



## Carl Shipp Marvel

September 11, 1894 - January 4, 1988

Carl S. Marvel had a spectacular career of 72 years in organic chemistry. From 1920 to 1961 he was on the staff of the University of Illinois and from the date of his first retirement through 1987, he was a faculty member at the University of Arizona. He consulted for nearly 60 years for the DuPont Company. He was a dominant figure in American organic chemistry and has been recognized as the "father" of synthetic polymer chemistry. His early contributions to *Organic Syntheses* are easily recognizable by perusal of Collective Volume I of this series, which contained the preparations that appeared in the first nine annual volumes, was published in 1932, and was reprinted in 1941. Nearly 20% of the 264 preps in that collective volume were either submitted by Marvel or checked by him. It was Marvel's experience with the "summer preps" group, or-more formally-"Organic Chemical Manufactures", at the University of Illinois starting in 1916, plus his provision and checking of preps for *Organic Syntheses*, that gave him wide-ranging synthetic experience.

Born on a farm near Waynesville, Illinois, Carl Marvel attended a one room grammar school and then Waynesville Academy, where he thrived on Latin and Greek. He was introduced to chemistry as a freshman at Illinois Wesleyan University in 1911. An uncle who had been a high school teacher advised his nephew to take this subject if he expected to be a farmer, since the next generation of farmers was going to require scientific knowledge to get the most out of their work. At Illinois Wesleyan, Carl Marvel found enjoyment in organic chemistry and was delighted to learn from his professor, Alfred W. Homberger, that he could be paid to study further, by means of a \$250 scholarship, at the University of Illinois. His graduate education in 1915 started with an overload of course work, including four lab courses, in order to "catch up". When he was not studying, he worked late at night in the laboratory. As a result, he slept as late as possible but still got to the breakfast table before the dining room door closed at 7:30 a.m. His student colleagues decided that was the only time he ever hurried, and they nicknamed him "Speed". A nickname was appropriate to his friendly spirit, but it

causes us to smile because it was really an accurate moniker indicative of his chemical thinking, his human insight, his fishing and bird-watching prowess, and the alacrity with which he found out how he could help a student or colleague with a chemical or personal problem.

We all know from the literature after 1920 and from his many award citations what followed in Speed Marvel's research when he joined the faculty of the University of Illinois, starting with synthesis as the initial motivation and moving boldly into areas of rearrangements, free radical chemistry and magnetic susceptibility, hydrogen bonding, stereoisomerism, structure of organo-mercury and phosphorus compounds, and most important of all - polymers. While he always felt, and often reminded his colleagues, that the essential product of academic research was the students, he also taught that the best graduate training was to be achieved, along with possible national prestige, by work on essential problems. He believed that there was no such thing as a dead end to a worthwhile problem - delays and detours and retracing of steps, indeed, but no dead end. His research on polymers started with the peroxide-initiated reaction of sulfur dioxide with olefins. He then became interested in the basic mechanism of vinyl polymerization and how vinyl units went together to form a polymer. His research contributions to synthetic rubber, initiated during the second world war under the auspices of the National Defense Research Council and lasting into the mid-50's, together with the findings of his technical intelligence mission after the war, had a lasting impact on the American rubber industry. Marvel's association with the U.S. Air Force research program began toward the end of his first career at the University of Illinois and continued throughout his entire second career at the University of Arizona. During a 30-year period he was the principal contributor to the Air Force program on high temperature polymer synthesis. His basic research led to the commercialization of polybenzimidazole (FBI) which, because of its exceptional resistance to fire, is used in the suits of astronauts and fire fighters.

Speed Marvel was a founder of the High Polymer Forum that became the Division of Polymer Chemistry of the American Chemical Society, of which he became Chairman in 1950-1951. During his 74-year membership in the ACS, he held just about every elective office possible up to and including the presidency in 1945. The all-purpose meeting room of the ACS building in Washington, D.C. is designated "Marvel Hall" to indicate the esteem with which the ACS held Speed Marvel and the Society's gratitude for the leadership he provided in raising the funds that made the building possible. During his long career he gave unselfishly of his time on a variety of committees and editorial boards, as he did also for his two Universities. Both Arizona and Illinois have annual Marvel Lectureships and Marvel Scholarships. In 1984, the University of Arizona renamed the chemistry laboratory building where he worked the Carl S. Marvel Laboratories of Chemistry.

Honors in steady stream were awarded to Marvel during his career, culminating in the Distinguished Service Award from the U.S. Air Force Materials Laboratory and the National Medal of Science. Other awards included the Nichols, Gibbs, Priestley, and Perkin medals and election to the Plastics Hall of Fame.

Speed will long be remembered by every chemist who came in contact with him. His students, colleagues, and fellow members of the Boards of *Organic Syntheses* will

particularly cherish his memory. He has left us a legacy we can all appreciate.

Nelson J. Leonard  
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