



IN MEMORIAM

Martin David Kamen
Professor Emeritus of Chemistry
UC San Diego
1913-2002

In February, 1940, Martin Kamen, working together with graduate student colleague Sam Ruben at the Berkeley Radiation Laboratory, looked for and found a long-lived radioisotope of carbon. The discovery of this material, C-14, immediately revolutionized biochemistry with its potential for tracing the path of carbon metabolism in living organisms. Four years later, early in 1944, Martin Kamen, who was by this time working on the Manhattan Project, was dismissed from his Berkeley position as a “security risk.” A talented musician, he had been overheard talking to members of the Russian consulate whom he had met through his concert playing. These two events were to dog Kamen for much of his life; the first because of the obvious importance of the science and the expectations for personal success that it implied, and the second because of its sinister tone and the opportunities it was to deny him. Indeed, Kamen was forced to spend a disproportionate amount of his time in the late 1940s and 1950s clearing his name from the scurrilous attacks of irresponsible journalists. That he ultimately triumphed speaks volumes about his nature.

Martin Kamen was born in Toronto in 1913, the child of poor Russian immigrants. His parents had actually moved to Chicago a few years earlier where his father had opened a photography studio, but his mother had gone back to Toronto where relatives could help when Martin was born. When he was three months old, he and his mother returned to Chicago.

It was realized early that Martin had a natural talent for music, and he was soon proclaimed a child prodigy, a title with which he was not at all comfortable. He certainly could have been a successful professional musician — he had settled on the viola — but a variety of circumstances propelled him in another direction. A declared English major at the University of Chicago at the start of the Great Depression, his father suggested he take chemistry, a practical subject that might offer the prospects of earning a living. In fact, Martin turned out to be good at the subject and stayed on at Chicago to earn a Ph.D. in physical chemistry. He had a scholarship, awarded in part he said, for playing first viola in the university orchestra. He further supported himself as a “jazz fiddler” in various Chicago night spots. He wrote about many of these events in his absorbing autobiography “Radiant Science, Dark Politics” (1985), and in a reminiscence for the Annual Review of Biochemistry (1986).

The importance of the discovery of C-14 cannot be overstated. It led directly to two Nobel Prizes, one to Melvin Calvin at UC Berkeley in 1961 for working out the path of carbon dioxide assimilation during photosynthesis, and another to Willard Libby at UCLA in 1960 for developing a method for determining the age of carbon-containing artifacts from the past on the basis of how much C-14 they contained.

Indeed, it was Kamen and Ruben and their colleagues who first undertook experiments to trace the path of carbon during photosynthesis. Their early experiments were with C-11, a radioisotope with a half-life of only 21 minutes. This was too short an existence for their experiments to be fruitful, and it was soon realized that a long-lived isotope was essential. C-14 turned out to have a half-life of about 5600 years, more than enough for biochemical experimentation and, as it developed, very appropriate for dating past archaeological and other events.

During this period Kamen made a host of other discoveries that, were it not for the celebrity of the C-14 discovery on the one hand and political troubles on the other, would have insured his eminence on their own. These included the discovery that oxygen incorporated into sugars during photosynthesis does not come from carbon dioxide as had been supposed, but originates instead from water molecules. Kamen also discovered that carbon dioxide assimilation can occur in the dark, the energy from light being introduced at a different stage of the process than carbon dioxide fixation. Initially, both of these findings were greeted with disbelief, but they were eventually shown to be absolutely correct. These early experiments led to Kamen's life-long fascination with photosynthesis, especially as it occurs in bacterial systems.

Martin Kamen's political problems reflect badly on the societal state of our nation during and after World War II. Certainly he was not the only American scientist to be harassed by the FBI on the basis of never to be revealed secret information (Linus Pauling and Robert Oppenheimer come to mind). After his firing from Berkeley, he found employment in an Oakland shipyard. As the end of the war neared, the noted physicist and Nobelist Arthur Compton became the chancellor of Washington University in St. Louis and invited Martin to become a faculty member and supervise their university cyclotron, and especially to develop its use in biology and medicine.

