



Henry Irving Kohn



Henry Irving Kohn, the David Wesley Gaiser Professor of Radiation Biology, Emeritus, died on December 22, 1996 of complications following surgery. He has left us a double legacy: one, the public record of his academic accomplishments; the other, an unpublished personal memoir recording his life and thought. With Linda Kohn's permission for the latter, we have drawn on both.

Henry Irving Kohn was born in New York City on August 19, 1909. His mother's obstetrician was out-of-town that day, so that his father had to enlist services of the only doctor he could find, a veterinarian. Henry attributed his interest in biology and zoology to that signal event. His paternal great grandfather had emigrated from Bohemia while his mother, born in Rumania, had

come to New York as a girl. Henry attended public schools, graduating from De Witt Clinton High School in 1926. He applied to Dartmouth College because a neighbor who was enrolled praised the pleasure of the school's student life and the beauty of the New Hampshire's hills and dales. He also did not have to sit the College Board examinations to apply but could rely on his grades in the New York State Regents tests. In addition, although he was not sickly, his mother thought the air in Hanover would be good for his health while his father would have preferred for him to go to work. He was admitted but costs were a problem (tuition was \$400 and total expenses \$1,000 to \$1,200 per year). A scholarship provided half the tuition, the remainder was provided by his Aunt Emma who hoped he would go to the Tuck School, earn lots of money and care for her disturbed son. He was disappointed in the cultural environment at Dartmouth claiming that its education "helps instill pep into one's personality, which gives a good time in the getting, consists of as little work as possible, and which is as far away from art and the field of culture as earth is from the furthest star," and his time there gave him a firm resolve not to enter the world of commerce. His letters and memos record that while at Dartmouth, Henry was greatly concerned about his financial circumstances, which self-inhibited him to some degree. Consequently, when his classmate,

*In tribute to their dedicated efforts to science and medicine, deceased members of the Harvard Faculty of Medicine (those at the rank of full or emeritus professor) receive a review of their life and contributions with a complete reflection, a **Memorial Minute**.*

Nelson Rockefeller, reached out to him in friendship including an invitation to attend his wedding, Henry declined the invitation based on his claimed inability to meet the attendant expenses and HIK's perceived disparity in their financial situations; in retrospect, he realized that these were lame excuses and that he had been foolish. In his junior year, Henry had to choose between concentrations in zoology and English literature. Most of his friends chose the latter but in spite of this, and against the recommendation of his advisor who cautioned him about the difficulties of a life in science, he chose zoology. None-the-less, his disciplined mind and his love of literature made his scientific writing a pleasure to read, distinguished by clarity and economy of words.

On graduation in 1930, at the beginning of the depression, he applied for teaching jobs at high schools in Tennessee and Connecticut. He was turned down for both, he was told, for being Jewish; he wrote that he was neither surprised nor embittered. Through a friend in public relations, he landed a job as Schenectady correspondent for the Knickerbocker Press of Albany. Although he spent most of the year reading comparative and general physiology at the Union College library, his journalistic triumph was to be the first person to interview Edna St. Vincent Millay. He also exposed a case of favoritism in the Schenectady police force, an early portent of the sense of fair play that marked his later character.

In 1931, Henry entered the Yale graduate school. He paid half of the \$200 tuition by selling the gold medal he had won at Dartmouth for public speaking. He tackled a problem suggested to his advisor T. Conliffe Barnes by the Harvard astronomer, Harlow Shapley, who noted that ants in the Harvard Observatory moved more quickly in hot weather. Henry worked out the temperature coefficient of ant creeping. That summer he occupied one of the Yale slots at the Marine Biological Laboratory in Woods Hole, working with Michaelis on respiratory poisons. The experience at Woods Hole was so innervating that he returned many times, eventually buying a summer home there. In the fall of 1932, he came to the newly opened Biolabs at Harvard to work under W.J. Crozier. In Crozier's lab he collaborated with William Arnold who was interested in what appeared to be a thermodynamically impossible outcome in photosynthesis. With Arnold he published a landmark paper in Nature showing that chlorophyll was packaged in a multi-molecular structural unit and that made the difference. Henry's finances continued to be limited, so much so that he fed himself by buying food in the North End on Saturday night so as to cook his meals in the animal farm prep room. While attending graduate school, Henry was befriended by Edward Castle, a young faculty member, and his wife, Natalie; this friendship lasted until Professor Castle's death.

