

largely from the German salt deposits, about which a great wealth of descriptive information is available, but Borchert makes frequent allusions to potash deposits elsewhere for purposes of comparison. The treatment of many examples from different points of view makes the book seem repetitious, but the author is frank to say that the repetitiousness is deliberate. It does have the effect, as he hoped it might, of making his major ideas clearer and more forceful than they would be in a single statement.

The last part of the book is ostensibly a discussion of the mechanics of deformation of salt deposits. The emphasis, however, is chiefly on experimental work concerned with the deformability of salt crystals and crystal aggregates under a variety of conditions—experiments to which Borchert has made important contributions. Wisely, the author does not try to rival or to duplicate the excellent discussion given by Lotze of large-scale deformation structures in salt deposits.

One may object that the book in some measure belies its title; for it is certainly not a general treatise on marine salt deposits. One may question the author's seeming lack of generosity toward viewpoints that differ from his own—for example, "Failure to think through all these possibilities, combined with uncritical interpretation of field observations, still gives rise to endless discussions . . ." (reviewer's translation). One may wish, from the point of view of a foreign reader, that the author had described more fully the way various controversies have arisen and have developed. But within the limits of what he set out to do, Borchert has made a notable contribution to the literature on the origin of salt deposits. He has summarized his own work and his own ideas very clearly and has provided voluminous evidence for the correctness of his theories.

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A Course of Pure Mathematics. G. H. Hardy. Cambridge University Press, New York, ed. 10, 1959. xii + 509 pp. Illus. Student's edition, paper, \$3.75.

This book occupies a special niche in my heart, since it was used in the first course in mathematics that I attended as a graduate student, in 1917. That text was the first edition (1908), and the book under review is the tenth edition

(1959). The book has been revised several times, but only in detail, to include newer concepts and proofs. The chapter titles and illustrations are intact, and so is the original flavor. Hardy always felt it necessary to defend the study of pure mathematics against those for whom mathematics is merely a tool; as this attitude was particularly prevalent in England in 1908, this book was written more or less in a spirit of evangelism. This tenth edition, now in its third printing, was brought out after Hardy's death in 1947 by several of his former colleagues at Cambridge University, among them J. E. Littlewood, and it is greatly to their credit that the enthusiastic style of the original has been preserved.

The book corresponds most closely with texts of advanced calculus in our American hierarchy of course titles, but one can learn much algebra and real and complex variable theory from it. It is 50 years old, and its hair is beginning to gray in places, but it is a fascinating book. With its wealth of problems, it is well suited to the needs of a student who must work by himself, without lectures. This, you must agree, is high praise.

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The Aztec: Man and Tribe. Victor W. von Hagen. New American Library, New York, 1958. 222 pp. Illus. + plates. Paper, \$0.50.

Mexico and the adjacent portions of Central America provided a varied geographical background for the development of an exceedingly interesting type of American civilization, which disintegrated under the impact of the Spanish conquest in the 16th century. Within the "Mesoamerican" region various subcultures have been distinguished by a combined archeological and ethnohistorical approach, the Maya and Aztec being the best known. The time period extends back to well before Christ.

Von Hagen's "paperback" undertakes to reconstruct Aztec culture, which appeared late, devoting suitable attention to its time-space relationships with its neighbors. It is planned for the general reader. The text is broken up into 32 short chapters, each with its own title, grouped under four major headings: "Historical and geographical background," "The people," "The Aztec 'kings' and directing classes," and "The

achievements." In chapter 1 the author explains his long-time interest in ancient American civilizations and briefly reviews the roster of past contributors to our knowledge of these civilizations. He explains his approach thus: "In this book I, as author, have leaned heavily on much of this literature of the five centuries. I have attempted ('according to my character and idiosyncrasy,' to paraphrase the *Gardens of Epicurus*, 'of my own taste and fancy—in a word, as an artist') to select what I regarded as pertinent."

There are a good many literary allusions scattered through the text, as well as world-wide generalizations relative to specific Aztec traits which do not appeal to me, for my bias is that of an archeologist too close to minutiae. In general, the work seems acceptable as a popularization of the subject, and it does not seem to depart in important respects from the late George C. Vaillant's more or less standard *The Aztecs of Mexico* (1941). It is worth noting here that this is still readily available as a 1951 paperback reprint, with a "Postscript" by C. A. Burland on important archeological findings as of the reprint date.

I think that Vaillant's book will remain a better choice for textbook use. Its photographic coverage is much fuller, it provides a much more extensive bibliography, and there is a series of footnotes packed with sound scholarship. Von Hagen's "Bibliography and notes" provide valuable thumbnail descriptions of some 30 sources, but the notes seldom lead one to anything specific.

Human behavior is enormously complex, and in any such works as these inference and opinion lie behind much that must be, perforce, stated as fact, and a plain mistake or two is bound to creep in. The short chapter on the ancient calendar needs revision in this respect.

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The Onset of Stuttering. Research findings and implications. Wendell Johnson *et al.* University of Minnesota Press, Minneapolis, 1959. ix + 243 pp. Illus. \$5.

The present volume is the latest in a long list of notable publications by its major author on the subject of stuttering. Johnson holds a position of preeminence in this field, and whatever he

chooses to publish will be read avidly by others interested in the same subject matter.

In this book Johnson and his associates report the findings of three research projects. Two of these are shown in great detail: the final 243 pages of the book are made up of tables of data indicating the responses to questionnaires of some 200 controls and an equal number of parents of stutterers. Such material is rarely made available in book form, and its value for the general reader is somewhat questionable; for those having an intense interest in the subject it is undoubtedly invaluable.

