

BOOK REVIEWS

A War Technology

America's Pursuit of Precision Bombing, 1910–1945. STEPHEN L. MCFARLAND. Smithsonian Institution Press, Washington, DC, 1995. xx, 312 pp., illus. \$29.95. Smithsonian History of Aviation Series.

In his foreword to this book, Air Force historian Richard Hallion celebrates a century's progress in precision bombing, suggesting that the Gulf War showed its capacity to make war short, decisive, and minimally destructive. Auburn University historian Stephen McFarland, opening with a sketch of how the atomic bombs missed their aiming points at Hiroshima and Nagasaki, persuasively tells a less happy story.

To be sure, this book's core, the history of bombsights, has its dry detail, especially since it is a story of incremental progress rather than dramatic breakthroughs—less because any one technical problem was baffling than because so many were woven together. Inventors and officials had to find

learned to think in terms not of clever individual devices but of entire systems—one reason they could by 1918 produce “the world's first cruise missile” (p. 21). Complementing the systems approach was a drive to automate the bombsight in order to minimize human error and strain: Norden's World War II bombsight incorporated an analog computer, “flew the aircraft directly to the correct release point, and released the aircraft's bombs” (p. 75).

Still, progress was slow and precision bombing largely a fantasy, undermined by Navy obstructionism (acidly described by McFarland), production problems, bad weather, enemy defenses, and other factors. While evenhandedly assessing American airmen's World War II record, McFarland notes that “the doctrine that sent them to bomb Germany depended on hitting the nail on the head, not the broad side of the barn” (p. 190), which was the usual practice. So too in Japan: *Enola Gay* missed its aiming point by 800 feet, *Bock's Car* by 1500, although as McFarland dryly adds, atomic bombs “insured that accuracy was not critical” (p. 2). Progress was also costly. Military officials broke federal law in their early contracts with Carl Norden, spent two-thirds as much on the development of Norden's wartime bombsight as on the Manhattan Project, and surrounded it with nearly as much secrecy.

McFarland captures the grand scale as well as the technical details of bombsight development, rescuing it from the obscurity that secrecy and more dazzling inventions left it in. He also links it well to politics and strategy—to “a deep-rooted opposition to making civilians targets in war” (p. 82), although the

doctrine of precision bombing obscured how much those civilians became the targets. And he captures its human dimensions, deftly portraying Norden, the Java-born Dutch citizen whose long stays in Switzerland prompted officials to spy on him and who believed he only designed God's “inventions” (p. 52). Norden seems



“World War II powered bombing trainer. The bombardier sighted his Norden bombsight on a powered ‘crab’ target. The movement of the trainer across the ground simulated the movement of the aircraft and the movement of the ‘crab’ target simulated the effect of wind causing the aircraft to ‘crab’ or drift relative to the target.” [From *America's Pursuit of Precision Bombing, 1910–1945*; USAF Historical Research Agency]

as fascinating and willful, though not as theoretically gifted, as the atomic scientists.

Obviously, this is a story not of science's natural and inexorable progress but of the forced march of state-driven technology. It undercuts an older but tenacious model of relations among the state, science, and industry. That model portrays the United States as gripped by interwar isolationism and pacifism, then awakening during World War II and the Cold War to develop a military-scientific-industrial complex. Although clinging to misleading concepts like “isolationism” (p. 82), McFarland, like other recent scholars, pushes back the start of that complex, making the interwar era the takeoff phase. To be sure, by post-World War II standards the funding was paltry, the products quaint, the choices still dependent on willful individuals rather than lumbering bureaucracies. By other measures—secret, sometimes illegal arrangements; fading distinctions between public and private institutions; state-driven technologies; dreams of a Pax Aeronautica enforced by a surgically efficient American air force—much was already in place.

Readers will likely embrace McFarland's complex view rather than Hallion's celebratory stance. McFarland sees the atomic attacks on Japan as marking the “bankruptcy” (p. 202) of precision bombing doctrine, although “the memory of World War II was



“The first 600-pounder dropped on the Pee Dee River Bridge missed by several hundred feet on December 22, 1927. Poor bombing accuracy sparked a crisis in the Air Corps.” [From *America's Pursuit of Precision Bombing, 1910–1945*; USAF Historical Research Agency]

ways to measure speed, drift, and other factors, to stabilize the bombsight and the bomber itself, and to connect bombsights to the airplane's controls and the crew's operations—and do all that amid fast-evolving aviation technology and strategy. Progress on one front often created new problems in another. Therefore designers and officials



Vignettes: Physics from the Bottom Up

Physics is not difficult; it's just weird. . . . Physics is weird because intuition is false. To understand what an electron's world is like, you've got to be an electron, or jolly nearly. Intuition is forged in the hellish fires of the everyday world, which makes it so eminently useful in our daily struggle for survival. For anything else, it is hopeless. Our intuitive fear of heights would be ridiculous for an albatross; our intuitive appreciation of the flight of a ball is silly if we want to trace a quark. Intuition gives us plausible nonsense like astrology, homeopathy, or quantum-mechanics-turned-into-Zen. Intuition does not help us much in doing physics, be it quantum theory or classical mechanics (ever tried to understand the motions of a spinning top intuitively?)

