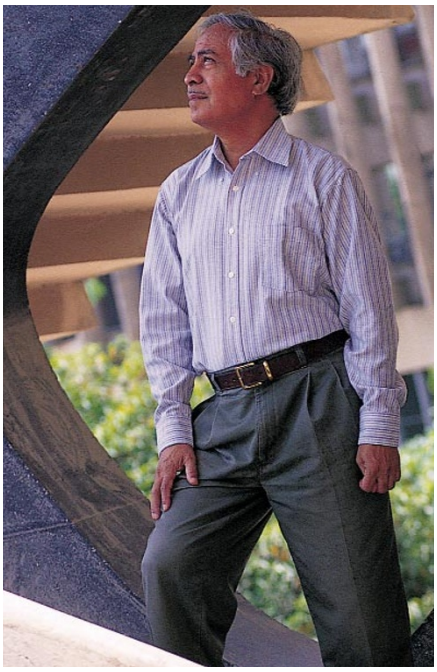
India's finest, for hire

By collaborating with western companies, are India's research institutes consolidating their positions or allowing their young researchers to be exploited as a cheap scientific labour force? K. S. Jayaraman investigates.

LINK/DINODIA PICTURE AGENCY



DINESH KHANNA

On entering the campus of the Indian Institute of Technology (IIT) in New Delhi, the very first building you see carries the logo of IBM. When IBM's New Delhi lab was set up three years ago, Paul Horn, the company's worldwide head of research, promised that this lab would "become a world class facility", with scientists from IBM and the IIT collaborating to develop "software solutions for challenging problems in information technology".

But since then, the IIT faculty's relationship with IBM has gone sour — as it has with several other western companies that have established a presence on the IIT's campus. In fact, last November, the majority of the IIT's faculty backed a resolution to prevent commercial organizations opening premises within the institute. The resolution also said: "Steps should be initiated to nullify the existing agreements."

This vote reflects a wider concern felt by many Indian academics. They believe that India's national research priorities are being distorted by links with western industry. And they are particularly worried that the country's highly qualified young researchers — its most valuable scientific asset — are being used as cheap labour to address the problems of multinational companies, rather than the issues facing India's developing economy.

Given its high profile, IBM's New Delhi lab has been a particular focus for criticism. Many IIT faculty members complain that the company has failed to fulfil its promises of a mutually rewarding, collaborative relationship. "IBM set up shop here because the IIT is the best address in the city and its students are available to provide cheap labour," claims H. B. Mathur, a former professor of mechanical engineering at the institute. "IBM can stay in the campus provided they want to work with us," adds J. S. Rao, another mechanical engineer. Rao felt so strongly about the issue that in July 1999 he resigned as faculty representative on the IIT's board of governors. "If they want to remain an island, they can step outside," Rao says.

Corporate collaborations

Links between Indian research labs and western companies began to grow in the early 1990s. The trigger was a government policy putting pressure on research institutions to generate their own money to supplement public funding. Multinational companies were only too happy to oblige, paying to set up new facilities on campuses or donating equipment to individual labs. The lure, in part, was India's able and motivated, yet relatively cheap, scientific labour force. Just as India's software engineers are in demand, either working in India on contract to western companies, or being lured to work in high-tech centres such as Silicon Valley, its brightest young scientists are attractive to western companies.

The IIT constructed a new building on a prime plot within its campus and invited IBM to set up its lab there, charging an annual rent of about US$450,000. Similarly, the agribiotech giant Monsanto set up a research centre at the Indian Institute of Science in Bangalore, agreeing to pay US$300,000 per year. And Germany's Hoechst gave US$150,000 to the National Institute of Immunology in New Delhi in exchange for first rights to discoveries that the institute had made in the fields of autoimmune disorders and drug delivery.

Also during the 1990s, labs run by the Council of Scientific and Industrial Research (CSIR), India's largest scientific agency, began taking up contracts from multinational companies including SmithKline Beecham, DuPont and General Electric. The CSIR's total earnings from contract research reached US$7.5 million last year, about a tenth of what it receives in government funding.

Proponents of these moves say that the influx of money provides jobs for scientists who might otherwise be unemployed. "The quality of research has also improved and, thanks to the training component of the agreements, our scientists have learned to run instead of crawling," says the CSIR's

DINESH KHANNA

DINESH KHANNA

Sell out? IBM's research facility (left) at the Indian Institute of Technology in New Delhi (above) has caused controversy. Researchers such as J. S. Rao (opposite) complain that the company has failed to work with the faculty.

director general, Ragunath Mashelkar, who took up the post five years ago with the promise that the agency would become financially self-reliant. Contract research, he argues, does not "conflict with our own priorities as it involves less than 2% of our scientists in seven out of our 40 laboratories".

