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REVIEW

The Most Influential Scientists in the Development of Medical Informatics (5): Charles Edwin Molnar

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Charles Edwin Molnar (1935–1996) was a codeveloper of one of the first mini-computers and a pioneer in cochlear modeling research (1, 2). As a young researcher at the Lincoln Laboratory of the Massachusetts Institute of Technology in 1962, Molnar with another engineer, Wesley A. Clark — led a team of designers in developing the Laboratory Instrument Computer, or LINC. The machine, which was one of the few unclassified projects at the laboratory in the early 60s, was intended for doctors and medical researchers. Although it would be considered of insignificant power compared to modern personal computers, it was a self-contained machine that had a simple operating system and a small display and stored its programs on a magnetic tape.

The LINC originated decades before the advent of the personal computer. Its development was the result of a National Institutes of Health (NIH) program that placed 20 copies of an early LINC prototype in selected biomedical research laboratories nationwide. Later, the LINC was produced in greater numbers by Digital Equipment Corp. and other computer manufacturers.

Molnar received a bachelor's degree (1956) and a master's degree (1957) in electrical engineering from Rutgers University, and received a doctoral degree (1966) from MIT in electrical engineering. His dissertation topic was the mechanics of the inner ear and how it translates auditory signals into neural responses. After leaving MIT, he established the Institute for Biomedical Computing at Washington University in St. Louis, where he worked from 1965 until 1995, when he became a senior research fellow at Sun Microsystems in California.

Molnar earned a worldwide reputation for his work in self-timed computer system theory, a design approach for ultrafast computers. While the operations of commercial computers

are controlled by a single clock, most researchers in the field believe that significant speed breakthroughs await the advent of systems whose components can operate independently. At Sun, Molnar was continuing his work in this area.

Molnar was known as an intensely curious researcher whose talents and interests ranged from physiology and bioengineering to electrical engineering and computers, music and furniture building, and hiking and canoeing. He started practice of sending computer programs by cable technology with his colleague Clark. In the 1960s, Molnar and Clark obtained a patent for sending computer programs over cable television lines to communicate data from central computers, which were expensive at the time, to less expensive bedside terminals in intensive-care units. The patent, which is now expired, turned out to be ahead of its time. Some companies are now starting to employ the cable technology, which allows users to send data much faster than by the more common telephone lines. Charlie Molnar was also well known as a pioneer in the modeling of the auditory system, especially numerical models of the function of the cochlea (the inner ear).

Before death in 1996, he was working at Sun Microsystems on asynchronous circuits with Ivan Sutherland. He died December 13, 1996 at home, at the age of 61 from the complications of diabetes. After his death, his body was donated to the University of California, San Francisco Medical Center. He will be the most remembered by his pioneer work in making numerical models of cochlea function.

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