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WORKING LIFE

From physics to revolution and back

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As a boy, I was not interested in science; I was interested in girls. Upon graduating from high school in Hong Kong, I did not particularly want to work in science; I just wanted a job, because I rarely left the dinner table with my stomach full. For graduate school, I went to Columbia University with a scholarship. There, I was surrounded by Nobel laureates—Isidor Isaac Rabi, Polykarp Kusch, Tsung-Dao Lee—and laureates-in-waiting: James Rainwater, Jack Steinberger, Leon Lederman. The most important moment in my physics education was when I noticed Lee standing next to me in the men's room, peeing. Nobel laureates are ordinary people, I learned, just like you and me. At Columbia, I was influenced by the student antiwar movement and the Cultural Revolution that was raging in China. I and several others (including Peter Kwong, now at Hunter College, and Jean Quan, who would become the mayor of Oakland, California) started the Chinatown Food Co-op; our aim was to “serve the people.” I wasn't interested in solving small problems; I wanted to save the world, to return to China and join the revolution.

I finally made it in 1978, at the beginning of the country's “reform and opening up” movement. I was assigned to do physics at the Chinese Academy of Sciences' Institute of Physics. In China, the spring of 1978 is called “Science Spring” because for 10 years science had come to a virtual halt. Basic science was banned. My colleagues and I resumed the work with great enthusiasm; if China was in ruins, we figured, the best option was to fix it. I helped open the door to the West, discovering bowlics—a type of liquid crystal—and publishing the first paper by mainland-only authors ever to appear in *Physical Review Letters*.



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ILLUSTRATION: ROBERT NEUBECKER

We did not have journals—only copies of journals—and there was just one Chinese-made copying machine in the institute, which broke down every half hour or so. Everything was scarce, including tofu and writing paper, but we were not troubled by the minimal calories available to fuel us. We worked diligently, day and night, except on Sundays. Sundays were for washing clothes, by hand.

China started sending scientists to the West—many to the United States—as visiting scholars and to international conferences. Among China's billion people were dozens of notable physicists, but the number of excellent ones was smaller; I was the only government-approved doctoral mentor in liquid crystal physics. Physics research can't be learned properly by reading books or papers; it should be learned by working alongside masters. China did have a few masters—those who had been trained in the West before 1949—but they were all busy establishing institutes or working on the atomic bomb.

Today, China is making progress scientifically, but there is still some distance to go. The Cultural Revolution sacrificed a whole generation of scientists. Among all the problems this created, it led to a scarcity of experts who could act as academic judges. Qualitative assessment was replaced by counting papers—a poor substitute. The damage lingers.

Lately, and happily, China's priorities have shifted toward innovation. Innovation is not easy, though, in a culture that for 2000 years has prided itself on taking the middle course in everything, for the sake of harmony and stability. It's the opposite of the Socratic method that's at the heart of Western science. Great scientists like Galileo show that breakthroughs can be made even in environments that emphasize orthodoxy—but then no one was counting Galileo's papers. China has very good scientists, but the country needs to find its way of doing innovative science.

After 6 years, I left China and returned to the United States—not for scientific or political reasons, or due to material want, but for family. During a visit to the United States with our daughter, my wife announced that she intended to stay. Forced to choose between the motherland and a daughter, I chose my daughter. I left China on good terms.

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