Michel Bakhoum

Pioneer of the Built Infrastructure of Africa's Most Populous Nation

By Seif El Rashidi

Think of Egypt, and three monumental engineering endeavors immediately come to mind: the pyramids – timeless, iconic, pioneering. But arguably more critical to the survival of this nation of almost 90 million people is the infrastructure of its modern capital, Cairo, home to a massive 20% of the country's population and host to several million commuters daily. Herein lies the legacy of Michel Bakhoum, master of prestressed concrete, born in the small northern Egyptian town of Tahta in 1913; Cairo- and then US-educated; boundary-pusher, practitioner, and educator.

Few engineers can claim to have designed structures that form the daily lifeline of a nation as Bakhoum did. To his credit lie the Sixth of October and May 15th flyovers (elevated freeways) in Cairo, literally, the arteries which enable one of world's densest and most traffic-ridden cities to function.

In the late 1960s, at the time of the construction of the first phase of the 6th of October flyover, Greater Cairo's population had doubled from 3 million in the late 1940s, and the need for large-scale infrastructure solutions as a response to changing demographics was urgent. Today, running for over 20 kilometers (12.5 miles), "6th of October" (as its users call it) is the longest flyover in Africa. Thanks to the pyramids, it is unlikely that 6th of October would be voted as Cairo's most beautiful landmark, but few of its 500,000 daily users would question its importance as the city's lifeline. As many have experienced, it takes just a small obstruction to the flow of traffic to bring the city to a standstill.

Bakhoum initially studied at Cairo University's Faculty of Engineering (then Fouad I University), obtaining a bachelor's degree in 1936, a master's degree in 1942, and a doctorate in 1945 – just the second to be granted by that department. He then went on to complete a second PhD at the University of Illinois and further studies at Columbia University. It was his specialization in the use of prestressed concrete, as well as his international involvement in the development of the material, that earned Bakhoum and his business partner Ahmed Moharram, a steel specialist, a key place in designing and delivering Egypt's largest construction projects. Many of them reflect a nation grappling with the crippling demands of a soaring population, burgeoning traffic, and limited space.

Like all companies, Bakhoum's, established in 1950, started small. However, he was soon involved in designing the structural elements of a new bridge being constructed across the Nile in Cairo, and it was this that established his reputation as the preeminent concrete engineer in the region. Several larger projects in the Gulf – such as the runways for Kuwait Airport and a major cement factory in Saudi Arabia – made the firm regionally significant and led to its rebranding as Arab Consulting Engineers. Bakhoum's expertise was essential for a region eager to leap ahead, and for which good infrastructure – especially in the form of bridges, high rises, and large public facilities – was critical.

Bakhoum's knowledge of concrete, coupled with Moharram's comparable expertise in steel, made them an ideal combination. They first rose to prominence at a time when Middle Eastern countries were redefining their identities as modern nations, for which national-scale projects were essential. In Egypt, for example, Cairo's International Stadium, its International Fair Ground, and the tunnel connecting mainland Egypt to the Sinai under the Suez Canal were all designed by Moharram-Bakhoum.

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Despite the scale of his endeavors, former office members and students remember Bakhoum as somebody who was quiet, hardworking and very competent in his field, and it was this that led to his professional success. He was also an excellent educator, and tens of thousands of engineers are estimated to have been taught by him over the twenty-year period during which he lectured at Cairo University. A former student and later staff member in his office, Fikry Garas, subsequently became head of Research and Development at Taylor Woodrow, one of Europe's largest engineering firms. He recalls:

"Professor Bakhoum was remarkable as a teacher because, as an international leader in his field, he was up-to-date with all the relevant technological

6th of October Bridge.

6th of October Bridge at night.

advancements around the world in a speciality which was then very new, and so brought valuable professional experience into the lecture hall. He was a soft-spoken man who looked you straight in the eye and explained everything in great detail, but did so with clarity and simplicity so that everything became comprehensible. Nonetheless, just to make sure, he would pause to check that everyone had understood what he had said before proceeding."

It is perhaps testament to his skills as a teacher that his own students went on to great things themselves. Apart from Garas, Bakhoum's protégés include the current Head of the Department of Structural Engineering at the University of California, San Diego; the former head of Civil Engineering at the University of Urbana Illinois; the former Dean of the Faculty of Engineering at Cairo University; and the former Dean of Cairo University – currently the Governor of Giza, Egypt – to name but a few.

Although Michel Bakhoum passed away in 1981, the firm he co-established over 60 years ago still continues to flourish, with Ahmed Moharram still at its head, supported by members of both the Moharram and Bakhoum families, along with a staff of over 800. The legacy of national projects continues. The Egyptian Ministry of Foreign Affairs Building and Cairo's newest flyovers are some of the firm's more recent landmarks, and in the near future, the Grand Egyptian Museum, currently under construction, will be another iconic project under their belt. Further afield, recent projects in places as disparate as Bangladesh, Chad and Mali all owe something to Egypt's quiet concrete king.▪

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