# Joseph J. Gajewski

The retirement of Joe Gajewski in August 2004 marked his 38 years of productive service as one of the most personable, interactive, and concerned members of the chemistry faculty. Over this time Joe established himself as an old-school scholar, mentor, and colleague who was always interested in learning about the research of others and critically discussing problematic issues and their theoretical and experimental resolution. His expertise and insights into the principles of physical organic chemistry frequently guided his colleagues into more rigorous and focused approaches to their research. The intellectual challenge and scientific give-and-take in this kind of problem solving was always a major source of satisfaction for Joe, and his unassuming enthusiasm for this was greatly appreciated by his colleagues.

A native Hoosier, Joe was born in Hammond in 1939, but grew up in a tough neighborhood in South Chicago. He obtained a B.S. degree at Loyola University of Chicago in 1961, where Jim Wilt guided him into organic chemistry. This led to graduate school at the University of Southern California, where he joined the group of the renowned physical organic chemist Jerry Berson. Joe moved with his mentor to the University of Wisconsin and completed his Ph.D. in 1965, submitting a thesis on stereochemical "memory effects" in carbocation rearrangements. He obtained an NSF postdoctoral fellowship for study with Ron Breslow at Columbia, where he used kinetic methods to quantify the destabilization of the anti-aromatic cyclopropenyl anions.

Armed with this background, Joe returned to IU in 1966 to initiate an independent career examining the mechanistic details of important organic reactions. He rapidly established a dynamic research program that attracted a number of bright graduate students, especially those with an aptitude for the more meticulous and quantitative aspects of organic chemistry. As a result of his early success, he was selected as an Alfred P. Sloan Fellow; he was promoted to full professor in 1975. Over the years Joe directed 24 successful doctoral theses and 12 master's dissertations, as well as a number of undergraduate honors students and postdoctoral associates. This body of work resulted in the publication of more than a hundred original research papers. In 1981 Joe published a highly regarded book, *Hydrocarbon Thermal Isomerizations*. Just last year an updated and expanded second edition of this classic was published; it serves as Joe's legacy for future researchers.

Initially Joe focused his research on understanding the structural and geometric rearrangements of small-ring hydrocarbons at high temperatures using complex kinetic and stereochemical analyses. Studies of systems like spiropentane and methylenecyclopropane defined the nature of the fleeting biradical intermediates and the intimate details of the three-dimensional atomic transpositions that occur during the formation of these transient species and their subsequent transformations. The intermediate biradical from methylenecyclopropane involves an interesting conjugated pi-system whose novel electronic structure was nicely defined by painstaking experimentation.

Perhaps the most significant work from Joe's laboratory was the incredibly comprehensive three-dimensional mapping of the concerted reactions of 1,5-hexadienes and allyl vinyl ethers, known respectively as Cope and Claisen Rearrangements. Exhaustive experimentation elaborated the intimate details of these processes' molecular pathways and demonstrated that the pathways varied with the nature and position of substituent groups in a rational manner. Joe's masterful use of deuterium kinetic isotope effects in this study was exemplary in demonstrating the power of this technique, which was pioneered by Jack Shiner.

In the early 1980s Joe and Kevin Gilbert developed powerful molecular modeling procedures for predicting the molecular properties of coal liquefaction. They adapted those procedures to the newly available personal computer, which involved combining a variety of cutting-edge computational methods and collaborating with colleagues doing related work. The overwhelmingly positive response of the chemical community to this accessible computational package prompted Joe and Kevin to commercialize it. They called the program PC Model and offered it through a new small business called Serena Software, which Kevin operates to this day. An enhanced form of PC Model is currently used worldwide by research chemists and undergraduate students alike.

Teaching was always Joe's other love. He enjoyed the challenges of the large undergraduate organic chemistry course that he taught frequently, and was regarded by these students as a demanding but sympathetic instructor. Joe also regularly gave a physical organic course to graduate students that went well beyond the standard texts to provide information about more recent scientific developments. Many students selected Joe for their thesis committees and were often seen in his office discussing the applications of his teachings to their own research problems.

Joe's connections throughout the chemical community led to his becoming an active participant in the affairs of the American Chemical Society (ACS). He served as secretary-treasurer and national program chair of the Organic Division of the ACS for four arduous years and was then elected chairman of the division. More recently he was the on-campus co-organizer for the National Organic Symposium held in Bloomington in 2003. Joe served two terms on the Petroleum Research Fund Advisory Committee of the ACS and is currently a member of the ACS Committee on Education. He was also elected a fellow of the American Association for the Advancement of Science and has served as member-at-large of its Chemistry Section.

During graduate school Joe married his college sweetheart Mary DiOrio. Once settled in Bloomington they adopted John and Jean and are now enjoying their grandchildren Nick and Emma. Joe is pleased to count John as a co-author on one of his articles. Some time ago Joe took up sailing and became a mainstay of the Bloomington Yacht Club, whose regattas provide an outlet for his competitive spirit. Joe's passion for downhill skiing remains unabated and his fascination for fast automobiles is now being directed to the restoration of 30-year-old Z-cars.

Jack K. Crandall