Happier Times. *UC-Irvine engineer Tien Chang Lin with Deng Xiaoping in 1984.*

U.S.-Chinese Scientists See Dreams Imperiled

A network of Chinese-American scientists has been nurturing China's best and brightest, but their efforts are now in jeopardy

As U.S. SCIENTISTS sit in their living rooms watching scenes of mayhem play across their TV screens, it may not occur to many that the fearsome images being broadcast out of China's major cities could have a direct bearing on their scientific colleagues in the United States. But over the past decade or so, scores of world-class U.S. scientists of Chinese descent have established close ties with scientists and science students in China.

It was under Deng Xiaoping's liberalization policies in the early 1980s that scientific collaboration blossomed between scientists in the two countries. Many Chinese-American scientists, in particular, have been hoping that China would emerge from its period of intellectual darkness and, with an infusion of foreign help, become a major, and positive, force in the world—especially in international science.

But suddenly the brutal government repression of student demonstrators has once again darkened the future of intellectuals in China. According to reports at press time, troops have moved onto several campuses in Beijing, including Beijing University, which is considered to be one of China's most prestigious academic institutions.

If such turmoil continues, it will do more than provoke outrage among Chinese-American scientists; it will throw into question the future of many collaborative projects that have been painstakingly set up in China and the United States. The impetus for these scientific links has come from a most remarkable network of Chinese-American researchers who have made a point of nurturing science in their motherland in numerous ways. In interviews with *Science*, many of them have expressed helplessness and frustration that the government may be about to crush what they have tried so hard to cultivate: bright, young students to propel China and its billion people forward toward modernization.

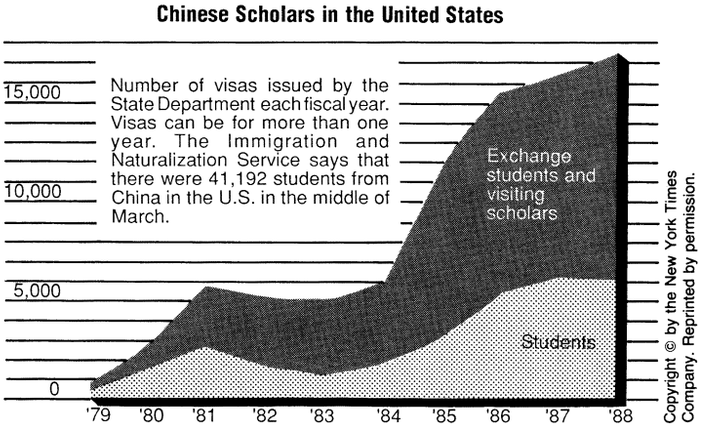
Leland Chung, a urologist at M. D. Anderson Hospital and president of the 1000-member Society of Chinese Bioscientists in America, expressed a typical reaction. He said he is faxing a personal letter to China's top leaders, colleagues, and whomever he can reach: "As an educator and a Chinese-American, I have wanted so much and for so long to see China finally take the correct course of action to modernize and improve the country's future. This dream of mine was shattered by the current leadership in China. We can no longer tolerate this senseless killing of the very students that we tried so hard to educate. It is time that we all work together to bring this bloody and shameful action of the Chinese government to a halt immediately."

The list of Chinese-Americans involved in forging scientific links between the two countries reads like a Who's Who in International Science. In addition to Chung, they include Yang Chen Ning and T. D. (Tsung-dao) Lee, who shared the Nobel Prize for physics in 1957; Yuan Lee, who won the Nobel for chemistry in 1986; superconductivity star Paul Chu, Chern Shiing-Shen, former dean of the math department at the University of California at Berkeley; Ernest Kuh, former dean of engineering at UC-Berkeley; Tien Chang Lin, executive vice-chancellor of the University of California at Irvine; Alice Huang, president of the American Society of Microbiologists, and others.

In what follows, *Science* provides sketches of some of the key players in this network, the projects that bind them to scientists in China, and their reaction to the military crackdown.

In the Chinese-American community, no researcher is regarded as more energetic and successful in furthering Chinese-American science ties than physicist Yang Chen Ning. Yang, a professor at the State University of New York at Stony Brook, most recently used his clout to raise $1 million from Hong Kong benefactors to construct a new research institute at Zhongshan University in

Chinese Scholars in the United States



Guangzhou (Canton). The institute, which was dedicated in December, is devoted to research in theoretical physics, mathematics, anthropology, and linguistics. (The fields were selected in part because they do not require expensive laboratory equipment.)

For Yang, who came to the United States in 1945, the institute is the realization of a 6-year dream. It represents the latest project in a long effort he has waged to help invigorate science in China and cultivate rapprochement between the two countries. Yang, who won the Nobel with Lee for work in "parity laws" that led to important discoveries in elementary physics, told *Science* that after President Nixon opened the doors to China in 1971, he was one the first prominent Chinese-American scholars to visit his native country. Since then, "as a person with roots in both countries, I felt I had to increase understanding" between China and the United States.

That took no small amount of courage in the 1970s when Taiwan was zealously opposed to the warming of relations between the United States and China. Yang said he and his family received threatening letters from Taiwanese students. He said they "were careful" when they received packages, fearful that they contained bombs.

But he continued his activities. In addition to spearheading the drive to create the Zhongshan institute, he also raised $1 million for an exchange program at Stony Brook for Chinese and American scholars, which is now in its seventh year. So far, about 90 scholars from a wide range of fields have studied at Stony Brook for an average stay of about 1 year each.

