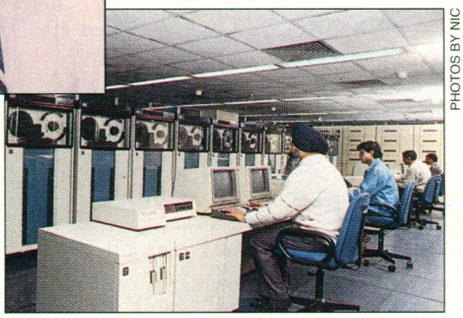
COMMUNICATIONS

India Expands Electronic Research Network



PHOTOS BY NIC

Plugged in. NICNET is based at the New Delhi headquarters of the National Informatics Center, headed by Narsimha Seshagiri.

NEW DELHI—Narsimha Seshagiri is visiting Mars from the comfort of his office. Staring at his computer screen, the director of India's National Informatics Center (NIC) jabs commands on the keyboard, zooming down on areas of the Martian landscape that most interest him. Barely able to contain his excitement, he turns away from Mars and joins up with Halley's Comet as it pulls away from the sun and heads back through and beyond the solar system.

The ability to gain access to these images from the U.S. National Aeronautics and Space Administration may be old hat to U.S. researchers, but it marks an important step forward for Indian scientists, who make up the world's third largest scientific work force. More and more Indian researchers now have the cosmos at their fingertips, thanks to an upgrade of NICNET—NIC's countrywide computer-based satellite communications network—that makes it possible to transmit such multimedia images. Last month, Seshagiri's agency linked 14 major Indian cities at transmission speeds up to 2.2 megabits per second (mbps), the lower limit for a real information highway that can handle images as well as text; by the end of the year, 70 more cities will be hooked into this high-speed network. (By comparison NSFnet, the backbone for Internet, operates at a transmission speed of 45 mbps.)

The upgrade is the latest installment in a $70 million investment in NICNET by the Indian government. The aim, in part, is to give India fresh ammunition in its ongoing struggle to keep its brightest scientists, many of them computer professionals, from fleeing to the United States and other western nations in search of better career opportunities. "All that you can do sitting at a computer in the United States, you can also do in India," Seshagiri enthuses.

NICNET was created in 1987 to provide government officials with immediate access to the type of data they need to do their jobs—from keeping track of the number of cattle on the island of Kavaratti in the Indian Ocean to monitoring construction of a drinking water facility in Ladakh in the Himalayas. It relies on 635 satellite dishes scattered around the country. It is also connected to Internet and other international networks and databases through two 64-kbps links, one through SprintNet in New York and another through an Indian company.

Even at the old transmission speeds, NICNET was beginning to change the way Indian researchers communicate. Take Ashok Kolaskar, a zoologist at the University of Pune. Kolasker has been using NICNET to collaborate with researchers at the University of Florida in Gainesville in modeling inhibitors of asparagine synthetase, an enzyme thought to play a role in leukemia. "NICNET has made it possible to put our brains together with advanced facilities in

The First Steps Toward a Virtual Library

Indian researchers have greatly benefited from the speed and easy access of electronic networks. Now library officials want to use those same qualities to mitigate the deterioration of their collections brought on by budget cuts, rising prices, and devaluation of the Indian rupee. The idea is to give researchers access to more of the world's scientific and medical literature—but via computer instead of leafing through the pages of their favorite journals.

T. Vishwanathan, director of the Indian National Scientific Documentation Center (INSDOC), has begun developing an electronic database system based on the combined offerings of the country's 1,000 scientific and technical libraries, in which each library contributes bibliographic information and abstracts from the journals it receives. INSDOC, with headquarters in New Delhi and regional centers in Bangalore, Calcutta, and Madras, already has access to about 5000 journals through international electronic databases, and it maintains a printed catalogue of science journals at 850 libraries in India.

At present, for $12 a year, individual subscribers to the center's Contents, Abstracts, and Photocopies Services (CAPS) can receive a printed monthly listing of the contents pages of up to 30 journals; for an additional fee, a portion of which is paid in royalties, subscribers can get photocopies of articles. "We receive about 25,000 photocopy requests annually," says Vishwanathan.

A similar menu is offered to 650 sites by the National Informatics Center (NIC) over NICNET. Besides online access to several international databases, NIC and the Indian Council of Medical Research run a national center for biomedical information, which can provide from CD ROM the full text of articles in more than 500 journals and maintains the MEDLARS database from the U.S. National Library of Medicine. "Search requests have risen six-fold [to 15,000 a year] in just 5 years," says Sita Lakshmi Chinnappa, joint director at NIC. Chinnappa says about 85 medical institutions in India have direct access to MEDLINE through the center and that the number is growing rapidly.

But some observers wonder whether Indian researchers are ready to trade the familiar—immediate access to a limited number of journals—for the promise of improved access via the information highway. "Sharing has never worked in India, whether it's a microscope, an ultracentrifuge, or a scientific journal," says K. Satyanarayana, who works with the *Indian Journal of Medical Research* in New Delhi. He predicts that libraries will be reluctant to give up their own subscriptions to core journals in exchange for a shared electronic collection.

There is also the question of how timely the information will be once it finally gets onto the network. At present, journals often arrive several weeks late and, if an institution receives only one copy, it is likely to go first to the director's office. By the time the journal is sent to the library, the information is often out of date. Libraries will have to do better if India hopes to maintain an electronic database that's useful to researchers.

