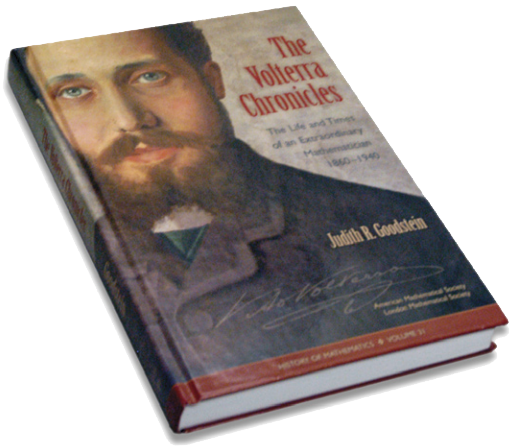


The Volterra Chronicles: The Life and Times of an Extraordinary Mathematician 1860–1940

by Judith R. Goodstein

The American Mathematical Society

310 pages, $47

Mathematician Vito Volterra was lucky enough to be born in the brief window of freedom for Italy's Jews that occurred between the liberation of their ghettos by the French and the beginning of Mussolini's fascist dictatorship. As Judith Goodstein writes in her biography *The Volterra Chronicles*, from the 1500s until the time of Volterra's birth, Jews were prohibited from, among other things, attending public schools at all levels (except for medical schools, so they could practice on other Jews), owning property, maintaining shops outside the ghetto, or remaining outside the ghetto after sunset. They had to wear a yellow armband, and they were restricted to a few trades. In contrast, Volterra, who was born in 1860, was free to pursue his passions of math and physics at the highest levels.

Volterra distinguished himself intellectually early in life—at age 13 he concocted an approximate solution to "the notorious three-body problem that had confounded mathematics since Newton's time," writes Goodstein. Despite his family's urging him to pursue a practical career like railroad engineer, Volterra seemed destined for academia. He was extremely gifted, but also charmed, winning a professorship soon after he earned his doctorate at the tender age of 23. This came at a time when most scholars toiled for a decade or more teaching high school or even junior high before climbing the university ranks. His best-known mathematical contributions are to integral and differential equations, but Volterra embraced all mathematical complexities that crossed his path.

This book is far more than the remarkable history of a man who remains extremely well known in extremely small circles. It is an exploration of Italian history, especially of its academic and political organization, from the late 1800s until the rise of Mussolini in the 1930s. Details like street addresses and their updated names today and descriptions of neighborhoods then and now give a sense of how people lived. Letters to and from Volterra intimately reveal his and his family's personalities, as well as how he and his colleagues dealt with one another.

In his lifetime, academics were also politicians and statesmen, and Volterra served as a senator as well as a lieutenant in Italy's Army Corps of Engineers during World War I. It must have hit him extra hard then when Mussolini enacted racial laws that mandated, among other things, that Jews could no longer attend public schools or universities or serve in Italy's armed forces. He died in this sad reality, shortly after World War II began. So as not to leave us dangling on this haunting note, Goodstein describes in the epilogue Italy's return to democracy and sanity and what happened to Volterra's Jewish colleagues and family, most of whom survived. She also provides the full text of Volterra's obituary by Sir Edmund Whittaker, which was a tribute to his life and work and was published in 1941 by the Royal Society of London. □—*EN*

Homer J. Stewart
1916 – 2007

Homer Stewart (PhD '40), a pioneer of rocket research who helped develop Explorer I, America's first satellite to reach orbit, died May 26 at his home in Altadena, California. He was 91.

A native of Dubuque, Iowa, Stewart earned his bachelor's degree in engineering from the University of Minnesota in 1936 and then came to Caltech as a graduate student in Engineering and Applied Science. He became interested in the rocketry work being done on campus by a small group of Caltech engineers and scientists, chief among them Theodore von Kármán. Stewart, von Kármán, and others began testing rockets in a rugged foothill area of the San Gabriel Mountains about five miles northeast of campus—a group of people and a site that would later become the heart of the Jet Propulsion

Laboratory.

