

FORREST M. HOLLY JR. (1946–2017)

Forrest Merton Holly Jr., distinguished hydraulician, leader in civil engineering, and stimulating companion, passed away on Monday, May 22, 2017. His professional life was filled with significant advances in computational hydraulics, understated leadership, and many interests that he pursued energetically. He gained the esteem, gratitude, and affection of the many people with whom he came in contact. His service as IAHR president (2000–03) reflected his genial, highly competent approach to the tasks he tackled.



Forrest Holly, a native of La Jolla, Calif., completed his undergraduate studies at Stanford University in 1968. He went on to earn the MS degree from the University of Washington and in 1975 obtained the PhD degree from Colorado State University. His PhD thesis was titled *Two-Dimensional Mass Dispersion in Rivers*. His thesis advisers at Washington and Colorado State were noted hydraulicians Ron Nece and Daryl Simons, respectively. In the course of attaining his formal education, Forrest worked short periods with the U.S. Army Corps of Engineers in Vicksburg, Miss.; and with Northwest Hydraulics Consultants in Edmonton, Alberta. In 1968, Forrest married Joyce Nowry, forming a close, supportive partnership that became a delightful aspect of their interactions with friends and acquaintances.

Forrest's special expertise was in computational hydraulics, particularly the modeling of dispersion and water-quality processes and flows in alluvial rivers. Upon graduating with the PhD, Forrest worked for a year with the consulting firm Dames and Moore in Washington, D.C., then moved overseas to Grenoble, France, where he spent the next five years (1976–81) at SOGREAH (Société Grenobloise d'Etudes et d'Applications Hydrauliques). SOGREAH, an engineering firm initially associated with the hydraulics laboratory at the University of Grenoble, was renowned for its work in civil engineering hydraulics. While at SOGREAH, Forrest worked with leading computational hydraulicians Alexandre Priessmann and Jean Cunge, developing numerical models for hydraulics applications. One outcome of his work at SOGREAH was the Holly-Priessmann scheme, which became widely used for numerically solving the advection-dispersion equations formulated to describe the spreading of material or heat in flowing water. Jean Cunge, below, extends this obituary with further thoughts from Forrest's time with SOGREAH.

Seizing the opportunity to delve further into the theoretical underpinnings of computational hydraulics, Forrest became a visiting research scientist in the Mathematics Department at the University of Reading, England (1981-82). There, he pursued the development of numerical methods for modeling pollutant dispersion in two-dimensional situations of unsteady flow in rivers.

The six years Forrest spent in France and England fostered his appreciation (and frequent enjoyment) of the differences in manner and approach encountered in countries other than the USA. Additionally, his insight into the ways of doing things in various countries, along with his familiarity with hydraulicians from around the world, gave him an international perspective that energized his career development and made him well-suited to be an IAHR president motivated to advance hydraulics internationally.

However, Forrest's long-term goal was to return to the United States and to contribute to that nation's engineering education and research while living there with his family. In 1982, Jack Kennedy, then director of the Iowa Institute

for Hydraulic Research (now IIHR—Hydrosience & Engineering) at the University of Iowa (UI), recruited him to join IIHR and UI, where he spent the rest of his academic career. Appointed first as associate professor, he in due course gained tenure as professor (1990). Forrest became chair of UI's Department of Civil and Environmental Engineering (1995–99) and eventually associate dean for academic programs in UI's College of Engineering (1999–2003). He retired from UI and IIHR in 2003, although he stayed engaged with some teaching and research activities.

As a UI faculty member, Forrest enjoyed teaching and working with students, and was very effective at both activities. He was

popular with students, who considered him to be a motivational and articulate instructor. He gained two teaching awards while at UI. In 1991, he received the department's Chi Epsilon Outstanding Teacher Award, and in 1995 the college's Outstanding Teacher Award. Forrest was committed to the professional development of civil engineering students. From 2000–08, he was a member of Iowa Engineering and Land Surveying Examining Board, chairing the board in 2006. Also, he was a registered engineer in eight states of the USA plus Alberta, Canada; most U.S. civil engineers are registered in only one or two states.

