

of dissidence, apart from Jack Steinberger's reference to refusal to sign a loyalty oath and the editors' comment on the unpopularity of the government decision on the 12.5 GeV zero-gradient synchrotron and allusion to "other Cold War decisions that alienated some physicists from the government." There should be scope for historical study of such themes.

In the face of history, there appears also a widespread desire to remedy past wrongs, to acknowledge unquoted sources, recall the role of little-recognized innovators such as Hartmut Kallmann, or acknowledge the contribution of humbler colleagues, as Alvarez does in the case of the discoverers of the strange resonances. When acknowledgment is not forthcoming, there are those who make their own claims, either by implication or directly, like Oreste Piccioni and E. C. G. Sudarshan.

The historians have paid considerable attention to the encouragement of phenomenological theory at the cost of axiomatic quantum field theory but little to the age-old contrast between experimenters and theoreticians. Abdus Salam, quoting Oppenheimer, refers to the experimenter's "desire to spite the theorist." The '50s was a period in which the experimenter was still dominant. Not only did the richness of the data pouring out of the machines keep the theorists calculating busily, unexpected discoveries obliged them to think hard too. There is much nostalgia in the experimenters' contributions for this aspect of the good old days.

The clarification of these various tensions is in part due to the editors' careful contrapositioning of texts and in part is to be found by an attentive reader in odd phrases. It is perhaps in the apparently minor details that the richness of this volume as a source book for the history of particle physics lies.

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Lost Heroes

Women of Science. Righting the Record. G. KASS-SIMON and PATRICIA FARNES, Eds. Indiana University Press, Bloomington, 1990. xvii, 398 pp. \$39.95.

There now exists a considerable amount of published material on women in science, and to make a substantial contribution to this field a new book must integrate its material with the new scholarship, provide an expanded reference source, or offer a unique approach to the subject. This collection of essays recounting the contributions of women to ten different scientific disciplines

takes an approach that is problematic in several respects. Kass-Simon writes that "since the method of evaluating a scientist's work has traditionally been by peer review, it . . . seemed essential that such an investigation be carried out by trained women scientists," and for the most part these essays were written by practitioners of the disciplines. Kass-Simon further reports that a major aim of the volume was to search for "the lost and buried women heroes of science." Yet an expert in a discipline is not necessarily qualified to write its history, and with the perspective that "in one sense history is the recounting of heroes' deeds," such a search may be too much concerned with assigning proprietorship over an idea or apparatus at the expense of historical context. Perhaps part of the problem lies with the appropriateness of the essay format for the purpose of calling attention to "forgotten women." Such information might have been better presented in a reference-book format.

The volume also seems to suffer from a lack of editorial direction. The editors do not address the question of criteria for inclusion, and the contributors use their own implicit criteria. The lack of an operational definition of science is especially apparent in Martha Moore Trescott's chapter on engineering and Farnes's on medicine.

The scope of the essays also varies. Some authors deliberately limit their coverage, others consider a broad sweep of time and geography, and some provide a combination of the broad and the narrow. Kass-Simon, for example, in dealing with developmental biology, genetics, and physiology stresses 19th- and 20th-century Americans but in her consideration of natural history goes back to the contributions of Hildegard of Bingen. Some authors consider living scientists and others include some oral history. For example, Cynthia Irwin-Williams (archeology) interviewed three living American archeologists, although she does not integrate the interviews into the rest of her essay. The question of how to deal with well-known material is a problem in the essay on physics by L. M. Jones, who rehashes biographical material on Marie Curie without adding any new information. However, by selecting women who have contributed to a variety of aspects of physics Jones supports her contention that there is no such thing as "women's physics."

At a more specific level, defects such as crediting Antony van Leeuwenhoek with the invention of the microscope, ignoring Leibniz's contribution to the invention of the calculus, and substituting question marks for easy-to-locate death dates should not have occurred.

