MEMORIAL RESOLUTION OF THE FACULTY OF THE UNIVERSITY OF WISCONSIN-MADISON

ON THE DEATH OF EMERITUS DEAN AND PROFESSOR STEPHEN COLE KLEENE

Professor Emeritus Stephen Cole Kleene died in Madison on January 25, 1994, after a long and distinguished career as a researcher, teacher, and administrator. He was 85.

Professor Kleene was born in Hartford, Connecticut, on January 5, 1909. He received a bachelor's degree from Amherst College in 1930 and a Ph.D. from Princeton University, under the direction of Alonzo Church, in 1934. For most of his career, Kleene was a member of the mathematics faculty at the University of Wisconsin at Madison, first as an instructor and assistant professor from 1935 to 1941, and then as full professor from 1946 until his retirement in 1979. He was appointed Cyrus C. MacDuffee Professor in 1964. In 1941, he returned to Amherst for a brief period as an associate professor. From 1942 to 1945, he served in the U.S. Navy as a navigation instructor at the Naval Reserve's Midshipmen's School and later as a project director at the Naval Research Laboratory in Washington, D.C. He achieved the rank of Lieutenant Commander.

Professor Kleene was one of the most important mathematical logicians of the twentieth century. The exciting period in mathematical logic that followed the appearance of Kurt Gödel's completeness and incompleteness theorems coincided with Kleene's graduate years at Princeton, where he attended Gödel's lectures at the Institute for Advanced Study. During this period, along with Gödel, Alonzo Church, Emil L. Post, Alan Turing, and Kleene's friend and fellow student J. Barkley Rosser (who joined him at Wisconsin in 1963), Kleene created recursive function theory, his major lifelong research interest. Kleene's greatest impact was as the principal developer of this theory, which investigates computability and undecidability in mathematics. A major branch of contemporary mathematical logic, recursive function theory is of central importance in computer science. Kleene is responsible for many of the fundamental results in the area, including the Kleene normal form theorem (1936), the Kleene recursion theorem (1938), the development of the arithmetical and hyperarithmetical hierarchies in the 1940's and 1950's, the Kleene-Post theory of degrees of unsolvability (1954), and higher-type recursion theory, which he began in the late 1950's and returned to in the late 1970's. His 1952 book, *Introduction to Metamathematics*, laid the foundations of the subject and inspired several generations of logicians. Beginning in the late 1940's, Kleene also worked in a second area, Brouwer's intuitionism. Using tools from recursion theory, he introduced recursive realizability, an important technique for interpreting intuitionistic statements. In the summer of 1951, at the Rand Corporation, he produced a major breakthrough in a third area when he gave an important characterization of events accepted by a finite automaton.

In addition to supervising the work of 13 Ph.D. students at Wisconsin, Kleene served two terms as chair of the Mathematics Department and one term as chair of the Numerical Analysis (now Computer Sciences) Department. From 1969 to 1974, he was Dean of the College of Letters and Science. Kleene was president of the Association for Symbolic Logic in 1956-1958 and editor of the Journal of Symbolic Logic for twelve years. He served as president of the International Union of the History and the Philosophy of Science in 1961 and of the union's Division of Logic, Methodology, and Philosophy of Science in 1960-1962, and was a founder of both. He was elected to the National Academy of

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Sciences in 1969. At a symposium held at the University of Wisconsin in honor of his 70th birthday in 1978, he presented an important paper on higher-type recursion theory. In 1983 he won the American Mathematical Society's Steele Prize for his seminal 1955 papers on recursion theory and descriptive set theory, and in 1990 he was awarded the National Medal of Science, the nation's highest scientific honor.

Kleene had a strong interest in nature and the environment and visited his family farm in Maine almost every summer. He discovered a variety of butterfly, *Beloria todde ammiralis ab. kleenei.* Although a private man, he was a skillful and enthusiastic teller of anecdotes. He possessed a powerful voice that always made it possible for others to know without seeing him whether he was in the math building. In 1942, Kleene married Nancy Elliot, who died in 1970. In 1978, he married Jeanne Steinmetz, who survives him. He is also survived by three sons and a daughter from his first marriage, three stepchildren from his second marriage, and ten grandchildren.

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