Stewart joined the Caltech faculty in 1939, one year before completing his PhD in aeronautics. He taught both aeronautics and meteorology while also conducting research at JPL. His research interests included the rocket-exhaust velocity requirements for lifting a spacecraft into orbit and maintaining its trajectory. He also used his knowledge of fluid flow to explore wind-driven energy. In the late 1930s, he and von Kármán built a wind turbine on a summit known as Grandpa's Knob in the mountains of Vermont. The machine generated up to a megawatt of power, and operated through World War II in cooperation with a local electrical company. The project was abandoned after the war, in part because fossil fuel became so available and cheap.

As chief of JPL's research analysis section, Stewart participated in many rocket projects, including the WAC Corporal, the Corporal, the Sergeant, and the Jupiter C. He was the chief of JPL's liquid propulsion systems division when JPL and the Army Ballistic Missile Agency (now the Marshall Space Flight Center) developed and launched Explorer I in January 1958.

During a two-year leave at the just-formed NASA, he served as director of planning and evaluation, and recommended what would become the Apollo missions to the moon. He also suggested Cape Canaveral as the launching site for putting rockets into orbit. He received the NASA Exceptional Service Medal in 1970.

Stewart served on the Caltech faculty until his retirement in 1980.

He is survived by two daughters, Barbara Mogel of Chesapeake Beach, Maryland, and Kay Stewart of San Diego; a son, Dr. Robert J. Stewart of Burien, Washington; two sisters; a brother; and two grandchildren. □

Felix Strumwasser
1934 – 2007

Felix Strumwasser, an early explorer in the field of neurobiology, died from cancer on April 19. He was 73.

Strumwasser's career spanned five decades, and he was active in the lab until the end. He was born in Port of Spain, Trinidad, on April 16, 1934, and started college at UCLA at age 15. After earning a bachelor's degree in zoology at age 19, he went on to his doctoral degree in neurophysiology and zoology, also from UCLA, in 1957.

Strumwasser arrived at Caltech as an associate professor in 1964 after a brief time as a lab scientist first at the National Institute of Mental Health, then at the Walter Reed Army Institute of Research. He also taught a neurobiology summer course from 1964 to 1969 at the Marine Biological Laboratory (MBL) in Woods Hole, Massachusetts.

During his 20 years at Caltech, Strumwasser headed a research program in neurobiology, focusing on the mechanisms of sleep as well as investigating procedures for measuring cellular activity. He also studied circadian rhythm and how neurons are stimulated and store information. His findings are still frequently cited and continue to pave the way for advances and research in the field.

After he left Caltech in 1984, Strumwasser taught physiology at Boston University's School of Medicine and then returned to MBL three years later, where he directed the neuroendocrinology lab until 1992. From that time until just before his death, he combined his neurobiology background with a burgeoning interest in human behavior as a professor and researcher of psychiatry and neuroscience at the

Uniformed Services University of the Health Sciences in Bethesda. He also served as a program director for the National Science Foundation's Division of Integrative Biology and Neuroscience.

He is survived by his close friend Phyllis; four sons; a daughter; and five grandchildren. □

Mildred G. Goldberger
1934 – 2006

Mildred Goldberger, wife of Marvin "Murph" Goldberger—Caltech's president from 1978 to 1987—died September 11, 2006. She was 83.