The essays by Michele L. Aldrich on geology, Pamela Mack on astronomy, Judy Green and Jeanne LaDuke on mathematics, and Jane Miller on chemistry do a good job of organizing and integrating materials. The authors clearly are aware of current literature and have set their subjects in a social and institutional context. Their essays reflect their understanding of historical problems. Maureen Julian's essay on crystallography is an especially valuable source for the names of women crystallographers and their connections with parent laboratories. Irwin-Williams makes a convincing case in her discussion of the "expedition mentality" as one reason for the exclusion of women in archeology.

In spite of obvious problems, the volume serves a valid purpose. Some new research is included (although in most cases still undigested), names of persons warranting future research are provided, and some (but not all by any means) of the essays integrate their material with recent scholarship.

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Reprints of Books Previously Reviewed

American Genesis. A Century of Invention and Technological Enthusiasm, 1870-1970. Thomas P. Hughes, Penguin, New York, 1990. Paper, \$10.95. Reviewed 244, 830 (1989).

The Analysis of Starlight. One Hundred and Fifty Years of Astronomical Spectroscopy. J. B. Hearnshaw. Cambridge University Press, New York, 1990. Paper, \$34.50. Reviewed 237, 783 (1987).

Reminiscences About a Great Physicist. Paul Adrien Maurice Dirac. Behram N. Kursunoglu and Eugene P. Wigner, Eds. Cambridge University Press, New York, 1990. Paper, \$27.95. Reviewed 241, 1239 (1988).

Studying Animal Behavior. Autobiographies of the Founders. Donald A. Dewsbury, Ed. University of Chicago Press, Chicago, 1989. Paper, \$19.95. (Originally entitled *Leaders in the Study of Animal Behavior: Autobiographical Perspectives*) Reviewed 235, 598 (1987).

Books Received

Aspects of Internalization. Roy Schafer. International Universities Press, Madison, CT, 1990. xxiv, 254 pp. Paper, \$19.95. Reprint, 1968 ed.

Atomic Rivals. Bertrand Goldschmidt. Rutgers University Press, New Brunswick, NJ, 1990. xviii, 372 pp., + plates. \$39.95. Translated from the French edition (1987) by George M. Temmer.

Attitudes. D. W. Rajecki. 2nd ed. Sinauer, Sunderland, MA, 1990. xii, 522 pp., illus. Paper, \$24.95.

Between Science and Technology. Andries Sarlemijn and Peter Kroes, Eds. North-Holland (Elsevier), New York, 1990. viii, 214 pp., illus. \$48.75. North-Holland Delta Series. From a conference, Eindhoven, The Netherlands, June 1989.

Biochemistry of Breast Cyst Fluid. Correlation with Breast Cancer Risk. Alberto Angeli et al., Eds. New York Academy of Sciences, New York, 1990. viii, 296 pp., illus. Paper, \$74. Annals of the New York Academy of Sciences, vol. 586. From a workshop, New York, Dec. 1988.

Divergent/Passive Margin Basins. J. D. Edwards and P. A. Santogrossi, Eds. American Association of

Request for Information on Asbestos

The Health Effects Institute-Asbestos Research (HEI-AR) is an independent, nonprofit organization formed recently to support research to determine the airborne exposure levels prevalent in buildings, to characterize peak exposures and their significance, and to evaluate the effectiveness of asbestos management and abatement strategies in a scientifically meaningful manner. HEI-AR is organized to gather and to generate reliable and objective information, and is supported jointly by the Environmental Protection Agency and a broad range of private parties that have an interest in asbestos. The Congressional mandate under which HEI-AR now operates specifies that the HEI-AR's research "effort shall in no way be construed to limit or alter EPA's authority or obligation to proceed with rulemakings and to issue rules as necessary."

HEI-AR, through a Literature Review Panel of highly distinguished scientists and experts under the chairmanship of Dr. Arthur Upton of New York University, is currently conducting a review of the literature on asbestos. The objectives of this review are: (1) to summarize for the public what is known about the significance of asbestos exposure for the health of people who work and live in buildings with asbestos-containing materials and what impact management strategies have on such exposures; and, (2) to identify important gaps in knowledge that should form the basis for an ongoing research program to be sponsored by HEI-AR.

