Sydney and Beyond

A Passion for Physics. The Story of a Woman Physicist. JOAN FREEMAN. Hilger, Philadelphia, 1992 (distributor, American Institute of Physics, New York). x, 229 pp., illus. $35.

Like many talented Australians, Joan Freeman decided to make her career in England, where she has done noteworthy work in nuclear physics, mainly at the Atomic Energy Research Establishment at Harwell. Her account of her career is most interesting in its details about persons and places, recounted with a reticent good humor, but it is somewhat disappointing in its lack of scientific details.

At the end of the book the author considers the question why so few girls take up physics. Her answer is that they are deterred by "ingrained social traditions, and the results of these in the education system." She herself, however, was born with a "passion for physics" that overcame all such barriers. Nothing in her familial or social environment had any influence on her choice of vocation; she was a physicist from early childhood. Given a fancy doll, she immediately attacked it with pins to discover why the eyes blinked simultaneously.

Freeman was the only child of a rather unhappy marriage between an unsuccessful accountant and an inspired school teacher. The mother was "utterly devoted" to her daughter, scrimping and saving to send her to one of the best private girls schools in Sydney. Physics was not taught there, but in her senior year, after school hours, Freeman sneaked into the Sydney Technical College, a grimy institution in a rough neighborhood where, surrounded by aspiring apprentices, she learned enough basic physics to gain honors in the university entrance exams, while the authorities issued an edict that schoolgirls must never again be allowed into the Tech.

Once Freeman entered Sydney University it was simply a matter of hard study in physics and mathematics. Graduation was followed by six years of wartime radar research and then a scholarship to Cambridge, where she earned the Ph.D. for research on one of the linear accelerators. Nuclear physics at the Cavendish Laboratory was disorganized at that time, since Lawrence Bragg, the laboratory's director, was interested only in x-ray crystallography. In 1948 Otto Frisch came to the Cavendish, having been appointed to the Jacksonian chair in experimental physics. His dreamy, childlike nature was endearing but did nothing to alleviate the administrative chaos. In 1951 Freeman moved on to Harwell, where, with an interlude at M.I.T., she has spent the remainder of her career.

This book should appeal to anyone interested in the life of science in mid-20th century. If it were not so expensive, it would make an ideal gift for any high-school girl who displayed an incipient interest in the physical sciences.

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Vignettes: Performance Tests

My father . . . worked all his adult life as a chemical engineer for the city of Chicago. He was in charge of a laboratory that tested everything the city considered buying, from concrete and asphalt for paving streets to fire hydrants and fire engines. I remember he used to test parking meters by first putting samples of the various models up on the roof of the building for a year to weather them. Then he'd hand out hammers to a group of teenagers, and send them up to try to break into the meters. The last to break was the one that won his approval. When it was time to purchase police paddy wagons, he rounded up a bunch of really mean guys from inside the city jail and turned them loose on the collected models from all the manufacturers; the winning vehicle was the one that required the largest number of inmates to turn it over.

—*Frank Drake*, in *Is Anyone Out There? The Scientific Search for Extraterrestrial Intelligence* (Delacorte Press, forthcoming)

On April 12 [1990], half a page of the *New York Times* was devoted to explaining how "smart" cars and highways would, in some indefinite future, "help unsnarl gridlock." . . . The *Times* article made no mention of the $500 million already spent by the Department of Defense on a "smart truck" about a year earlier. That five-year program to develop an "autonomous truck" that could drive itself and find its way on and off highways had been phased out because of abysmally deficient performance. When the truck was being taught to guide itself on a highway, it could operate only at noon, with the sun directly overhead, because it was confused by shadows. Eventually, it was able to travel at 12 miles per hour on a straight, paved test track, and "to negotiate curves and to travel at any time of day and even at night using laser range finders." When it tried to make its way across open desert, "avoiding bushes and ditches along the way," its best performance was to guide itself about 600 yards at 2 miles per hour.

—*Eugene S. Ferguson*, in *Engineering and the Mind's Eye* (MIT Press)

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