—Vincent Icke, in *The Force of Symmetry* (Cambridge University Press)

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—Robert Gilmore, in *Alice in Quantumland: An Allegory of Quantum Physics* (Copernicus/Springer-Verlag)

sufficient to delude millions of Americans into believing that the American way of war was the most humane on earth. . ." (p. 209). Modest success with precision-guided munitions in the Gulf War "means fewer people will die, but people will still die" (p. 209).

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Undervalued Contributors

Hidden Scholars. Women Anthropologists and the Native American Southwest. NANCY J. PAREZO, Ed. University of New Mexico Press, Albuquerque, 1994. xxii, 429 pp., illus. \$47.50.

Hidden Scholars carries forward the theme of an earlier work, *Daughters of the Desert* (University of New Mexico Press, 1988), and the museum exhibition for which it served as catalog. A considerable number of women have contributed significant work to the anthropology of the U.S. Southwest, yet much of their work is unacknowledged. Nancy Parezo, editor of this volume and coauthor of *Daughters of the Desert*, introduces and concludes *Hidden Scholars* with extensive discussion drawn from the literature on careers of women in science. She demonstrates that neither anthropology nor the relatively underpopulated Southwest has

been particularly open to women seeking careers.

Parezo and her collaborators discovered the names of over 3500 men and 1600 women who have published on American Indians of the Greater Southwest. Of the men, a number are standard figures in the history of the discipline (Bandelier, Powell, Cushing, Goddard, Hewett, Cummings, Kroeber, Kluckhohn, Eggan, Haury, and Devereaux come readily to mind). Of the women, only Ruth Benedict is usually discussed in histories of American anthropology. Some of the omissions can only be attributed to a pervasive obtuseness in recognizing work when it is done by a woman. For example, Dorothy Keur's *Big Bead Mesa* was Memoir No. 1 of the Society for American Archaeology as well as a landmark in ethnoarchaeology and historical archaeology, but Keur is not discussed by the major historians of American archaeology, Trigger, Willey and Sabloff, and Patterson. Worse, the reason Keur gets into Willey and Sabloff's index is that she is mentioned by a social anthropologist they quote. In Parezo's book, Keur garners 13 index listings.

The patterns discovered in the half-hundred women's lives examined in *Hidden Scholars* are clearly exemplified by Keur. She carried heavy teaching and some administrative responsibilities in an undergraduate department; she never had

access to graduate students or research assistants; after she married, she collaborated in her husband's field projects and published monographs jointly with him. Again and again, Parezo's volume reveals women teaching in undergraduate programs outside the top-ranked universities or employed in museums where they were jills-of-all-trades, curating, preparing exhibits and popular publications, giving public lectures, and womaning the reception desk during the attendant's lunch hour (p. 284). A few of the women carried out applied anthropology projects or programs that veered into social work or public health, falling into the nurturing stereotype for women. A few other women are discussed because their popular writing about the land and its inhabitants overlapped with that of women anthropologists, feeding the public image of the Southwest. I missed seeing explicit discussion of the predominant pattern of women anthropologists of the benighted generations carrying out serious research both in archaeology and in ethnography. Men gave up fieldwork on such a broad front by 1950, women not until the late '70s; in this volume, Jane Holden Kelley is an example of a still-active woman contributing major work in both fields.

The papers in *Hidden Scholars* focus on a few of the principal women—Matilda Cox Stevens, Elsie Clews Parsons, Ruth Benedict, Gladys Reichard, Esther Goldfrank, Ruth Bunzel—and on such topics as wealthy museum founders and women in museums, linguistics, archaeology, and Yaqui ethnogra-



"Florence Hawley Ellis, Gladys Phare, Emil Haury, and Clara Lee Tanner at University of Arizona field school, 1926." [From *Hidden Scholars*; courtesy of the Arizona Historical Society, Tucson]

phy. This leads to redundancy, which can be rhetorically suasive. Florence Hawley Ellis, Marjorie Lambert, and Bertha Dutton deserve to be mentioned again and again. Interviews with 18 of the most prominent women brought out their determination to continue