As implied above, it was Kamen's musical avocation that led to his political problems. While in the Bay Area, he had played with numerous musical groups of exceptional caliber; Isaac Stern was a personal friend. It was in the wake of a concert that he met a member of the Russian Consulate and with whom he would subsequently dine, although he was already under suspicion and being shadowed because of having associated with leftist friends he met both socially and musically.

On the occasion of Martin's departure from the West Coast for St. Louis, a surprise good-bye party was held, to which so many musician acquaintances were invited that it was possible to stage a full rendering of Hayden's Farewell Symphony, the musicians leaving the performance area one by one until only Martin himself remained. Truly a memorable occasion!

For a few years it seemed as though the political hounding was behind him. Then, in 1948 Kamen was subpoenaed to appear before the House Un-American Activities Committee (HUAC). He testified and was verbally assailed, but no charges were filed. At about the same time, he accepted an invitation to attend a meeting on photosynthesis in Paris. Astonishingly, federal agents raided the travel agency making his travel arrangements and confiscated his passport. Subsequently, articles appeared in the Chicago Tribune and Washington Times-Herald describing him as an atom spy who had passed secrets to Russian agents during the war.

With Compton's courageous approval, Kamen sued the newspapers for libel and fought for his passport. In 1955 he won the lawsuit, and in 1956 his passport was restored. These were extremely difficult years for him, and it is remarkable how much science he was able to get done in spite of the torment. When he finally did obtain a passport, he took to traveling with the pent-up zeal of the denied, to the point that he seemed always on the move. He quickly developed collaborations in France, Sweden, Japan and elsewhere, and by the early 1960s he was spending much of his time abroad, including long stays at an institute for photobiology at Gif-sur-Yvette south of Paris.

In 1957, Kamen had joined Nathan Kaplan in setting up a new department of biochemistry at Brandeis University. Four years later he once again succumbed to the lure of California and joined a group of former University of Chicago chemists in a decidedly innovative chemistry department at the brand new San Diego campus of the University of California (UCSD). These were happy and productive years for Kamen. He and his students and collaborators began a pioneering study comparing the amino acid sequences of various electron transport proteins, and especially those involved in bacterial photosynthesis. A series of papers on the subject was initiated that was to span a thirty-year period, from 1964 to 1994, by which time Martin was 81 years old.

Martin Kamen enjoyed a number of idiosyncrasies. For one, he never bothered to learn to drive an automobile, although it never impaired his mobility. A willing cadre of volunteer drivers always materialized wherever he happened to be. Driving Martin around town was guaranteed to prompt one of his many well known stories, especially if sitting in traffic somewhere. Among his favorites was a quote from Ring Lardner: "Are we lost, Dad?" the boy wondered. "Shut up," he explained. And his story about the clarinetist with the

wrong- key instrument and an inability to transpose was well known to all his friends, who nonetheless always opted for the long version at dinner parties.

In 1978, a 65th birthday tribute was held for Martin in the form of a three- day symposium at UCSD. The many contributions were published in book form under the title “From Cyclotrons to Cytochromes.” (Academic Press, 1982). At about this time Martin became emeritus at UCSD and moved to the University of Southern California where his wife, Virginia Swanson, was on the faculty. Her untimely death in 1987 was a devastating loss to Martin; twice a widower, neither his music nor his endless travel could assuage his grief.

In spite of his many honors, some of Martin’s friends and students felt that he had been passed over for some of the biggest. In his later years, there was a continuous drumbeat to accord him the acclaim he richly deserved. It may be that during these later years Martin himself grew weary of such laments. In 1995, he was awarded the Enrico Fermi Prize. The news came to San Diego, apparently because the nomination had originated here, but Martin’s whereabouts were unknown. He was finally traced to the Oregon home of one of his former graduate students, Arthur Robinson, where he was visiting. When told the news, his response was decidedly subdued. Although he was no doubt pleased by the award, by this time he was taking the world in the stride it came to him.

Martin Kamen died on August 31, 2002, just four days after his 89th birthday. On November 1, 2002, a remembrance was held at the University of California, San Diego. Dozens of his former students and colleagues traveled from all over the country to join his family and friends and to share their memories of this extraordinary human being. Along with his discoveries, his experiences and travails should not be forgotten.*

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*Adapted from an article written by one of us for the American Philosophical Society.