The HEI-AR is currently seeking information on all aspects of the asbestos in buildings issue. The Institute is particularly interested in:

1. Technical literature (peer-reviewed publications, unpublished papers, reports, testimonies, depositions, and other written documents) that include relevant information on characterization of asbestos levels in buildings. Such literature may focus on any aspect of the mandate given to HEI-AR by the Congress (see above). The descriptions and data provided should be in sufficient detail so as to enable a reader to reconstruct the conditions under which the data were collected and the methods that were employed. Information on quality assurance and/or other precautions taken to assure the credibility of the data should be provided. The supplier of literature should also be prepared to answer any queries that the Panel may have.

If you have any literature that would be useful to the Panel, please send a printed copy, along with your name, affiliation and address, to the Institute (see below).

2. Data on exposure levels: The Panel believes that, although much information has been and is being generated on exposure levels in buildings, especially in conjunction with abatement activities, there has been no comprehensive attempt to summarize and analyze such data. A summary of exposure data and its critical review will be extremely valuable.

HEI-AR invites anyone, particularly consultants, analytical laboratories, industrial hygiene specialists, asbestos management firms, and building owners, who has raw data on exposure levels in buildings to supply such data to HEI-AR. The data should be provided in a standardized form that the Panel has developed. Data from samples analyzed with PCM will be accepted only if relating to maintenance or construction-type activities. TEM and SEM results will be considered for all types of samples. A summary description of quality assurance practices (such as those recommended by NVLAP) would be necessary. If you are interested in providing information as described above, please contact HEI-AR for details on how to submit such data.

For further information, contact:

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Health Effects Institute Asbestos Research

Petroleum Geologists, Tulsa, OK, 1990. iv, 252 pp., illus., + maps. \$102; to AAPG members, \$68. AAPG Memoir 48.

Farming and Birds. Raymond J. O'Connor and Michael Shrubbs. Wash drawings by Donald Watson. Cambridge University Press, New York, 1990. xii, 290 pp. Paper, \$19.95. Reprint, 1986.

Fuels to Drive Our Future. Committee on Production Technologies for Liquid Transportation Fuels, National Research Council. National Academy Press, Washington, DC, 1990. xii, 223 pp., illus. \$24.50.

HPLC of Biological Macromolecules. Methods and Applications. Karen M. Gooding and Fred E. Regnier, Eds. Dekker. New York, 1990. xiv, 676 pp., illus. \$150. Chromatographic Science, vol. 51.

Human Performance Models for Computer-Aided Engineering. Jerome I. Elkind *et al.*, Eds. Academic Press, San Diego, CA, 1990. xviii, 326 pp., illus. \$34.50. Reprint, National Research Council edition.

Ice Time. Climate, Science, and Life on Earth. Thomas Levenson. Harper and Row, New York, 1990. xiv, 242 pp. Paper, \$9.95. Reprint, 1989 edition.

QCD Spectral Sum Rules. Stephan Narison. World Scientific, Teaneck, NJ, 1990. xvi, 527 pp., illus. \$38. World Scientific Lecture Notes in Physics, vol. 26.

Red Giants and White Dwarfs. Robert Jastrow. 3rd ed. Norton, New York, and McLeod, Toronto, 1990. viii, 270 pp., illus. Paper, \$11.95.

The Right Place at the Right Time. John D. Roberts. American Chemical Society, Washington, DC, 1990. xx, 299 pp., illus. \$24.95. Profiles, Pathways, and Dreams. Autobiographies of Eminent Chemists.

Roadside Geology of Pennsylvania. Bradford B. Van Diver. Mountain, Missoula, MT, 1990. viii, 352 pp., illus. Paper, \$12.95. Roadside Geology Series.

Roadside Geology of Utah. Halka Chronic. Mountain, Missoula, MT, 1990. x, 326 pp., illus. Paper, \$12.95. Roadside Geology Series.

Standards Management. A Handbook for Profits. Robert B. Toth, Ed. American National Standards Institute, New York, 1990. xvi, 505 pp., illus. Paper, \$99; to members, \$70.

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