

Memorial to James Tinley Wilson

1914–1978

WILLIAM C. KELLY

*Department of Geology and Mineralogy, the University of Michigan,
Ann Arbor, Michigan 48109*



The field of geophysics lost one of its senior statesmen with the passing of James Tinley Wilson, who died without warning of a heart attack on the evening of May 25, 1978. An internationally known seismologist, Wilson was Director of the Institute of Science and Technology and Professor of Geophysics in the Department of Geology and Mineralogy at the University of Michigan in Ann Arbor. He is survived by his wife, Martha Wheeler Wilson, and their daughter, Deborah, and also by one aunt, Mrs. John W. Brooks of Long Beach, California. "J. T." Wilson was an extraordinary man—a pioneering scientist, a superb administrator, and a warm and gentle human being whose life had major impact upon his profession and upon the many friends and colleagues privileged to know him.

Wilson's professional career followed a transitional pattern, beginning with his significant contributions as a gifted young researcher and teacher, and shifting gradually to positions of increasing administrative and advisory service to his university, to government at all levels, and to the scientific community as a whole.

As a researcher, Professor Wilson was interested in the full scope of seismology, publishing many significant papers on earthquake seismology, nuclear explosion seismology, and a variety of geotechnical applications running the gamut from evaluation of ice sheets as landing and transport platforms to the seismological appraisal of nuclear reactor sites. J. T. was perhaps best known in research for his pioneering studies of the effects of crustal structure upon the dispersion of Rayleigh and Love waves. This work, begun as a graduate student under Perry Byerly in the late thirties, appeared in several landmark papers in the forties dealing with dispersion patterns associated with earthquakes in the Atlantic Ocean; these contributions were interspersed with more theoretical treatments of the transmission of surface waves through heterogeneous media. His studies of the Atlantic Ocean crustal structure showed clearly that oceanic crust was distinctly different from continental crust. Jim Wilson was one of the very first to recognize the potential of surface wave dispersion for studying the crust and upper mantle—a potential fully realized by a generation of younger geophysicists soon to follow. Wilson published in parallel with Sir Robert Stonely, who provided a theoretical framework for dispersion studies, whereas Jim took a complementary observational approach.

It is difficult to gauge, but impressive to ponder, what Wilson's lifelong contributions in first-hand research might have been had his university and government not recognized the breadth of his talents and soon called upon him for other roles. J. T. was destined to become an administrative leader of research at his home institution and a respected spokesman for seismology in the complex webwork of scientific committees in our nation's Capitol. Jim was not a "geopolitician" in any self-promotional sense of that word, for he accepted only those administrative and committee assignments that offered a real opportunity for advancement of the causes he espoused. Nevertheless, the press of committee duties began in the sixties and

was to intensify until the time of his death. He served, for example, as a member of the National Academy of Sciences/National Research Council Committees on Uses of Computers, Strong Motion Seismology, and Gas Reserve Estimation, and he chaired the NAS/NRC Committees on Seismology and on Remote Sensing of the Environment. He was also a member of the Air Force's Scientific Advisory Committee for Geophysics and of the International Union of Geodesy and Geophysics Committee for Standardizing Seismographs and Seismograms. For the last twelve years, Wilson served as consultant to the Nuclear Regulatory Commission Advisory Committee on Reactor Safeguards and, since 1970, was an active member of the Task Force on Earthquake Hazard Reduction of the United States Office of Science and Technology. These are but a few of his committee activities, but they illustrate both the breadth of his expertise in seismology and the depth of his commitment to societal problems where his science came to bear.

On his home front in Ann Arbor, Jim moved steadily into positions of increasing administrative responsibility at the University of Michigan over the last twenty-two years of his life. This phase of his career began in 1956 with his acceptance of the chairmanship of the Department of Geology; soon thereafter, he engineered the merger of this unit with the former Department of Mineralogy—a notable feat in view of historical factors that had previously kept these kindred groups apart. In his quiet but effective way, J. T. led the department in the early stages of its metamorphosis from a predominantly field-oriented organization into a more balanced unit with strong faculty representation in laboratory aspects of mineralogy, geochemistry, and geophysics. Almost single-handedly, he transformed his “one-man show” in geophysics into the department's present-day program with strong components in seismology, paleomagnetism, terrestrial heat flow, and tectonics. Keenly attuned to the scene in Washington and to changing patterns of federal research funding, Wilson put this knowledge to work in his chairmanship and was particularly effective as an advisor to the young faculty members upon whom the future of the department would come to rest. Although himself primarily a laboratory researcher, Wilson was initially trained as a geologist and was strongly supportive of all departmental field activities; he recognized the value of field instruction particularly for students who, like himself, were headed toward more indoor occupations. Even in recent years, when the pressure of other duties had become intense, Wilson relished brief stints of instructional duty at the department's summer camp in Wyoming, where he introduced valuable field exercises in geophysics as an integral part of the general geology program. There are a privileged few who will always cherish the crowded but delightfully private moments with J. T. when—packed together in an undersized tent at the end of a long field day—we enjoyed a “happy hour” highlighted by Jim's preciously dry humor and accounts of his constant world travels and encounters with the geophysical giants of yesteryear.

