



Commemoration

In memory of Csaba Horváth

It is highly appropriate that a memorial volume in honor of our good friend Csaba Horváth is published in the *Journal of Chromatography A*. His name is and always will be associated with the field of chromatography. His untimely passing in April 2004 has resulted in many tributes being paid to him, this issue being special as the journal is so much associated with chromatography. The reasons for the tributes are due to the major impact Csaba had on the field of chromatography, and separation science as a whole, as well as the high regard that all his colleagues had for him as a scientist and human being.

Csaba received his Ph.D. degree under the direction of István Halász in Frankfurt, Germany. They both were Hungarian refugees who left Budapest in 1956 as a result of the Hungarian uprising. My association with Csaba goes back to 1964 when I first met him in Boston during his post-doctoral stay at Harvard Medical School. At that time, my research involved gas chromatography, and Csaba suggested two directions for me, both of which indicated his foresight and understanding. First, he recommended I move into the field of column liquid chromatography, as he believed that biological compounds would need a liquid mobile phase for successful separation. Secondly, he recommended studying hydrophobic interaction as he believed it to be an essential ingredient in retention behavior for biological substances. Csaba was helping to guide me, and over the years, while we were close colleagues, I always viewed him as a mentor.

Csaba was one of the fathers of high-performance liquid chromatography, publishing among the first papers in this field in the late 1960s. He significantly helped all of us understand reversed-phase liquid chromatography (RPLC) by formulating a retention mechanism model based on hydrophobic interaction of the solute with the *n*-alkyl bonded stationary phase. This mathematical description of retention was a major step forward for the field. He then advanced the science greatly by being the first to demonstrate the power of RPLC to separate mixtures of peptides at high resolution. Of course today, RPLC is the conventional separation approach for most applications in HPLC. Consider only proteomics,

where LC–MS is a major technique, with C₁₈ bonded phases being the chromatographic packing.

For these research achievements and others, he was recognized by the American Chemical Society as one of the most significant chemists of the 20th Century. Everyone in the chromatography community would agree that this recognition was well deserved. He was also elected to the US National Academy of Engineering just a few months before his passing. He won many prestigious national and international awards, including the ACS Award for Chromatography, the ACS Award for Separation Science, and he was elected as a member of the Hungarian Academy of Sciences.

Lloyd Snyder, Csaba and I wrote a textbook, *An Introduction of Separation Science*, which was published in 1973. I know that Csaba was very proud of this textbook, as it became the standard graduate text in separations over a quarter of a century. His scientific rigor and ability to present complex topics in a clear manner was a significant factor in the success of the book.

As Yale and Northeastern are only 200 miles apart, in the 1980s we began a wonderful tradition for our two laboratories in which twice a year our groups met for symposia, followed by beer and pizza—one time at New Haven and the other at Boston. The students in the two groups got to know each other, in one case later on they even married, and to this day I am happy to greet students of Csaba's group at the various international meetings. The discussions at these research meetings were quite active, and Csaba's deep insight into chromatography came though loud and clear. At the same time, his humanity also was apparent, and it was clear to me that the students who worked for him loved him and felt their education was unsurpassed.

His research achievements in HPLC are well known, but what may not have been emphasized sufficiently is that he deserves recognition for the current practice of LC–MS. In the 1980s John Fenn was a colleague of Csaba Horváth at the Chemical Engineering Department of Yale. It was Csaba that suggested that John take his background in gas phase ionization and apply it to the separation and analysis of

biological substances. The method of electrospray ionization mass spectrometry, which then developed and for which Fenn received the Nobel Prize, thus arose from suggestions from Csaba.

I also want to talk about Csaba, the man, whom I knew well. He was so respected because of the way he handled himself. First, he was a most trustworthy person, someone whom you could confide in and know that it would remain secret. Secondly, he understood that attacking the work of others was a time consuming and ultimately fruitless effort. He always used to say “let the data speak for itself” and “don’t worry about the histrionics”. Thirdly, he was probably the most broadly educated individual in the field of chromatography. He is the one who introduced many of the terms we now use, most coming from his knowledge of ancient Greek and Latin. He was always proud when a new term he suggested was adopted. A good example is the term isocratic (equal strength) for constant mobile phase (non-gradient) liquid chromatography. The word has stuck to this time.

Csaba was part of the tradition of Hungarian physical chemists who left the country in 1956 and went on to dis-

tinguished careers in the West. George Olah, for example, won the Nobel Prize. As part of that tradition, Csaba was taught to be a rigorous scientist. It was that rigor which stood him above many of his peers. His commitment to science was total, and his insight into the field of separation science, especially chromatography was unique.

The fruits of his labor are before us today; the field of proteomics would be much less advanced without his research. His achievement was recognized by the Association of Biomolecular Resource Facilities (ABRF) with their prestigious award.

While his colleagues will remember him as long as they live, his achievements will live on well beyond the present generation of scientists. His efforts have significantly advanced the fields of biology and chemistry. I know I speak for all his colleagues when I say that it was a pleasure to know him and an honor to call him a friend. I am personally very pleased that Andras Guttman has assembled this important special issue in his memory.

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