IN MEMORIAM

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Henry Rapoport
Professor of Chemistry, Emeritus
Berkeley
1918 — 2002

Professor Henry Rapoport was born in Brooklyn, New York, on November 16, 1918, a few months after his family's arrival in the United States. His parents were Russian Jewish émigrés who had immigrated to this country via Harbin, China, where his father was a reporter for a Russian newspaper and where Henry's elder sister was born. When Henry was three years old, the family moved from Brooklyn to Atlantic City, New Jersey. There they ran a small newspaper and cigar store. English was Henry's second language; he spoke only Yiddish until second grade. Inspired by reading assorted press releases cover- to- cover during long hours tending shop, Henry established an early and lasting passion for current events and history. At his graduation from high school, he was awarded the Press- Union Gold Medal for Current Events. It was during his high school days that Henry became known as Rap.

Henry Rapoport obtained a B.S. in chemistry in 1940, an M.S. in chemistry in 1941, and a Ph.D. in organic chemistry in 1943, all from the Massachusetts Institute of Technology (MIT). At MIT, he managed newspaper distribution in the student dormitories, and this, along with the milk delivery concession, helped finance his way through college. While in Cambridge, he met his future wife, Sonya Goldberg. They were married in Boston in 1944, two years after meeting. The marriage ceremony was interrupted by bells tolling in Copley Square, announcing that Rome had been liberated from Fascist occupation – the near- end to World War II. After obtaining his doctorate, Rap worked briefly during WWII at the Heyden Chemical Corporation on penicillin, and then in 1945 he accepted a National Research Council Fellowship at the National Institutes of Health in Washington, D.C., where he studied the synthesis of morphine derivatives with Lyndon Small.

In 1946, Henry Rapoport was appointed an instructor in chemistry at the University of California, Berkeley. Not realizing that the University would provide transportation costs, including airfare, he and Sonya traveled to Berkeley by train. They were generously welcomed by Melvin and Genevieve Calvin and stayed with the Calvins until they found their first living quarters in California. Rap was promoted through the ranks, reaching full professor status in 1957. For more than 40 years, he taught the essential organic chemistry courses required of premedical and other physical and life science students at Berkeley, as well as numerous upper- division and graduate- level courses in natural products and heterocyclic chemistry. He also helped with government educational initiatives in chemistry, including educational films. Rap retired reluctantly in 1989, but as an emeritus professor, maintained an active laboratory right up until his death. He died of pneumonia on March 6, 2002.

During his professorial career, Henry Rapoport was outstandingly productive. He trained 253 students: 13 graduate students who received an M.S. degree, 103 graduate students who received a Ph.D. degree, and 137 postdoctoral students who honed their research skills under his tutelage. At least 20,000 UC Berkeley students took his synthetic chemistry courses between 1946 and 1989. His organic chemistry laboratory textbook,

coauthored with James Cason, went through several editions and was one of a select number of laboratory books used across the U.S. and translated into other languages so that it could be used more widely around the world. During the 13 years following his official retirement, Rap mentored 50 postdoctoral students in his laboratory, published 75 of his 436 papers and was issued 17 of 33 patents. One of his patents, assigned to the University of California, is on ways to synthesize hydromorphone, or dilaudid, which is still used regularly today as an invaluable pain medication.

Henry Rapoport was internationally recognized for his work in pharmaceutical and medicinal chemistry. He was particularly noted for the total synthesis of heterocyclic drugs, including opium alkaloids such as morphine and codeine, camptothecin, and a paralytic shellfish poison called saxitoxin, in addition to antibiotics and antitumor compounds. His chemistry was exceptionally broad, covering areas rarely found in organic chemistry departments but often found in industry, whether agricultural, biotech, chemical, or pharmaceutical in nature. Included in the long list of his synthetic interests were nitrogen heterocyclic chemistry, nucleoside and nucleotide chemistry, peptide chemistry, radiochemistry, natural product chemistry and the development of the techniques of combinatorial chemistry.

