FACES OF MASS SPECTROMETRY / Jane Gale

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May 2026

More than a Profession

Jane Gale was captivated by the field of mass spectrometry more than fifty years ago. After earning her PhD in physical chemistry at Brandeis University, Jane completed postdoc studies at Yale University and at the University of Virginia. Focusing on the practical applications of mass spec by working with government and industry partners while at UVA, she went on to work at RCA Research Labs and at Bristol-Myers Squibb. When Jane began her career, she was one of the few women in mass spec. Jane notes that although finding their places among their male cohorts was at times difficult, she and her peers were encouraged and supported by the few women trailblazers who had come before them.

Throughout her career, Jane has been deeply engaged with ASMS. In addition to regularly attending annual conferences beginning in 1974, Jane has co-taught the short course on quantitative mass spec and has served twice as ASMS treasurer. Jane has also served as ASMS Archivist/Historian since 2016. In this role, Jane and her team have endeavored to document important aspects of the history of the field while preserving the Society's institutional memory. These efforts are just one example of the many outlets Jane has found that combine her love of writing with her passion for mass spec.

Did your interest in mass spec begin before or during your postdoc studies at Yale (with Prof. John Fenn, Nobel Laureate) and UVA (with Prof. Donald Hunt)?

It was long before! It was actually in graduate school that I began my now more than fifty-year love affair with mass spec. I studied with Prof. Michael Henchman at Brandeis University and with John Paulson at what was then known as Air Force Cambridge (later AF Geophysics Laboratory), where I had access to magnetic sector, quadrupole, and time-of-flight (TOF) mass spectrometers, all built for purpose. Under those mentors, my training as a gas phase kineticist made mass spectrometers integral to my research. Using TOF to visually demonstrate the existence of two types of charge transfer reactions occurring simultaneously in the ion source was a highlight of my graduate education.

What led you to focus on pharmaceutical R&D?

As a postdoc in Don Hunt's lab, I was introduced to using mass spectrometers to solve practical problems. We worked with EPA on developing analyses for priority pollutants in air and water and with industry partners like Union Carbide to study raw materials. From there I went to Rick Honig's Materials Characterization Group at RCA Research Labs in Princeton, NJ, where we studied the constituents of RCA's product lines. And from there, I went to Bristol-Myers Squibb, also in Princeton, where I became involved in pharmaceutical research. The throughline of all those experiences is the enormous versatility of mass spectrometry as an analytical technique.

We understand that during your postdoc studies, you were one of the few women in mass spec at the time. How did this role influence you?

It was definitely not just during my postdocs! Working in science in the 1970s, whether in industry or academia, women were few and far between. The numbers ticked up a bit in graduate school, because with the end of the military student deferment in the United States, men were being shipped off to Vietnam. But outside that, one expected to be the only woman in the room or lab during 1960s and 1970s. We learned to be tough and to insist on being part of the conversation, but it wasn't easy. The hardest part was that there were so few women to serve as mentors. For instance, at my first ASMS meeting in 1974, the only women I remember seeing were Catherine Fenselau, Chava Lifschitz, Peggy Frisch, and Sharon Lias—four women among some three hundred men! Over the years, these and a few other female pioneers in the field made special efforts both to encourage women newcomers and to help us find our places.

How did you first come to your role at Virgin Instruments?

I had been friends with Marvin Vestal, the founder of Virgin Instruments, since my graduate school days. He actually gave me permission to use some of his unpublished data in my PhD thesis.

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Jane at work on "Historical Perspectives," Vol. 9 of the Encyclopedia of Mass Spectrometry. (Photo courtesy of Jane Gale.)

Over the years, I also became friends with his wife Christina. In fact, at one ASMS meeting in the late 1980s, she actually took my infant daughter out of my arms so that I could better participate in a mass spec discussion. Both Marvin and Chris were always supportive of me, and in 2009, when they learned that I was moving back to New England, they invited me to join them at Virgin.

Since you spent time in both the laboratory and management, what were some of the challenges of navigating the two?

I don't think I ever felt a need to navigate between the two. I loved maintaining instruments and constructing experiments to test theories. But when offered the opportunity to manage the work of other scientists, I jumped at it, thinking how much more I could accomplish as a team leader.

There have likely been many changes since you began working in mass spec; can you tell us about one that you find particularly noteworthy or striking?

As a scientist who consistently worked as a materials analyst through most of her career, I found the biggest challenge always to be how to get the sample into the source and ionized. The breakthroughs in those areas over the last fifty years—from chemical ionization (CI) to fast atom bombardment (FAB) to electrospray (ESI) to matrix-assisted laser desorption ionization (MALDI)—brought into range a breathtaking array of molecules and molecular species we would not have thought possible when I began my graduate studies in the late 1960s. Complementary to that, of course, are the many developments in mass separation, detection, and data deconvolution, without which the breakthroughs in sample introduction might have been for nought.

We understand that in your retirement, you have served as ASMS Archivist Historian. How has this role been rewarding?

Having attended ASMS conferences almost every year since 1974—and having served twice as ASMS Treasurer, along with having co-taught the ASMS short course on Quantitative Mass Spectrometry for nearly ten years—I have long been deeply involved with ASMS. Being appointed to the ASMS Archivist/Historian position in 2016 and given a team of four other ASMS members with similar interests with whom to work was a sort of capstone opportunity. Over the course of my tenure, we've added substantially to the ASMS Oral History interviews and to our poster collection that documents the history of the field and of ASMS. But perhaps the most rewarding aspect of my time as Chair has been that so few committee members have chosen to leave after completing their official two-year terms. It's extremely gratifying to realize that we've gone from the original team of five active members in 2016 to sixteen in 2026. The generous contributions of knowledge and expertise of these dedicated committee members underlie all of the committee's successes.

As you prepare to step down from this role at the end of this year after a decade, what is your advice for your successor?

> *...mass spectrometry isn't a job or a profession; it's a passion that animates the lives of those of us lucky enough to come under its spell.*

Jane and her daughter, Elizabeth McCurdy, at Chapman's Peak, South Africa. (Photo courtesy of Jane Gale.)

I'm not sure my successor, Mariam ElNaggar, really needs my advice. She was an original member of the ASMS History Committee appointed in 2016 and has been a major contributor to the committee's efforts over the past nearly ten years. As she assumes the reins, Mariam will, of course, put her own stamp on the position of Chair, but her commitment to the History Committee's primary purpose—investigating, documenting, and securing the institutional memory of ASMS—will be unwavering.

We understand that you enjoy writing; what does that entail for you?

Being an English major as an undergraduate, writing was just one of the things I did every day—frequently we were required to submit three or four essays each week. As a scientist, that skill has served me well: being able to explain one's thinking and support one's results in written and oral argument is paramount to achieving success. In addition to the writing associated with scientific publications, I've also enjoyed contributing to articles and books related to the field and to my colleagues.

As you prepare to step down, what kind of traveling have you been able to do?

Oh, I haven't retired from mass spec! I've just stepped down from my position as Chair of the History Committee. In fact, I've already accepted Mariam's invitation to remain as an emeritus member of the committee, and I have plans to continue to work on History Committee projects (Figure 1). Several of my colleagues on the committee and I have begun exchanging ideas on posters we hope to present in coming years. As you may have guessed from other interviews, mass spectrometry isn't a job or a profession; it's a passion that animates the lives of those of us lucky enough to come under its spell. But it's not the only passion that animates me. I love to travel and look forward to doing more of that now that I'll have fewer professional responsibilities.