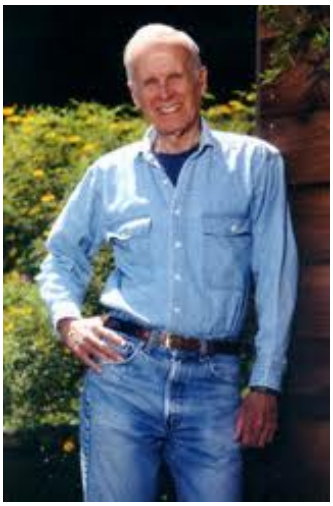
John Warner Backus

Born December 3, 1924, Philadelphia, Pa.; leader of the IBM team that created the programming language Fortran; inventor of the metalanguage BNF, known variously as Backus-Normal or Backus-Naur Form; currently Proponent of improved methods of programming such as the functional approach.



Education: BS, mathematics, Columbia University, 1949; AM, mathematics, Columbia University, 1950.

Professional Experience: IBM Corp.: programmer, Pure and Applied Science Departments, 1950-1953, manager, Programming Research Department, 1954-1958, IBM Research Staff, 1958-1963, IBM fellow, 1963-1991; adjunct professor of information sciences, University of California, Santa Cruz, 1974; visiting professor, University of California, Berkeley, 1980,1985.

Honors and Awards: IBM fellow, 1963; W.W. McDowell Award, IEEE, 1967; National Medal of Science, 1975; ACM Turing Award, 1977; IEEE Computer Society Pioneer Award, 1980; member, National Academy of Sciences; member, National Academy of Engineers; Charles Stark Draper Award, National Academy of Engineering (NAE), 1993.

John Backus was employed by IBM as a programmer for the Selective Sequence Electronic Calculator (SSEC) in 1950, after receiving his Master's degree in mathematics from Columbia University.[1] Later he headed the development of the Speedcoding interpretive system for the IBM 701. He also took part in the design of the IBM 704, and was the original advocate for its built-in floating-point operations. From early 1954 until late 1958, he was manager of the programming research group (later department) in IBM during its development of Fortran.

While Backus was a member of the committees that designed Algol 58 and Algol 60, he joined IBM Research. In the course of efforts to define Algol 58 more precisely, he employed the syntax description technique known as BNF; this technique was improved and used by Peter Naur to describe the syntax of Algol 60 in the Algol Report.

After his work on Algol, Backus spent a number of years working on the mathematics of families of sets. Between 1970 and 1978 he developed a functional style of programming and its associated algebra of programs. This work became the topic of his 1978 Turing Award Lecture, “Can Programming be Liberated from the von Neumann Style? A Functional Style and Its Algebra of Programs.”

In 1963 Backus was appointed an IBM fellow. He resides in San Francisco, Calif. He retired on October 31, 1991, and is associated with the IBM Almaden Research Center as a consultant.

On February 22, 1994, the National Academy of Engineers awarded Backus the third Draper Award “for the development of Fortran—FORmula TRANslation—the first general-purpose, high-level computer language, which ushered in the computer software revolution.”

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[1] Adapted from the biography that accompanied John Backus' paper in Wexelblat 1981.

QUOTATIONS

"It [Fortran] is an incredible achievement that 25 years ago these people designed and produced a compiler that has remained the best overall optimizer for not 5 years, not 10 years, but 20 years."

"I myself have had many failures and I've learned that if you are not failing a lot, you are probably not being as creative as you could be, you aren't stretching your imagination enough.[1]

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[1] On the occasion of receiving the Draper Award, February 22, 1994.

UPDATES

Portrait inserted, MRW, 2012