THE FACULTY OF MEDICINE
Harvard University

# Harold Amos

Harold Amos, scientist, educator, mentor, and avid Francophile, was born in Pennsauken, New Jersey, the second of nine children of Howard R. Amos Sr., who worked in the Philadelphia post office, and his wife Iola Johnson. Iola had been adopted by, and worked for, a prominent Philadelphia Quaker family who home schooled her with their own children. This family remained lifelong friends of Iola and kept the young Amos family well supplied with books, including a biography of Louis Pasteur, which stimulated fourth-grader Harold's interest in science. Harold did confide that an important factor in his becoming enchanted with microbiology and immunology at such a young age was the combination of Pasteur's use of goats as experimental animals and his own dislike of the family goat.

Harold received his early education in a segregated school in Pennsauken, then graduated first in his class from Camden High School in New Jersey. He later recalled that the wonderful teachers he had in primary and secondary schools awakened in him his love of teaching. After high school graduation in 1936, he attended Springfield College in Springfield, Massachusetts, on a full academic scholarship at a time when very few such scholarships were offered to African Americans. He graduated *Summa cum Laude* in 1941, with a major in Biology and a minor in Chemistry. The following year he worked as a graduate assistant in the Biology Department at Springfield College.

In 1942, Harold was drafted into the Quartermaster Corps of the United States Army, where he served as a warrant officer in a battalion that supplied gasoline to regular troops. He spent two years in England, then entered France six days after the invasion of Normandy. Harold served on the continent, moving as far east as Pilsen in the former Czechoslovakia, until his discharge in February 1946. Experiences during his service led to Harold's life-long love of France and all things French, as well as to his well-known aversion to flying. Whenever possible, he traveled by train or ship, which was consonant with Harold's sense of the appropriate pace of a civilized existence and afforded him countless opportunities to meet people, as

well as time to read and to think. Indeed, on several return trips to his beloved France he took ocean liners, once even traveling on the Queen Elizabeth II. There is an authentic report of Harold in animated conversation on the promenade deck of the "Liberté" in 1953, his copy of Marjorie Stevenson's Bacterial Metabolism, open but neglected. Harold made time for everyone and was seldom in a hurry.

Upon his return to the United States in the fall of 1946, Harold enrolled in the Biological Sciences' graduate program within the Division of Medical Sciences at Harvard Medical School. He earned an M.A. in 1947 and a Ph.D. in 1952, becoming the first African American to earn a doctoral degree from the Division. Harold was a graduate student with Howard J. Mueller, chairman of the then named Department of Bacteriology and Immunology, now Microbiology and Molecular Genetics. Mueller was famous as the discoverer of methionine through studies of bacterial nutrition but, in those days of breadth, Harold's thesis project was in virology, on agents affecting infectivity of Herpes virus, using plaquing on the chick chorio-allantoic membrane as earlier reported by John Enders in the Department. Perhaps it was a relief afterwards to completely switch fields, a Fulbright Fellowship taking him to the Pasteur Institute – and back to France to reinforce the Francophile within – to work with threonine mutants of *Escherichia coli* in the laboratory of Georges Cohen.

This period in Paris also broadened Harold's serious life-long interest in literature and the arts, especially music. An accomplished amateur pianist and lover of classical music since childhood, the artists of the St. Germain des Prés Quartier introduced Harold to the work of many contemporary jazz musicians, including Louis Armstrong and Ella Fitzgerald. Harold later held season tickets to the Boston Symphony Orchestra, and regularly invited friends to join him for concerts, as well as opera and ballet performances.

Those were the years in Paris when the Pasteur Institute, with to-be Nobel laureates Andre Lwoff, Jacques Monod, and Francois Jacob, was becoming a Mecca for American scientists, and it is no surprise that on his return to Harvard Medical School, now as a faculty member, Amos' next papers were on *E. coli* and its phages, a notable one being the 1958 finding of 5-methylcytosine in *E. coli* RNA, confirmed only decades later.

Interestingly, however, Amos' work soon returned to - and remained with - animal cells. And that was not in the usual thrust of employing viruses as probes of higher cell function, but rather to focus directly on the cells. Over thirty years he directed an unusually broad array of studies: on the use of bacterial RNA to program higher cell protein synthesis, on enzyme inductions, insulin, serum, temperature effects, ribosomes, phosphoproteins, RNA metabolism, and, particularly influential, a thread on glucose starvation, hexose metabolism and transport. Perhaps the rubric had been set at the beginning: nutrition in the widest sense. It is no surprise that over the decades of his attendance at seminars Harold was so knowledgeable on a broad range of biological problems. His long habit, now quaint, of working at the bench must have counted too in keeping him abreast on all of the latest techniques. And of course it was that breadth that contributed to his influence, through mentoring, teaching, administration, and committee work up to the national level, on large issues of the thrust of biomedical education and research.

