

# Anthony Ralston

*Born 1930, New York City; computer educator, numerical analyst, author*



*Education:* SB, mathematics, MIT, 1952; PhD, mathematics, MIT, 1956.

*Professional Experience:* member, technical staff, Bell Telephone Laboratories, Whippany, NJ., 1956-1959, supervisor, 1959; lecturer, Department of Mathematics, University of Leeds, Leeds, England, 1959-1960; manager of technical computing, American Cyanamid Company, New York, 1960-1961; Stevens Institute of Technology, Hoboken, NJ.: associate professor of mathematics, 1961-1964, professor of mathematics, 1964-1965, director of the Computing Center, 1961-1965; visiting senior research fellow, Institute of Computer Science, University of London, 1971-1972; visiting professor, Department of Statistics and Computer Science, University College, London, 1978-1979; visiting professor, Department of Computing, Imperial College of Science and Technology, London, 1985-1986; State University of New York at Buffalo: professor, computer science, 1967-present, chairman, 1967-1980, professor, mathematics, 1965-present, director, Office of Computer Services, 1967-1970, director, Computing Center, 1965-1967.

*Honors and Awards:* ACM Distinguished Service Award, 1982; fellow, American Association for the Advancement of Science, 1989; fellow, ACM, 1994.

Ralston was born in New York City in 1930, graduated from the Bronx High School of Science in 1948, and then attended MIT, where he graduated with an SB in mathematics in 1948 and a PhD in mathematics in 1952. He spent three years at the Bell Telephone Laboratories as a member of technical staff and then supervisor (interrupted by a six month sojourn in the US Army) working on military systems, mainly the Nike Zeus antiballistic missile system. During this time he was awarded his only patent, on a “track initiator” for sorting and categorizing the trajectories of incoming missiles. While at Bell Telephone Laboratories he published his first book, *Mathematical Methods for Digital Computers* (co-edited with H.S. Wilf), the first of a series of three books and an encyclopedia.

Following a year as a lecturer at the University of Leeds, England, he became manager of technical computing for the American Cyanamid Corporation in 1960. Thinking better of the world of industry, however, he left after five months to become associate professor of mathematics and director of the Computer Center (initially an IBM 1620 and, later, the last manufactured Univac 1105) at the Stevens Institute of Technology. He has been an academic ever since.

Before leaving Stevens in 1965, he was promoted to professor and published *A First Course in Numerical Analysis*, which for some years was a standard text in this subject. In 1965 he left Stevens for the State University of New York at Buffalo, where he has been ever since, except for four sabbatical years at the University of London. Originally professor of mathematics and director of computer services (until 1970), he founded the Department of Computer Science at Buffalo in 1967 and remained its chair until 1980.

Service on the editorial boards of the *Journal of the ACM* and *Computing Reviews* in the late 1960s led to an invitation from George Forsythe to run for the ACM Council as Northeast regional representative in 1968.

Election to this post led to further elections as ACM vice president (1970-1972) and president (1972-1974). During those years some progress was made on putting ACM on a firmer organizational and financial footing. Following service on the AFIPS board of directors ex officio as ACM president, Ralston became AFIPS president in 1975 and spent a rather stormy year in that post trying unsuccessfully to wean AFIPS away from dependence on the National Computing Conference and into new ventures such as publishing a popular journal of computing, a project which AFIPS never embraced but which was resurrected outside AFIPS later (see below). After urging more activity by ACM in the human rights field for some years, Ralston became the first chair of the Committee on Scientific Freedom and Human Rights in 1980 and served in that post for eight years.

During the 1970s Ralston moved away from numerical analysis to more specifically computer science pursuits, which included publication of a textbook (*An Introduction to Programming and Computer Science*) and the editing of the *Encyclopedia of Computer Science* (first edition, 1976, second edition, 1982, third edition, 1992), which for 15 years was the only reference of its kind and still is the major one-volume reference in computer science. During this period he served a term on the Computer Science and Technology Board of the National Research Council.

Starting in the late 1970s and continuing until the present, his interests turned to education, first the mathematical aspects of computer science education, then college and university mathematics education generally and, for the past few years, elementary and secondary mathematics education. He has been at the forefront of those calling for more emphasis on discrete mathematics in undergraduate mathematics and computer science education, beginning with a paper "Computer Science, Mathematics and the Undergraduate Curricula in Both" and culminating in 1991 with a book, *Discrete Algorithmic Mathematics* (coauthored with Stephen B. Maurer).

Ralston's increasing interest in mathematics education in the 1980s led to a term on the board of governors of the Mathematical Association of America, as well as a term on the newly chartered Mathematical Sciences Education Board of the National Research Council. During the 1980s he also became the founding (and, as it turned out, only) editor of *Abacus*, a magazine intended to be a popular journal of computing, but which never achieved a wide audience, and which ceased publication when Ralston resigned as editor after five years in that post.

His current interests are in precollege education broadly, with a particular focus on mathematics education.

## QUOTATION

"Questions about education arouse strong feelings. For this reason and because seldom, if ever, can propositions about education be proved or even strongly supported with evidence, they provoke strong statements.... Our essential proposition is simple and not immodest. It is time to consider (i.e., try) an alternative to the standard undergraduate mathematics curriculum, which would give discrete analysis an equivalent role to that now played by calculus in the first two years of the undergraduate curriculum."

## BIBLIOGRAPHY

## Significant Publications

Ralston, A., and H.S. Wilf (coeditor and author of two chapters), *Mathematical Methods for Digital Computers*, John Wiley and Sons, New York, 1960. [French, German, and Japanese translations].

Ralston, A., *A First Course in Numerical Analysis*, McGraw-Hill, New York, 1965. [Hungarian, Polish, Spanish, Czech, and Bulgarian translations].

Ralston, A., and Stephen B. Maurer, *Discrete Algorithmic Mathematics*, Addison-Wesley, Reading, Mass., 1991.

Ralston, A., et al., *Encyclopedia of Computer Science*, 3rd ed., Van Nostrand Reinhold, New York, 1992.<sup>1</sup>

## UPDATES

Portrait added (MRW, 2013)

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<sup>1</sup>2nd edition was entitled *Encyclopedia of Computer Science and Engineering* the 3rd edition returned to the original title.