentally, and although x-ray determinations of the structure factor of liquid helium had already been made, the use of neutron spectroscopy for the same purpose and for the determination of the spectrum of elementary excitations was still many years away. All of these topics are thoroughly covered by Atkins, together with discussions of the more recent theories of liquid helium of Bogoliubov, Feynman, Onsager, and Yang and Lee. The book is rounded out with a presentation of experimental and theoretical information regarding properties of helium films, He^3, and He^3–He^4 mixtures. In discussing various theories of liquid helium Atkins is careful to give the experimental data which prompt the theory, and experimental results are discussed in the light of the existing theory. Notwithstanding the wealth of material contained in this comparatively short book and its rather detailed presentation, it is still a very readable book.

Almost any book on recent developments in the study of liquid helium could have won a place in the literature for itself by default; Atkins' monograph accomplishes this on its merits.

Progress in Elementary Particle and Cosmic Ray Physics, Vol. 4. Edited by J. G. Wilson and S. A. Wouthuysen. 470 pp. (North-Holland) Interscience Publishers, Inc., New York. 1958. $12.50. *Reviewed by R. D. Sard, Washington University.*

LIKE its predecessors, this fourth volume of an approximately biennial series consists of critical, self-contained surveys by active workers in the field. The editors have maintained the international character of the series, the authors of the present volume being from Geneva, Madison, Bristol, Durham, Maryland, and Moscow.

The broadening of the title and the editorship, to straddle accelerators and cosmic rays, as well as theory and experiment, is to be welcomed. Compartmentalization should be resisted as long as possible.

The first article, "Some Theoretical Aspects of the Strong Interactions of the New Particles", by D'Espagnat and Prentki, is a critical exposition of the theoretical speculations up to early 1957 on the physical significance of the "strangeness" quantum number. The main experimental results to be correlated were already known at the time of writing, and it appears that this explicit account should still be of value to a reader versed in the transformation properties of abstract spaces.

"The Properties and Production of K-Mesons", by W. D. Walker, is a brief survey of the experimental results again as of early 1957. It includes a presentation of the strangeness scheme, and a presentation of the data on energy and angle distributions in tau decay and the theoretical arguments based on them about spin and parity of the parent. The Revolution of January 1957 has demolished the parity arguments, but the considerations about spin are still cogent.

"The Interaction of Mu-Mesons with Matter", by G. N. Fowler and A. W. Wolfendale, is mainly of interest as a survey of experiments bearing on apparent anomalies in the behavior of fast mu mesons, in many of which the authors have been involved. To the reviewer, who has also worked in this field, the evidence for anomalies seems on the whole rather ghost-like, enveloped in the clouds of uncertain particle identification, naïve sampling, and noise analysis, and uncertain theoretical prediction. A major step toward clarification has recently been made by Fukui et al. (*Phys. Rev.* **113**, 315, 1959). The survey under review is required reading for anyone venturing into this difficult field, if only for the warnings it contains.

"The Primary Cosmic Radiation and its Time Variations", by S. F. Singer, is a well-written and well-organized presentation, some 125 pages long. It contains a wealth of reference material on geomagnetic theory and high-altitude observations, as well as some stimulating comments on current research problems.

V. L. Ginzburg's "The Origin of Cosmic Radiation" is a presentation of his theory that most of the cosmic radiation comes from supernovae, and perhaps novae, in our galaxy. The nonthermal radio and optical emission from them is regarded as evidence for very high-energy electrons, up to some 10^{12} ev, and whatever mechanism it is that accelerates the electrons is assumed also to accelerate protons and complex nuclei. The article surveys present knowledge of the primary cosmic radiation near the earth and of cosmic radio-emission, presenting many useful theoretical results on magnetic bremsstrahlung. The reviewer is not competent to compare Ginzburg's theory with its rivals, but he is impressed by the physical insight and breadth of view shown in this article.

The book is attractively printed and bound, but there are more typographical and editorial slips than one is accustomed to in this series.

Applied Mathematics for Engineers and Scientists. By C. G. Lambe. 518 pp. The Macmillan Co., New York, 1959. $8.50. *Reviewed by J. Gillis, Weizmann Institute of Science.*

THIS is a welcome addition to the series of excellent textbooks which have been appearing under the general editorship of Sir Graham Sutton. Let us hope that the dichotomy "engineers and scientists" will not cause offense to members of the first group.

The material is all completely standard and includes dynamics of particles and of rigid bodies; Lagrange's equations with applications; statics of a rigid body and of ropes and chains; structural statics, hydrostatics, hydraulics, and elementary hydrodynamics; the wave, heat-flow, and Laplace equations, leading to the study of Legendre and Bessel functions. The examples, both those worked out in the text and also those set as exercises for the student, are abundant and well chosen.