

Building United States-Asia Scientific Exchange

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As Asia has become a force in the international marketplace, an undercurrent of concern is sweeping the American public. A growing number of Americans question whether Asian nations are relying on U.S. resources and goodwill to out-compete the United States. Universities, which try to maintain a polite distance from controversy, have been caught in the middle of the debate. University scientists find themselves in an uncomfortable spotlight, responding to questions about whether Asian industry is profiting from research underwritten by American taxpayers.

The science community, instead of shying away from this debate, must meet the issues squarely. Already U.S. institutions educate the majority of Asians who have and will become leaders in science and technology here and in their home nations. U.S.-educated scientists are on the faculties of the most distinguished Asian universities. Asian industry, highly skilled in the rapid transfer of technology, makes use of knowledge and management systems developed in the United States.

However, it is not just Asia that benefits from trans-Pacific exchange; American science stands to gain as well. U.S. scientists and engineers can broaden their knowledge and applications base through closer exchange relationships. Japan is in the forefront in several applied fields, and other regions—China, India, Korea, and Taiwan—are developing rapidly. Most important of all, exchange deepens cross-cultural understanding. In a very real sense, free scientific exchange can promote a lasting global peace and create a climate of cooperation necessary for addressing problems of regional and international proportions.

Although the promise of exchange is great, a two-way flow of knowledge is not automatic. It is up to the science community to open avenues of exchange and mine potential resources fully on both sides of the Pacific Ocean.

Since the beginning of this century, Asia has turned to the Western world for technology and training in the sciences as emerging nations struggled to overcome a centuries-old gap. Some 500 years ago, scientific and technological advances ground almost to a halt when Confucian ideology re-

emerged, tightening its hold on China and spreading to neighboring countries. Although Chinese society always valued education and intellectual pursuits, this regard did not extend to science. Intellectuals, who governed China, disdained the innovation and progress inspired by the Industrial Revolution. Science and technology were beneath intellectuals who considered these pursuits to be suitable only for the lower class of commercial entrepreneurs.

After World War II, students from Asia poured into American universities, seeking the science training and research experience that were not available in Asian institutions. Today, nearly 250,000 Asians are studying in American institutions, most of them in science and engineering. Interest in American higher education is so great that *Asia, Inc.*, a business magazine, did a cover story that ranked the top 50 U.S. universities for Asians (1).

The United States has benefited from this phenomenon with the scores of Asian scholars who remained here to continue as active scientists and teachers. In recent years, though, a growing number of Asian graduates are returning to their native countries as opportunities in science and higher education are burgeoning.

Two Nobel laureates are leading the return. Leo Esaki, the eminent solid-state physicist at IBM's Thomas J. Watson Research Center in Yorktown Heights, New York, returned to Japan in 1992 to serve as the president of Tsukuba University. Yuan T. Lee, the world's foremost experimental physical chemist at the Berkeley campus of the University of California, has announced that he may retire from Berkeley and return to Taiwan, where he plans to help advance science and education. Japan and Taiwan are not alone in recruiting U.S.-educated Asian scientists. The new Hong Kong University of Science and Technology, for example, recruited almost 60% of its 300 professors from graduates and faculties of top North American institutions.

In sharp contrast to the Asian emphasis on overseas studies, American students and scientists have been reluctant to pursue opportunities in Asia. Despite the availability of grants and appointments—enough in Japan alone to fill two National Science Foundation directories—young American scientists frequently are discouraged by differences in language and culture. Moreover, many

regard these opportunities as interruptions in their careers, a view that all too often is reinforced by their institutions.

This reluctance to study and work in Japanese and other Asian institutions means that the U.S. science community is losing valuable insights into fields where Asia is gaining dominance. Even though Asia is strong primarily in manufacturing technology, we can anticipate that the recent upsurge in Asian universities will lead to exciting avenues of basic research.

Although Asian students and scholars who come to the United States face language and cultural barriers, they are highly motivated. Indeed, there is an unwritten rule in major Japanese universities that scientists cannot advance to full professor until they have research experience in the United States or other advanced Western nations. American institutions should offer incentives to our young scientists as well, rewarding them for pursuing opportunities in Asia and developing lifelong professional contacts that will enrich their research.

In the wake of controversy over research agreements between U.S. universities and Asian corporations, university leaders hesitate to seek financial support from Asia. Considering the tremendous service that American higher education is performing by preparing the leaders of Asia, universities should step up their demands for support from Asian business leaders and corporations.

As public funds for higher education decline and competition intensifies for federal research support, universities need to tap every available resource. Increased support from Asia for U.S. universities will benefit science research and education both directly and indirectly. For instance, on my campus, two new buildings will be named after the Asian benefactors who contributed significant funds. One building will house chemistry and chemical engineering facilities; the other is our new student health center. Donations should be free of strings that require universities to produce research that can directly benefit the benefactors. Instead, universities should convince donors that their contributions will promote the kind of education and research that will transform our world.

We have a historic opportunity to overcome barriers and open two-way exchange. The popular tide of rising anti-Asian sentiment can be countered with hard evidence of how both the United States and Asia benefit from exchange. Our case, however, is weakened if the American science community does not take full advantage of Asian resources.

REFERENCE

1. P. Ciotti, *Asia Inc.* (September 1993), pp. 42-43.

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