

Aglobal race. Super-Kamiokande will also be facing competition from facilities in Europe and the United States with links to an accelerator or nuclear power plant (*Science*, 18 February 1994, p. 916). Detecting flavors of neutrinos not produced at the source would be additional evidence of oscillation and, thus, of mass. Most of the experiments are still in the planning stage; Super-Kamiokande, for example, hopes to work with a proposed new accelerator 250 kilometers away at the Institute for High-Energy Physics in Tsukuba.

Whichever group succeeds in collecting evidence of mass first, there will be plenty for

others to do. Pennsylvania's Mann says a determination of nonzero mass for the neutrino will "open up a cottage industry of investigations." Among the most important issues to resolve would be the mass of each flavor of neutrino and the conditions under which each one oscillates.

For now, however, Japanese neutrino scientists are grateful for the support they have received from the central government for the project, which was approved in 1991 by the Ministry of Education, Science, Sports, and Culture. Masatoshi Koshihara, a former professor of physics at the University of Tokyo and the

godfather of Kamiokande, says the international attention garnered by Kamiokande mightily impressed governmental decisionmakers. The decision was made easier by the lack of competing proposals in Japan, unlike in the United States (*Science*, 29 September, p. 1813).

On 11 November the politicians will see what their \$100 million has bought when they attend a ceremony at the mine site to mark the official end of construction. "The people from the ministries are all happy to see this project completed," Suzuki says. "But for us, it's just the beginning."

—Dennis Normile

UNDERGRADUATE EDUCATION

India Proposes Private Universities

NEW DELHI—Heidi Dewan, an undergraduate computer science major at the Jaynarayan University in Jodhpur, Rajasthan, has a common complaint about her education. She's worried that it won't prepare her for a job. "It leaves me with a lot of bookish, obsolete knowledge that is way behind what is actually going on in the world of software development in India today," says Dewan, who is halfway through her 4-year course of study. Her potential employers echo her complaints: Indian industrialists bemoan the fact that graduates are pouring out of the

academic and scientific community. Critics worry that it will generate a flood of profitable "teaching shops." Officials of the faculty union at the University of Delhi fear the effect on public education of "captains of industry being put in charge of vital sectors like information and knowledge." Even supporters of the bill, like Vegesna Satyanarayana Raju, director of the Indian Institute of Technology (IIT)—Delhi, acknowledge that "there is the danger that the whole thing might become one business." A similar reaction greeted a proposal last year by Indians living abroad to create a National Science University funded by nongovernmental sources. That idea is still pending before policy-makers.

On the other hand, other academic administrators say that fears of a corporate takeover of Indian higher education are unfounded. "Some of the best teaching and research institutions all over the world are privately funded," notes Pratap Narain Srivastava, a radiation biologist and former vice chancellor of New Delhi's prestigious Jawaharlal Nehru University.

India has a chronic oversupply of highly trained technical and scientific personnel. In 1993, for example, the country's 183 universities awarded roughly 5000 Ph.D.s in the sciences, including medicine and engineering, but only about 1000 of them found jobs in industry that made use of their skills. A smaller number entered academia, with the rest settling for something outside their field.

Business leaders say that hiring rates are low because most students require extensive and costly retraining before they can function well in industrial R&D labs. "The mindset of a student must be tuned to the practical functioning of business and industry, rather than just theory," says Sanjay Dalmia, chair of one of India's big industrial houses, which has just given \$300,000 to

IIT-Delhi to support research on comparative management practices in Asia. The bill would help to narrow that gap. "A private university will make this interaction easier," he says, "and better trained students will make industry perform better."

Private institutions are also expected to offer a broader range of higher quality courses, as well as boosting salaries and improving working conditions for faculty. The existence of such institutions could also lead to improvements among public universities. "Excellence is the child of competition," says IIT-Delhi's Raju, "of which there is not much in the existing university system."

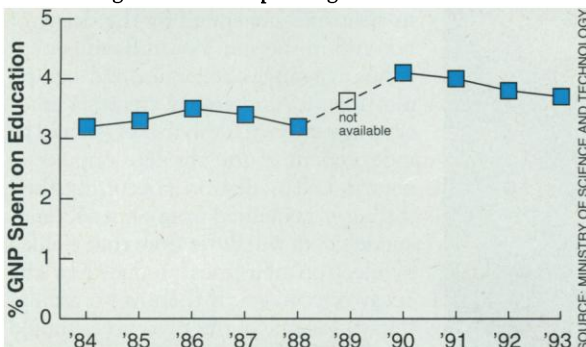
Many academic leaders also see the government's proposal as a useful platform for a broader discussion of higher education in India. Armaity Desai, chair of the University Grants Commission (UGC), which oversees academic research funding, feels that the bill reflects an inexorable trend in which the private sector will play a larger role in higher education. Although Desai applauds the bill's plan to preserve UGC's oversight of the system, she says that the real issue is the quality of the education imparted, not whether students are taught at a private or public school.

Although no companies have publicly said they would finance such a private university, there is believed to be considerable interest in the idea. The next step for the bill is a hearing before a joint committee of both houses of Parliament. Supporters are hoping for speedy passage, noting that the government would like to clear the measure before the national elections in July 1996.

In the meantime, Jaynarayan University's Dewan says that revising her curriculum to fit the needs of the computer industry would greatly improve her chances of finding a good job when she graduates. And she hopes that the prospect of competition from private universities will spur her institution into action.

—Pallava Bagla

Pallava Bagla is a science writer in New Delhi.



Shrinking support. Private schools could ease pressure on government to fund higher education.

country's universities poorly equipped for high-tech occupations.

Now these complaints have resonated within the government. Last month it introduced a bill into Parliament that would permit the formation of the country's first private universities. The bill, drafted by the Human Resources Development Ministry, would allow companies and other organizations to exert much greater control over curricula and other academic matters in the universities they help establish. The measure is not just intended to make universities more responsive to market needs, however: It may also ease the financial burden on the government, which now supports the entire system of higher education in India.

The proposal has ruffled the country's