The first person to receive a Ph.D. degree from Carnegie Mellon was Mao Yisheng. In 1917, this young man came to Pittsburgh to study civil engineering, and by 1919, with his academic work done, he returned to China to do great things.

Mao has been called the founder of modern bridge engineering, and he revolutionized bridge building in China by designing several of that country’s most famous bridges, including the dual-purpose road-and-railway Qiantangjiang Bridge. He was a master engineer and scholar. He taught at a number of Chinese universities and served as the president of four. Mao is so respected by the Chinese that in 2006 he was featured on a postage stamp that was part of a series called “Scientists of Modern China.”

Mao’s contributions to engineering and education have been recognized by Carnegie Mellon, as well. In 1979, Mao returned to Pittsburgh, and then University President Richard Cyert and former President John Warner presented him with a lifetime achievement award. More recently, in 2006 an 8½-foot statue of Mao was erected on campus near Porter Hall. The China-based Broad Air Conditioning Company donated the statue, and other donors contributed to the statue’s installation. “The founding of the statue here is very significant. When Chinese engineers visit campus, they usually are quite aware that Mao received his Ph.D. from Carnegie Mellon and want to see his statue,” says James Garrett Jr., the head of civil and environmental engineering. To honor the fact that Mao received his Ph.D. in civil engineering, Garrett’s department established the Mao Yisheng Outstanding Dissertation Award that is given annually to a graduating CEE Ph.D. student in recognition of a high-quality dissertation.

Honoring Mao and his accomplishments is important, but his daughter Madame Mao Yulin believes that it is also necessary to help other young engineers follow her father’s example. The foundation that Madame Mao heads, the Mao Yisheng Scientific and Technical Education Foundation, has given $50,000 to an endowed fellowship fund that will support graduate students from China (or students of Chinese descent) who are studying civil and environmental engineering at Carnegie Mellon. This past June, Madame Mao, along with a delegation of Chinese officials, traveled to Pittsburgh to announce the donation.

“It has become clear to me how revered Mao Yisheng is in the Chinese engineering community, and it’s not just in civil engineering. Engineers in other disciplines also are very aware of him and his many accomplishments,” says Garrett. He explains that Mao’s importance in Chinese engineering and science has also increased that country’s awareness of Carnegie Mellon. He says, “The establishment of this Mao Yisheng fellowship will help young Chinese graduate students do what Madame Mao’s father did early in his career: go abroad and study engineering at Carnegie Mellon.”
“When I went to school, I received help, and now I want to help others.”

When Nicholas Vlahakis (M.S. MechE, 1974) retired in 2005, he was at the top of his field. He was the executive vice president and chief operating officer for Alliant TechSystems, Inc. (ATK). ATK is an advanced weapons and space system company with sales of $4 billion. “From bullets and missiles to spacecraft, ATK manufactures almost anything that flies,” says Vlahakis.

Vlahakis’ career was filled with accolades. In 1991, President George H. W. Bush awarded him the National Medal of Technology for his work on the Pegasus rocket system. Pegasus enables the deployment of satellites from moving aircraft, which offers many advantages. For example, the problems associated with launching satellites from Earth, such as bad weather conditions, can be avoided. Pegasus’ design featured a number of breakthroughs, including the use of graphite in rockets, which just happens to be one of Vlahakis’ areas of expertise. (He credits Carnegie Mellon for expanding his knowledge about the mechanics of materials.)

By most measures, Vlahakis has achieved great success, but he worked hard to get it. He had to make his own way through college. After earning a bachelor’s degree at Northwestern University, he returned to his hometown, Pittsburgh, to find a job. During the 1970s, he worked for Westinghouse in East Pittsburgh. Back then, Westinghouse sent a number of its engineers to night school at Carnegie Mellon. Vlahakis designed generators by day, while pursuing a master’s degree in mechanical engineering. When he left Westinghouse, he moved to Utah to work as a rocket scientist for Hercules Aerospace Company. He added to his academic arsenal with an MBA degree from the University of Utah. Degrees in hand, he spiraled up the corporate ranks. First, he managed programs, followed by plants and divisions. Proving himself a capable leader, he then ran companies. Finally, he was running the entire operations for ATK, a major corporation with 14,000 employees across the United States.

