

Melvin P. Klein: A Short Personal and Scientific Biography

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I am delighted to write some words about the life and science of my beloved colleague and friend Mel Klein.

Born in Denver to an American mother and a Hungarian father, he attended, appropriately for half a Hungarian, the Teller Elementary School. As a young lad Mel displayed an early affinity for biology and physics, playing endlessly with both plants and baseballs. He went on to Aaron Gove Junior High where, by age 10, it had become clear that he was a prodigy with gadgets and electronics. He became a radio ham at age 11, infected his physics teacher with this nonkosher affliction, and instituted a school radio club. It is told that the young Mel stalked the residents of his Denver neighborhood, confronting them in the streets, challenging them to give him a broken radio to fix—an early example of radio frequency bugging. At East Denver High School, Mel was an outstanding student and a much decorated scout leader. He attended Denver University, working at the same time as an “engineer” in local radio stations. When December 7, 1941, came along he quickly found a job with the Army Air Corps at Logan Utah air base. Mel maintains that the Utah period was the only time in his life that he was a “gentle”.

Sent from Logan to a subsidiary outpost at Las Vegas Nevada air base, Mel did a lot of flying in C-47s with outside temperatures of -60 °F or lower. He later got a job with the Office of War information in San Francisco as an engineer. After a year in which he learned to love the bay area, he went to Washington, D.C. to a firm of consulting radio engineers. He was then transferred to the Harvard Radio Research Lab that worked on countermeasures to the MIT Radiation Lab’s development of radar. A few months later, he was attached to a group of civilian scientists/technicians who went to the Pacific as part of an intelligence section of MacArthur’s headquarters, following him closely from Australia to New Guinea to the Philippines. During that period, Mel learned physical optics and decided to learn more about physics and electromagnetic theory.

In 1945, back in Cambridge, Mel listened to Felix Bloch talk about an idea he had for doing “something magnetic”. In fact, Bloch essentially offered Mel a GSRA at Stanford to work on this “thing”. Mel remembers that he was not yet turned on to the idea of graduate school, and hence, he reminisces, what became Bloch, Hansen, and Packard could have been Bloch, Hansen, and Klein.

Deciding to return to school, Mel went to Dave Sloan’s lab at Berkeley, where George Feher was also working at that time. He started school again, did the first year of medical school, then switched to physics and biophysics. He finished the degree in Physics and joined the Radiation Lab in 1952 in the electrical engineering department. During this period, Mel became acquainted with the Alvarez group and spent some time at Livermore where he was involved with the rf for a giant proton LINAC. He learned about NMR as a way of measuring magnetic fields for a mass spectrometer being used for the

measurement of Li isotope ratios. Looking at a table of spins and moments, Mel realized that NMR could also be used directly to obtain this ratio. Management concurred and bought the first Varian instrument for delivery to Livermore.

In 1959, Margaret came into Mel’s life. That year, Bill Blumberg, one of Erwin Hahn’s students had gone to Bell Labs, and in 1960 he invited Mel to come for a year. Mel was able to arrange the leave, and following their marriage, Mel and Margaret took off for a yearlong honeymoon in Greenwich Village. The Labs were a super place, and many friendships were forged, friendships that have lasted to this day. It was shortly after returning to Livermore in 1961 that George Barton and Mel came up with the idea of digital signal averaging from which we have all benefited so immensely. In 1963, Melvin Calvin invited Mel to join his group in Berkeley to help strengthen the staff of the new Round House. It has been a ball ever since, with Mel involved in an extraordinary range of activities, making important contributions to NMR, EPR, Mossbauer, ESCA, PAC, MCD, and microwave photoconductivity.

In 1973, Marvin Cohen invited Mel to a Gordon Conference on “Deep Level Spectroscopy”. It was there that the first examples of EXAFS were presented. Mel came home knowing two problems that could be approached—the Mo in the nitrogenase enzyme system and the Mn in the oxygen evolving system. In 1975, EXAFS experiments were done at SSRL and it was there that Mel devised the fluorescence detection of EXAFS for his group’s dilute samples. He has been working on the Mn problem ever since, and he and co-workers have established much of what is known about the structure and oxidation states of the Mn complex as it cycles through its five light-induced states. The system displays a lovely synergy between EXAFS and EPR and an equally lovely synergy between Mel Klein and Ken Sauer.

A Guggenheim Fellowship permitted Mel and family to spend the 1976–1977 academic year in Paris, and a Humboldt Award took the family to Berlin for the 1988–1989 academic year, again resulting in wonderful friendships and new ideas for using X-ray absorption spectroscopy and magnetic resonance in biology.

One indication of Mel’s influence and breadth as a scientist and educator is the spectrum of articles in the present issue of *The Journal of Physical Chemistry B*. Another indication is the range of meetings he has attended, often as chair. Just a few examples, the ESCA meeting in Uppsala, Sweden, the Gordon Conference on magnetic resonance chaired by Mel, the conference on magnetic resonance in chemistry, biology, and physics at Argonne, the Japan conference on photosynthesis and oxygen evolution, the conference on metals in biology, and the Gordon Conference on photosynthesis.

Mel Klein has educated generations of students and postdocs, many of whom have gone on to stellar careers, and he has been

and remains an enduring inspiration to us all. But Mel also has that rarest of human qualities, he is a mensch, a real mensch. Dear Mel, I am sure that I write on behalf of all your students and colleagues when I say that you have earned our love and

our respect. All the bypasses in the world cannot change the integrity and the warmth of your heart. On the occasion of your anniversary, we offer a toast to you, to Margaret, and your children, Mel to 100 years.