

OBITUARY

Peter J. Todd (1949–2015)

Peter Justin Todd died Friday, September 25, 2015, age 66, after suffering a stroke. He was born on June 26, 1949 in Lackawanna, New York, the second of five children of Charles Justin Todd and Veronica Patricia Todd. He earned a B.S. in chemistry at Rensselaer Polytechnic Institute in 1971, and a year later received an officer's commission in the United States Navy. Soon after, he married his first wife Eileen Specyal, and served as a deck officer with various units of the Atlantic and Pacific fleets. He entered graduate school at Cornell University in 1976 and joined Professor Fred McLafferty's group.

Pete was among the pioneers of tandem mass spectrometry and of organic ion imaging by mass spectrometry. He was a born scholar and engineer, tempered by the discipline and experience of a naval officer. Pete was also a sage, the wittiest person many of his close friends have ever known, with a deep sense of irony to go along with his tremendous technical knowledge. For many of us, it was easy to get into protracted impromptu conversations with him. Tom Covey recalls a particular ACS meeting when they were so deeply immersed in a discussion that Tom missed his own presentation. It was always more than science. It was also the wisdom to live life and realize that the things that seem big—money, lovers, misbehaving mass spectrometers, whatever—is all noise and will work its way out.

Pete's first seminal contribution was his Ph.D. project, design and construction of a state-of-the-art four-sector tandem mass spectrometer. In 1976, the only choice for a high mass resolution analyzer was the magnetic sector: time-of-flight analyzers were not used much because of limited mass resolution and the Fourier transform ion cyclotron resonance mass spectrometer was still an experiment in the hands of pioneers. The triple quad just being invented for MS/MS was limited to nominal mass resolution, and the Orbitrap was decades away. The practical choice for a high mass resolution tandem system was coupled magnetic and electric sectors, a complex task that Fred McLafferty remembers was surely too tough for a Ph.D. thesis. But Pete's disciplined approach to research was an example for the entire McLafferty group. "You've never installed a diffusion pump? Here's a great chance to learn." To connect the grounded first magnetic sector to the second MS, the last sector was floated at 25keV off ground, facilitated by special insulators acquired by Pete from the New York State Power Authority. As was customary, Pete started full time research in the summer of 1977; his paper describing the first MS/MS instrumentation achieving high resolution in both

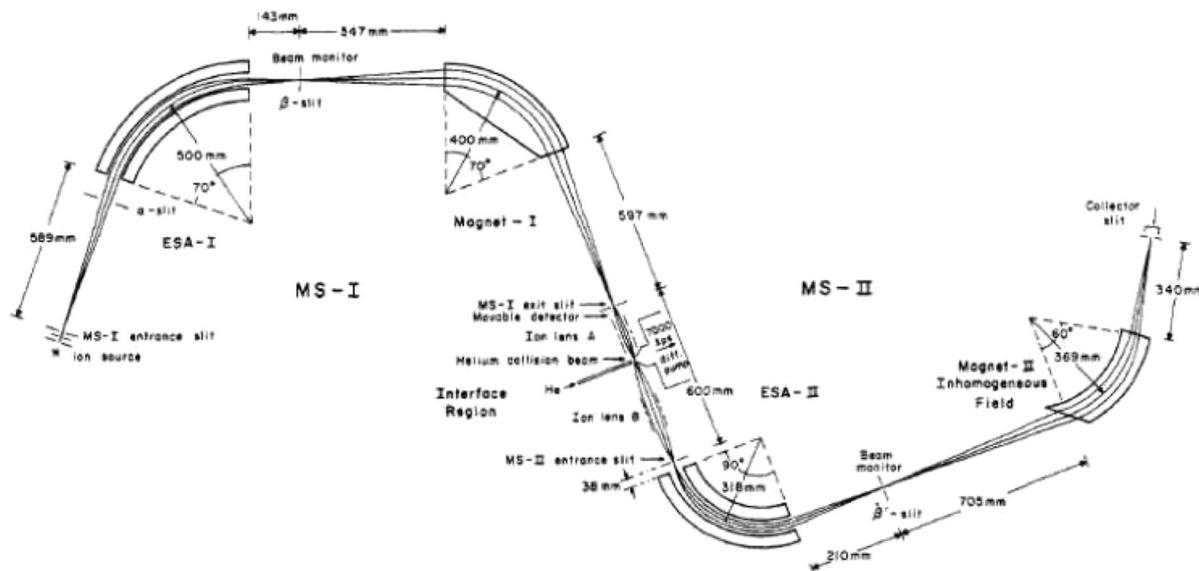


sectors was published in May [*J. Am. Chem. Soc.* **102**, 3360–3363 (1980)], less than 3years later.