He credits his education for helping him make the most of the opportunities he’s encountered, but there is more to his story. Vlahakis will never forget how his parents and their friends inspired him to excel as an adult and persevere as a child, when his life was less than idyllic.

Vlahakis’ parents, George and Antonia, had both immigrated to Pittsburgh from the Chania region of Crete. With tremendous determination and effort, the Vlahakis family forged their American dream: They opened a bar in downtown Pittsburgh, the Allies Cafe. In 1952, when Vlahakis was just four years old, his father suddenly died, and his mother, who barely spoke English, was forced to run the business and raise three children on her own. By working to provide for her family, she taught her son to work hard and to appreciate the Cretan community that played a large role in their lives.

Today, both of Vlahakis’ parents have passed away, but as a tribute to them and his heritage, a $1,000,000 ATK/Nick Vlahakis Scholarship and Fellowship Fund at Carnegie Mellon was established. “When I went to school, I received help, and now I want to help others,” he says.

Since 2003, financial awards have been given to students studying electrical and computer engineering, mechanical engineering, and chemical engineering, along with materials science and engineering, and computer science. Although the awards are granted to young adults who meet specific financial and academic criteria, Vlahakis wants students to know that whenever possible, a special feature of these awards can sometimes give preference to students of Cretan descent.

“My DNA is from Crete,” says Vlahakis. “These scholarships honor my parents and heritage, and I hope they encourage an awareness of the Isle of Crete.”
For 20 years, Sonya Miller (B.S. MechE, 1987) has successfully managed large-scale, heavy industrial engineering projects (some in the neighborhood of $200,000,000) both in the United States and abroad. Although she finds that her guiding tenet, “treat others as you want to be treated” works worldwide, she has not once deluded herself into thinking that she can conduct business in a foreign country the same way she would in the United States.

Miller, who is fluent in Mandarin Chinese, French, and English, first exercised her killer combo of linguistic and management skills in the mid-1990s, when her then-employer, Rust Engineering, sent her to China to take over the construction of a pharmaceutical plant. When she arrived, she found her construction teams were comprised of peasant laborers “who had no formal construction trade training. They were wearing flip-flops and bamboo hard hats,” she said. “The project became a test for me. Did my skills translate into an Eastern culture?”

Instead of clinging to an ethnocentric mindset, she looked for solutions to problems that “bridged the gap between the two cultures.” For example, Miller was taken aback when she saw workers using bamboo scaffolding instead of metal. “I had to know if it would hold up,” she said. She, along with fellow engineers, taking into consideration the weight of the average Chinese worker, did a few calculations and learned that the bamboo scaffolding, after minor alterations, would be safe.

Miller said that on that job, she had to keep an open mind, but there were essential items missing at the plant site for personnel hygiene, namely dumpsters and port-a-potties, and she insisted that they be brought in. Looking back on the project and the engineering and cultural challenges she faced, she said, “They were not problems, they were things I had to manage. Whenever you work outside of your comfort zone, you learn more about yourself.”

Through the positions she has held, ranging from (but not limited to) general manager and structural engineer to procurement and contract administrator, she has amassed insight as to what it takes for U.S. engineers to succeed in a global environment.

“First, you cannot be monolingual. You need to learn two or three languages,” Miller said, “and dreadfully important is cultural diversity training.” She explains that before you travel to a foreign country, you need to know the cultural faux pas. She believes that if you make the effort to speak another country’s language and exercise awareness of its culture that will help you make a good impression when abroad. She adds, “Even if you stumble, people will say you tried.”

Miller offers this warning, too: “Don’t lower yourself to unethical behavior.” She has seen instances where engineers are pressured to cut corners or engage in unethical conduct. “In certain countries, facilitating payment which could be misconstrued as bribery is often commonplace, and some people don’t know how to manage that.” She points out that U.S. engineers are subject to U.S. laws wherever they work. The Foreign Corrupt Practice Act dictates that you conduct yourself in an ethical manner.

“By engaging in unethical behavior, you can destroy your career. You’ve got to be responsible at all times. You’re on the global stage—you represent your country and yourself.”

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