On receiving his Ph.D., Henry won a Rockefeller fellowship to study abroad. He first worked with John Runnstrom at the Hogskolen in Stockholm. Despite being at cross purposes with Swedish manners (he spoke to senior professors without being spoken to; he refused Runnstrom's invitation to speak at a fancy dinner club feeling he had too little to say) this visit kindled in him great warmth for Scandinavia, to which he attributed some of his early attraction to Linda Hansen whom he met later and eventually married. After a not very successful attempt to measure heat production by the fertilized egg, Runnstrom sent Henry to David Keilin's laboratory at the Moltano Institute in Cambridge by way

of the marine biological station in Brittany. Asked to work on tyramine oxidase with or without Keilin, he chose to be independent. He wrote, "In retrospect, it is difficult to understand my choice. What was the point of being in his institute if not to know him and to learn his way of looking at things." From our vantage, it is consistent with the mature Henry, fiercely candid and without pretense, a point-of-view that certainly demands a sense of autonomy. Again, he was brought face-to-face with his own financial stringencies by living with a working-class family and learning much of the structure of English society in the 30's from their point of view. He was struck by the great disparity in opportunity between the poor in Britain compared to those in the USA.

On returning to the United States, Henry learned from Edward Castle that there was an opening in Fred Bernheim's laboratory at Duke. He worked with Bernheim on pellagra, taught physiology, and shortly joined the Faculty. Henry befriended Philip Handler when the latter came to Duke in 1938; they remained lasting friends.

At the outbreak of WWII, Henry was working on the mode of action of sulfonamides. He applied for duty with the Duke Base Hospital Unit but was rejected because he did not have a medical degree. He immediately applied to the Duke Medical School and was inducted into the Army Specialized Training Program. Embarrassed to be a student of his former colleagues, he applied for transfer after two years to Columbia and Cornell where he was not warmly greeted and to HMS where he was admitted. Although he was the oldest student in the class, this was a very happy time for him. He wrote "the work was interesting, my classmates amiable, and I was able to take my place among them without prejudice." He graduated in 1946 with a foresighted interest in the physical basis of psychiatric illnesses, consequently, interning in the med-surg program of Bellevue psychiatry.

With the war having ended, Henry searched for a way to fulfill his residual military obligation. His former Biolab colleague Bill Arnold introduced him to Alexander Hollander who was establishing a biology group at Oak Ridge National Laboratory. Henry thought Hollander "tight-lipped, Germanic and very materialistic," none-the-less, the problems were potentially interesting and the position an entry to the USPHS. His first project was to study the effects of x-rays on the blood chemistries of rats and guinea pigs. After a year, he felt he was getting nowhere and missed the contact with patients. He asked the USPHS to reassign him, which was just as well, as his relationship with Alex Hollander had deteriorated badly.

About this time Gino Failla was trying to organize a society around radiation science. Henry disagreed in principle, believing radiation biology was a branch of pharmacology or toxicology and not an independent discipline. However, Failla was able to mobilize other proponents to found the Radiation Research Society and Henry became a loyal member. He subsequently served on the Society's Council and as an associate editor of its journal, *Radiation Research*. In 1981, he gave the Failla lecture under the title of *Radiation Genetics: The Mouse's View*.

In 1949, the Public Health Service assigned Henry to the Radiology Department at UCSF under Robert Stone who also headed its diagnostic division. He began to study the WBC counts of patients after x-ray therapy. Shortly thereafter, Stone and Low-Beer, the head of radiation therapy asked him, to become a therapy resident. After two years of clinical experience he was board certified in radiation therapy. When a 70 MeV synchrotron was built at the UCSF Radiation Laboratory, Gail Adams came as the medical physicist and Henry was appointed as the radiation biologist. Then, with Shirley Gunter and Robert Kallman, began a fruitful period of research on dose-response curves in various tissues and organisms and on the relative biological effects of synchrotron radiation.

In the early 60's, Henry, along with Sam Leshner and Michael Fry, at Argonne National Laboratory, began a series of elegant experiments to determine the effects of radiation and aging on cell proliferation kinetics and transit in mouse intestinal epithelium. At about the same time Henry continued to work in San Francisco with Paul Guttman on life span in relation to the development of intercapillary glomerulosclerosis in laboratory rodents. In his last years at UCSF he began to study 2nd cancers (leukemia) after radiation therapy for cervical cancer as well as the radiation sensitivity of histocompatibility genes in the mouse. The latter project was to occupy him for the remainder of his scientific career.

In 1962, Henry was approached by Shields Warren, whom Henry had met when HIK was scientific secretary of the AEC advisory committee on biology and medicine. Realizing that Henry was one of the few radiation therapists who was also a radiation biologist, Warren hoped that Henry would come to Harvard and establish a radio-therapy-cum-biology center under Deaconess Park. Henry thought the germ of the idea a good one but wanted to broaden its scope as well as move the center to a more central location. Henry suggested to Shields that the Deaconess purchase the Boston Edison transfer station site across Brookline Avenue in a location now adjacent to the Dana-Farber Cancer Institute and establish there the radiologic laboratories as well as the headquarters for the radiation therapy program. Warren agreed to the change of plan and somehow convinced the Deaconess, the Edison company and the PHS to go along with it. More than that, the \$1M provided by the NIH had to be matched by outside funds in order to build the facility. With the help of the Malinckrodt Foundation, Warren was able to do this also. Henry then accepted the call to Harvard and became the first Fuller-American Cancer Society Professor.

