Memorial to George F. Sowers 1921–1996

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Although structures have been built on the ground or constructed of soil and rock since the origins of people, most of what we know about soil and rock has only existed since 1935. Many cultures viewed soil as, well, *dirty*—so little was done to analyze the earth until the late 19th and early 20th centuries. We owe a debt of gratitude to men like George F. Sowers, who loved geology and were fascinated with the earth's strength and reactivity—fascinated enough to make its study their life's work.

George liked people, loved helping others, and especially enjoyed solving problems—the more complex, the better. It is no surprise, then, that he took his love of geology and used it to further the "new" discipline of geotechnical engineering—the use of geological information to determine site suitability and predict structure stability. George saw this as more than facilitating better construction; he saw it as making life safer and easier for people.

"George would apply his training as a geologist first and as an engineer second, when he looked at a problem such as a landslide or a failed dam," says Clay Sams, a geotechnical colleague. "He understood better than most the critical interdependence between geology and geotechnical engineering, and that solving problems required both disciplines. He had a rare combination of personal expertise in both fields, along with the experience to apply his knowledge in a very practical way."

And apply he did. Through his 50 years of practical consulting with Law Engineering, his teaching at the Georgia Institute of Technology, his writing, and his work with professional societies, George Sowers became preeminent in his field. He was the author or coauthor of eight books, several of which are the definitive geotechnical engineering texts. He wrote over 150 technical papers, many of which received prestigious awards. He traveled the world as a much-sought-after speaker, and an even more in-demand consultant for his expansive knowledge and razor-sharp judgment. And yet most often, people remember George for his wit, wisdom, and power of personality. Adored by students, enjoyed by colleagues, and respected by all who knew and worked with him, George F. Sowers is indeed sorely missed.

Getting Started

George F. Sowers was a native of Cleveland, Ohio. The son of George B. Sowers, a prominent civil engineer who specialized in foundation design, port design, and heavy construction, young George's earliest memories were of tramping underground with his father in tunnels, mapping the geology, and inspecting foundations. It was an activity he never failed to enjoy.

Clay Sams, speaking at the memorial service honoring George, said, "George's constant enthusiasm about his work always amazed me. He always said, 'If your job's not fun, get out!'

Very few people who got to work with George ever got out."

George graduated from Case University (now Case Western Reserve) in 1942. He went to work with the U.S. Tennessee Valley Authority in Knoxville, Tennessee, as a hydrologist and hydraulic engineer. There he met his future wife, Frances Adair Lott of Greenwood, Mississippi. Soon after they married, George joined the Navy as an electronic technician, and eventually became an instructor. This was his first formal training in teaching.

After the war, George and Frances went to Boston, where he entered the Harvard Graduate School of Engineering to study under Karl Terzaghi, the father of soil mechanics and probably the most brilliant civil engineer of the first half of this century. In 1947, while still at Harvard, George responded to a joint advertisement for a professor for Georgia Tech, and part-time consultant for Law. It was the perfect arrangement. Georgia Tech needed faculty expertise in soil mechanics; and Law, then a small testing laboratory with one engineer, had been approached by clients to solve structure stability problems.

Consulting for Law Engineering

George, founder Thomas C. Law, and then-president George Nelson poured their hearts and minds into building the company. Over and over again, sometimes at great sacrifice, they rolled profits back into the business rather than spend the fruit of their considerable labor. Over the next 50 years, Law grew from a handful of employees working in the basement of a bookstore into a global leader across a wide range of engineering and scientific disciplines. George Sowers, with his knowledge, energy, and work ethic, was an integral part of the company's success.

George's consulting work generally involved evaluating sites to determine the cause of structural failure, or to provide the data needed to design and build appropriate structures for the property. He was constantly comparing a site's properties with his "mental database" of geological and engineering knowledge. "George approached each project as if he were solving a mystery," David Alcott says. "Basically, he loved solving problems, and he solved them in terms of geology."

Much of George's consulting was in southeast Asia and in the southeastern United States, working with dams. He spent considerable time consulting in South and Central America, most notably on the Pan American Highway and other transportation projects. He is also well known for his work with limestone terrain in the Caribbean and the U.S., especially Puerto Rico and Florida. In the 1970s, George also worked on the evaluation of proposed sites for nuclear plants. Primary considerations were the geology and seismic activity of the sites, because stability and proclivity toward earthquakes were of great concern.