More than 100 commercial instruments based on Pete's fundamental design were sold, mostly for biomedical research. Although this was the field of dozens of peer reviewed publications using his original instrument, the 1980 paper even described the first of the new technique, neutralization-reionization MS. That original 1980 instrument was in service well into the 1990s, so valuable that in its last years Fred persuaded Pete to visit Ithaca to breathe life into the old beast. Ever the designer of the perfect machine, Pete spent much of the week marveling at the many novel, as he saw it, patches installed by several generations of graduate students that he undid, or redid.

During the design and construction of that too-tough project, Pete sadly lost his first wife Eileen Specyal, leaving him a single father with a 4-year old daughter with PKU, requiring a highly restrictive diet. That project went well too, as Meagan earned a B.S. degree and has five wonderful children of her own.

Pete joined Oak Ridge National Laboratory (ORNL) directly from graduate school and spent his career there, retiring in December 2011. His work at ORNL was across the spectrum of mass spectrometry, specializing in secondary ion mass spectrometry (SIMS), metal isotope ratios, and molecular analysis. He was an instrument designer and delighted in developing the next great component: an ion source, an analyzer, a detector. Pete's attention turned, in part, to biomedicine in the late 1980s when he acquired a home-built secondary ion mass spectrometer with a triple quadrupole analyzer for molecular analyses. SIMS molecular imaging was primitive then, but still the MS/



“High-Resolution Tandem Mass Spectrometer (MS/MS) of Increased Sensitivity and Mass Range” McLafferty, F. W., Todd, P. J., McGilvery, D. C., Baldwin, M. A. *JACS* **102**(10), 3360–3363 (1980). From page 1 of Pete’s Ph.D.Thesis: “MS/MS appears to have an analytical potential for complex mixtures rivalling the techniques combining gas or liquid chromatography with mass spectrometry (GC/MS or LC/MS).”

MS capability established that m/z 184 emission was from phosphocholine and not epinephrine, as single stage MS publications of that era had suggested. His biological SIMS images were the subject of the September 1, 1997 cover of *Analytical Chemistry*, a lasting testament to an early vision now adopted by many mass spectrometrists. His last years at ORNL were spent in research outside MS, but after retirement he drifted back into MS and in 2015 had a pending NIH proposal on a novel mass analyzer.

Pete’s quips were legendary among his close circle of friends. He was often a NIH study section member, usually concerned with ion optics and related instrumentation design issues. Occasionally he would grumble and summarize his feelings with a comment familiar to many friends, “Despite what some people imply, the laws of physics are not suspended inside a mass spectrometer.”

Tim Short recounts a Pete suggestion that helped with an ion optical idea. Tim asked if Pete was sufficiently sure to warrant testing the idea. Pete said, “Tim, when have you known me to not be sure?” Tim: “Sure, yes, but are you ‘right’ ”? Pete: “Who the hell knows!?”

Beyond his contributions to the published literature, Pete answered the call to many tasks related to national security, news of which never went beyond the confines of Oak Ridge National Laboratory. Though he could not speak of them, he seemed at least as proud of these as any.

Pete was a treasure to many of us, sometimes tough, sometimes polite, always insightful and witty. His sudden passing leaves us missing a great friend and colleague.

Pete is survived by his loving wife of 28years, Carolyn Anderson Todd, and his two daughters, Mollie Elizabeth Todd, who had been working with her father at his company, Nebulytics, Inc., founded after retirement from ORNL, and Meagan Todd Normand, who lives in Parkville, MD, with her husband, Major David Normand, and their five children, Peter, Adelaide, Marguerite, Luke, and John. Other surviving family members include his sisters, Moira Todd of Gainesville, GA, Patti Fryling of DePew, NY, and Barbara Gioia of Albany, NY. He has many nieces and nephews. Peter is preceded in death by his parents, Charles J. Todd and Veronica P. Todd, of Cheektowaga, NY, Meagan’s mother, Eileen Specyal Todd, and his brother, Christopher (Chris) T. Todd of Gainesville, GA.

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