Wilson's abilities as both researcher and administrator were not lost upon the University of Michigan management: in 1960 they appointed him Associate Director of the Institute of Science and Technology. He assumed the full directorship in 1964, a position he was to hold until his death. Few of Jim's colleagues outside the university realized the dimensions of this job, but it involved administration of several large interdisciplinary laboratories, the provision of financial support to basic and applied sciences across the campus, and assistance to industry in the utilization of scientific expertise and research facilities available at the university. The interdisciplinary organizations under Wilson's direct administration included the Biophysics Research Division, the Great Lakes and Marine Waters Center, the Highway Safety Research Institute, the Industrial Development Division, the Merit Computer Network, and the Macromolecular Research Center. Given such responsibilities, it is little wonder that Wilson brought such an extraordinary range of scientific knowledge to his numerous external assignments. In his post as IST Director, Wilson came into close contact

with scientists of virtually every discipline on the Michigan faculty. The remarkable thing one learns in talking with these people is that each one felt he or she somehow held the private ear and warm personal interest of this high-ranking executive. Even more remarkable—they in fact did.

In recognition of his stature and accomplishments in the field of seismology, the professional societies called upon Wilson to serve in their highest offices. He worked, for example, on the Board of Directors of the Seismological Society of America and was later elected that society's first Vice President (1959) and President (1960). He also served as President of the Seismology Section of the American Geophysical Union in 1974. He was elected to Fellowship in the Geological Society of America, the American Geophysical Union, the Earthquake Engineering Research Institute, and the Royal Astronomical Society.

These honors testify to the importance of the man, but do not tell the full story of the way in which J. T. was, as usual, able to turn such accolades away from himself and toward the benefit of the public and the scientific community. To appreciate his very special leadership, one must examine Wilson's place in time. J. T. was one of a very few outstanding seismologists occupying an age gap between the older group—Richter, Gutenberg, Jeffreys and other pioneers—and a younger wave of scientists that was to sweep across the seismological scene beginning in the mid-fifties. Jim thus filled a sparsely populated niche in the genealogy of his field, and, greatly respected by both the older and younger groups, he fell natural heir to a position of leadership at a time when exciting events began to develop in geophysics. In the period of his vice-presidency and presidency of the Seismological Society he was a strong proponent of the Worldwide Standard Seismographic Network, emphasizing its value not only as providing one of the foundation stones for ultimate nuclear arms control, but also for its assured contribution to our understanding of the Earth's internal structure and dynamics. His outspoken advocacy of this system was soon justified; the data gathered from this instrumental network provided the sine qua non for many dramatic advances in world seismology, chiefly by younger investigators, in the decade to follow. In the seventies, when public concern with earthquakes as natural hazards intensified, we again find J. T. (then President of the AGU Seismology Section and a member of several critically related advisory groups) in a unique position to advocate and guide the allocation of federal research funds to these areas of societal importance.

Given this outstanding record of professional accomplishments, it is interesting to backtrack and to examine the personal history and development of James Tinley Wilson. Jim made his first public appearance in Claremont, California, on November 13, 1914, as the newborn son of Raleigh and Mary Brooks Wilson. Shortly before his birth, the family had moved from their lands in Iowa to the farming community of Strathmore, California, where Jim spent most of his early youth. His was a rich but rigorous life consumed by schoolwork and spare-time jobs as fruit-picker, well-digger, fence-mender, and general handyman on the local farms. The family ate well, though their diet emphasized surplus items on the local vegetable market (a fact that may well explain J. T.'s lifelong distaste for spinach). This austere upbringing was enriched by strong family ties and, particularly, by the influence of a gifted mother. Mary Wilson, a Phi Beta Kappa from the University of Iowa, was an amateur naturalist with wide-ranging interests in botany, ornithology, and virtually all aspects of the natural world around her, and she conveyed these interests to her son. Mary also happened to be a first cousin of the soon-to-be Vice-President Henry Wallace—a relationship that enlivened family reunions—but the two really had little in common other than their mutual interest in agriculture. The Wilson family took pride in their ownership of a rare, if not the only, eleventh edition of the *Encyclopedia Britannica* (the "Scholars' Britannica") to be found in Strathmore, and young Jim was among its most avid readers. J. T. Wilson thus came from a

devoted family whose hands were calloused, but whose minds were still sensitive to all forms of knowledge of the world around them. Jim's father and mother, as well as his only sister, Lucy E., preceded him in death in 1944, 1960, and 1945, respectively.