George's dual careers with Law and Georgia Tech served both organizations very well. At Law, he assumed the highest positions in the company: senior consultant and chairman of the board. At Georgia Tech, he achieved the highest honors attainable in teaching and influenced many careers and lives.

Teaching at Georgia Tech

George's teaching shaped the careers of many people in the Georgia Tech community and well beyond, through his texts and scientific papers. At the memorial service, James Wallace, Law's Director of Engineering and Science and a former Sowers student, spoke as a representative of the "Techies" who flocked to George's classes.

"I'm not sure anyone could pay a higher compliment to George than to thank him for being a great teacher," Wallace related. "When I was in college, I would ask my fellow students what courses they planned to take the next term, and they would say, 'Whatever Professor Sowers is teaching.' His classes were always full, not only because they were important parts of the curriculum, but because he was both entertaining and ... taught with authority. Many days he came

to class with his boots still on, having just returned from a construction site. He would tell us about the problems he had just solved and, within a few days, he would show slides of the project to the class."

"George was a master of anecdotes," Wallace continued. "He told more stories, had more experiences, and remembered more examples than anyone I ever knew. It was George's vivid storytelling and recollection of real case studies that captivated his audience and won the admiration of his students and fellow geologists and engineers. In every story George told, there were lessons to be learned."

George's love of sharing knowledge also carried over into his family life. He and Frances were blessed with four children, and George actively cultivated their interest in the earth and all things geological. Often, on family vacations, George would pull over to the roadside and show them some unique feature of the land or a structural problem with the road. Thanks to his boundless enthusiasm, three of his four children later earned their own geology degrees, much to George's delight.

In 1996, the fiftieth year of George's association with Georgia Tech, the university established the George F. Sowers Distinguished Graduate Student award in his honor. Some of the awards George personally achieved were: Teacher of the Year, Georgia Institute of Technology, 1971 (first engineering faculty member); Engineer of the Year, Georgia Society of Professional Engineers, 1973; Herschel Prize, Boston Society of Civil Engineers, 1976; American Society of Civil Engineers (ASCE) Middlebrooks Award, 1977; Terzaghi Lecture, 1979; ASCE Martin Kapp Lecture, 1985; ASCE Middlebrooks Award, 1994; ASCE Terzaghi Award, 1995.

There was one well-deserved honor that George seemed to especially appreciate: a formal resolution of thanks from Law's Board of Directors, drawn up to publicly acknowledge his extraordinary contribution to the company's success. "Above all," Wallace said, "I believe his teaching awards were perhaps his most gratifying recognition."

Personal Glimpses

George had an exceptional amount of physical and mental stamina. In the early 1970s, in addition to teaching three days per week at Georgia Tech and consulting at Law, George was also drafted to serve as the chairman of Law's board of directors.

George was active in many professional societies, including: Geological Society of America (Fellow), American Society of Civil Engineers (executive committee), International Society of Soil Mechanics & Foundation Engineering (vice president), Geological Academy of Science, Association of Engineering Geologists, Earthquake Engineering Research Institute, National Society for Professional Engineers, American Society for Testing and Materials, U.S. National Society of Soil Mechanics, U.S. Committee on Large Dams, Seismological Society of America.

"You might think he couldn't have done all those jobs well, but he did," Clay Sams related. "His students never felt neglected or shortchanged, and those at Law felt the same way. You or your project were always the most important thing to George when you were with him."

Betty Brooks, George's longtime assistant, remembers: "He always took time to talk to you, and to really listen. No matter how busy he was, George always had time for you. When he returned from a trip, he would sit by my desk and tell fascinating stories about the exotic places he'd visited. And wherever he went, he was constantly taking notes for his students."

As James Wallace said at the memorial service, "George Sowers loved his work. He was truly and uniquely a full-time consultant *and* a full-time professor. He was a geologist *and* an engineer. He was a great man *and* a humble man. He was serious business *and* he was quite humorous. He was pragmatic and direct. He was a very giving and sharing person."