Two general findings are emphasized: the parents of stutterers are more demanding than others in their expectations regarding the fluency of their children, and they are somewhat more dissatisfied with their children and with each other, than the parents of non-stutterers are. These are certainly not surprising findings, but it is nice to see them stipulated so specifically. It has long been postulated that certain attitudes of parents toward their children cause tension states in the children; to see the relationship to stuttering so carefully drawn is extremely worth while.

The book includes a chapter devoted to what the authors call a "general interaction hypothesis" based on the research findings. As stated, this seems to support and implement Johnson's previously reported "semantogenic" theory of the cause of stuttering.

While it is limited in its appeal, the book is carefully written, claims no more for itself than its contents warrant, and makes available research data to indicate the source of its findings. It will undoubtedly find its place on most reference shelves in the sections reserved for worth-while books on speech problems.

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Just before Darwin: Robert Chambers and "Vestiges." Milton Millhauser. Wesleyan University Press, Middletown, Conn., 1959. ix + 246 pp. Illus. \$4.50.

It has become almost a game to discover anticipations of Darwin's ideas and accomplishments. Indeed Darwin, like everyone else, had predecessors and built on the past, but until *The Origin of Species* was published there were

almost no full-length, thoroughgoing, sufficiently documented publications on evolution in general or on particular theories of evolution. The nearest thing to an exception was *Vestiges of the Natural History of Creation*, issued anonymously in 1844 but now known to have been written by the Scottish publisher, encyclopedist, and hack writer Robert Chambers. In that remarkable work a dilettante perceived more clearly and sooner than most of the professional scientists the new direction that biology was taking at the time. Yet *Vestiges* was not basically or soundly a scientific or even a forward-looking production. It smacked rather, and in a somewhat half-baked way, of philosophical and theological predilections already obsolescent. (It is significant that the author was sympathetic, at least, to both phrenology and spiritualism.)

Chambers believed that the realm of natural law extends to living things and that evolution ("development") is among the universal natural laws. In that he was both right and progressive. But he mingled legitimate evidence with false data, naive arguments, wild speculations, and impossible theories. Darwin and Huxley, among many others, really were justified in acknowledging no scientific debt to Chambers. Nevertheless, *Vestiges* did make a contribution to the history of opinion, as distinct from that of ideas. In a later, more mellow mood Darwin eventually expressed well the real indebtedness. He still spoke of Chambers' "little accurate knowledge and . . . great want of scientific caution" but added that Chambers had "done excellent service. . . in calling attention to the subject, in removing prejudice and in thus preparing the ground" for general acceptance of the fact of evolution.

It is thus unwarranted to agree entirely with T. H. Huxley that Chambers' extravagances were a positive hindrance to the rise of evolutionary biology, or with a few later writers (for example, Lovejoy) that he should be regarded as a founder of that movement. His role was between those extremes, and it was minor. Yet it is an interesting and essential part of the drama. Millhauser's account is careful and fair. It gives particular attention to the climate of opinion and to the popular and literary antecedents and reactions. The biography of Chambers which is included is intellectual rather than personal, but it is adequate for the purpose. As an individual, Chambers remains a shadowy figure, but his ideas and influence have been well explored.

This is a welcome specialized addition to the wealth of new books on Darwin and his forerunners that are appearing in this centennial year of *The Origin of Species*.

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New Books

Australian Atomic Energy Symposium, 1958. Proceedings of a symposium on the peaceful uses of atomic energy in Australia held in Sydney 2-6 June 1958. Melbourne Univ. Press, Melbourne, 1959. 799 pp. The symposium was attended by 435 people, including 38 foreign representatives from Great Britain, the United States, Canada, New Zealand, Pakistan, and the International Atomic Energy Agency. A total of 114 papers were presented. They covered a wide range of interests in relation to raw materials, nuclear power, nuclear research, the basic sciences, education, and the industrial and medical uses of isotopes, and were divided into the following sections: "Materials"; "Power engineering"; "Power auxiliaries and research reactors"; "Basic sciences"; "Associated techniques"; "General." The appendices include a list of participants and a list of authors.

Automation: Its Impact on Business and Labor. John Diebold. National Planning Assoc., Washington, D.C., 1959. 73 pp. \$1.

The Challenge of Science Education. Joseph S. Roucek. Philosophical Library, New York, 1959. 503 pp. \$10.

Circumpolar Arctic Flora. Nicholas Polunin. Oxford Univ. Press, New York, 1959. 542 pp. \$20.20.

The Orchids. A scientific survey. Carl L. Withner, Ed. Ronald Press, New York, 1959. 657 pp. \$14.

Psychosomatic Methods in Painless Childbirth. History, theory and practice. L. Chertok. Translated by Denis Leigh from French ed. 2 of *Les Méthodes psychosomatiques d'accouchement sans douleur*. Pergamon, New York, 1959. 276 pp. \$6.50.

Reproduction in Domestic Animals. vol. 1. H. H. Cole and P. T. Cupps, Eds. Academic Press, New York, 1959. 666 pp. \$14.50.

Solid State Physics. Advances in research and applications. vol. 8. Frederic Seitz and David Turnbull, Eds. Academic Press, New York, 1959. 533 pp. \$13.50. Contents: "Electronic spectra of molecules and ions in crystals. pt. 1: Molecular crystals," D. S. McClure; "Photoconductivity in germanium," R. Newman and W. W. Tyler. "Interaction of thermal neutrons with solids," L. S. Kothari and K. S. Singwi; "Electronic processes in zinc oxide," G. Heiland, E. Mollwo, F. Stockmann; "The structure and properties of grain boundaries," S. Amelinckx and W. Dekeyser.

Vector Space and Its Application in Crystal-Structure Investigation. Martin J. Buerger. Wiley, New York; Chapman & Hall, London, 1959. 366 pp. \$12.