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Trolling for Brains in International Waters

By JAMES GLANZ

THE world is a global marketplace. Money flows like water across national borders, creating a perpetual motion machine of investment, development and wealth creation. Theoretically, it is a system in which everybody wins.

The global market for knowledge and expertise, by contrast, has developed far less rapidly, and thus far has produced only one big winner: the United States. Information technology (I.T.) generates about a third of the economic growth in this country with just five million workers, said Dr. B. Lindsay Lowell, director of research at Georgetown University's Institute for the Study of International Migration. And over one million of those people are foreign born.

But America is beginning to lose its monopoly on the world's best brains. From Ireland to India, South Korea to South Africa, and Australia to Albania, said Dr. Allan Findlay, a geographer and the director of the Centre for Applied Population Research at the University of Dundee in Scotland, resources are being poured into retaining native talent.

Australia, for example, recently announced a \$2 billion package of research grants, tax breaks and new education funding to attract and retain technical talent. Japan has budgeted billions of dollars to increase I.T. development and retain workers across Asia. And Taiwan, by expanding the scope of its graduate science programs and emphasizing the country's growing high-technology industry, has lured back some 50,000 scientists who had left the country over the last two decades, according to Dr. Tzu-Feng Marlene Lin at the National Science Council in Taipei.

Scientific knowledge and technical skill have become so essential to the economic future of nations that the migration of skilled workers has come under intense scrutiny. Transilience, which means to leap across, is now used to describe what Dr. Lowell calls "brain currents," the movement of educated individuals, like a new form of currency, around the globe.

In the competition for the best and brightest, the cost to the losers can be devastating. For example, a study by the Colombian government estimated that the nation lost tens of thousands of people with three years or more of higher education in 1999 alone, said Jean-Baptiste Meyer, a senior researcher at the Institut de Recherche pour le Développement in Paris.

Dr. Meyer added that losses of the most highly skilled people from Colombia and South Africa, which he has also studied, are accelerating as international head-hunting companies have become active there.

"These countries are thus under tremendous pressures on their skilled populations," Mr. Meyer wrote in an e-mail message from Colombia. The same is also true of India and Asia, where local job markets often can absorb only a fraction of the scientists and engineers produced every year.

Rather than fight transience, a number of countries are trying to benefit from it by keeping their borders open to technically advanced workers. In the short term, this may encourage scientists to leave their native lands for the United States or Europe, but they may return later, with extensive professional networks and far greater experience than they would have had otherwise.

Take India, which may have the world's largest diaspora of scientists. IndUS Entrepreneurs, a group whose members include the leading Indian software engineers in Silicon Valley, estimates that 30 percent of the software engineers there are of Indian origin. And AnnaLee Saxenian, an economist at Berkeley, has used a Dun & Bradstreet database to count 750 Silicon Valley companies run by Indians.

ON the other side of the ledger, though, India itself appears to have benefited enormously from its far-flung citizens. The worth of India's information-technology exports has catapulted, to \$4 billion in 2000, from just \$150 million in 1990. And the Indian government projects that by 2008 that number will be \$85 billion.

"The fact that all these Indians are here is enabling massive changes which are beneficial to India, and also beneficial to the U.S.," said Dr. Jagdish Bhagwati, an economist at Columbia University, who is a special advisor to the United Nations on globalization.

Sheer wealth and unmatched research infrastructure continue to make the United States the Mecca of scientists and engineers. Data from the National Science Foundation show that, except for a brief dip mid- decade, students from the top exporters of talent in Asia enrolled in American graduate programs in increasing numbers during the 1990's. Last year, some 75,000 were here from China and India alone. The most recent figures also show there are about 20,000 students here at any given time from the three largest European exporters, Germany, Britain and France.

"Yes, yes, you are seen by us as a kind of vacuum cleaner or something," said Dr. Dominique Martin-Rovet, the Washington representative of France's Centre National de Recherche Scientifique.

But the growing global effort to retain highly educated workers may begin to level the playing field. The number of graduate students here from Taiwan, which has changed its research institutions to retain native-born talent, has

fallen by 40 percent since 1995. And a recent National Science Foundation study concluded that China, South Korea, Japan, Mexico, Chile, Argentina and other developing countries are also undertaking structural changes to attract students and young scientists.

Research spending in Ireland has reportedly soared from a few million dollars to more than half-a-billion dollars in the past three years, and the University of Limerick recently announced plans to attract two dozen world-class researchers to new positions. Germany is overhauling its entire university system, in part to make it more attractive to young researchers and engineers.

As the market for brains tightens, the United States could come to regret its reliance on foreign talent at the expense of educating its native born, said Dr. Lowell of Georgetown.

"In the short to medium term, the U.S. makes out like a bandit," he said. "In the medium to long term, the outlook is questionable, even for the U.S."

The first challenge the country will face, he said, is the impossibility of granting permanent citizenship to the vastly expanded pool of high-tech workers being granted temporary visas, following new rules enacted by Congress this year. "We can easily project a greater demand than current visas are available," Dr. Lowell said.

Assuming that those human and bureaucratic stresses can be handled, he said, the country will still have to deal with the slowing of wage growth in I.T. that an increase of temporary workers will almost certainly bring. If historical parallels hold up, lower wages will discourage women and minorities from seeking training in these fields, increasing the country's reliance on foreign talent even further, he said.

"Cheap labor puts off the day of reckoning for employers," Dr. Lowell said.

As the global competition for the world's most precious commodity heats up, the United States could come to regret its neglect of native-born minorities and the educational system that develops their talent and provides them with skills. America may learn the definition of transience the hard way.

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