



Irene K. Fischer

IRENE K. FISCHER

1907–2009

Elected in 1979

“Pioneering in geoid studies for application to defense and space programs in connection with development of a unified world geodetic system.”

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IRENE KAMINKA FISCHER, the grande dame of 20th-century geodesy, died on October 22, 2009, at the age of 102. During her 25 years at the U.S. Army Map Service and its successor agencies, spanning the period 1952 to 1977, she established an unmatched scientific record. Among the notable achievements that she participated in or was wholly responsible for were the revision of the International Ellipsoid in 1956, the refining of the National Aeronautics and Space Administration (NASA) reference ellipsoid for satellite tracking, the transfer of astrogeodetic deflections of the vertical into geoid contours, the construction of the U.S. Department of Defense (DOD) 1960 World Geodetic System (a.k.a. the Fischer Ellipsoid or Mercury Datum of 1960, modified in 1968), the creation of the South American 1969 Datum, the reconciliation of oceanographic leveling with geodetic leveling, and the construction of oceanic calibration zones for satellite altimetry. (A more complete summary of her work can be found in a centennial tribute to her appearing in *Survey Review*, July 2007).

Irene Fischer's workplace recognized her accomplishments by naming her to its hall of fame and presenting her with the DOD's Distinguished Civilian Service Award and the U.S. Army's Meritorious Civilian Service Medal. Her peers elected her a fellow of the American Geophysical Union, and in 1979 she was elected to the National Academy of Engineering. The University of Karlsruhe granted her an honorary doctorate. An Earth spheroid employed operationally by NASA in the 1960s bore her name. After her retirement from U.S. government service, she received the first Federal Retiree of the Year Award. The successor to her agency, the National Geospatial-Intelligence Agency facility, has named its Learning Center on its new campus at Fort Belvoir, Virginia, scheduled for completion in 2011, in her honor

Born and educated in Vienna, Austria, Irene Fischer studied descriptive and projective geometry at the Technical University of Vienna and mathematics at the University of Vienna. Her teachers Moritz Schlick and Hans Hahn were among the luminaries of the Vienna Circle; and her fellow students included physicist Victor Weiskopf, sociologist Paul Lazarsfeld, and social psychologist Marie Jahoda. Her father, Rabbi Armand/Aaron Kaminka, was head of the Maimonides Institute and regularly led high holiday services at the famed Vienna Musikverein. He worked for the Alliance Israelite, investigating pogroms in Eastern Europe, and raised money in the United States and Western Europe to help victims.

In 1930 Irene married historian and geographer Eric Fischer, who helped introduce U.S. history, as distinct from British history, to Vienna. The Fischer family founded and ran the Vienna Kinderbewahranstalt, the first professional kindergarten and kindergarten teacher training school in Vienna, a place that also became a refuge for immigrants to Vienna from Eastern Europe.

In 1939 the Fischers, with their young daughter, Gay, fled Nazi Austria, traveling by rail to Italy, by boat to Palestine, and in 1941 by boat around East Africa and the Cape of Good Hope to Boston, where they lived with Eric Fischer's sister, mother, and brother-in-law, the physician Otto Ehrentheil,

and their two daughters. Looking for jobs, Irene Fischer first worked as a seamstress assistant; then she graded blue books for Vassily Leontief at Harvard and for Norbert Wiener at the Massachusetts Institute of Technology (MIT). She also worked on stereoscopic projective geometry trajectories for John Rule at MIT. She taught mathematics at Brown and Nichols Preparatory School in Cambridge and then at Sidwell Friends in Washington, D.C.

In 1952 Irene joined the Army Map Service as a mathematician in the Research and Analysis Branch of the Geodetic Division. Subsequently, she attained the position of chief of the geoid branch of that division, which she held until her retirement. Her entry into geodetic science coincided with three remarkable breakthroughs in that field in the 1950s. First, the arrival of artificial satellites and space techniques enormously multiplied the quantity and scope of geodetic observations. She was fortunate to have John O'Keefe, a pioneer of the satellite era, as an initial mentor. Second, the introduction of electronic computers enabled data to be handled much more expeditiously. The Army Map Service was the recipient of one of the first of these computers—the UNIVAC. Third, widened support for geodetic programs was recognized as essential for national security and enabled resources to flow to her agency. During Fischer's tenure, and due in large part to her contributions, the Army Map Service became acknowledged as one of the key centers of geodetic activities in the country.