A Legacy

For decades, George Sowers was a pioneer in geotechnical engineering on an international level, and unequaled in his communication of this knowledge. His extraordinary gift for sharing ideas set him apart from others in his field. He consulted around the world and became synonymous with dedication, energy, enthusiasm, and integrity in geology and engineering.

The enormous gap left by George's passing will never be filled, but he lives on through the students he taught, the colleagues he touched, and the many personal and professional contributions he made throughout the world. Through his love of helping people and solving problems, George was able to build an international career doing both, and to create a legacy that will influence generations to come.

Only as the years pass will we fully understand George Sowers's impact. Someday, through the practical experience he contributed to geology and geotechnical engineering, students he never met will create dams that cannot fail, and skyscrapers undisturbed by earthquakes. Because of George F. Sowers, the built environment will forever be safer, stronger, and more stable—which is just what he wanted all along.

SELECTED BIBLIOGRAPHY OF G. F. SOWERS

1948 Discussion of classification and identification of soils: ASCE Transactions, v. 113.
1953 Discussion on methods for making highway soil surveys: ASCE Transactions, v. 118A.
—— Application of geophysical exploration: AIME Transactions, Mining Engineering, August.
1961 Earth and rockfill dam engineering: Bombay, Asia Publishing House.
1954 Soil problems in the southern Piedmont regions: ASCE Proceedings, v. 80, March.
1956 Foundation investigation for industrial sites: Industrial Development, v. 3, no. 5, September, p. 7–14.
1957 Trench excavation: Bulletin of Construction Safety Association of Ontario, Canada, September.
1961 Use and misuse of earth dams: Consulting Engineer, July.
1964 Excavation failures and their prevention: Construction, March, p. 28.
1973 Remote sensing for water resources: Civil Engineering, no. 2, p. 35–42.
1974 Engineering approach to responsibility for unexpected problems in foundations: ASCE, Boston Society of Civil Engineers Section, Journal, v. 61, no. 4, October, p. 201–223.
1975 Failures in limestones in humid subtropics: ASCE, Geotechnical Engineering Division, Journal, v. 101, no. GT8, August, p. 771–787.
—— Engineering properties of Georgia soils: Georgia Geologic Survey Bulletin 60.
1977 Dam failure at Toccoa Falls: USCOLD Newsletter, no. 54, November, p. 13–16.
1978 Reconnaissance report on the failure of Kelly Barnes Lake Dam, Toccoa Falls, Georgia: Washington, D.C., National Academy of Sciences, Committee on Natural Disasters.
1979 Introductory soil mechanics and foundations: Geotechnical engineering [fourth edition]: New York, Macmillan.
—— (with Carter, R. B.) Paracti rockslide, Bolivia, *in* Voight, B., ed., Rockslides and avalanches, Volume 2: Engineering sites: New York, Elsevier.
1981 Lost-ground subsidences in two shallow tunnels, *in* Resendiz, D., and Romo, M. P., eds., Soft-ground tunneling failures and displacements: Rotterdam, Netherlands, A. A. Balkema
—— There were giants on the earth in those days: ASCE, Geotechnical Engineering Division, Journal, v. 107, no. GT4, April.
1983 Residual soils of Piedmont and Blue Ridge: Transportation Research Record 919, p. 10–16.

1984 (with Akins, K. P.) Tunneling under a building with thin rock cover: ASCE, Geotechnical Engineering Division Journal, v. 110, no. 3, p. 311–318.
—— Ancient earthworks: Geotechnical News, v. 2, no. 4, December.
1986 Correction and protection in limestone terrain: Environmental Geologic Water Science, v. 8, nos. 1/2, p. 77–82.
1988 Foundation problems in residual soils, *in* Proceedings, Conference on Engineering Problems of Regional Soils: Beijing, International Academic Publishers.
1992 (with Schuster, Robert L.) Volcanic debris, avalanche, and lahar deposits, *in* Proceedings of the Twelfth International Conference on Soil Mechanics and Foundation Engineering, Rio de Janeiro, 1989, Volume 4: Rotterdam, Netherlands, A. A. Balkema, p. 2453–2461.
1994 Geotechnical issues in site selection and project development: Association of Engineering Geologists Bulletin, v. 31, no. 2, p. 209–216.

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