

Of Motions Large and Small

A lifelong interest in railroads and structural vibration have accompanied Tom Murray around the world.

TOM MURRAY MAY BE most well-known in structural steel circles for his expertise in floor vibrations. He and Dave Allen were the primary authors of AISC *Steel Design Guide No. 11, Floor Vibrations Due to Human Activity*, published in 1997. But his interest in motion runs from nano to loco, and goes all the way back to his younger days in Iowa.

"My father was a railroad man," Murray said, "a conductor on the Illinois Central, and ran trains out of Waterloo." The elder Murray had served in World War I before going to work for the railroad, where he spent the next 47 years.

Every summer the family would vacation together by rail, Murray recalls. By the time he was in high school, he had been in 40 states and five provinces. One of the more memorable of those outings was in the early 1950s on a Canadian transcontinental train going from Winnipeg to Edmonton.

"My father had been in 19 wrecks in his career, and I was with him on the last one. We were stopped. We had run by a siding," Murray said. "A local passenger train came around a curve and hit us head-on." It was, as he recalls, the last head-on collision of two steam-powered passenger trains in North America, and he has been a railroad buff ever since.

Murray studied engineering at Iowa State University, then signed on with Pittsburgh-Des Moines Steel where he had some small involvement with one of the company's then-current projects, the St. Louis Arch. He left to pursue his master's degree at Lehigh University, finishing in 1966. After a year at the University of Omaha, he went to the University of Kansas to work with Ken Lenzen, one of the first people in the U.S. to investigate issues related to structural vibration due to human activity. "I liked the subject because it was different and involved humans," he said.

He received his doctorate in 1970, joined the University of Oklahoma faculty, and started doing research. Word got around and he soon was asked to speak on the subject.

"The first thing I did with AISC was a breakfast meeting in Minneapolis in the early 1970s. Since then I have given close to 100 presentations on floor vibrations for AISC. That was the beginning and it has never stopped. I get emails almost every day now with questions."

Murray spent the 1986-87 school year as a Distinguished Visiting Professor at the U.S. Air Force Academy, then went to Virginia Polytechnic Institute and State University.

All the while, his railroad interest and travels continued. While on sabbatical in Australia, Murray rode the Great Southern Railway more than 1,600 miles from Adelaide, on the south central coast, to Perth on the western edge of the continent. Another excursion took Murray across the Andes Mountains (at 14,000 ft) on a narrow gauge railroad. "It took us a week, and we derailed seven times," he said. "Most of the time the rails spread and the steam engine dropped down on the ties. But it didn't take long before they got the engine up on the rails, spiked the rails back down, and away we went."

More recently, Murray had a special railroading opportunity in conjunction with an AISC committee meeting in Las Vegas. A week before his 70th birthday his wife arranged for him to operate a steam engine in Ely, Nev.

"I was the engineer and they let her sit in the cab and be the fireman," Murray said. "I operated the engine up the mountain for 10 miles, then back again. The throttle is relatively easy. Braking is the hard part. It's very touchy. The engine was a hundred years old, and they don't want you to rough it up," he said, adding, "I got caught speeding."

Today Murray carries on the family tradition of a strong work ethic. In February he presented the most recent AISC webinar, which drew an estimated 2,000 participants. In May he will moderate an educators roundtable at The Steel Conference in Pittsburgh. And one never knows what might be next.

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Far left: Shortly before his 70th birthday, Murray operated a century-old steam engine near Ely, Nev. Now owned by Northern Nevada Railway, its markings are from its days with the Nevada Consolidated Copper Company.

A long-time university professor, in 2010 he received AISC's prestigious Geerhard Haaijer Award for Excellence in Education. During Murray's 21 years on the Virginia Tech faculty he constructed a world-class structural engineering laboratory at the school. In 2009 it was named after him. Also in the photo are his wife, Nancy, and the school's AISC Steel Sculpture.