Apart from her research activities, Fischer was an outstanding expositor. For example, she wrote articles for *The Mathematics Teacher* to explain basic geodetic concepts and results to students, and she published a geometry textbook. Geodetic history was one of her favorite avocations (cf. "At the Dawn of Geodesy," *Bull. Géodésique*, June 1981). Her agency took advantage of her reputation and skills, both written and oral, for innumerable presentations to high-ranking government authorities. Fischer was an engaged member of the worldwide geodetic community, and she developed close friendships with leading geodesists in many countries, especially Guy Bomford

and Erik Tengström. Starting with the Toronto (IAG) General Assembly in 1957, she and her husband became well-known participants at international geodetic gatherings. Almost immediately she joined, and eventually headed, several IAG special study groups, and at the 1963 Berkeley assembly she was elected a section secretary. Inevitably she would have attained at least a section presidency, but unfortunately her agency refused permission for her to attend the 1971 assembly in Moscow, when she would have been considered for that office. However, her many friends were gratified to see her and Eric again at the 1975 Grenoble and 1979 Canberra meetings. One of Fischer's most lasting legacies is her unconventional memoir, *Geodesy? What's That? My Personal Involvement in the Age-Old Quest for the Size and Shape of the Earth*, a fascinating, detailed account of her 25 years as a research geodesist. It provides a unique window into this critical transition period for geodesy and many other sciences. Fischer frankly describes her handicaps as a female in the male-oriented environment of the 1950s and the bureaucratic obstructions she faced. But she also gave "tribute to the many friendly souls at all levels who made my government service such an interesting and satisfying experience."

Not just an expositor of geodesy, Fischer also loved to teach and delighted in writing introductory texts. Already in Palestine in 1941 she had created and taught a short-hand for Hebrew, dedicated to the memory of her father-in-law, who had been a stenographer in parliament in Vienna until he was terminated at the demand of some parliamentarians that a Jew not be recording their words. Her "Basic Geodesy" was a popular item in its time. She was delighted to be the first woman to be invited to address the all-male Cosmos Club. Like her father, she was a good linguist, and she taught herself Russian so that she could read their technical literature, helped teach her colleagues some basic German, and then taught herself Yiddish in order to research the history of the village from which her father had come.

Irene loved her carpenter-built house in Takoma Park, Maryland, and her garden with its raspberry patch and figs.

After 12 years of moving every two or three years (Vienna, Palestine, Boston, Washington, Charlottesville, New York, Washington), she put down deep roots in Washington. She was active for many years at Temple Israel in Silver Spring, Maryland, where she also taught an adult class in basic Hebrew, and was an active member of a 40-year-long *chavura* (discussion group). She loved to entertain foreign and local colleagues and for family occasions was a great cook and baker of Viennese Sacher, Dobosh, and Linzer Torten and other delicacies. As a mother she was proud of her daughter, who followed her mathematical talents to become one of the first-generation systems programmers, working after college for the Army Map Service as a liaison to Honeywell on the big mainframe that AMS obtained and writing a high school algebra textbook in the same series as Irene's own geometry book. Her son academically followed more in his father's line, becoming an anthropologist. Fischer loved traveling with her husband, always using meetings as an occasion for a family geographical exploration across the United States and to all five continents. In 1992 she took her family to Spain with the Washington Hebrew Congregation on the 50th anniversary of the expulsion of the Jews, visiting Toledo and other Jewish sites and making sure to be in Granada on the day of the commemorative proclamation.

As a boy, I (Michael) grew up learning about geodesy from her, *tektites* from Dr. O'Keefe, geometry as a beta tester for her geometry textbook, and was fascinated by her stories about the people of the Vienna Circle as I began studying philosophy in college. Eventually, when I became an anthropologist of science and technology at MIT, I used to enjoy thinking about Irene as a young woman there and of her as a student entering the Technical University in Vienna as if it were MIT. I was particularly fortunate to have had parents who not only were supportive but who were also throughout my life emotional and intellectual companions, sharing their many interests scientific, historical, and familial.

When my mother finally gave up her beloved house in Takoma Park and moved nearby to Rockville, to be near close

friends, she endowed a Biblical archeology lecture series in her husband's memory at the Rockville Jewish Community Center. In Israel, where many family members live, she and my father had endowed fellowships to a technical college, as well as being supporters of Haddassah (a life member of the Bialik chapter). In 2001 she moved back to Brighton, Massachusetts, three blocks from where she had first lived as an immigrant in 1941. She is survived by her daughter, Gay A. Fischer, of Oberlin, Ohio, and her son and daughter-in-law, Michael and Susann.

