



MIHRAN S. AGBABIAN

1923–2019

Elected in 1982

“Contributions in the application of advanced methods of applied mechanics to structural design, and contributions in the field of structural response to blast and shock and the reduction of seismic hazards to existing structures.”

BY ARMEN DER KIUREGHIAN AND PAUL AGBABIAN

MIHHRAN SIRAGAN AGBABIAN, known to his early professional colleagues as Mike, passed away on February 12, 2019, at the age of 97.

He was born in Larnaca, Cyprus, on December 9, 1923, to Siragan and Parouhi Agbabian, who had fled Eastern Turkey during the Armenian persecutions of the early 20th century. He had an older brother who died of tuberculosis in his early 20s, and a younger sister and brother, Lucina and Hrant. His father was a Protestant Armenian minister who, 9 years after Mihran’s birth, moved the family to Aleppo, Syria, where he had been invited to be the pastor of the Emmanuel Armenian Evangelical Church. A significant Armenian community had settled in Syria following the demise of the Ottoman Empire, and the Syrians were a friendly host during the British Mandate. Mihran’s Armenian Evangelical family upbringing significantly influenced his life of service to his profession and his Armenian heritage.

Mihran showed an early interest in science, mathematics, and physics while attending high school in Aleppo. Upon graduation he attended the American University of Beirut, where he graduated with a BA in physics in 1944. These were the war years, and he decided that physics might be a difficult professional course, so, while serving part-time as a radio operator

for the British, he followed his BA with a BS in engineering in 1947. He applied to UK and US graduate schools and was granted a full scholarship with room and board at Brighton College. On the eve of his departure for Britain, he received an acceptance to the California Institute of Technology, which was his preference. He returned his paid fare to the British Embassy and arranged his travel to Pasadena.

One challenge with attending Caltech was that he did not receive a scholarship and his acceptance was contingent on his ability to provide for tuition and accommodation. He debarked in New York City with \$50 and the suit he was wearing, but an Armenian family friend loaned him money for the cross-country train journey to Pasadena. A cousin and her husband offered him lodging on Hill Street adjacent to the campus, which he paid for via a teaching assistant job at Caltech.

After he earned his MS in civil engineering in 1948, he wanted to get his doctorate in structural mechanics and traveled to Berkeley, thinking he might continue his education at the University of California, Berkeley. To his dismay, he learned that the school was not offering a doctoral program in structural mechanics. However, a young assistant professor, Egor Popov, took him under his wing and introduced him to the chair of the Civil Engineering Department to make the case for starting a doctoral program. Mihran returned to Caltech and a few months later received a letter informing him that he would be the first student in the newly formed doctoral program in structural mechanics at UC Berkeley.

While at Berkeley, Mihran courted and later married Elizabeth Apkarian, also the daughter of an Armenian Protestant minister who was the pastor of a church in Oakland. Elizabeth became Mihran's lifelong partner, supporting his professional career as well as his work for the Armenian community.

Upon receiving his PhD in 1951, Mihran started his professional career at Bechtel in San Francisco. In 1955 he and Elizabeth moved to Los Angeles, where he worked for a short time at the firm of John Minassian & Associates before continuing his engineering work at the Ralph M. Parsons

Company (1955–62), where he rose to the position of chief engineer.

Mihran had the entrepreneurial bug and decided to join with Stanford professor of mechanical engineering Lydik S. Jacobsen, a pioneer in structural dynamics, to form an engineering consulting firm in 1962, which they named Agbabian Jacobsen Associates. When Jacobsen retired in 1969, the firm was renamed Agbabian Associates (AA). Its stated mission was to provide in-depth consulting of the highest technical level to government and industry for the design, analysis, and testing of civil and military structures and mechanical systems.

Throughout the 1960s many of the firm's contracts revolved around Cold War defense work, including structural hardening of facilities to withstand nuclear attacks. Their customers included the Nuclear Regulatory Commission (US NRC) Atomic Energy Commission, US Air Force, and National Science Foundation. His work for the NSF renewed Mihran's interest in research and academia, interests that endured the rest of his life.

Defense work was important, but after Jacobsen's retirement AA chose to expand into other areas that could benefit from the practice of structural and civil engineering and experimental mechanics. Mihran acquired assets from a small firm called DigiTek to augment AA's capabilities with an automotive crash testing facility in Mira Loma and computer software packages developed by University Software Systems, including the MAC/RAN software for time series, shock, and spectrum analysis of digitized vibration data. He also ventured into adjacent projects, such as aeroelectric power, which required sophisticated structural engineering for the design of extremely tall towers—up to 5000 feet from the desert floor—that could sustain high wind forces.

After the 6.5 magnitude 1971 San Fernando earthquake, AA's expertise in vibrations and structures became important in the updating of building codes and new design methods for tall structures, nuclear reactors, and hospitals to withstand high-magnitude tremors.

AA's research projects in 1975–79 included analysis of geotechnical and strong motion earthquake data from US accelerograph stations, with historical data from earthquakes such as the 1940 El Centro earthquake in Imperial Valley, CA. Statistical analyses of earthquake ground motion parameters were carried out for the US NRC's Division of Reactor Safety Research.

Mihran became more involved with the Earthquake Engineering Research Institute during the 1970s and 1980s, and was president in 1983–84. He also served as the coordinating editor of the *EERI Monograph Series*, with contributions by some of the most important names in earthquake engineering, including George Housner, Nathan Newmark, Anil K. Chopra, and Donald Hudson.

