

## John George Kemeny

**John George Kemeny** (May 31, 1926 – December 26, 1992) helped design the world's first atomic bomb while working on the Manhattan Project. He later became a pioneer in the computer revolution by co-creating the programming language BASIC (*Beginner's All-Purpose Symbolic Instruction Code*). It was the first programming language to use a very simple syntax and served simultaneously as an "interpreter," in that it analyzed (compiled) each line as it was written. As president of Dartmouth College during the tumultuous period of student protest during the Vietnam War, he was able to maintain a relative calm on his campus by his personal popularity with the students. Later he chaired the commission appointed by President Carter to investigate the Three Mile Island nuclear power plant accident.



Kemeny was a prodigy, born in Budapest. When the Nazis annexed Austria and threatened to invade Hungary, Kemeny's father realized the danger to Jews, so he emigrated to the United States in 1938. His family followed in 1940.

Unfortunately not all of his relatives chose to leave their home, and his grandfather, an aunt and an uncle failed to survive the Holocaust. The family settled in New York City, where despite speaking no English when he arrived, Kemeny graduated from high school first in his class. He entered Princeton where he studied mathematics and philosophy. While still an undergraduate he interrupted his studies to join the United States Army and spent a year working on the Manhattan Project at Los Alamos under the direction of Richard Feynman. At Los Alamos Kemeny was inspired by fellow Hungarian John von Neumann, who proposed a fully electronic computer based on a binary number system, with internal memory for both data and a stored program.

After the war Kemeny returned to Princeton, graduating in 1947 with a B.A. summa cum laude, Phi Beta Kappa. He completed his doctorate in 1949 with a dissertation written under the direction of Alonzo Church. While completing his thesis, Kemeny served as Einstein's research assistant at the Institute for Advanced Study. He recalled Einstein as a shy, humble man who never performed an experiment, but by just sitting and thinking changed the entire universe. He was

Kemeny's life-long hero. Once asked why Einstein needed him as a mathematical assistant, Kemeny merely smiled, and responded, "Einstein wasn't very good at math." After receiving his Ph.D., he stayed on at Princeton teaching mathematics and philosophy until 1953. That year Kemeny joined the faculty at Dartmouth College, becoming the chair of the mathematics department the next year. He was given great freedom to develop a mathematics program. He remained in this post until 1967, when he resigned to serve as the Coordinator of Educational Plans and Development for the College.

In 1970 Kemeny was selected as President of Dartmouth, and during his tenure, he was instrumental in reversing a 203-year old tradition by opening the all-male school to women in 1972. Kemeny also worked diligently to increase the number of minority students. Mindful of the early mission of Dartmouth to educate Native Americans, he made a special effort to recruit more of them and to establish a strong Native American program. Two months after Kemeny became Dartmouth's 13<sup>th</sup> president, the bombings of Cambodia and the killings at Kent State ignited fear and rage on campuses across the nation. Kemeny canceled classes and led the college in a weeklong retreat of soul-searching and mourning. When the ultra-conservative *Manchester Union Leader* denounced Kemeny with a front-page editorial headed, "Dartmouth Has Bought Another Lemon," Dartmouth students donned T-shirts emblazoned with pictures of lemons. They also delivered bushels of lemons to the newspaper and presented Kemeny with a lemon tree. He addressed a rally on campus and concluded his talk by tossing autographed lemons to his audience, which were highly prized.

Kemeny's first love was teaching. He accepted the position of president only after being given assurance by the Board of Trustees that he could continue teaching. Throughout his presidency, he taught two classes a year, ranging from computer science to freshman mathematics. Lamenting, "Math is the only subject you can study for 14 years and not learn a single thing that has been done since 1800." With his colleague Laurie Snell, he created a new course, Finite Mathematics, which combined applications of logic, set theory, probability and matrix algebra. As they stated in the preface of the book *Introduction to Finite Mathematics* (1956), coauthored with Gerald Thompson, they were forced to write because no existing text did what they wished to do:

"Our purpose in writing the book was to develop several topics from a central point of view.

In order to accomplish this on an elementary level, we restricted ourselves to the consideration of *finite* problems, that is, problems which do not involve infinite sets, limiting processes,

continuity, etc. By so doing it was possible to go further into the subject than would otherwise be possible, and we found that the basic ideas of finite mathematics were easier to state and theorems about them considerably easier to prove than their infinite counterparts.”

In 1964, believing that Dartmouth students needed greater access to computers and a simple effective language in which to write programs, Kemeny and Thomas Kurtz created the Dartmouth Time-Sharing System, one of the first such systems in the United States. The result was BASIC, which they felt would enable a student to write a program after only three classroom sessions. The students found the third classroom session unnecessary and it was eliminated. Kemeny and Kurtz did not copyright or patent BASIC, preferring to let it be in the public domain so it would be readily available to everyone. Entrepreneurs freely copied it and went on to reap millions from it. Author Katherine Paterson, a parent of a Dartmouth student, recalls an address by Kemeny during parent’s weekend, when he was asked if there was anything that a computer could not do. He replied that there were two tasks perfectly suited for human minds, but even if computers eventually were constructed that could perform the tasks, he hoped they would never be used to do so. The two areas that he hoped would always be exclusive to the human mind were “creativity and judgment.”

Kemeny met his wife Jean Alexander from Burlington, Vermont, when she was a freshman at Smith College and he was an assistant professor at Princeton. They married in November 1950 and had a daughter Jennifer and a son Robert. They both attended Dartmouth, and Jennifer was a member of the first co-educational class. Jean and John’s marriage lasted 42-years. Kemeny once claimed his marriage was a model for his relationship to Dartmouth. “My commitment to this College is the same as my commitment to my wife: ‘til death do us part.”” Kemeny died at his home in Etna, New Hampshire of heart failure the day after Christmas in 1992 still committed to his wife and to Dartmouth. Each year at Dartmouth’s commencement he ended his remarks with the same heartfelt expression: “Women and men of Dartmouth, all mankind is your brother – and you are your brother’s keeper.” In a sketch that appeared in the Dartmouth Alumni Association, Nardi Reeder Campion began the piece with the remark: “The newspaper said John G. Kemeny, 13th president of Dartmouth College, died of heart failure. Clearly this was a mistake. John Kemeny’s heart never failed anyone.” Kemeny described his wife’s contributions to his presidency thusly: “When I say that I could not have done this job without the support of my wife, I am making a simple, factual statement. Her contributions to the welfare of the College and its president have been manifold. Often they have been achieved at great personal sacrifice. The thirteenth president has been a two-person team

effort.”

John Kemeny was a most gracious and somewhat shy man who not only talked but also listened attentively. When he lectured, the sheer delight he felt in sharing ideas with an audience, no matter of what mathematical level, was electrifying, charging the room with the warmth of his personality. His goal always was to charm his audience with whatever mathematical topic he presented, making certain that everyone not only understood his presentation but enjoyed it as well. Kemeny was well aware and proud of his teaching skills. At the time he handed over the presidency of Dartmouth to David McLaughlin in 1981, Kemeny told the Boston Alumni Association: “History alone will be able to judge whether my presidency was good or what my record is worth. But there is one thing I do know for certain: I’m one hell of a good teacher.”

Quotation of the Day: “The man ignorant of mathematics will be increasingly limited in his grasp of the main forces of civilization.” – John G. Kemeny