tripartite division of conics. While his contemporaries were fumbling with negative coordinates, Newton with consummate analytical skill graphed scores of beautiful new curves of third degree, later grouped into 72 species, in a systematic search for general curve properties.

This volume resembles its predecessor not only in the wealth of previously unpublished material, but also in the impeccable translations, the numerous illuminating notes, and the ample and perspicuous editorial introductions to the sections. The long-standing indebtedness of mathematicians to Newton is now complemented by the debt of gratitude which historians of mathematics owe to Whiteside.

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Physics: Six Reviews

High Energy Physics. Vol. 2. E. H. S. BURHOP, Ed. Academic Press, New York, 1967. xii + 483 pp., illus. $24.

This book, with contributions by nine authors grouped under six subject headings, is the second volume of a projected three-volume treatise edited by Burhop. The first volume was reviewed in *Science* last fall (13 Oct. 1967, p. 251). The reviewer commented unfavorably there on the basic concept of such treatises, the long delay in publication, the random selection of material in any one volume, and the exorbitant cost. I can only echo most of his sentiments. The authors of articles reviewing a specialized area in physics should think seriously about publication in the review journals, with their considerably speedier publication schedule, rather than in collaborative commercial volumes that are out of date before they appear. Some of the articles in the book under review warranted better treatment than they have received. Oh, the quality of the paper and the typesetting are excellent, but the articles were read and used by some of us one-and-a-half or two years ago when they appeared in preprint form, multilithed on poor-quality stock, but readable nonetheless.

The book begins with a 70-page article by R. Gatto on the present status of quantum electrodynamics. The discussion is comprehensive and authoritative, covering the low-energy, extremely precise experiments, as well as the information from high-energy experiments with electrons and positrons. The recent, but not the very recent, developments are included. For example, the revised value of the fine-structure constant occasioned by the important measurement of $2e/h$ using the Josephson effect, published almost a year ago, is not mentioned. This is no criticism of Gatto. However, it does illustrate the rapidity of developments and the desirability of timely reviews.

The next two articles treat the strong interactions of fundamental particles at high energies. L. Bertocchi and E. Ferrari in their 146-page survey attempt to cover the whole subject, reviewing the basic experimental facts, the elements of relevant theory, elastic and inelastic processes, and also the area of ultra-high energies. The other article, by A. C. Hearn and S. D. Drell, focuses on peripheral processes. Their 45 pages overlap parts of the Bertocchi-Ferrari article, but go into considerably more detail. The time lag to publication has, unfortunately, taken the edge off both these articles. When the first version of the Hearn-Drell article was written more than two years ago, it provided a review of a subject that had just undergone interesting and extensive development in both experiment and theory. But by now other reviews have appeared in the journals and in conference and summer-school proceedings. Bertocchi and Ferrari have included fairly extensive experimental information on all aspects of high-energy collisions, rather than merely selected illustrative examples. While the material is somewhat dated, it provides a useful starting point for an outsider or graduate student who wishes to apprise himself of the salient facts. The summary of theory is likewise a useful compendium of theorems and results.

The last 200 pages of the book contain articles on interactions at very high energies by J. M. Kidd (37 pp.), neutrino physics by L. Lederman (61 pp.), and hypernuclei by D. H. Davis and J. Sacton (90 pp.). Kidd's article gives a concise survey of the experimental information obtained from cosmic-ray interactions in photographic emulsions, including multiplicities, and energy and angular spectra of particles and photons. The interpretation is made chiefly in terms of the "two-fireball" model with properties of the excited baryons extrapolated from accelerator energies. One gets the impression that progress is slow and interpretation ambiguous. Nevertheless, until storage rings for protons are operative, ultra-high energies are available only with the cosmic radiation.

Neutrino physics, as a subject of its own, is less than ten years old. In fact, ten years ago, present-day neutrino physics would have been viewed as a pot-smoker's fantasy. Lederman gives a detailed review of the experiments done at Brookhaven and at CERN, as well as the cosmic-ray experiments in progress. Experimental details on the neutrino energy spectrum, the makeup of the detectors, and their positioning are covered along with the essentials of the theory. The facts, from the discovery of two kinds of neutrinos through to the momentum-transfer dependence of the form factors, are presented in a masterly fashion, as is an optimistic outlook for future neutrino experiments.

Hypernuclear physics is in a strange position. It is neither fish nor fowl. High-energy physicists do not look to it for valuable advances in their understanding of the interactions of fundamental particles. Nuclear physicists also see the field as something apart. Its main relevance for the fundamentals is the information it can provide on N–Λ and Λ–Λ interactions. For anyone wishing to learn of the latest work in this very specialized area, Davis and Sacton present a comprehensive survey of hypernuclei, discussing the experimental data on production, binding energies, and decay modes. They then interpret these facts within the framework of the model pioneered by Dalitz and Downs.

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Biological Control

Regulation and Control in Living Systems. H. KALMUS, Ed. Wiley, New York, 1967. viii + 468 pp., illus. $13.75.

Biologists have long recognized the central importance of regulation and feedback in living systems. Indeed, much of the research of the past half century has been aimed at describing and elucidating such mechanisms, and the results of such work are being rapidly incorporated into the corpus of biological science.

In addition to this essentially descriptive or "classical" approach to biologi-