Professor Rapoport manifested the finest qualities of a dedicated academic. He was intensely committed to his discipline and worked unceasingly to remain current. He was demanding of himself and of those with whom he worked, constantly providing guidance toward the goals at hand. Although most would agree that Rap did not suffer fools, inside his lab or outside of it, he was truly happy for the success of others. He was the kind of intelligent critic who is invaluable in challenging a person to strive to do better. Factors of personal ambition and ego- driven competition stayed muted in Rap so that he excelled as a mentor for young people.

In the words of one of his former students, “Rap was an awesome research director.” He expected his students to work just as hard as he did. Rap would spend Saturday mornings in the Chemistry Library reading the literature, photocopying the front pages of articles and delivering them to the desks of his students and postdocs. The articles were often accompanied by a handwritten note saying, "Sorry to have missed you." Thus, to avoid collecting these notes, students were compelled to be at work on Saturday mornings. Of the library, Rap would say ironically, "Two weeks’ work in the laboratory will save two hours in the library." Many of his former colleagues will fondly remember Rap's aphorisms with a tinge of nostalgia. Indeed, years later, many of his colleagues have adopted them for use in their own research laboratories.

For many a new student, Rap was an intimidating figure. He addressed all his students and postdocs by their family name rather than their given name. This was not because he wanted to distance himself emotionally from his students, but because, by chance, the organic chemists who initially joined Rap's lab all had the same first name. The large size of his group prompted Rap to schedule two types of regular meetings with his students, the multiple weekly Show & Tells (“S & Ts”) of four or five students each, and the Tuesday evening colloquium with his whole group. As the newspaper clipping next to the array of weekly three by five inch card schedules on Rap's door indicated, “Show & Tell: teaches, entertains, enriches.” His "S & Ts" (to which Rap regularly brought pastry) had tremendous impact in managing, training, challenging and prodding the students and postdocs in his group to their finest work. Students were strongly encouraged to come prepared to discuss the results of the previous week’s progress. Perhaps “encouraged” is too weak a word to use, which explains why some of his students would save some of their results from a good week in the laboratory to present at a future Show & Tell when experiments were not as fruitful.

The Tuesday night colloquia were particularly intimidating for new initiates. Sitting at the front of the long conference table in Latimer Hall, smoking a cigar, Rap would start the meeting with a “counting,” inquiring who was missing. In these meetings, a full year's worth of research was presented, and Rap spared no one from the ordeal – even undergraduates had their dates with the Tuesday night colloquium! Finally, there were the dreaded QRs or Quarterly Reports. A three by five inch card would appear next to the Show & Tell schedules with the names of those whose QRs were delinquent. One's name would appear twice if the delinquency continued beyond the next quarter's deadline. While QRs were a challenge, they brought the group together, and his students were thankful that Rap had insisted on these reports when it came time to compile their dissertations.

In addition to his profound influence as an educator in organic chemistry, Henry Rapoport had a remarkable impact in the world of corporate America. Consulting in industry was an important part of Rapoport’s professional activities during his entire academic career, the list including most of the major pharmaceutical companies as well as a substantial representation from the California biotechnology industry. He was a familiar figure to leading researchers in the pharmaceutical, biotech, agricultural, medical device, and

instrument industries. He is on record as having been a consultant to at least 43 companies, and on average he was consulting for 15 or more such companies simultaneously. At the time of his death he had consultantships with approximately 20 companies, including Amgen, Berlex, Chiron, Millennium, Pfizer, and Procter & Gamble.

In the 1970s, Henry Rapoport teamed up with his UC Berkeley colleague John Hearst to develop the synthetic chemistry of psoralens. The novel psoralens became exceptionally useful in the photochemical inactivation of pathogens including RNA and DNA viruses, bacteria and protozoa. This method of inactivation became the basis for the formation of several Bay Area companies, including HRI Research, HRI Associates, Advanced Genetics Research Institute, and Cerus Corporation. HRI Research and HRI Associates ("HRI" stands for Hearst, Rapoport, and Isaacs, the three cofounders of these companies) evolved into Cerus Corporation, a successful public company that uses psoralen photochemistry to inactivate pathogens in blood components for the blood transfusion industry. The current CEO of Cerus is Stephen T. Isaacs, a former graduate student in the Hearst laboratory whom Rapoport mentored in the 1970s. Rap remained a key scientific advisor to Cerus as it developed, tirelessly providing enthusiasm and advice at its monthly Synthetic Chemistry meetings. Professor Rapoport was also the cofounder of two other companies, ChemQuip and Oncologic. ChemQuip, now closed, was probably best known for its rotary evaporators affectionately referred to as "Rap- o- Vaps." Oncologic is a start- up biotechnology firm based in Richmond, California, developing approaches to cancer diagnosis and therapy. In addition, Rapoport was involved very early on with both Cetus and Chiron, two major biotechnology companies that merged in 1991.

