Morrough Parker O'Brien

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Morrough Parker O'Brien, dean emeritus of the College of Engineering, University of California, Berkeley, an engineering educator of renown, founder of modern coastal engineering, and consultant on a wide variety of vital engineering projects, died July 28, 1988, at his home in Cuernavaca, Mexico, at age eighty-five. He is survived by his wife, Mary, of Cuernavaca; a son, Morrough, of Boulder, Colorado; and a daughter, Sheila, of Berkeley, California.

> Mike, as he was known to close acquaintances, was a dynamic and powerful person. He enjoyed tackling problems and getting things done through hard work. He did not shrink from making decisions, and once made, he did his best to implement them. He was conscientious and always thoughtful in his approach, but persevering. His interests were broad and his knowledge pervasive. One of his most important characteristics was always looking ahead trying to foresee what was to occur. (University of California: *In Memoriam,* 1988, Academic Senate.)

He foresaw the coming changes in engineering from a largely descriptive approach to an analytical basis and proceeded to guide the Berkeley and national education programs in this direction. He was also alert to the importance and difficulties of effective technology transfer from research to practical application. Many of his ideas, and details on

how he implemented them, are given in the 312-page printed version of his oral history, *Morrough P. O'Brien: Dean of the College of Engineering, Pioneer in Coastal Engineering and Consultant to General Electric, An Oral History Conducted 1986-88 by Marilyn Ziebarth,* Regional Oral History Office, The Bancroft Library, University of California at Berkeley, 1988.

Mike was born September 21, 1902, in Hammond, Indiana. He completed high school in Toledo, Ohio, and after some starting college studies entered the Massachusetts Institute of Technology at Cambridge, Massachusetts, receiving his B.S. in civil engineering in 1925. After two years of graduate work at Purdue University, he was the John R. Freeman Scholar of the American Society of Civil Engineers for study of fluid mechanic subjects in Germany and Sweden. Throughout his career he kept on the "cutting edge" of engineering and science by extensive self-study.

Mike always combined his considerable faculties for teaching, research, and professional engineering for mutual enhancement of achievements. His academic base was the College of Engineering at the University of California, Berkeley, from his appointment as assistant professor of mechanical engineering in 1928 to his recognition at retirement in 1959 as the dean emeritus of the College of Engineering. He received his professorship in 1936, serving as chairman of mechanical engineering from 1937 to 1943, followed by sixteen years as dean of the college. During his years at Berkeley, the national ratings of excellence for the college increased from good to outstanding. This was recognized by the Regents in awarding him the LL.D. in 1959 and by the Academic Senate in 1988 with the Clark Kerr Award, made to "An individual considered to have made an extraordinary and distinguished contribution to the advancement of higher education." This award was presented to Mike by Clark Kerr, president emeritus of the University of California. Of his many special assignments within the University, we consider his dynamic leadership as Academic Senate chairman during the faculty loyalty oath controversy and as

institutional representative for the University Engineering, Science, Management War Training Program from 1941 through 1944 to be good examples. He was a most capable, yet demanding and interesting, classroom teacher as well as the author or coauthor of over a hundred published articles including many on technical subjects and engineering education, and coauthor of *Applied Fluid Mechanics,* published by McGraw Hill in 1937 (one of the first three texts to present the then new methods of treating flow problems). The building on the Berkeley campus that houses the Hydraulic Engineering Laboratory and the Water Resources Center Archives is named O'Brien Hall in his honor.

While in Berkeley, Mike completed, in a consulting capacity, many engineering assignments in a wide range of applications, such as pump selection and performance testing, fluid meters standards, propulsion systems for amphibious tanks (FMC Corporation), regulation of the estuary of the Columbia River, and sand bypassing at the Santa Barbara Harbor, California (probably the first such application as the solution to a common problem and now in general use). With the U.S. Navy Bureau of Ships, he was concerned about underwater sound and propeller noise, as well as torpedo design with General Electric Company. He also participated at Bikini (1946) in "Operation Crossroads." On leave from the University as director of research and development for more than a year for the Air Reduction Company (Airco), he worked with a wide variety of engineering technical and management problems, establishing the research and development activities of that company.

Mike was executive engineer of the Radiation Laboratory under Professor Ernest O. Lawrence in 1942-43. O'Brien was asked by Lawrence and General Groves, the Manhattan Project director, to recruit an engineering team to design the production facilities at Oak Ridge for the electromagnetic system. He has said that probably the most important thing he did in his life was to convince them that there was not time to build a competent staff, and that they should hire

companies with an established engineering staff to do the job.

