

CHARLES BROWN TOMPKINS

1912–1971

We regretfully announce the demise on January 11, 1971 of our former editor, Dr. C. B. Tompkins, a pioneer in the fields of numerical analysis and computing. He served diligently as chairman of the editorial committee from 1955 to 1958 and worked as an editor in 1959, when the journal was called *Mathematical Tables and other Aids to Computation*.

Professor Tompkins was born in Florida in 1912. He received his training through the M.A. at the University of Maryland in chemistry, physics, and mathematics, and took his Ph.D. in mathematics at the University of Michigan in 1936. After a year as Instructor at Maryland, he spent two years as a National Research Council Fellow at Princeton University and the Institute for Advanced Study, followed by three years as Instructor at that University. During these years, he became associated with Professor Marston Morse and the latter's Calculus of Variations in the Large; the papers he wrote in collaboration with Professor Morse played a significant role in the development of this important field. He has also held a Visiting Lectureship at the University of Wisconsin. During the Second World War, he served as a Naval Communications Officer in the Pacific, rising to the rank of Lieutenant Commander. His experiences there impressed upon him the need for the development of high speed computers, and, accordingly, in 1946, he became one of the founders of Engineering Research Associates in St. Paul, Minnesota. Out of this firm have evolved two of the important present day computer builders: the Univac Division of the Sperry Rand Corporation, and the Control Data Corporation. In 1949, he organized, on behalf of the Office of Naval Research, the Logistic Research Project at George Washington University. He served as consultant and member of advisory panels to various governmental agencies. In this connection, he played a major role in the development of Project SCAMP, which later became an integral part of the Institute for Defense Analyses at Princeton. He also served as consultant to various computer corporations.

Professor Tompkins came to UCLA in 1951 as a member of the Institute for Numerical Analysis, then sponsored on the campus by the National Bureau of Standards. Soon after, he became the Director for the Institute, and joined the Department of Mathematics in 1954. At the same time, he became Director of Numerical Analysis Research, the successor organization to the Institute for Numerical Analysis. He was among the first to recognize the formidable role computers were to play in our society and strove endlessly to establish a strong computer center at UCLA. He played a key role in developing one of the country's most powerful computing activities, and the eminent position in computing at UCLA, acquired at an early date, was due largely to his efforts and his vision. When the UCLA Computing Facility was set up in 1961, he became its first Director.

Professor Tompkins was an active member of the American Mathematical Society and served on its Council. He was a member of the first Council of the Association

This obituary notice was prepared by Dr. John Todd after the one prepared at the University of California, Los Angeles, by Professors J. W. Green, M. R. Hestenes and M. Melkanoff.

for Computing Machinery. In addition to his editorial services for this journal, he was an associate editor of the Office of Naval Research publication, *Naval Research Logistics Quarterly* since its beginning in 1954 until his death.

Professor Tompkins was keenly interested in teaching and devoted himself unselfishly to his students, particularly to those at the Ph.D. level; they, in turn, were enthusiastic and loyal to him. Like many numerical mathematicians of his generation, he was trained in pure mathematics and only turned to numerical mathematics because of his activities in World War II. His theoretical background and practical—indeed, engineering experience—gave him a very balanced outlook on the subject. He was continually advocating the broadening of the mathematical curriculum and organizing seminars. He was convinced that mathematics and computers would have an increasingly significant role to play in many new fields of research, and, accordingly, he enthusiastically organized and conducted interdisciplinary colloquia.

In 1937, he married Mary Lewis; they had two daughters and two sons. Most of his family has been active, in one way or another, in the computer field.

PUBLICATIONS

"Linear connections of normal space to a variety in euclidean space," *Bull. Amer. Math. Soc.*, v. 41, 1935, pp. 931–936.

A Type of Integral Invariant Associated with a Defined Class of N-Dimensional Variety in Euclidean (2N - 1)-Space, Thesis, University of Michigan, Ann Arbor, 1936.

"Isometric embedding of flat manifolds in Euclidean space," *Duke Math. J.*, v. 5, 1939, pp. 58–61.

"Classification of curves on a two-dimensional manifold under a restricted set of continuous deformations," *Ann. of Math. (2)*, v. 40, 1939, pp. 386–391.

"Fréchet deformations and homotopy," *Ann. of Math. (2)*, v. 40, 1939, pp. 392–399.