A joke shared among Forrest's IIHR colleagues was that his first graduate-student advisee was an elderly gentleman named Frank. Nobody quite knew how Frank got admitted to UI's graduate program, and some even wondered if Frank was a homeless person, but Forrest was game enough to take him on as an advisee. One day, Frank, who usually wore an odd well-worn pinstriped suit, was sitting with Forrest when IIHR Director Jack Kennedy wandered by. Frank loudly remarked, "Who is that tall guy?" Forrest said, "That's Professor John F. Kennedy." Frank replied, "So, he's named after the president?" Kennedy tersely retorted, "No, my mother named me after the airport!" and walked on. This joke, occasionally recalled by Forrest, is indicative of the sense of fun with which he undertook his work.

Forrest never lost his keen interest in investigating complex river hydraulics and sedimentation problems and offering consultant service as a registered engineer. His areas of special research interest included computational hydraulics, dispersion in natural waters, alluvial-river processes, urban hydraulics, thermal discharges, and irrigation control systems. One research project, for example, involved numerical simulation of flow and heat dispersion from thermal power plants along the Illinois River. He published widely in peer-reviewed academic journals, and was a frequent presenter at conferences and symposia. In 1980, he co-authored a popular reference in computational methods for river processes (*Practical Aspects of Computational River Hydraulics*, by Cunge, Holly and Verwey, Pitman Publishing). In 1983, Forrest received IAHR's Arthur T. Ippen Award for his demonstration of exceptional ability and promise for continued research productivity. Additionally, UI selected him for a Faculty Scholarship to aid his research during the period 1985–88. He received the Hunter Rouse Hydraulic Engineering Lecture Award from the American Society of Civil Engineers (ASCE) in 2000 in recognition of his outstanding contributions to hydraulics and waterways. Twice in preceding years, 1995 and 1998, he received the Best Technical Note Award in ASCE's *Journal of Hydraulic Engineering*. In 2001, he received IAHR's Harold J. Schoemaker Award for his article in the *Journal of Hydraulic Research*. The article, *Two-phase Formulation of Suspended Sediment Transport*, was judged the journal's most outstanding publication in the two years preceding IAHR's 2001 World Congress.

Though living in the United States, Forrest retained his international perspective. He was an active member of IAHR for many years, serving as a member of the IAHR Council (1988–2003); becoming vice-president (1992–94); and serving as president (2000–2003). In 2007, Forrest was named an Honorary Member of IAHR, the group's most prestigious recognition. He was highly committed to serving IAHR. Also, Forrest was connected to the EuroAqua MS-degree Program in Hydroinformatics at the University of Nice Sophia-Antipolis, France. He made several trips to Nice during the period 2006–2010, participating as a lecturer and serving on its international advisory board; the program was developed by an international consortium of universities. Forrest's English translation of Pierre-Louis Violette's book, *Water Engineering in Ancient Civilizations, 5,000 Years of History*, was published in 2007 as an IAHR Monograph.

As IAHR president, Forrest was responsible for moving IAHR's headquarters from Delft to Madrid, and for introducing IAHR's newly-appointed first executive director, Chris George, to IAHR's membership. Additionally, he and Helmut Kobus created IAHR's student chapter. Further, he was the only IAHR president to bring his skill as a pilot to IAHR's service. In 2000, following IAHR's Hydroinformatics Conference in Cedar Rapids, Iowa, Forrest and Chris flew to the World Bank headquarters in Washington, D.C. Forrest was also IAHR president during the 2001 World Congress in Beijing, two days after the 9/11 disaster in New York. Owing to meetings arranged by Chris George in Tokyo prior to the congress, Forrest was out of the United States when the disaster occurred and was able to manage with his characteristic aplomb and working with the LOC the difficult task of running a successful congress.