Henry Rapoport's outstanding research and scholarship led to the award of a Guggenheim Fellowship (1955), the Research Achievement Award in Pharmaceutical and Medicinal Chemistry from the Academy of Pharmaceutical Sciences (1972), the Arthur C. Cope Scholar Award from the American Chemical Society (1985), the Ernest Guenther Award in the Chemistry of Natural Products from the American Chemical Society (1988), the Distinguished Hope Scholar Award from Hope College (1989), the Research Achievement Award from the American Society of Pharmacognosy (1992), and the Berkeley Citation from the University of California (1997). He also received numerous awards from foreign institutions during his career. Professor Rapoport was an invited and Plenary Lecturer at symposia and universities across a wide sweep of the world, from Brazil to Teheran to Sweden to Beijing, and he spent two years in the late 1970s as External Examiner in Malaysia and Nigeria.

Rap was known for his dry wit – an intellectual, penetrating humor that could be funny or scathing – and for his keen intelligence: after finally deciding that C-13 nuclear magnetic resonance (NMR) spectroscopy was a worthwhile technique, Rap took a new C-13 NMR book home over the weekend and by Monday knew more about C-13 NMR than all but the few multinuclear specialists on campus. Students occasionally commented that Professor Rapoport was too fast to keep up with "because he writes with both hands at the same time." This wasn't exactly true, but Rap was ambidextrous: he would start writing or drawing organic formulas at the extreme left side of the blackboard with his left hand; then, as he approached the right- hand side of the board, he would switch to drawing with his right hand at a pace that would create the illusion.

Despite the high expectations he maintained, Rap was devoted to his students and colleagues, whom he treated like members of his extended family. Colleagues were welcomed to Thanksgiving Dinner by Rap, his wife Sonya and their children. Thanksgiving Dinner was an occasion not to be missed – even for those students whose families lived close to Berkeley. Rap's Indian Pudding and slivovitz- lubricated after- dinner discussions were unforgettable. Invariably after such discussion, even into his eighties, Rap would "entertain, enrich and teach" with a spirited kazatska, the Russian Sailor's Dance.

Rap was a man of principles. In his personal life, he harbored a deep love for both Judaism and Israel and was a member of Berkeley Hillel. He lived in a family that was close, loving and talented. His wife, Sonya, is a successful avant- garde artist whose artwork has been featured in a number of scientific circles, including the College of Chemistry, as well as outside of science. Her art will grace the cover of the 2002 Journal of Organic Chemistry's Special Issue on Henry Rapoport. In addition to his wife, Rap is survived by his daughter Hava of Cordoba, Spain, his son David of Berkeley, his son Robert of Cincinnati, Ohio, and five grandchildren.

The Henry Rapoport Endowed Chair in Organic Chemistry has been established at UC Berkeley in honor of Rap and the exceptional educational and personal experiences he made possible. An endowment of more than $500,000 has been raised, largely through the individual contributions of his colleagues, students, family and friends – a testament to the quality of their experiences with Rap and to the devotion he inspired. Professor

Rapoport's meticulously organized papers, comprising nearly 20 linear feet of research notes, manuscripts, correspondence, lecture and meeting notes, and other files related to his career, have been bequeathed by his family to the History of Science and Technology Program in The Bancroft Library at UC Berkeley. The Library, with more than 600 science and technology collections, has become an international center for the study of the modern history of science, and Professor Rapoport's papers constitute a unique and invaluable addition.

James K. Cason
John E. Hearst
J. Clark Lagarias
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