

likely to draw a popular audience, but those interested in the evolution of the theories and practices of radiation protection will find it interesting.

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The Young Einstein: The Advent of Relativity

Lewis Pyenson

255 pp. Adam Hilger, Bristol, UK (US dist. Taylor and Francis, Philadelphia), 1985. ISBN 0-85274-779-9. \$44.00

Rumor has it that the about-to-be-published first volume of the Einstein papers, edited by John Stachel (see *PHYSICS TODAY*, May, page 45), contains a trove of newly discovered Einstein letters that will give us new insights into precisely the Einstein of the relativity years. Does this make the sort of close work done by Lewis Pyenson in *The Young Einstein*, presumably without the benefit of these letters, "academic?" I don't think so. What scholars like Pyenson give us is a context and a loving attention to detail. While I do not have the patience—or perhaps because I do not have the patience—for this kind of careful scholarship, I enjoy and admire it greatly. To me there is something fascinating about seeing the actual final examination Einstein took in 1896 when he left the cantonal school at Aarau for the Polytechnic Institute in Zurich. He was, for example, asked (Pyenson informs us) to consider a circle inscribed in a triangle with the line segments connecting the median to each of the apices in ratio of 1:2:3, and asked to find the radius of the circle. He got essentially perfect grades on both this and his physics examination, although, as is well known, his grades were only mediocre, compared with those of some friends among his classmates, once he got to the Polytechnic. I learned, incidentally, from the book, that Einstein actually took nine mathematics courses from Hermann Minkowski while he was there—none of which he seemed to have liked.

About half of the essays in the book deal with Einstein, or his family, directly. One wonderful essay, for example, has to do with the kind of electrical equipment manufactured by Einstein's father and uncle, and an analysis of why their businesses continually failed. It certainly was not for lack of ingenuity. With a little luck and more capital they might have become rivals to Siemens. The rest of the essays deal with the more general scientific and political environment in which Einstein found himself. They can be read, surely by readers of *PHYSICS TODAY*,

although they are as technical as they need be. I would write more about them, except that I want to devote the rest of the few words of this review to a footnote—footnote 18 in the first essay: "Einstein's education: mathematics and the laws of nature."

Einstein was given some books—mathematics books—by his uncle Jakob and these, after Einstein's death, were given to his long-time secretary Helen Dukas. Pyenson writes in the footnote: "Miss Dukas declined to let me examine the books, which until her recent death were located at the Institute for Advanced Study, Princeton." I do not know what lies behind this footnote, but I do know a good deal about the arbitrary and capricious attitude of the trustees of the Einstein estate—especially that of the late Otto Nathan—towards scholars who needed access to the material. I had the misfortune of trying to get permission, for nearly a year, to use quotations from published material owned by the estate. Otto Nathan attempted to exercise control over the profile I wrote of Einstein for the *New Yorker*. It was a nightmare. I can still hear his voice telling me that I was always free to paraphrase. I think there are some valuable lessons to be learned from what happened to the Einstein estate; I hope that that is a story that some scholar will soon tell.

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New York, New York

My Daughter Beatrice: A Personal Memoir of Dr. Beatrice Tinsley, Astronomer

Edward Hill

xx + 118 pp. American Physical Society, New York, 1986. ISBN 0-88318-493-1. \$11.00

This biography of a brilliant theoretical astrophysicist, written by her father largely on the basis of hundreds of letters, can be read on several different levels. At first sight it is the appreciative and touching story of a gifted child, her education, her personal life, the evolution of her career, and the fortitude with which she coped with cancer during her last three years.

Beatrice Hill was born in England in 1941 and grew up in New Zealand, where her father was an Anglican clergyman. She was a brilliant student, excelling in mathematics but also becoming an accomplished amateur violinist. After college she married a young physicist, Brian Tinsley, and came with him to Dallas in 1963 when he obtained a position at the Center for Advanced Studies there. But Dallas

offered little scientific opportunity for Beatrice, and in 1964 she enrolled in astronomy at the University of Texas at Austin, where she took her PhD late in 1967, having commuted from Dallas for half of each week. Her thesis opened up the study of galactic evolution and its relation to cosmology. Nontechnical references to her scientific work were part of her letters home, but this volume also includes an extended introduction and an obituary that summarizes her main research contributions. Most of her papers were published in specialized professional journals. Her 1977 article in *PHYSICS TODAY* (June, page 32), "The cosmological constant and cosmological change," which appears in the *Astrophysics Today* (AIP, New York, 1984) reprint book, will give the non-specialist an idea of some of her research. She published close to a hundred papers, but she also liked to teach and was in demand as a speaker at scientific meetings. Her last paper was written from her hospital bed, where she died in 1981, at the age of forty.

Beatrice Tinsley left an important intellectual legacy, and is vividly remembered as a stimulating and generous colleague. She was clearly a delightful person. On social issues, such as the Vietnam War and planned parenthood, Beatrice was not bound by convention. But society, or her perception of her role in it, was responsible for genuine unhappiness in one area. She had decided on her career goal toward the end of her first year in college, but in the same letter home she wrote "because I am a woman, my home must come before my science." Home and family were very important: When she was unable to bear children herself she adopted two in succession. The five year period following her PhD was devoted largely to domesticity, but she kept some professional work going and her scientific reputation grew. She began to be invited for extended visits to various institutions—in Pasadena, Santa Cruz, Maryland, Cambridge (UK)—taking the children when she could make proper arrangements for them, and getting back to Dallas when she could. Her husband was away even more. She designed the Astronomy Department when the Dallas Center became a branch of the University of Texas, but never obtained a faculty position there. Good offers did come from other places, the most congenial from Yale. Going there as associate professor in 1975 involved leaving home and children, a decision that was a source of sorrow and remorse, even guilt. Her scientific career, to which she was driven by her genius and enthusiasm, was incompatible with the