

**A Different Sort of Time: The Life of Jerrold R. Zacharias, Scientist,
Engineer, Educator**



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job of pulling together information from the myriad documents at Hanford but does little to put that information into the context of the Manhattan Project, the Atomic Energy Commission (AEC), or the Cold War, perhaps because of classification restrictions. One wonders why the events occurred when they did and what specific mandates or events drove the AEC to operate Hanford at ever-higher production levels. The book is filled with details on the contamination released to the air, ground, and water, and no doubt is left that the area was heavily polluted by the plutonium production there. Gerber raises many interesting questions about government conduct in operating such grossly polluting facilities and about when such operation is justified. The question of blame is difficult to answer, for much of this work was done when knowledge was scant and pressure great.

Hal Rothman's book, *On Rims and Ridges*, is a well-written history of the Pajarito Plateau covering roughly the last hundred years. The book deals with the Los Alamos area, not the Los Alamos Laboratory. Its main theme is the competition for use of the land on the plateau, often illustrated through the competing philosophies and priorities of the National Park Service, the National Forest Service, local interests, and the federal government. The plateau, which had been a backwater for many years, came to be greatly influenced if not manipulated by the government. The federal presence became the economic backbone of the area in the latter half of the twentieth century. Rothman says that Los Alamos is more like other parts of the American West than inhabitants of those other parts think because they are more dependent on the federal government than they like to admit. The book is not directed toward a history of science audience, but it does provide some agrarian context for the laboratory at Los Alamos. The book is much more important for the modern history of the American West. Rothman draws an important conclusion from his work: he sees the Pajarito Plateau as a barometer of the West and the end of available land in Los Alamos as a harbinger of the end of free land in the West. Rothman's book was printed before the end of the Cold War, when cutbacks in defense spending began to reduce the size of Los Alamos and remove some of the competition for land. Are we nearing the ultimate end of the frontier in America, or just an end to interest in the frontier on the part of the federal govern-

ment? The book as a whole is a delight to read, but some of its details are a little repetitive.

Hans Graetzer and Larry Browning's book, *The Atomic Bomb*, is a short bibliography (148 pages) of books on the atomic bomb and the nuclear arms race. It begins with a brief summary of the time period covered and then provides a brief chronology. This bibliography is intended for high school and college students, general readers, and adult discussion groups. One paragraph of annotation is provided for each of the entries, whatever the relative importance of the book. These paragraphs are useful—not often critical, but always informative. The coverage of works on the arms race is more complete than the coverage of those on the development of the atomic bomb. Why books were chosen for inclusion is sometimes hard to fathom. Richard Rhodes's Pulitzer Prize-winning *The Making of the Atomic Bomb* (Simon & Schuster, 1986) is not included; Robert Williams's book on Klaus Fuchs does appear, but Norman Moss's book published at the same time on the same subject does not. Nonetheless, this bibliography is a good introduction to the general subject of the arms race and should provide plenty of food for thought. It concludes with a section on films that have a nuclear theme and science fiction books with a similar bent. Readers should not expect the bibliography to be exhaustive.

PAUL W. HENRIKSEN

Jack S. Goldstein. *A Different Sort of Time: The Life of Jerrold R. Zacharias, Scientist, Engineer, Educator.* xx + 373 pp., frontis., illus., apps., index. Cambridge, Mass./London: MIT Press, 1992. \$35.

Jerrold R. Zacharias, a nuclear physicist by training and profession, is perhaps best known as a mover and shaker in postwar American science and education. Jack R. Goldstein's colorful biography of Zacharias captures well both the many adventures of a scientific entrepreneur and the times he lived in.

Making ample use of interviews and the MIT archives, Goldstein, a professor of physics at Brandeis University, paints the life of Zacharias in vivid detail. A native of Florida, Zacharias matured scientifically under the mentorship of I. I. Rabi at Columbia in the 1930s. World War II transformed the young

physicist into a masterful scientific organizer as he worked on radar at the MIT Radiation Laboratory and briefly on the atomic bomb at Los Alamos. At the end of the war, Zacharias recruited many bright young talents for MIT and founded its Laboratory for Nuclear Science and Engineering with support from the Office of Naval Research. As the Cold War intensified in the late 1940s and 1950s, Zacharias, operating from MIT, became a central figure in the effort to mobilize science for national security. He served on advisory committees and directed several major "summer studies" that brought top-notch civilian scientists and engineers together to solve military problems. One such project, "Hartwell," dealt with antisubmarine warfare and had great impact on the U.S. Navy.

That is the first half of Zacharias's career and of the book; the second half of both focuses on education. In 1956 Zacharias founded the Physical Science Studies Committee (PSSC) to reform precollege science teaching. The PSSC introduced the innovative use of films and hands-on experiments into classrooms. Its success led Zacharias to initiate many other enterprises in education.

Exactly why Zacharias developed an almost obsessive interest in science education even before *Sputnik* (1957) made it a national priority is not entirely clear. Goldstein makes several thoughtful suggestions, the most revealing of which points to Zacharias's belief in the cultural function of science. A better public understanding of the scientific method—based on "observation, evidence, the basis for belief"—could, Zacharias thought, help eliminate irrational intolerance, such as engendered by McCarthyism. In the early 1950s Zacharias himself felt keenly the damages of the "Red scare," as he headed an MIT committee to deal with McCarthy's attack on certain faculty members and testified in the Oppenheimer hearing.

Zacharias's hope for a better society through science and education faltered during the Vietnam War era. Antiwar students questioned the premises of scientific rationality and challenged the science-military partnership on university campuses. The late 1960s marked the change of times suggested in the book's title. In the last years of his life (he died in 1986), Zacharias continued to push for education reform and nuclear arms control.

Well documented and lucidly written, the book provides an understanding of a unique American scientist-educator and his changing

environment. For historians of science, the book probably does not probe deeply enough into some of the critical questions, such as the impact of military sponsorship on the direction of American science and education. The reliance on interviews has its problems as well. Nevertheless, historians of science will find much useful material in this sympathetic and lively biography of a major figure in postwar American science and education.

ZUOYUE WANG

William H. Schneider. *Quality and Quantity: The Quest for Biological Regeneration in Twentieth-Century France.* (Cambridge History of Medicine Series.) x + 392 pp., illus., figs., tables, bibl., index. Cambridge/New York: Cambridge University Press, 1990. \$49.50.

Tracing the history of French ideas and institutions concerned with eugenics from the turn of the century to 1945, William Schneider distinguishes several periods. The first shows specifically French characteristics in that its ideas grew out of puericulture, particularly puericulture *before* conception; the author claims that this theory resembled Darwin's pangenesis (Lucien March would maintain that this is identical to Alfred Ploetz's idea). The members of the French Eugenics Society, founded in 1912, were for the most part physicians and neo-Lamarckians who believed that bettering an individual's living conditions would improve him *and* his future offspring. Thus they were as concerned with personal health as with the specter of the population's degeneration. Through the efforts of a clinical obstetrician named Adolphe Pinard, a bill requiring prenuptial medical examinations (for men only, with an emphasis on detecting infectious diseases) was proposed in 1926 but not voted into law until 1942, in a slightly modified form.

Demography is another factor that Schneider sees as heavily influential in this first period: it had taken only a few decades for neighboring populations, particularly the German, to surpass the stagnant French population. Quality is necessary, practitioners agreed, but also quantity, because quantity was seen as required to guarantee the production of an elite. Moreover, France was Catholic; at the same time, it had more than