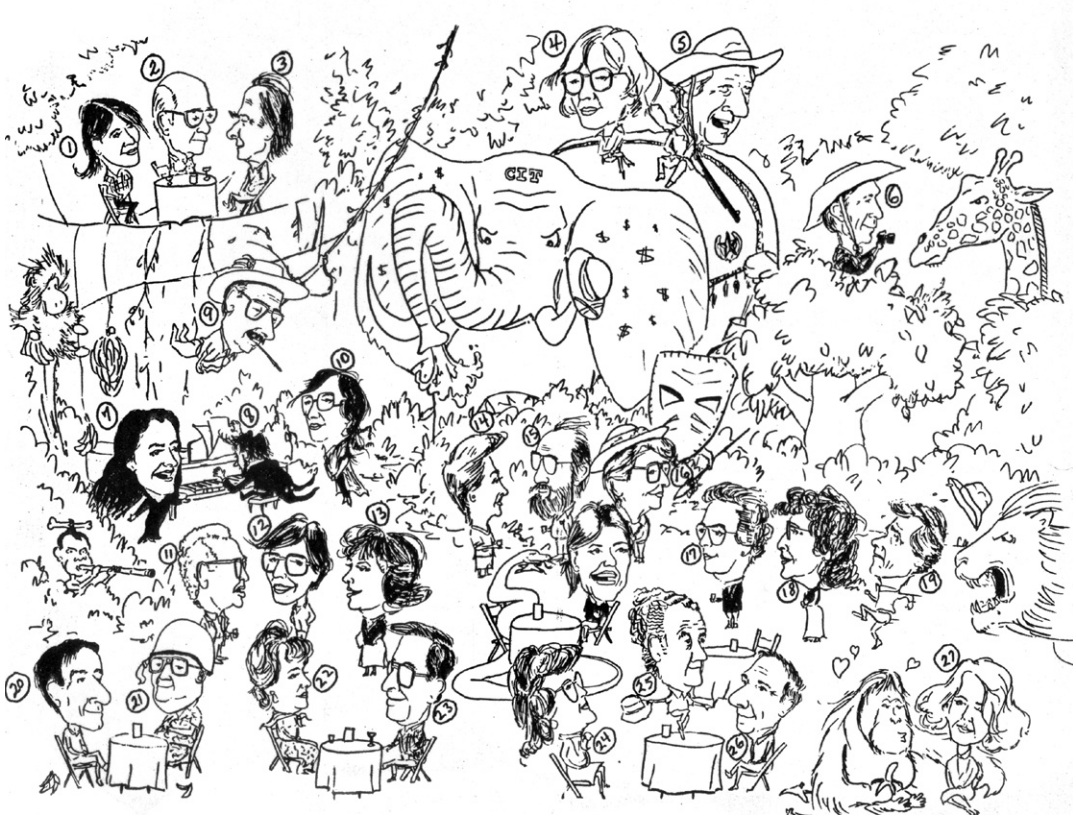
As Caltech's "first lady," Goldberger was an avid gardener, an enthusiastic supporter of the Women's Club, and a skilled hostess. She also edited the *Los Angeles Times* column "Scientific View," for which she solicited contributions from female scientists and science writers.

Born Mildred Ginsburg in Wichita Falls, Texas, on March 26, 1923, Goldberger received a BA in mathematics from the University of Illinois in 1943 and then went on to do graduate work in math, physics, and economics at the University of Chicago. During her time there at the height of World War II, she was a research assistant for the theoretical physics division of the Manhattan Project.

Among other jobs, Goldberger served as chief of the computation group for the University of Chicago Air Force Project, course manager for the math department at Princeton University, economics instructor at Rutgers University, research analyst with the New Jersey Department of Higher Education, and research associate with Princeton's Center for Environmental and Energy Studies, all before she arrived at Caltech in 1978. The topic of the environment was dear to her, and she addressed it in her column. In one op-ed piece written in 1981, Goldberger broke down the pros and cons of using solar energy, a term gaining currency and sorely abused.

A colleague, Faculty Associate in History Judith Goodstein, described Goldberger as a head-turner, with platinum hair and unabashedly bold and outsized black-framed eyeglasses that matched her personality. According to those who knew her, her laugh was breezy, her mind inquisitive, and her opinions passionate. Her columns, about science and scientists, addressed serious themes with a good dose of humor, and she ignored the surgeon general's warnings about cigarette smoking. "I doubt that she charmed the trustee wives, but perhaps that was part of Mildred's charm—she was the quintessential, outspoken, unscripted, candid first lady of the campus who only marched to her own drummer," says Goodstein.