J. T. left the farm and the family with an appreciation for work, with a kindling interest in natural science, and with a commitment to further education. After two years (1931–1933) at Porterville Junior College, he moved on to the University of California at Berkeley, where he received his A.B. degree in geology in 1935. These college years were no release from the old need to support himself, but among the part-time jobs he held, one in particular was to shape his later career. Professor Perry Byerly, himself a newcomer to Berkeley, found for this needy student an hourly job changing records at the university's seismograph station. These menial duties soon gave way to weightier responsibilities for preparation of reports on California earthquake activity. Young Jim was "hooked." Four years later, in 1939, he was to receive his Ph.D. degree in seismology as one of Byerly's very first doctoral students.

After one year of postdoctoral study under Professor Francis Birch at Harvard University, Wilson accepted an instructorship in 1940 in the Department of Geology at the University of Michigan, the institution that was destined to benefit from thirty-eight years of his loyal service. Jim's early teaching duties in geophysics and introductory geology were soon to be interrupted by World War II; he took leave of absence from 1943 to 1945 to join Columbia University's Division of War Research at Mineola, Long Island, where he had an opportunity to be associated with Victor Vacquier in the development of military applications of airborne magnetics and of the then primitive forms of SONAR.

Jim did not leave Ann Arbor empty-handed. Keenly observant as always, he had taken particular notice of an attractive young secretary in the department—one Martha Wheeler—and he soon convinced her to accompany him on the wartime adventure soon to unfold in the unlikely locale of Mineola. Martha and Jim were married on July 17, 1943, entering a permanent contract that was to grow in strength for all the ensuing years. The highlight of their New York escapade was the arrival of Debora Mary Wilson who, as their only child, was to occupy a very special place in the hearts and lives of her parents. All of their friends in later years were aware of the exceptionally close ties within the Wilson family and were constantly amused by Jim's weakly feigned annoyance with all the detailed plans "his girls" were laying for their annual trips abroad. Those trips now continue for Martha and Debbie, greatly saddened by his absence, but enriched by his constant memory along the way.

The Wilson trio returned to Ann Arbor in 1945, where Jim resumed his teaching and began the gradual ascent of the administrative ladder previously described. His professional responsibilities left little time for local civic activities, but he did serve for many years on the Board of Trustees of the Cranbrook Institute of Science in Bloomfield Hills, Michigan, and as a Trustee and Water Commissioner for Barton Hills Village, a community on the outskirts of Ann Arbor where the family resided. His interests in travel, in people, and in the natural world around him were so diverse that no one subject was elevated to the status of a special hobby. He was a modest collector of stamps and of antique maps, but the collections suffered both from the competition of his other interests and from the fact that Jim did not have to possess things to enjoy them. He did have a fascination with sundials and with the use of the sun as a navigational guide. His department was the skeptical recipient of a home-made sundial constructed by Jim for instant read-out of Greenwich time in Ann Arbor, and many were the students he literally led out of the woods in magnetic terrane with his personal set of solar navigational tables and a sundial compass; but that was, perhaps fortunately, about the extreme to which any one hobby was developed.

J. T. was a genuinely, though not ostentatiously, religious person. A faithful attendant at Saint Andrews Episcopal Church in Ann Arbor, he was deeply honored by the opportunity to serve as a member of their Vestry, an assignment that he personally ranked far above

any of the lofty positions he had held in professional circles. Jim's religious convictions ran deep and rarely surfaced in public conversation, but these, along with his inherited thirst for knowledge, seem symbolized by the nature of his bedtime reading. Only two items were within reach on the bedstand: a set of the *Encyclopedia Britannica* and a thumb-worn copy of an Episcopal prayerbook.

All of us—his family, his friends, his former students and his colleagues—suffered an irretrievable loss with the passing of James T. Wilson, but his life was a gift to us all, even though it may have touched us in very different ways. The memories of this gentle man and of his contributions are deeply etched in many hearts and in the annals of his science. It seems a fitting tribute to J. T. that, as this memorial is written, the world has a second strategic arms limitation treaty within its near grasp. Although he never reached the headlines in this connection, Jim was a leader among those scientists working forcefully but quietly behind the scenes to provide the seismological capability essential to such international treaties. Thus the public at large, knowing little of this man's life and probably nothing about his death, was perhaps his major beneficiary after all.

