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The Revolution Egypt Needs

Op-Ed by Ahmed H. Zewail

Pasadena, California — When I was a boy in Desuq, Egypt, a city on the Rosetta branch of the Nile, about 50 miles east of Alexandria, my family lived steps away from the local landmark, a mosque named for a 13th-century Sufi sheik. Five times a day, we would hear the call to prayer. Our imam encouraged us to study, telling my friends and me, again and again, of the message revealed by the Prophet Muhammad: “*iqra*” — read! Education was in the fabric of our culture and religion.

I left Egypt in 1969 for graduate school at the University of Pennsylvania. I have been on the faculty at Caltech for 37 years and carried dual citizenship for 31. But my commitment to the country of my birth never wavered. Political tumult — two uprisings, and the overthrow of two regimes, in the space of two years — has left Egypt in deep political uncertainty. But what’s been lost in the deadly machinations among both the secular liberals and political Islamists is what touched off the revolution: the aspirations of Egypt’s youth.

Like many Arab societies, Egypt is young. The activists who filled Tahrir Square in 2011 demanded liberty and social justice, valid ends in themselves, but their ultimate goal, I believe, was social and economic change — educational opportunities, leading to sound jobs and a decent life — necessary to flourish in the modern world. As the first Egyptian, and Arab, to be awarded a Nobel Prize in science, and a former special envoy sent by the Obama administration to promote science in the Middle East, this is my foremost concern.

Westerners often forget Egypt’s long history of educational accomplishment. Al Azhar University, a center of Islamic learning, predates Oxford and Cambridge by centuries. Cairo University, founded in 1908, has been a center of enlightenment for the whole Arab world. Intellectuals pioneered Egypt’s first democratic elections in the 1920s through the 1950s, under the monarchy that succeeded British rule. This period of

modernization, into which I was born, included the establishment of scientific institutions and the emergence of modern industries like banking, news media, textiles and motion pictures.

I grew up during the time of Gamal Abdel Nasser, who participated in the 1952 revolt that overthrew the monarchy and led the country until his death in 1970. His was a state deficient in democracy, but not in optimism. Science, engineering and technology were among the top-ranked disciplines in the country's universities, which attracted the best students and scholars from the Arab world. Huge infrastructure projects, like the high dam at Aswan and the nuclear reactor in Inchass, required skilled engineers, which Egypt was able to provide. As an instructor at Alexandria University, I did research that was published in international journals. Although I left to pursue a doctorate in the United States, it was not for want of a good life.

But in the past 30 years, roughly since the assassination of Anwar el-Sadat, Nasser's successor, the country deteriorated. During the rule of President Hosni Mubarak, attention to schools and infrastructure gave way to a focus on media and security, mega resorts and vanity projects, even as a growing population produced intense — and unfulfilled — demands for education.

It gives me no pride to note that in science and technology, Egypt, and the entire Arab world, have made insignificant contributions. A part of the world that pioneered science and mathematics during Europe's dark ages is now lost in a dark age of illiteracy and knowledge deficiency. With the exception of Israel, the region's scientific output is modest at best. Turkey and Iran have made strides in technology; Egypt under Mubarak, in contrast, depended on revenues from the Suez Canal, tourism, gas and oil, with little contribution from high-tech industries.

After Mubarak was overthrown, Essam Sharaf, who was prime minister for less than a year, called on me to establish what the government named the Zewail City of Science and Technology, an educational and research project I had proposed to Mubarak and a number of prime ministers for nearly 15 years, without success. With immense public support, we raised money to create the project on more than 100 acres on the outskirts of Cairo. The leaders governing Egypt since the latest uprising, in June, have continued to support it. Essam Heggy, a planetary scientist at the NASA Jet Propulsion Laboratory and an adviser to the interim president, Adly Mansour, recently said that "education and science must be our national priority."

Research in biomedicine, solar energy, nanotechnology and other fields is under way. Last summer, some 6,000 applicants applied for spots at the university. I continue to support the project and to lead its board of trustees, which includes six Nobel laureates, but violence must end for the project to succeed. And high unemployment among young people, who represent nearly one-third of Egypt's population of 90 million, all but guarantees instability.

Egypt is strategically vital for the United States, because of the Suez Canal, its peace treaty with Israel and its cooperation with the American military and intelligence agencies. But most of the discussion about aid has focused on political leverage. America should instead think of aid in new, apolitical ways. The U.S. gives about \$1.5 billion a year to Egypt and \$3 billion to Israel; the former goes mainly for military equipment, while the latter is more of a partnership that includes not just military but also scientific and industrial cooperation.

I call on Egypt's leaders, of whatever religious or political persuasion, to insulate education and science from their feuds. I also call on great powers like the U.S. to support the development of human capital. The aid America gave Japan, South Korea and Taiwan after World War II, for example, enabled them to become economically vital.

I remain optimistic about Egypt, whose people will no longer settle for the status quo of the past half-century. The question, one I cannot answer as a scientist, is what will replace it, and how long it will take. Egyptians are known for their patience, which derives, perhaps, from the eternity of the Nile. But their patience has run thin, and their aspirations are unmet. Any group hoping to authentically represent the hopes of the Egyptian people must make educational attainment and economic growth its priority.

Ahmed Zewail, a professor of chemistry and physics at the California Institute of Technology, was awarded the Nobel Prize in chemistry in 1999.

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