Harold described teaching as one of his greatest joys. He was always accessible and quick to offer words of praise, encouragement, advice, and support. Even during his graduate school days, he was lauded for his devotion to teaching and his compassion as a mentor. He followed his students' careers and personal lives with enthusiasm, regularly corresponding with countless medical and graduate

students, many of whom today hold important positions in a very broad range of fields.

Harold remained an active faculty member at Harvard Medical School for nearly fifty years. He rose through the academic ranks becoming a Full Professor in 1969. In 1975 he was named the Maude and Lillian Presley Professor of Microbiology and Molecular Genetics and became Professor Emeritus in 1988. Twice, from 1968 to 1971, and again from 1975 to 1978, he served as Chair of the Department, thus becoming the first African American to head a department at Harvard Medical School. He also served twice as Chair of the Division of Medical Sciences, from 1971 to 1975 and from 1978 to 1988. In these roles he provided creative, forward-looking leadership with fairness and diplomacy. The door to his office was invariably open, always welcoming drop-in visitors. Beyond his duties as Department and Division Chair, Harold held many leadership positions on national boards and committees dedicated to the advancement of science as well as those serving the interests of minority students. Among others, Harold sat on the Board of Directors of the Josiah Macy Jr. Foundation, the Minority Medical Faculty Development Program Advisory Committee of the Robert Wood Johnson Foundation, the National Cancer Society Advisory Board, the President's Cancer Panel, and was a past President of the Massachusetts Division of the American Cancer Society. As part of his interest in expanding the participation of members of underrepresented minorities in research, he was an early advocate of the National Institutes of Health's programs for minority college students. Harold was also a lifetime delegate to the National American Cancer Society Assembly, a volunteer governance body for the ACS.

Harold was the recipient of numerous awards, including an *Honoris Causa* doctoral degree from Harvard University (1996), the Centennial Medal of the Harvard Graduate School of Arts and Sciences (2000), the first Charles Drew World Medical Prize from Howard University (1989), and the National Academy of Sciences' highest honor, the Public Welfare Medal (1995). He was elected to the American Academy of Arts and Sciences (1974), named a Fellow of the American Association for the Advancement of Science (1991), and the Institute of Medicine of the National Academy of Sciences (1991). A truly modest man, few of his colleagues or relatives were aware of the full range of honors he had received. His modesty was typified when friends decided his bust should be placed in the Division of Medical Sciences graduate student lounge when it was named in Harold's honor. He refused to sit for the sculptor, and a photograph from which the sculptor could work was only obtained by subterfuge.

Upon the occasion of his retirement from Harvard Medical School at the age of seventy, Harold noted that he "had to get back to work to try to do something useful with these few remaining years." Soon thereafter, and true to his word, he accepted the position as the first national director of the Minority Medical Faculty Development Program (MMFDP) of the Robert Wood Johnson Foundation, serving until 1994. He developed a reputation for keeping in contact with and encouraging the MMFDP Fellows and their family members long after their tenure in the program, and for seeking alternative positions for applicants who were not awarded fellowships. In 2004, this program was renamed the Harold Amos Medical Faculty Development Program. Reflecting his concern for the academic family at all age levels, Harold also conceived the Medical School's highly popular annual Emeritus Day and Symposium, which is still ongoing. A few days before his death Harold was still working full-time in the laboratory of his long-time friend Jack Murphy at Boston University and writing two manuscripts on glycerol metabolism. He died in Boston on 26 February 2003, shortly after suffering a stroke.

It is a custom to assert, and sometimes kindly exaggerate, our colleagues' selfless dedication to the personal as well as scientific welfare of their associates and students. In Harold's case, the assertions would be correct and, to many of us, his very essence. He made a large difference in the lives of

many people, spending time, patience, and effort on their behalf: professional advice to colleagues and students, attending their talks, counseling on academic and personal problems, even playing tennis with those who did not deserve his high standard. Consequently, as was well known – and sometimes irritating - a conversation with him, in the corridor or walking across the Quadrangle, was likely to be interrupted by engagement with someone else, often a former medical student (there appeared to be thousands of them) whose history would be keenly remembered and attended to and, likely as not, would finally be politely concluded with an invitation (usually vague!) to share a meal soon at the current favorite French restaurant. Many of us were indeed quite fortunate to converse at length with Harold at such restaurants over wonderful meals invariably accompanied by fine wine and espresso. Harold was able to enjoy in the sharing of his gastronomic passions until the very end – listed in his agenda for the last days of February 2003 remain the plans for several such meals with friends. Harold, we miss you, cherish the companionship and inspiration of the time spent in your company, and continue to survey this town's culinary marvels in your honor!

Roberto Kolter, *Chairperson*
Darren Higgins
Dan Fraenkel
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