HENRY GILMAN

No one person has had a greater influence nor contributed more to the field of organometallic chemistry than Henry Gilman. Without his broad, pioneering research, his remarkable drive and his warm personality, those working in organometallic chemistry would find this a far less interesting branch of chemistry than it is today. We dedicate this issue of The Journal of Organometallic Chemistry to Professor Gilman in honor of his extraordinary accomplishments.

Born in Boston May 6, 1893, Henry Gilman attended Boston public schools and English High School. For his university training he never seriously considered any school but Harvard where he completed his programs in minimum time — BS 1915 (summa cum laude), MS 1916 (awarded in 1917 due to his advisor's absent-mindedness) and PhD 1918. During this period, he also held a Sheldon Fellowship which supported his predoctoral studies at the Zürich Polytechnikum, the Sorbonne and Oxford.

His first publication, "Phenyl Esters of Oxalic Acid," appeared in the Journal of the American Chemical Society in 1915; the senior author was a young professor named Roger Adams. Henry Gilman was Professor Adams' first research student and he remembers this work as "a sheer delight. Here I was, just a senior. We would work at night until 11 or 12 o'clock, without any compulsion — just for the joy of it." It was the beginning of two remarkably productive careers.

After serving briefly as an instructor at Harvard, Dr. Gilman accepted an instructorship at the University of Illinois in 1919. Less than one year later, he was appointed assistant professor at Iowa State. He was attracted to Iowa State because of the new graduate program in chemistry; this was a challenge and he loved it. It was a mutual love affair; he was not moved again. In 1919, Dr. Gilman recalls, the chemistry program at Iowa State was "very modest — 15 or 18 undergraduate majors and perhaps a dozen graduate students. But there was a nice esprit de corps. We were young and enthusiastic. We all worked quite hard. And we had a nice, easy, personal relationship with the students." The hard work, the esprit de corps and the results were recognized and in 1923 he was named professor of organic chemistry at Iowa State.

From 1919 to 1947, Professor Gilman taught all of the organic chemistry courses (undergraduate and graduate) for chemistry majors and chemical engineers. He has guided more than 140 students to doctorates. A colleague notes that "more than 50 corporate research directors, nine corporate vice presidents, one corporate president, more than 40 professors and three college or university presidents have been trained in his laboratory."

Within six months of his arrival at Iowa State, Professor Gilman submitted his first of many papers dealing with the Grignard reagent, influenced perhaps

by the interests of his Harvard mentor, Professor E.P. Kohler. Beginning at a time when Iowa State had little financial support for research, Professor Gilman has made contributions so enormous — over 1000 articles, books, and chapters in books bear his name — that a brief summary cannot treat them justly. The principal themes have been heterocyclic chemistry and organometallic chemistry.

Professor Gilman's interest in heterocyclic chemistry was stimulated by a desire to find new uses for furfural, a by-product of the corn industry. This led ultimately to new sources of raw materials for nylon, to new pesticides, to new antimalarials and to new herbicides. Another phase of this research concerning heterocyclic compounds involved the synthesis and study of derivatives of phenothiazine, many of which are useful pharmaceuticals today. In addition to these extensive investigations in the heterocyclic field, he has published a number of articles concerning long-chain aliphatics and organofluorine compounds.

However, Professor Gilman's first and continuing love has been organometallic chemistry. Starting from a few scattered observations in the literature and inspired by the Grignard reagent studies, he developed that branch of science now known as organometallic chemistry. His research papers describe the organic chemistry of aluminum, arsenic, barium, beryllium, bismuth, cadmium, calcium, copper, gallium, germanium, gold, indium, lead, lithium, magnesium, mercury, phosphorus, platinum, potassium, selenium, silicon, silver, sodium, thallium, tin, uranium and zinc. His initial interest in organomagnesium chemistry led to extensive studies of organolithium compounds. This pioneering research made possible the wide use of these versatile reagents in organic synthesis and provided the background for the preparation of polymers such as polyethylene and *cis*-polyisoprene. Professor Gilman was among the first to study organocadmium chemistry and he was the first to prepare the organocuprates (Gilman reagents) which have now found so many uses in organic synthesis.

For many years, Professor Gilman has been an international leader in the organic chemistry of silicon; his fundamental discoveries in this field contributed to the development of silicone polymers and many related industrial products. His many and outstanding contributions to the organosilicon field were acknowledged when, in 1962, he was named the first recipient of the American Chemical Society's Frederic Stanley Kipping Award in Organosilicon Chemistry.

Through the years many other honors and awards have come to Professor Gilman. He was elected to the National Academy of Science in 1945. In 1951, he received two American Chemical Society awards: the Iowa Award and the Midwest Award. He has been selected as Fellow of the Chemical Society (London), a signal honor limited to forty persons. At Iowa State, the chemistry building has been named Henry Gilman Hall and the annual Gilman Lectures were initiated in 1974. In 1976, he was one of three foreign scientists to be elected to honorary membership in the British Royal Society. The following year, 1977, he was presented the American Chemical Society's Priestly Medal "for distinguished services to chemistry"; this gold medal is considered the highest honor in U.S. chemistry.