AA was a strong proponent of computer simulations of structures under load from ground motions using the finite-element method, originally developed by Ray Clough. Mihran wanted AA to have a stronger research focus in this area and began a visiting professor program with the University of Southern California and UC Berkeley, bringing in consulting professors such as Sami Masri, Thomas Hughes, and the author (ADK) to work on research projects with the AA technical staff. At the time a young assistant professor at USC, the author later became his partner and cofounder of the American University of Armenia (AUA).

In 1982 Masri suggested that Mihran apply for the newly vacant Fred Champion Chair of Civil Engineering Department at USC. The university wanted to bring in practical industry experience to better equip students for their careers and to assist with fundraising that would help make USC's engineering school a world-class institution. Mihran chaired the department from 1984 to 1992 and retired as professor emeritus in 1998. During his tenure, he planned and raised funds for new laboratories in instructional and research programs. In particular, the structures, dynamics, concrete, geotechnical, hydromechanics, and strong ground motion labs of the department were revitalized. His fundraising efforts produced a continuous stream of research

funds that allowed for the purchase of state-of-the-art experimental equipment.

As department chair, he had a prominent role in the initial proposal for a California-based national center for earthquake engineering. His stature at the national level contributed to the ability of the School of Engineering to receive funding from private organizations and public agencies.

Other achievements included the creation of undergraduate degree programs in civil engineering–environmental engineering and in environmental engineering. At the time of his retirement, the number of students in these programs represented one third of the undergraduate civil engineering enrollment.

On December 7, 1988, the Soviet Republic of Armenia was struck by a devastating earthquake. More than 25,000 people died, more than 100,000 were injured, and half a million became homeless. The US National Academy of Sciences and US Geological Survey dispatched a reconnaissance team of 22 seismologists and earthquake engineers to Armenia. Mihran and the author were members of that team. Upon investigation of the effects of the earthquake and the poor quality of structural design and construction, they resolved to take action to improve the quality of education and training in earthquake engineering in the country.

In March 1989 they prepared a proposal to establish an American-style university that would promote evidence-based inquiry and critical thinking and serve as a bridge between western academia and Armenian educational and research institutions. After receiving a promise of funding from the Armenian General Benevolent Union, they approached the University of California for assistance in establishing the new university. In June 1990, the University of California President's Office sent 11 academics to Armenia including Mihran and ADK. Upon their return, the UC team recommended offering support and leadership to the nascent American University of Armenia. Mihran was appointed the founding president of the university in March 1991. In July 1991 a proposal for affiliation between the University of California and the AUA was approved by the UC Board of Regents and an agreement

was signed by Agbabian and UC president David Gardner in September 1991, a momentous event that charted the course of AUA. The American University of Armenia started its instructional programs on September 21, 1991.

Mihran was president of AUA until 1997. During the 6 years of his presidency, he planned and implemented all the essential elements of a modern university—academic programs with faculty and deans, offices for admissions, registrar, accounting, information and communication technologies, alumni and career development offices, and even the student council and faculty senate. Due to the breakup of the Soviet Union and blockade of Armenia by its neighbors, the living conditions were extremely difficult and there were severe shortages of food and essential utilities. Realizing how difficult it was for students to commute and find food, Mihran arranged for food vouchers for them and allowed those who were commuting from distant areas to stay on campus overnight. He organized the first graduation ceremonies in 1993 with complete regalia and a faculty procession typical of American universities. He also developed good relations with the government officials and representatives of other local universities, no small feat considering the cultural and language differences.

With the heavy workload of running AA, chairing the USC Civil Engineering Department, and the effort required to start AUA, Mihran sold his company to the earthquake instrumentation firm Kinometrics in 1989.

In 1982 he was inducted into the National Academy of Engineering, and in 1990 he was elected as a foreign member of the National Academy of Sciences of Armenia. In 1995 he received the Ellis Island Medal of Honor for distinguished immigrants, and in 2001 the Movses Khorenatsi Medal from the president of the Republic of Armenia for exceptional achievement in educational development. The Armenian Church recognized him with the Sahag-Mesrob Medal from His Holiness Catholicos Karekin I, the St. Mesrob Medal from His Holiness Catholicos Aram I, and the St. Vartan Medal from His Holiness Catholicos John Bedros XVIII. Other honors include the UC Berkeley Distinguished Engineering

Alumnus Citation (1987), California Institute of Technology Award of Distinguished Alumnus (2000), and honorary doctoral degrees from Yerevan State University (1994), the State Engineering University of Armenia (2003), and Haigazian University in Lebanon (1980).

Mihran retired from AUA in 1997 and from USC in 1998, but remained active in contributing to both institutions in a volunteer capacity. In particular, he was instrumental in helping to build the USC Institute of Armenian Studies and its endowment fund, and he served for many years as a member of the AUA board of trustees. In 2002 he published *AUA: A New Beginning for a New Generation*, a history of the founding and early years of the AUA. In June 2019 the AUA posthumously bestowed upon Mihran its most prestigious award, the Presidential Commendation, for his role in founding the university and for leading it during the critical initial years.

Mike is survived by his wife of 65 years, Elizabeth Apkarian; sons Paul (Kate Nyberg), Bryan (Valina Ghoukassian), and Michael; and four grandchildren.