SELECTED BIBLIOGRAPHY OF J. T. WILSON

- 1934 (and Byerly, P.) The central California earthquakes of May 16, 1933 and June 7, 1934: Seismological Society of America Bulletin, v. 25, p. 223–246.
- (and Byerly, P.) Northern California earthquakes, April 1, 1934 to December 31, 1934: Seismological Society of America Bulletin, v. 26, p. 207–214.
- 1935 (and Byerly, P.) Earthquakes in northern California and the registration of earthquakes at Berkeley, Mount Hamilton, Palo Alto, San Francisco, Ferndale, and Fresno: Seismograph Station Bulletin 4, no. 1–3, Bulletin 6, no. 4 (Berkeley, University of California Press).
- 1936 (and Byerly, P.) The Richmond quarry blast of August 16, 1934: Seismological Society of America Bulletin, v. 25, p. 259–268.
- (and Byerly, P.) Northern California earthquakes, April 1, 1933 to March 31, 1934: Seismological Society of America Bulletin, v. 25, p. 269–274.
- Foreshocks and aftershocks of the Nevada earthquake of December 20, 1932, and the Parkfield earthquake of June 7, 1934: Seismological Society of America Bulletin, v. 26, p. 189–194.
- (and Byerly, P.) Northern California earthquakes, January 1, 1935 to December 31, 1936: Seismological Society of America Bulletin, v. 27, p. 225–230.
- 1937 (and Annis, W.) Earthquakes in northern California and the registration of earthquakes at Berkeley, Mount Hamilton, Palo Alto, San Francisco, Ferndale and Fresno: Seismograph Station Bulletin 4, no. 4; Bulletin 5, no. 1 (Berkeley, University of California Press).
- 1938 (and Byerly, P.) Microseisms recorded at Berkeley: American Geophysical Union Transactions, p. 107–109.
- 1940 The Love waves of the South Atlantic earthquake of August 28, 1933: Seismological Society of America Bulletin, v. 30, p. 273–302.
- 1942 A statistical study of the periods and amplitudes of microseisms: American Geophysical Union Transactions, p. 228–231.
- Surface waves in heterogeneous media: Seismological Society of America Bulletin, v. 32, p. 297–403.
- 1944 Ground-water exploration by earth-resistivity methods: Michigan Academy Papers, v. 29, p. 345–354.

- 1947 *Laboratory and field trip manual for Geology II: The University of Michigan.*
- 1948 (and Baykal, O.) Crustal structure of the North Atlantic Basin as determined from Rayleigh waves dispersion: *Seismological Society of America Bulletin*, v. 38, p. 41-53.
- Increase in period of earthquake surface waves with distance traveled: *Seismological Society of American Bulletin*, v. 39, p. 89-93.
- Bending and shear tests on lake ice: *American Geophysical Union Transactions*, v. 29, p. 909-912.
- 1952 Preparation for petroleum geology and geophysics: *Journal of Engineering Education*, v. 42, p. 295-296.
- 1953 (and Zumberge, J. H.) Quantitative studies on thermal expansion and contraction of lake ice: *Journal of Geology*, v. 61, p. 374-383.
- 1954 Effect of ice on shore development: *Proceedings, Fourth Conference on Coastal Engineering, Chicago, Illinois, Council on Wave Research.*
- 1955 Coupling between moving loads and flexural waves in floating ice sheets: *Snow, Ice, and Permafrost Research Establishment Report 34*, p. 1-33.
- 1962 (and Willis, D. E.) Maximum vertical ground displacement of seismic waves generated by explosive blasts: *Seismological Society of America Bulletin*, v. 50, no. 1, p. 455-459.
- Underground shocks: *International Science and Technology*, no. 1, p. 47-53.
- (and Frantti, G. E., and Willis, D. E.) The spectrum of seismic noise: *Seismological Society of America Bulletin*, v. 52, p. 113-122.
- (and DeNoyer, J., and Willis, D. E.) Observed asymmetry of amplitudes from a high explosive source: *Seismological Society of America Bulletin*, v. 52, no. 1, p. 133-138.
- (and Willis, D. E.) Effects of decoupling on spectra of seismic waves: *Seismological Society of America Bulletin*, v. 52, p. 123-132.
- 1969 (and Havlick, S. W.) Water-related research for the Great Lakes region: *EOS (American Geophysical Union Transactions)*, v. 50, no. 8, p. 492-494.
- 1970 (and Willis, D. E.) A note on the Anna, Ohio, earthquake of July 26, 1968: *Earthquake Notes*, v. 41, no. 3, p. 21-25.