

A Scientist's Journeys

On the Frontier. My Life in Science. FREDERICK SEITZ. AIP Press, Woodbury, NY, 1994 (overseas distributor, Oxford University Press). xvi, 415 pp., illus. \$35 or £27.50.

A major shift in world leadership in the physical sciences got under way in the 1930s. Frederick Seitz, a physicist, was a participant in and has been a lifelong observer of many of the key events. He was Eugene Wigner's first American graduate student. His thesis was a theoretical study in the fertile field of solid state physics. He held posts at a number of universities. Later, he was president of the National Academy of Sciences, following which he was president of Rockefeller University. At all times, he reached out to interact with leading individuals he encountered. His new book is in part an autobiography and in part a description of people he met. It also is in effect a photograph album, for it contains pictures of some of the world's leading scientists.

Seitz was born in San Francisco on 4 July 1911. Like other youths of the 1920s who later became scientists, he was active in amateur radio. He graduated from an excellent high school in December 1928 and entered Stanford University in January 1929. One of his undergraduate years was spent at the California Institute of Technology, but he graduated from Stanford in December 1931. At Caltech, he mingled with professors and students, one of whom was William Shockley. At Stanford, fellow students included William Hewlett and the Varian brothers. On one occasion, Edward U. Condon—then a professor at Princeton University—was a guest lecturer at Stanford. Seitz conversed with Condon. As a result, he was accepted as a graduate student at Princeton, beginning in January 1932. He began studies there in theoretical physics with Condon, seeking ways in which quantum mechanics could be used to explore properties of crystalline solids. Later, Condon arranged for Seitz to study with Wigner. The combination was successful and led to important papers explaining properties of solids. Seitz received the Ph.D. degree in 1934 and stayed on at Princeton for a postdoctoral year.

During the period 1932–1935, Princeton was an especially exciting place. Among the many luminaries there were Paul Dirac, John von Neumann, Wigner, Condon, and (from 1934) Albert Einstein. Fellow graduate students included John Bardeen, Conyers Herring, Edwin McMillan, and Roman Smoluchowski. Once a month—on a Saturday—Isidor Rabi brought his graduate students to Princeton for discussions with

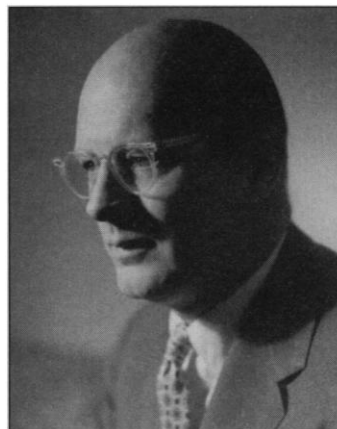
Wigner. One consequence was a lifelong friendship between Seitz and Rabi.

In May 1935, Seitz and Elizabeth Marshall were married. She was a graduate student in physics at Bryn Mawr when he met her. It was a good marriage, and she was helpful to him in many ways. The summer of that year was spent in Schenectady, where Seitz was a summer fellow with General Electric. That autumn, they went to the University of Rochester, where Lee DuBridge headed the physics department. He had made an attractive offer to Seitz. After two years at Rochester, Seitz joined the staff at the General Electric Research Laboratory. During his two years there, he interacted professionally and socially with Leonard Schiff, Robert Hofstadter, Louis Ridenour, and others. While on travel from the lab, he became acquainted with Vladimir Zworykin and Emanuel Piore.

Seitz continued a now well-established pattern by moving to a position at the University of Pennsylvania, where he was on staff from 1939 to 1942. He was head of the department of physics at the Carnegie Institute of Technology in Pittsburgh from 1942 to 1949.

World War II had profound effects on scientists, especially on physicists. They were drawn into it early. In the preamble to his book, Seitz stated, "I became involved part-time in administration during World War II and was never again a truly free agent." He served as a consultant to many organizations, and was off campus much of the time. His travels included a visit to the Metallurgical

Laboratory of the Manhattan District at the University of Chicago to consult about effects of intense neutron irradiation on the structure and strength of materials. Later, in 1946–47, he was on leave for a year at Oak



Frederick Seitz. [American Institute of Physics Emilio Segrè Visual Archives; Shelburne Studios, Inc.]


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Ridge, where he was in charge of a Reactor Education Program. One of his students was Admiral Hyman Rickover.

In 1949, Seitz moved to the University of Illinois, where he was, successively, professor of physics, head of the department, dean of the graduate college, and vice-president for research. In spite of continuing frenetic activities, he took time to write two important books—*Modern Theory of Solids* (1940) and *The Physics of Metals* (1943)—and (with David Turnbull) to edit the ongoing series *Solid State Physics* (begun in 1955).

Seitz served as president of the National Academy of Sciences from 1962 to 1969 and then as president of Rockefeller University from 1968 to 1978. Again, he interacted with leading scientists and with others in fields of politics and finance. His comments about them will be of special interest to physicists and others who have known of the names of famous scientists of this century. In keeping with Seitz's habits of traveling often and far, there are discontinuities in his narrative. Whatever the imperfections, however, significance remains.

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Books Received

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Biostatistics. A Foundation for Analysis in the Health Sciences. 6th ed. Wayne W. Daniel. Wiley, New York, 1994. xvi, 780 pp., illus. \$48. Applied Probability and Statistics.

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Container Molecules and Their Guests. Donald J. Cram and Jane M. Cram. Royal Society of Chemistry, Letchworth, Herts, U.K., 1994 (U.S. distributor, CRC, Boca Raton, FL). xiv, 223 pp., illus. £49.50. Monographs in Supramolecular Chemistry, vol. 4.

An Equation that Changed the World. Newton, Einstein, and the Theory of Relativity. Harald Fritzsch. University of Chicago Press, Chicago, 1994. xx, 279 pp., illus. \$29.95. Translated from the German edition (Munich, 1988) by Karin Heusch.

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Immunobiology. The Immune System in Health and Disease. Charles A. Janeway, Jr. and Paul Travers. Current Biology, London, and Garland, New York, 1994.

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