Henry envisioned a radiation oncology program among the Longwood hospitals under a single chief. His work with Zippin in epidemiology had taught him that a large number of patients are required for clinical trials and that the small numbers provided by the Deaconess would not be sufficient. However, he found, when he arrived in Boston, that George Berry, the Dean of HMS, was opposed to a joint venture among the Harvard hospitals. Always intrepid, Henry recruited 30 faculty members to join him in the cause and Berry recanted.

Shortly after Henry's appointment, Herbert Abrams was recruited to Harvard as the first Philip H. Cook Professor and given the charge of reorganizing and revitalizing Radiology at HMS. Among the

inducements that brought Herb to Boston from Stanford was a laboratory building to house radiologic science and the promise that radiation therapy would be separated from diagnostic radiology in the school's organization. The conjoint program in therapy conceived by Henry and the building he designed and built with the money raised by Warren fulfilled these conditions.

Shortly after his arrival, Abrams recruited Samuel Hellman to head the therapy program and the foundations for the Joint Center for Radiation Therapy were established. The JCRT offices were located on the first floor of the new Shields Warren Radiation Laboratory and its laboratories on the second. The diagnostic radiology research laboratories were on the third floor with Henry's office and laboratory on the fourth floor, which he shared with experimental nuclear medicine.

The importance of Henry's vision on the growth and development of radiology, radiation oncology and nuclear medicine in the Longwood area hospitals cannot be over emphasized. Although the funding came principally from Warren and the programs were built by Abrams, Hellman and Adelstein respectively, it was Henry's insistence on a conjoint radiation therapy program and a laboratory for the radiation sciences that made the later developments possible.

Henry's research at Harvard focused on the genetic effects of radiation. He was particularly interested in variations among genetic loci in their radiation sensitivity. With his colleague, Roger Melvold, he found that histocompatibility genes were much more radiation resistant than those identified earlier by the Russells at Oak Ridge, until then the only mouse genes so tested.

Henry's interest in genetics was, of course, shared with other Harvard colleagues, particularly Bernard Davis, Samuel Latt and Park Gerald. With them, he started the Harvard Center for Human Genetics, the principle locus for mammalian genetics teaching until the establishment of the Department of Genetics in 1980. Henry served as the Center's first director, becoming the Gaiser Professor on the occasion while relinquishing the Fuller-ACS chair to Sam Hellman.

Henry became emeritus in 1975. His first post-retirement appointment was to the NAS Committee on Nuclear and Alternate Energy Systems chaired by Harvey Brooks. Henry immersed himself in the various facets of coal as a fossil fuel. He quickly became an expert in this complex field. Shortly thereafter, Henry became a consultant to Equifax and then Epidemiology Resources. This, in turn, led him to become chair of the Bikini Atoll Rehabilitation Committee of the Department of Interior (1982-1988). The remainder of Henry's professional life was devoted to the evaluation of residual radioactive environments from the Pacific atoll testing of nuclear weapons. His final assignment was as representative of the Bikini people in the Rongelap Reassessment Project (1987-91).

Henry Kohn's life covered most of the twentieth century. His professional career was spent in Durham, Oak Ridge, New England and the Bay Area. He saw the changes that took place in biology and medicine over 70 years in those places of ferment and, fortunately for us, left a legacy of comment on

what he observed. He had an intense curiosity about what makes things tick that covered many areas of biology and life. It was expressed in probing questions that invariably targeted the root of the matter and took nothing at face value. Fiercely candid and independent, his view of himself and others was also fresh and clear. He despised pomposity and pretense and authoritarianism and delighted in ideas. He would not suffer fools but he was eminently accessible and fair. Possessed of a dry sense of humor that could sometimes be acid, he had a wonderful capacity to laugh at the absurdity of existence. He appreciated, as few who have not lived through it can, the great changes in the degree of openness and acceptance that have occurred in our academic communities. He was without guile, almost to the point of naiveté, and it gave him an air of mild eccentricity that was part of his cherished character. And cherish him we did, as did his wife Linda, his children Anabel and Lars, and his grandchild Henry whom he leaves behind.

Respectfully submitted,

Herbert L. Abrams

C. Norman Coleman

R.J. Michael Fry

Samuel Hellman

John B. Little

S. James Adelstein, *Chair*