In the context of hydraulics history, mention should be made of Forrest's great-grandfather, Birdsell Holly (1822–94). Willi Hager's book *Hydraulicians in the USA, 1800–2000*, includes Birdsell Holly as an early engineer engaged in the manufacture of hydraulics machinery. Forrest would speak admiringly of his great-grandfather's pioneering work developing pump systems for supplying water to many communities in the United States.

Forrest always displayed a certain independence of spirit. While earnestly dedicated to the advance of hydraulics (especially computational hydraulics) and engineering education, he also set and followed his own path in life. He could have gone on further in hydraulics research or academia, but many other things drew his interest. He liked the practical aspects of engineering consulting, was an avid pilot, became a certified flight instructor, enjoyed repairing old mechanical clocks (his house ticked with them), and in later years became an enthusiastic stargazer, to name just a few interests. Forrest and Joyce moved to Arizona in 2008, in part to better pursue their interests. When he retired from UI in 2003, he founded a small engineering consulting firm, Holly and Associates. His last consulting project, completed in late 2016, involved computational modeling of water flow along a reach of the Illinois River.

Forrest Holly was a valued colleague, mentor, and friend to many people. He is survived by Joyce and their son Lance and daughter-in-law Laureen.

By Jackie Hartling Stolze, Rob Ettema, Larry Weber and Chris George

Further Thoughts on a Great Friend: Forrest M. Holly Jr.

By Jean A. Cunge

Forrest stayed with SOGREAH in France for five years, beginning in 1976. SOGREAH was a private consulting engineering company, probably one of the last, if not the last, that succeeded in carrying out engineering hydraulics and water resources projects and development and research projects at the same time. The links with the University of Grenoble were of the person-to-person kind, not formal. The reputation of the company was such that, when the idea of coming to Grenoble "for some time" was put before Forrest, he did not wait long time to accept.

Forrest was a musician—he played guitar—and he had perfect musical ear. This helped enormously in quickly learning French. At the beginning, it was rather colloquial French, but after a couple of months he was perfectly integrated within the team. His participation in development of SOGREAH's CARIMA (the world's first commercial software allowing numerical modelling of 1D-2D combined flood situations) in 1976–77 was extremely important. At the same time, given SOGREAH's position as a private consulting company, Forrest worked on engineering projects on coastal pollution, modelling urban sewage networks, and other topics. Leaders were stupefied in Marseilles when the Director of the State pollution-control authorities put before decision-makers, "the study of coastal outfall consequences presented by Forrest Holly from SOGREAH" – stupefaction because Forrest was American and his French at this time was very, very much colloquial. But the director, M. De Rouville, insisted, "He did the job, and the result is exceptional; it's up to him to present, but in French, please."

Forrest and Joyce created many personal links with colleagues at work and friends in town during their stay in France. Those links remain strong today. When they went back to the United States, Forrest was instrumental in admitting to the University of Iowa several younger engineers from SOGREAH for periods of 6–12 months. This activity was exceptional, leading to reciprocal exchanges of engineering ethics, knowledge, and working habits. The French "expatriates" of one year, such as Jean-Marc Usseglio, Patrick Sauvaget, and Jean-Luc Rahuel, all became important leaders of research, engineering, and management at SOGREAH, and then at the ARTELIA Group (the biggest private French consulting firm), and also in French hydraulics.

I feel that something concerning Forrest's family should be added. There is no doubt that Forrest's character was forged by his parents, both of whom were blind. This was an extraordinary situation that did not stop his family from living full lives. For example, his father was a building contractor. When his parents visited Europe, they went to all the famous art galleries where they admired famous paintings. Although they could not see the paintings, the artworks were described to them by Forrest's sister, who accompanied them. Forrest followed his career path far from his parents, and it was not easy for all concerned. Certainly, the family's religious convictions and faith were important, but also important were their individual characters.