Yang, who was interviewed before the killings by government troops, could not be reached at press time for reaction after the attacks.

Mathematician Chern Shiing-Shen, 78, who is professor emeritus at Berkeley, has been instrumental in keeping China and Taiwan up to speed in his discipline by establishing leading math institutes in both countries. In 1946, 3 years before the Communists took over the mainland, Chern founded the math institute of the Chinese Academy of Sciences in Beijing. He maintained collaboration with members of the institute after they fled to Taiwan during the Communist takeover of the mainland and reestablished the organization there in Taipei.

In 1984, Chern founded another Chinese math institute, this one at Nankai University, his alma mater. He said in an interview, "My concern is to get young people started." The institute now has about ten researchers and, if it survives the current period, it will eventually have up to 30. According to Chern, it is better equipped than most, if not all, other math institutes in China, including the Academy of Sciences in Beijing.

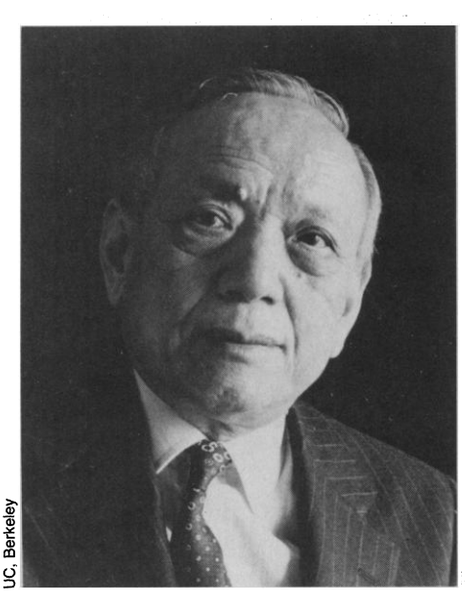
Like Chern, Nobel laureate and chemist Yuan Lee, a native of Taiwan, has established links with research institutes in both Taiwan and China. In Taiwan, he advises two research institutes, helps to raise funds, and recruits scientists there. In China, he provides technical advice to two research institutes and is an honorary professor at several universities. Lee says that he tries to help as many countries as he can, regardless of origin, but China and Taiwan are a special concern.

Tien Chang Lin, UC-Irvine official and engineer, has been influential in shaping educational policy in China, often advising presidents of Chinese universities and officials from the government education ministry. In the past, he has also met with Deng and other top Chinese leaders to discuss educational reforms. Responding to the repression, Tien remarked, "It is very tragic for people like Deng, who have done so much to liberalize the system, to take such a backward measure." Lin called on American scientists to support the U.S. government's suspension of military weapons sales to China and said that "they should make it clear to the Chinese that they've got to change to more freedom and democracy."

Superconductivity pioneer Paul Chu of the University of Houston echoes these sentiments. Asked for his reaction to the killings in Beijing, he said, "I'm extremely mad and sad. It is unbelievable—especially the announcement by the government that the actions against the demonstrators were a victory over counterrevolutionaries. It's a big lie." Chu, who was born in China and grew up in Taiwan, says that he had been "extensively" collaborating with scientists from both nations before his "work heated up." Recently, though, he has been too busy to maintain the pace of cooperation, limiting his activities to working with the Chinese in his laboratory.

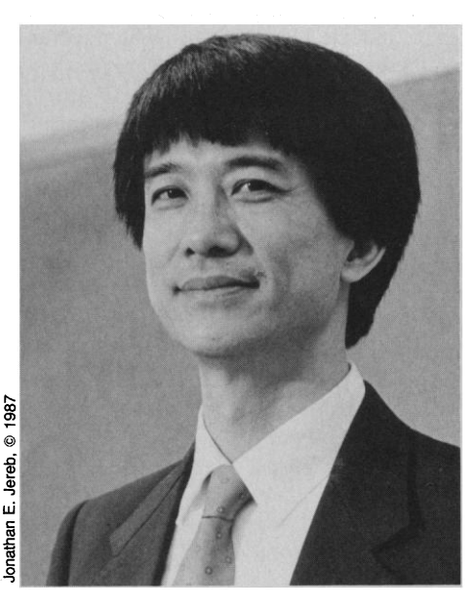
Chinese-American scientists are mostly linked to each other through informal, old-boy networks. But 3 years ago the Society of Chinese Bioscientists in America was formed, in part, to encourage more extensive ties. In a way, it functions like any other scientific society, holding scientific symposia, publishing the proceedings, and issuing a newsletter listing job openings and meeting notices. But this year, it began a new program to sponsor Chinese students (14) for training in the United States. Its ethnic focus has obviously struck a chord among many Chinese-American scientists; membership has quadrupled since its first year.

Since its inception, the society has been very careful to avoid political matters, especially with regard to relations between Taiwan and China. But the society's president, Leland Chung of M. D. Anderson, says that he will press the membership to make a political statement in response to the repression. He said that in his personal opinion, "I want to see Americans take the strongest action possible. We should cease dealing with China altogether." They are strong words for a man who has been promoting scientific collaboration between the United States and China. But they evince the depth of concern among this band of world-class Chinese-American scientists that if they do not speak out, the period of collaboration could be over. ■ MARJORIE SUN



UC, Berkeley

Chern Shiing-Shen *of UC-Berkeley has established math institutes in China.*



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Paul Chu: *the superconductivity hotshot calls government statements "lies."*