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ters deal with selected topics of solid-state physics. A reevaluation of the Debye temperature is followed by an article on elastic constants of isotropic and anisotropic solids and relations between them. Two chapters on ultrasonic attenuation as influenced by phonon and thermal processes, as well as by impurities, are preceded by articles on the rather special topics of the effect of light on alkali halide crystals and on magnetoelastic interactions in ferromagnetic insulators.

Since the articles seem to aim for an in-depth discussion rather than for a broad exposé of the entire field, the reader should not expect to find a great deal of continuity from one chapter to the next. However the individual sections treat the subject matter extensively and thoroughly.

It would indeed be a mistake to assume that the present volumes were written exclusively for acousticians. Anyone concerned with solid-state physics or strength of materials should find many pieces of interesting information about his own field. One of the successful features of the books is the inclusion of a sufficient amount of introductory discussions, in addition to a host of new material, so that a rather uninitiated reader should not find it too difficult to understand the subject matter. Readers working in physical acoustics will find the books extremely valuable.

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The reviewer teaches physical acoustics and solid-state physics at Georgetown University, Washington, D. C.

Biography collection

THE GOLDEN AGE OF SCIENCE: THIRTY PORTRAITS OF THE GIANTS OF 19TH-CENTURY SCIENCE. Besie Zaban Jones, ed. 659 pp. Simon and Schuster, New York, 1966. \$12.00

by Robert L. Weber

From 1858 to 1931 the Smithsonian Institution published in its Annual Reports more than a hundred biographies of great scientists written by contemporary scientists. Many of the memoirs were translated from the *Eloges* of the French Academy of Sciences. Other memoirs came from the

scientific journals of England, Germany, Italy, Switzerland, Belgium and our own country as these were established.

Mrs Howard Mumford Jones has brought her experience with university presses and with the editorial staff of the Smithsonian Astrophysical Observatory to bear on the selection of the biographies for this volume. These include Herschel, Volta, Laplace, Oersted, Faraday, Henry, Darwin, Helmholtz, Pasteur, Kelvin, Langley, Rowland and Poincaré. The selection was made "in subject to cover the widest possible range of theories advanced by 'original and ingenious promoters of modern science,' and in authorship to show 'enlarged and original views of science itself.'"

In his introductory essay on the context of 19th-century science, Everette Mendelsohn traces the professionalization of science in this age of synthesis. He outlines the development of scientific societies on the model of the Gesellschaft Deutscher Naturforscher und Ärzte (1822) and their success in advancing scientists. The growing importance of applied science in this period is traced. That Germany outstripped England as a producer of organic dyes is attributed to the fact that Germany had moved quickly to develop wide-scale training for technicians, while England lagged behind, depending upon her few great men of science. Mendelsohn presents the development of scientific institutions in America in the 19th century as a slow adaptation of developments in England and on the continent, but with the advantage that it could be selective and was no longer in the 18th-century pattern of an undernourished colony tied to a mother country.

Dominique Arago, Pierre Flourens and Henry Roscoe each contributed more than one biography to this collection. Asa Gray and Joseph Henry, whose biographies appear in this volume, also appear as biographers.

Because of the sponsorship of this book by the Smithsonian Institution, the biographies of two of its secretaries may be of special interest. Joseph Henry, as the first secretary, was conscientious and imaginative in shaping James Smithson's establishment "for the increase and diffusion of knowledge among men." Henry considered

that wide distribution of the Institute's publications was important for this goal. But regarding his own important investigations he had little eagerness for publication, despite the aim he expressed in a letter, "My whole ambition is to establish for myself *and to deserve* the reputation of a man of science." Fortunately the breadth of his scientific interest and his felicity in treating scientific topics gained recognition, as implied in a remark by Sir David Brewster (written when Henry was only 35): "The mantle of Franklin has fallen upon the shoulders of Henry."

Samuel Pierpont Langley, the third secretary, is described by Cyrus Adler as a man rigidly truthful in "that extraordinary Puritan New England sense, which did not even permit him to subscribe himself as being 'very sincerely yours' if he was not." His loneliness at the Allegheny Observatory and need for intellectual companionship led Langley to welcome his appointment to the Smithsonian Institution. In 1869, at the age of 35, he wrote his first two papers that resulted in replacement of a confusion of empirical local times by a national-standard time system. Langley's later investigations of solar radiation, aerodynamics and aerial navigation were carried out with the conviction that "science is not for the professional student alone, but everyone will take an interest in its results if they are only put before the world in the right way."

These biographies, some written in a style that appears ornate today, are a good supplement for the depersonalized outline of science presented in most textbooks.

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R. L. Weber has tried to interest physics students in biography by including in College Physics, of which he is coauthor, biographical notes and portraits of the winners of the Nobel Prize in physics.

Dust everywhere

PARTICLES IN THE ATMOSPHERE AND SPACE. By Richard D. Cadle. 226 pp. Reinhold New York, 1966. \$10.00

by Ernst J. Opik

Atoms make dust; dust builds the planets; it rules their surfaces and per-

NEW



BASIC ELECTROMAGNETISM

By Eugene W. Cowan
California Institute of Technology

Based on a course in electromagnetism originated by Professor Cowan, this text is for use at the senior undergraduate or first year level. Although the text contains those subjects traditionally considered to be part of classical electromagnetism, it is specifically concerned with the various possible basic postulates in electromagnetism and their interrelationship. Problems included at the end of each chapter emphasize the important points covered in the chapter and serve as effective review.

May 1968, about 475 pp., approx. \$12.75

THE SCIENTIFIC APPROACH

By J. T. Davies
University of Birmingham, England

"An unusual book, both highly informative and thought provoking which could with much advantage be read by all students and staff in our universities . . . it is well worth considering as recommended reading by any department that believes in educating students as well as training them." —Science Journal

Professor Davies is the winner of two international prizes for his contributions to the subject of the scientific method. This unique, new text is written in terms comprehensible both to the humanist and to the scientist. It treats such topics as origin and testing of theory, laws of science, prediction and probability, and science and society. It shows how man's interpretation of nature has developed since classical times, how his philosophy of science changed radically in the early seventeenth century, and how our presently accepted scientific method was developed.

Third printing December 1967, 110 pp., softbound: \$2.75

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