

cause of his background, Becker is able to explain many phenomena, such as differentiation and embryonic development, in lucid terms suited to a lay reader. He describes a wide range of phenomena and practices, such as acupuncture and the effective use of pulsed electromagnetic fields, to show the importance of understanding the role of electromagnetic energy in biological systems. Becker then goes on to ascribe various "new plagues," including such diverse illnesses as AIDS, autism and Alzheimer's disease, as perhaps having connections to the modern environment which is permeated with high ambient electromagnetic fields.

This is where Becker makes himself vulnerable to the charge that he indiscriminately attributes all present-day health problems to electromagnetic fields. While Becker's book makes for interesting reading, too many apparently disparate ideas are clustered under the "electromagnetic" explanation.

These two books are important reading for those interested in the recent paradigm shift regarding the biological effects of fields and the accompanying sociological and economic conflicts. However, for the reasons explained above, those books do not stand as complete sources of scientific information for the reader unfamiliar with the subject.

INDIRA NAIR
Carnegie Mellon University

The Space Telescope: A Study of NASA Science, Technology and Politics

Robert W. Smith
Cambridge U. P., New York,
1989. 478 pp. \$39.50 hc
ISBN 0-521-26634-3

The publication of this study of the history of the Hubble Space Telescope about six months before the launch of the telescope reflects both an innovative approach to writing recent history and the delays that resulted from the space shuttle Challenger accident. Robert W. Smith and his colleagues at the Johns Hopkins University and the National Air and Space Museum studied the history of the Space Telescope as it happened. They sat in on meetings, interviewed scientists about their current work (rather than asking them to recall past intentions) and read documents that might later be lost or destroyed.

The resulting book is not the type of instant history that journalists sometimes produce, but rather an impor-

tant contribution to space history. Smith tackles a broad and significant issue: the politics of "big science." He examines the complexity of political, economic and scientific influences that shape large new scientific projects such as the Space Telescope. The result is a book valuable not only to those interested in the history of the Space Telescope and the space program in general, but also for scientists and historians who want to better understand how government funding affects the scientific process.

Smith's book deals with a number of important themes. He shows how work on large, long-term experiments fit (or failed to fit) into scientists' careers. He examines the strategies that supporters of the Space Telescope used to lobby for funds and to build support within the scientific community. Because of the problems that the Space Telescope developed after launch, the theme that stands out most is Smith's analysis of the impact of inadequate funding on the telescope. He shows clearly that NASA managers took significant risks in deciding how much to test the telescope and how closely to supervise the contractors. Funding was so short that the choice seemed to be between taking risks or building a less ambitious telescope that would not represent a significant improvement over ground-based telescopes.

The Space Telescope is well worth reading by anyone affected by big, government-funded science. It reveals the inner workings of funding and development as few other studies have, and it points clearly to a number of important issues. Smith provides no prescription for solving the problems of big science, but he significantly improves our understanding of those problems.

PAMELA MACK
Clemson University

BOOK NOTE

Discovering Alvarez: Selected Works of Luis Alvarez with Commentary by his Students and Colleagues

Edited by W. Peter Trower
U. Chicago P., Chicago,
1987. 272 pp. \$37.50 hc
ISBN 0-226-81304-5

A year before Luis Alvarez's death in 1988, Peter Trower compiled this sampling of the great experimenter's papers, each accompanied by an ex-

planatory reminiscence by a former colleague. The range is incredible: from the discovery of nuclear K capture in 1938; through the heyday of big bubble chambers; to his analyses of the pyramid of Chephren at Giza, the assassination of John Kennedy and the extinction of the dinosaurs.

In addition to the facsimiles of Alvarez's research publications, the volume contains writing of a different sort: his Nobel Prize lecture; his letter to the Japanese physicist Ryokichi Sagane, dropped over Hiroshima with a telemetry package on the fateful day; and Luie's letter to his son, written on that same day aboard a B-29 accompanying the Enola Gay.

The commentaries are informative and entertaining, evincing the deep admiration of these men who knew Luie as friend and colleague. Wolfgang Panofsky recalls their work on accelerator design; Hans Bethe describes the discovery of helium-3; Phillipe Eberhard chronicles the search for monopoles; Stanley Wojcicki tells what it was like to be a student in Luie's group at the Berkeley Rad Lab; and Richard Garwin writes about Luie's analysis of the Kennedy assassination.

Luie had always discouraged the creation of a *Festschrift*, Trower tells us. "There's nothing interesting in getting a year older," he would say. *Festschriften* often stray rather far from the spirit of the honoree. This excellent compilation, giving us so much of Luis Alvarez, is a more than adequate substitute.

—BERTRAM SCHWARZSCHILD

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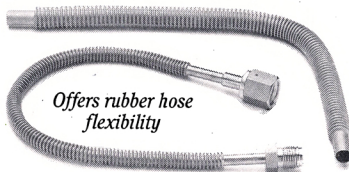
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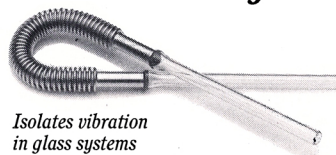
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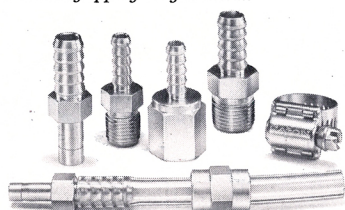
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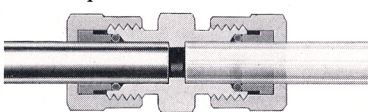
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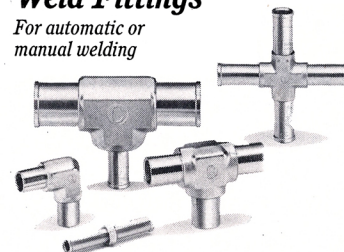
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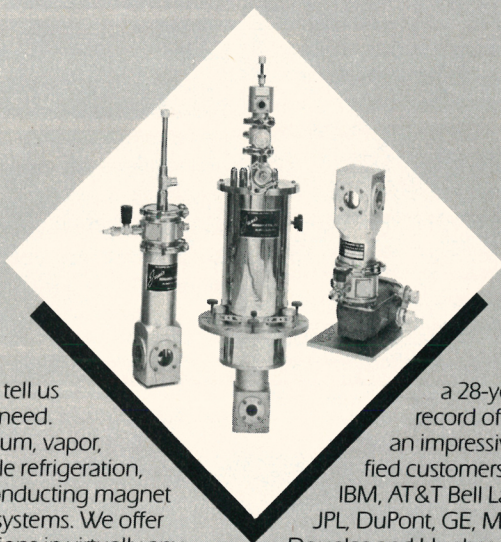
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