Professor Gilman's former students speak of him with respect and affection. He has often, and with some justification, been referred to as a stern taskmaster who demanded hard work and perfection from his students; but he asked no

more than he was willing to give. A research director at one of our large chemical companies once remarked that he found that former Gilman students not only knew their chemistry but also had been taught precision in chemical reporting. Professor Gilman is a person of highest integrity with a strong sense of ethics; these attributes were also part of the "Gilman training."

Long before our federal equal opportunity and affirmative action programs, Professor Gilman had his own program. He took an early interest in the education of black students. The first black student to receive the PhD in chemistry west of the Mississippi studied with Henry Gilman. These early black graduates, often members of faculties of colleges and universities, sent many other black students to Iowa State for their graduate training in chemistry.

While demanding and unyielding on a professional level, Professor Gilman was always kind, thoughtful and helpful to his students on a personal level. He would loan money and arrange medical care or legal assistance when needed. He was always available for personal advice when his students were having difficulties. In addition, he has been ever helpful to his students and former students in finding suitable employment, making a change in employment and arranging for postdoctoral studies, especially studies abroad.

One former student has written to Professor Gilman: "You probably are bored with eulogies about your contributions to chemistry. But how many people realize what a lovely lob you had in tennis? Or what a fantastic left hand you played in handball? Or what a delightful conversationalist you can be?" Indeed, Dr. Gilman is superb at conversation — articulate and knowledgeable in many areas, a good story teller but also a good listener. In group conversations there may be one person who is quiet and not participating; in such situations Professor Gilman has often been observed to stop, turn, and ask just the right question to make sure all are included.

Throughout his career, Professor Gilman has been known for his splendid lectures, beautifully delivered with an absence of lecture notes. He once left two assistants in charge of lectures to an undergraduate organic chemistry class while he attended a national meeting. When he returned he found that these students had placed an advertisement in the college newspaper, "All is forgiven, Henry. Please return."

Professor Gilman's philosophy of education has been to stress breadth as well as depth. He believes that we owe students much more than a professional education. For undergraduates he advocates "something beyond chemistry, something of the cultural and the humanities." At the graduate level, he wonders if our programs have not become too narrow: "Today you find more and more contraction, more highly specialized training. I wonder if we aren't going too far in that direction, if we aren't stressing immediate results at the expense of long-term results."

Henry Gilman is indeed a literate person and he has always had a great respect for literature, both chemical and general. For many years, he served as a valuable member of the Iowa State Library Committee. He greatly assisted in founding the Journal of Organic Chemistry and served on its editorial board, including the chairmanship, for many years. He was associate editor of the Journal of the American Chemical Society and of Chemical Reviews. As well as serving on the advisory board, he edited Volume VI and the First Collective

Volume of Organic Syntheses. In addition, he has served on the advisory or editorial boards of the Journal of Organometallic Chemistry, Advances in Organometallic Chemistry, Organometallic Syntheses, Science Citation Index, Organometallic Reactions and Inorganica Chimica Acta. He is perhaps best known for his massive, four-volume Organic Chemistry: An Advanced Treatise; this work became one of the classics in the literature of organic chemistry.

Professor Gilman's career is all the more remarkable considering that in 1947 an attack of glaucoma and a detached retina left him with severely restricted eyesight, an event which to many would have been a tragedy — but not for Henry Gilman. For the next 18 years he kept abreast of developments in his field by having students read to him six evenings a week. His time in the chemistry building and his discussions with graduate students and postdoctoral fellows once or twice a day remained on schedule. More than half of Professor Gilman's publications, including the last two volumes of his treatise, were published after 1947. One of his former students called this ". . . the triumph of man's spirit over the frailty of his body." An article in Chemical and Engineering News, in 1976, reported: "His continuing 'joy' in life is obvious. Henry Gilman speaks easily, casually, of his 'impaired vision'. But he's wrong. His eyesight may have dimmed, but his 'vision' has not."

Now most of the reading for Professor Gilman is done by his wife, Ruth Shaw Gilman, who first met him when she entered his basic organic chemistry class in 1922. Ruth Shaw graduated from Iowa State in 1924; she received a master's degree in English and speech at Cornell University. She returned to Iowa State and taught speech for three years. The Gilmans were married in 1929. Once their two children were old enough, Mrs. Gilman accompanied her husband in his many national and international travels; her warm manner and her keen memory have made for her many lifelong friends. The program for the dedication of Gilman Hall at Iowa State describes her as "the one woman in a million who could match Henry Gilman's robust personality."

Professor G.A. Razuvaev, whose comments are similar to those expressed by many, has written: "I am personally happy to be Professor Gilman's and his family's friend. I appreciate him not only as one of the greatest scientists in the field of organometallic chemistry but as a kind and sympathetic man."

Professor Henry Gilman, master chemist, superb teacher, outstanding human being, we wish you and Mrs. Gilman many more happy years.

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