–B.M.

the United States," he says. A similar endorsement comes from developmental neurobiologist Shashi Wadhwa of the All-India Institute of Medical Sciences in New Delhi. A frequent NICNET user, Wadhwa learned from searching abstracts available through NICNET about a new technique that has benefited her work on ganglion cells in the eye.

Not everybody is happy about NICNET's new capabilities, however. Officials in the Department of Electronics, which operates a second government network, the Education and Research network, or ERNET, would like to have seen some of the new investment in NICNET come their way. ERNET was created in 1986 as a pilot project to demonstrate how to connect the nation's universities and research institutes, and it quickly won scientists' backing. Indeed, a heavy demand for networking services rapidly pushed it beyond its backbone of the five Indian Institutes of Technology (IITs)—India's elite engineering schools—and the Indian Institute of Science in Bangalore, until it now operates more than 250 nodes across India. One result: "Computer networking has broken down hierarchical barriers in scientific research," says Srinivasa Ramakrishnan, ERNET's director. "Younger scientists in India have free access to the world without bothering to ask permission from their superiors."

ERNET is, however, getting overloaded. It transmits information at only 9.6 kbps, and it depends on leased telephone lines that break down frequently. An improvement to 64 kbps, as well as 64-kbps satellite links for its backbone, is planned, but a proposal to upgrade to 2.2 megabits per second was rejected because of its $33 million cost.

The latest expansion of NICNET is likely to make it the information highway of choice for Indian researchers. That's fine with Seshagiri who, between trips to Mars, is busy working out ways to improve the ease of locating and accessing data on the network. His goal is to give Indian scientists access to anything, anywhere, whenever they wish.

–Bhupesh Mangla

Bhupesh Mangla is a medical doctor and science writer based in New Delhi.

GERMANY

Public Health Agency Shakeup Opposed

BERLIN—Researchers at Germany's largest public-health agency are up in arms over a proposal to reduce the independence of the agency and bring it under tighter control of the government's secretary of health. The scientists say the restructuring would hamper their ability to notify the public of impending health threats and delay the adoption of other measures to ensure the safety of drugs and other health-related products.

The proposal before the Bundestag, Germany's parliament, would dissolve the agency, the Bundesgesundheimsamt (BGA), into four institutions reporting to the health ministry. BGA, which aspires to a role similar to those of the U.S. Food and Drug Administration and the Centers for Disease Control and Prevention, began 118 years ago as the Robert Koch Institute and was expanded and made into an independent federal agency in 1952. Since then, it has grown into the largest public-health institution in the country, with 3000 scientists and technical employees.

GERMAN INFORMATION CENTER

In control. Health Minister Horst Seehofer wants a restructured agency.

The new law would dismantle BGA by taking away its central coordinating division, now headed by an interim president. The remaining divisions, which now study problems as diverse as environmental toxins, drug safety and epidemiology, would be grouped into four "independent" institutes, each with its own president. Three would be directly responsible to Secretary of Health Horst Seehofer, and the fourth would report to the environmental minister.

Last week, at a hearing before the Bundestag's health committee, some 50 experts testified against Seehofer's plan. Scientists are unhappy that the presidents of such nominally independent institutions would in reality be overseen by a lawyer or other nonscientist within the health ministry and that the authority of the BGA president would be eroded. The Working Group of Scientific-Medical Societies (AWMF), representing 88 of 100 organizations in the field and some 90,000 professionals, has declared that "only a politically and economically independent BGA led by scientists can ensure the quality of drugs and medical products." Walter Messer, speaking for Germany's premier science organization, the Max Planck Society, said it was "unlikely that ministerial guidance would increase efficiency." And Georg Henneberg, a former BGA president, said he feared that legal experts at the ministry might try to direct the work of scientists. The strongest support came from representatives of the pharmaceutical industry, which hopes the changes will speed up the drug-approval process.

Seehofer says closer political oversight is needed in the wake of the agency's failure last fall to keep him adequately informed about a scandal involving the improper screening by some German companies for the human immunodeficiency virus (HIV) among blood donors. In short order, Dieter Grosklaus, then president of the BGA, took early retirement and Gottfried Kreutz, head at the relevant division at BGA's medical institute, was suspended. The head of the ministry's programs on communicable diseases was also forced out. Kreutz has since been quietly reinstated.

Within days, however, it became known that the vast majority of the incidents, involving 373 hemophiliacs who had been given blood-clotting agents contaminated with HIV, took place before a blood test became available in 1985. Moreover, all cases had been registered properly and were included in statistics published monthly by the BGA. An investigation by parliament has so far failed to substantiate allegations of a coverup at BGA.

BGA scientists who oppose the changes argue that the current system is already vulnerable to political influence, and the proposed reorganization would make matters worse. They point to the conduct of the government last summer in response to a report of mad-cow disease (BSE) in Great Britain, when BGA recommended the government stop importing British beef to rule out the risk of a transmission to humans in Germany, where the disease is rare. Such a ban would require consensus within the European Community, and the ministry, choosing not to seek such a step, removed the recommendation before making the report available to the Bundestag. (Seehofer is, however, now actively pushing for such a ban among his European counterparts.) In another incident, this one involving the spread of salmonella, a BGA recommendation to require that eggs be cooled after 10 days as a way to slow the replication of the bacteria was watered down to 18 days after lobbying by agribusinesses worried about the cost of the preventive action.

The Bundestag must still vote on the proposed change, which Seehofer regards as one piece of a larger overhaul of the country's health-care system. But opponents appear to have time on their side: The ruling coalition government could well be toppled in elections this fall, and the opposition socialist party does not favor such a change.

–Michael Simm

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