"*The existence of minimal surfaces of general critical types," *Ann. of Math. (2)*, v. 40, 1939, pp. 443–472. [For a correction see *Ann. of Math. (2)*, v. 42, 1941, p. 331.] MR 2, 227.

"*Unstable minimal surfaces of higher topological types," *Proc. Nat. Acad. Sci. U.S.A.*, v. 26, 1940, pp. 713–716. MR 2, 226.

"*The continuity of the area of harmonic surfaces as a function of the boundary representations," *Amer. J. Math.*, v. 63, 1941, pp. 825–838. MR 3, 249.

"*Minimal surfaces not of minimum type by a new mode of approximation," *Ann. of Math. (2)*, v. 42, 1941, pp. 62–72. MR 2, 227.

"*Unstable minimal surfaces of higher topological structure," *Duke Math. J.*, v. 8, 1941, pp. 350–375. MR 3, 55.

[The starred papers were written in collaboration with Marston Morse.]

"A flat Klein bottle isometrically embedded in Euclidean 4-space," *Bull. Amer. Math. Soc.*, v. 47, 1941, p. 508. MR 2, 301.

"Projection methods in calculation," *Proc. Second Sympos. in Linear Programming*, Washington, D. C., 1955, Nat. Bur. Standards, Washington, D. C., 1955, pp. 425–448. MR 17, 537.

"Machine attacks on problems whose variables are permutations," *Proc. Sympos. Appl. Math.*, vol. 6, Amer. Math. Soc., Providence R. I., 1956, pp. 195–211. MR 18, 238.

"*What you should know about digital computers," *Chem. Engin. Progress*, v. 52, 1956, pp. 451–454. [This paper was written in collaboration with F. H. Hollander.]

"John von Neumann, 1903–1957," *Math. Tables Aids Comput.*, v. 11, 1957, pp. 127–128. MR 19, 108.

"*An extension of a theorem of Dantzig's, in *Linear Inequalities and Related Systems*, *Ann. of Math. Studies*, no. 38, Princeton Univ. Press, Princeton, N. J., 1956, pp. 247–254. MR 18, 459. [This paper was written in collaboration with I. Heller.]

"Methods of steepest descent," in *Modern Mathematics for the Engineer*, First series, E. F. Beckenbach (Editor), McGraw-Hill, New York, 1956, Chapter 18.

"*Maximizing functions of rotations," *J. Assoc. Comput. Mach.*, v. 4, 1957, pp. 459–466. [This paper was written in collaboration with D. A. Pope.]

"Some aspects of mathematics in social sciences," *Naval Res. Logist. Quart.*, v. 7, 1960, pp. 335–356. MR 23 #B2069.

"*The size of the 10×10 orthogonal lattice square problem," *Proc. Sympos. Appl. Math.*, vol. 10, Amer. Math. Soc., Providence, R. I., 1960, pp. 71–83. [This paper was written in collaboration with L. J. Paige.]

"Method of successive restrictions in computational problems involving discrete vari-

ables," *Proc. Sympos. Appl. Math.*, vol. 15, Amer. Math. Soc., Providence, R. I., 1963, pp. 95-106.

"Sperner's Lemma and some extensions," in *Applied Combinatorial Mathematics*, E. F. Beckenbach (Editor), Wiley, New York, 1964, Chapter 5.

"Mathematical techniques for on-line systems," *On-line Computing Systems*, American Data Processing, Detroit, Mich., 1965, pp. 25-35.

BOOKS

High-Speed Computing Devices, by the staff of Engineering Research Associates, Inc., supervised by C. B. Tompkins and J. H. Wakelin, edited by W. W. Stifter, Jr., McGraw-Hill, New York, 1950.

"Preface, pp. v-vii," to D. L. Bernstein, *Existence Theorems in Partial Differential Equations*, Ann. of Math. Studies, no. 23, Princeton Univ. Press, Princeton, N. J., 1950.

Elementary Numerical Analysis (with W. L. Wilson), Prentice-Hall, Englewood Cliffs, N. J., 1969. MR 40 #3670.

In addition to these formal publications, there are many internal reports written for the organizations with which he was associated and which continue to be of value to those who possess them. Also, Professor Tompkins held several patents which arose out of his war-time work.