But in some of those seven labs, the agreements have brought about major changes in the research culture. Topping the list is the National Chemical Laboratory (NCL) in Pune. Last year, it earned about US$5 million, or 40% of its budget, from contracts with more than a dozen foreign clients. "NCL has its hands full with foreign projects," says one senior CSIR official, who asked not to be named. "I would not be surprised if they find no time to tackle problems posed by Indian industry." But Swaminathan Sivaram, head of polymers at NCL, rejects that criticism. He says he would be happy to enter into contracts with Indian companies, if only the demand was there. "Indian software professionals are working for America and nobody complains about it," Sivaram adds. "Why pick on us?"

K. V. Raghavan, director of the Indian Institute of Chemical Technology (IICT) in Hyderabad, also defends the rise in contract research. Besides bringing in money for his institute, he says it has exposed IICT scientists to the latest pharmaceutical production methods. Raghavan argues that about half of the contracts the IICT has accepted will have relevance to India at "some time in the future".

But Raghavan's predecessor, A. V. Rama Rao, is less enthusiastic about the benefits of contract research to the institute. "No foreign company gives us any part of their core project," he says. Rama Rao now runs his own contract research company in Hyderabad, but argues that doing this work privately is different from committing the resources of publicly funded labs, which were set up using taxpayers' money with the intention of building up Indian industry's capabilities.

Balancing act

A single contract can employ a large number of researchers. The IICT, for example, deployed eight PhDs, 12 MScs and several technicians for one year on a SmithKline Beecham project for a total fee of US$100,000. In the United States or Europe, this sum might not even cover the salary and lab costs of a single scientist. Even some senior figures at the IICT believe that directing high concentrations of human resources into contract research is damaging the institute's intellectual climate. "Pressure to earn money has arrested free thinking," says J. S. Yadav, deputy director of the IICT and head of its natural products division, and who manages many of the institute's research contracts. "Everyone is sitting with a calculator to see how much he will earn once the contract is done." Yadav also worries about PhD students who spend a year on a project that does not contribute towards their doctoral thesis.

Sensing something of a backlash against his policies, Mashelkar accepts that contracts from foreign companies must not be allowed to dominate to the point that research institutes turn down offers of collaboration from Indian industry. "That day is very far off," he says. "But in any case we are already slowing down on contract research business."

As the CSIR tempers its enthusiasm for research contracts with western industry, the future of the labs set up by multinational companies on Indian research campuses is uncertain. Monsanto has already closed down the bioinformatics component of its Bangalore research centre. And Prem Vrat, acting director of the IIT, told *Nature* that companies must fall in line with a new 'synergy' policy or quit the campus when their rental agreements expire. The policy calls for openness, joint projects, two-way academic interactions and an annual review by a coordinating committee. "We will look at the conditions in the new policy and then decide our future course of action," says Pradeep Dubey, a spokesman for the IBM lab, adding that the company has yet to receive any formal communication from the IIT. But he admits that so far there has been no joint project with the IIT of the type that was originally envisioned.

Terminal problems

In part, the hostility towards IBM might reflect the financial anomalies its presence on the IIT campus has created. A student working for IBM in the summer can make more money than a professor working at the institute makes in a whole year. Not surprisingly, the lure of working for IBM has made some of the brightest students switch their priorities away from their supervisors' own projects. "When our students are sitting before the terminals, we do not know if they are working on IBM projects or those assigned by us," complains one computer scientist. In an attempt to ease these tensions, the IIT has now put a ceiling of five hours per week on the time students can work for IBM during term-time.

Given the benefits that collaboration with companies such as IBM could bring — not just money, but the chance to work on projects that otherwise might be beyond the reach of Indian research institutes — many of the country's academics hope that India's institutes will, in the future, manage to work with multinational companies on more favourable terms.

But there might be another way for Indian research institutes to profit from links between their brightest young students and western high-tech companies. The IIT is now eyeing some of its alumni who have made huge fortunes working in Silicon Valley. Perhaps donations from such individuals could provide an alternative to contracts from western companies. ■

K. S. Jayaraman writes for *Nature* from New Delhi.