Goldberger was a staunch advocate for women and helped found the Organization for Women at Caltech. In one column in 1981, she declared women better suited for space travel than men—they are smaller and lighter, more dexterous, and can handle equipment with delicate precision, she wrote—and encouraged them to shrug off the "time-worn stereotype" of timid dependence. But she also took her "first lady" duties seriously, as Charlotte Erwin and Romy Wyllie recalled in their book *The President's House at the California Institute of Technology*, which depicts Goldberger presiding with panache over countless formal teas for Caltech Associates and faculty wives. She used freshly grown



The guests at the Wasserburgs' tropical-themed good-bye party for the Goldbergers were immortalized in this cartoon. How many do you recognize? Check your answers at right.

herbs and edible flowers from her garden in many of the exotic meals she and her husband cooked from scratch and served at dinner parties at their home.

Indeed, food sparked what Goldberger called an epiphany about her Jewish heritage, which she also wrote about. She grew up in a town she described as "just a wide place in the road before oil was discovered," where "very few people had ever actually seen a Jew, let alone lived alongside one." It wasn't until her first visit to family in Chicago during spring break at college, when she accompanied them to temple services, that she embraced her heritage. "People were helping themselves from enormous trays of pastries like none I had ever seen," she wrote. "In the Protestant world where I grew up . . . you were supposed to pretend not even to look when you took just the nearest piece from the plate." Her enthusiasm for quality food and good humor was evident at the small au revoir to the Goldbergers on May 25, 1987, at the home of MacArthur Professor of Geology and Geophysics Gerald Wasserburg—who was also chair of the Division of Geological and Planetary Sciences—and his wife, Naomi. The 27 guests were told to bring good company, no serious presents, and lots of "Banana Republic banality and style to the send-off of the Top Banana and the Pineapple Queen." The hosts and their helpers were rumored to have cooked for three days straight to prepare an authentic Indonesian banquet, with every herb, spice, and condiment researched. A "foodie" long before the word was introduced, Mildred blessed the feast, praised the kitchen staff, and ate with the style and gusto that marked her presence at Caltech.

Goldberger is survived by her husband; sons Samuel and Joel; and grandchildren Nicole, Natalie, and Natasha. □

1. Judith Goodstein 2. Norman Lear 3. Richard Feynman 4. Mildred Goldberger 5. "Murph" Goldberger 6. John Hopfield 7. Cynthia Blum 8. Arie Michelson 9. G. J. Wasserburg 10. Marie Morrisroe 11. Murray Gell-Mann 12. Lydia Matthews 13. Gwyneth Feynman 14. Susan Goldreich 15. Stanley Sheinbaum 16. Naomi Wasserburg 17. Betty Sheinbaum 18. Shirley Cohen 19. Barclay Kamb 20. Peter Goldreich 21. David Morrisroe 22. Dianne Epstein 23. David Goodstein 24. Cornelia Hopfield 25. Samuel Epstein 26. Marshall Cohen 27. Linda Kamb

Kanamori Wins Kyoto Prize

Hiroo Kanamori, the Smits Professor of Geophysics, Emeritus, has been awarded Japan's top honor, the Kyoto Prize, by the Inamori Foundation. The foundation was established in 1984 by Kazuo Inamori, founder and chairman emeritus of Kyocera and KDDI Corporation, to award those who "strive for the greater good of society."

Kanamori is one of the world's leading authorities on earthquakes, and is widely known for many important contributions to the field, including the moment-magnitude scale, devised in 1977, which determines the magnitudes of very large earthquakes based on the amount of energy they release. Using the improved method, Kanamori assigned more precise magnitudes to large earthquakes of the past, like the 1960 Chilean earthquake, which he determined to be the world's largest known earthquake at a moment magnitude of 9.5. Kanamori also contributed to the understanding of tsunamis, in particular the relationship between ground motion and the giant sea waves generated by it. He has long been an advocate of automated early-warning systems to alert populations to a seismic event that could result in a tsunami. Kanamori will receive a cash gift of 50 million yen (approximately $410,000), a medal of 20-karat gold surrounded by emeralds and rubies, and a diploma, and will be feted at a special weeklong event in Kyoto beginning November 9. He plans to donate half of the award money to Caltech's Seismological Laboratory and the other half to Japanese earthquake relief funds. □