

Dudley Herschbach: My Source of Inspiration

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An inspiration to me has always been my PhD thesis advisor, Prof. Dudley Herschbach. He epitomized to me the scientific man in quest of new knowledge and able to see beyond fashionable topics to pursue instead what he found interesting. As a senior at Harvard with a double major in chemistry and physics, I sought the advice of my undergraduate advisor, Prof. William Klemperer about going to graduate school. He kindly explained to me that there was not much else out there, but if I was determined to leave Harvard, he suggested I should contact, a researcher at Columbia University by the name of Charles Townes, and two people at UC Berkeley where Bill Klemperer had trained, George Pimentel and Dudley Herschbach, who had just moved there after being a Harvard Junior Fellow. I sought the advice of other Harvard chemistry faculty and was told repeatedly to pay attention to Herschbach. I remember receiving this advice from Prof. William Lipscomb and from Prof. George Kistiakowsky. So, I was convinced what I should do.

Not knowing any better, I wrote directly to Herschbach asking to join his research group. I told him, in the spirit of Bill Klemperer, that I was hoping to say much about small molecules through spectroscopy rather than little about large molecules. He instructed me that I needed to apply to the Department of Chemistry at UC Berkeley for graduate admissions. He understood from my letter to him that I was enamored by molecular spectroscopy. He explained to me how much he was excited in pursuing what he called “translational spectroscopy,” which involved the collisions of small molecules that would be studied one collision at a time by the use of two intersecting molecular beams. I was fascinated by this idea of crossed molecular beams and came to Berkeley for that purpose.

I promptly failed all the qualifying exams given to entering graduate students. I had taken as an undergraduate at Harvard a double major in chemistry and physics and certainly was not at the top of the new graduate class in understanding chemical principles. Nevertheless, Herschbach believed in me and accepted me into his research group. There I joined a tiny band of fanatics believing that molecular beam studies would completely revolutionize our understanding of chemistry. I was the least physically gifted among this group, and as I watched the likes of Sam Norris, Phil Brooks, George Kwei, Kent Wilson, John Birely, and Jim Kinsey, I realized that experiments in molecular beams would be too hard for me to do well. Dudley encouraged me to pursue theoretical calculations. Even though that was not his primary passion, he supported these interests. All the theoretical projects I explored as a graduate student were suggested by him. The Herschbach group worked intensely day and night to make molecular beam experiments a reality, and I was thrilled to be a bystander as I watched a new research field come to life. I did not realize at the time that these efforts were training me for my later interests in experimental physical chemistry.

Born in San Jose, California in 1932, Dudley Herschbach entered Stanford University on a football scholarship but went on to achieve the highest grade point average as an undergraduate in the history of my Department. He received a B.S. degree in Mathematics (1954) and M.S. in Chemistry (1955) at Stanford University, followed by an A.M. degree in Physics (1956) and Ph.D. in Chemical Physics (1958) at Harvard. I trust from this record you are beginning to understand why I regard him as a renaissance figure! He is curious about everything, and he makes contributions to a wide

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range of fields. His approach stimulated my own willingness to look broadly for interesting problems. After being a Junior Fellow in the Society of Fellows at Harvard from 1957 to 1959, he was a member of the Chemistry Faculty at the University of California, Berkeley (1959–1963), before returning to Harvard as Professor of Chemistry in 1963. Dudley Herschbach beats his own drum and has never followed the drumbeat of others.

But it was not all hard work for his research group although at times he drove himself to exhaustion. There was also much play, including sporting matches with the Pimentel group which I carefully avoided. They tended to end up with physical injuries to the players on both sides. I also remember a delightful time we spent in nearby Tilden Park, and I attach a photograph taken by Jim Kinsey of a happy Dudley Herschbach lying on the ground while I looked on.



And here is a more recent picture of Dudley and his wife Georgene with George Olah that I took.

Dudley has always brought out the best in me, and to him and his guidance I owe so much.