O'Brien was the founder of modern coastal engineering. He wrote a number of papers that have had a lasting influence and encouraged others to work successfully in solving coastal problems. He was appointed civil engineer for the U.S. Army Board on Sand Movement and Beach Erosion in 1929, and initiated this board's research on coastal engineering by personally conducting field studies on the New Jersey and Long Island shores. In 1930 he made field studies along the coasts of Washington, Oregon, and California and wrote a detailed seven-volume report on the results of his observations. A landmark paper on the relationship between tidal prisms and entrance areas of natural estuaries was one of the results of these studies. He summarized many of his early observations in his paper "The Coast of California as a Beach Erosion Laboratory" *(Shore & Beach,* July 1936). His work on sand bypassing was mentioned above. His work in using graphical means of estimating wave refraction was done a few years later. In 1938 he was appointed a member of the Beach Erosion Board, U.S. Army Corps of Engineers, and served on it until is was abolished in 1963. He was then appointed to its successor, the Coastal Engineering Research Board, serving from 1963 until 1978, a total of forty years on the two boards.

During World War II, he worked for the U.S. Navy Bureau of Ships on subjects described above, and he directed a program of field and laboratory studies of landing craft. With Professor H. U. Sverdrup of the Scripps Institute of Oceanography, he also worked on the forecasting of waves. Examples of his work are given below. The use of dimensionless parameters relating wind speed, fetch, and wave height and period were thought of by Mike at that time, and he recommended their use in a memorandum to Sverdrup and Walter H. Munk; they are still in use today. Around 1950 Mike conceived of the equation containing both viscous and inertial terms expressing forces exerted by waves on pile-supported

coastal and offshore structures. The equation, developed by one of his graduate students (J. R. Morison) through extensive laboratory tests and by others at the University through field tests, has been used in the analysis of wave loading of nearly every coastal and offshore structure using piles, columns, and/or tubular bracings.

Mike and Professor Joe W. Johnson started what are now known as the International Conferences on Coastal Engineering. The first was held in Long Beach, California, in 1950; the most recent, the twenty-first, was held in Torremolinos, Spain, in 1988, with Mike still active in choosing the more than 250 papers presented at the conference. He served as president of the American Shore and Beach Preservation Association from 1972 through 1983.

After his retirement from the University, Mike made many visits to the University of Florida during an interval of twenty-one years; he was very interested in the coastal processes along the extensive Florida coastline. His close colleague there, Professor Robert G. Dean, commented on Mike's continued love for visiting and observing beaches and raising questions during such a trip that would provide research topics for several graduate students. During these exchanges with the students, he would "range out" beyond the limits previously identified; provide the benefits of his experience and background on related problems; and infuse the students with enthusiasm, motivation, and direction. He continued this activity through his last visit in 1988.

About 1950 Mike began his longtime consulting on technical and management problems with the General Electric Company, where he was still active at his death. Although he was associated with other divisions, his most significant work was with the Aerospace and Defense Group where the compressor design for the first American axial-flow jet engine was laid out exactly in accordance with the method presented in the paper by O'Brien and Folsom entitled *The Design of Propeller Pumps and Fans.* He was elected to the General Electric Company Propulsion Hall of Fame in 1984.

Mike received three honorary degrees: D.Sc., Northwestern University; D.Eng., Purdue University; and LL.D., University of California. He was an honorary member and fellow of the American Society of Civil Engineers and the American Society of Mechanical Engineers, and elected to honorary membership in the American Society for Engineering Education in 1969 (awarded the Lamme Award in 1968) and the Japan Society of Civil Engineers in 1988. He was elected to membership in the National Academy of Engineering in 1969. (Note: In 1956 Mike suggested to the president of the Engineers' Joint Council, Enoch Needles, that a national academy of engineering might be a good idea. *The Making of the NAE: The First 25 Years,* by Lee Edson, National Academy Press, 1989). Mike was a member of the National Research Council's Committee on Engineering Implications of Changes in Relative Mean Sea Level (1984-1987); the Army Scientific Advisory Panel from 1954 to 1965, serving as its chairman from 1961 to 1965; the Defense Science Board from 1961 to 1965; and the Board of the National Science Foundation (a presidential appointment) from 1958 to 1960. For his service to the U.S. government, he was twice awarded the Distinguished Civilian Service Medal by the Secretary of the Army.