

could have been set off by a wiring error. The premature signal occurred in four tests of a second lander. NASA's plan to launch that lander in 2001 has now been postponed indefinitely, but an orbiter is still scheduled for 2001.

With only its aging Global Surveyor in orbit around Mars, NASA is reassessing its entire approach to exploring the planet. The agency has undertaken a comprehensive review

of the data relay and spacecraft tracking capabilities of Mars probes.

Goldin, to his credit, accepted some of the blame. He delivered his *mea culpa* to JPL employees on 29 March, a day after the Young report was made public, and a few days later at a House appropriations subcommittee hearing. "I pushed too hard . . . and in so doing, stretched the system too thin," he said in an uncharacteristically

apologetic tone. "It wasn't intentional; it wasn't malicious. I believed in the vision . . . but it may have made failure inevitable." He confessed to members of Congress that he and NASA had become too complacent with the string of successes in space and that many young and inexperienced managers and engineers had entered the program in recent years.

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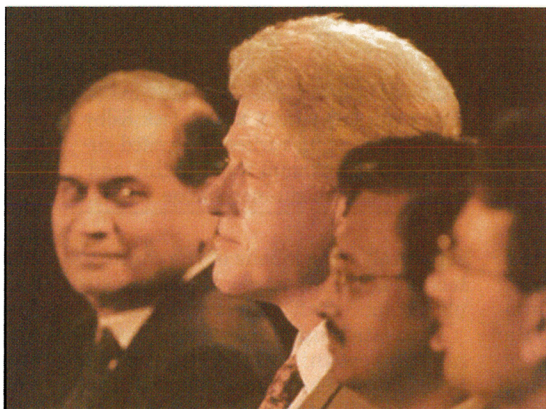
Clinton's One-Day Visit to India's Silicon Valley Leads to Science and Technology Collaborations

After devoting most of his week-long Asian subcontinent trip to issues of nuclear nonproliferation, environmental problems, and the political impasse over the disputed Kashmir area, President Clinton turned to matters of science and technology on 24 March in India's own Silicon Valley. Clinton and his entourage, which included his science adviser, Neal Lane, National Science Foundation Director Rita Colwell, and Commerce Secretary William M. Daley, visited Hyderabad, also known as Cyberabad and as Hitec City (an acronym for the Hyderabad Information Technology–Engineering Consultancy). Among the US computer, software, and information technology companies that have set up research shops there are Microsoft, Oracle, Lucent, and Sun Microsystems—though most of the enterprises in Hitec City are established Indian companies and small start-ups.

On the main streets were signs reading "Wel.com Mr. President" and children, given a day off from school, waving miniature US flags. Never one to miss a chance to address a crowd, Clinton spoke about the "new economy" and the "cyber revolution" flourishing in Andhra Pradesh, the southeastern state in which Hyderabad is located. He noted that India is "fast becoming one of the world's software superpowers," proving that "in a globalized world, developing nations not only can succeed, developing nations can lead."

India's exports of information technology have catapulted in value to \$4 billion last year from some \$150 million a decade earlier, and the Indian government has projected that by 2008 such exports may amount to as much as \$85 billion. What's more, one of India's principal exports is its strongly motivated and highly educated scientists, engineers, and tech-

nicians. Indian students compete ferociously to attend a top-notch science or engineering school. Last year, India's Institute of Technology in New Delhi had 130 000 applicants for 2000 places. The ratio is even larger to enter the Institute of Science, founded in Bangalore in 1933 by India's only Nobel laureate in physics, Chandrasekhara Venkata Raman.



AMID HITEC CITY LEADERS, Clinton extols India's information revolution.

To emphasize the quality of education in science and technology, Clinton noted that India produces 30% of the world's software engineers. The US benefits mightily from this talented workforce. Some 750 high-tech companies in California's Silicon Valley are led by executives of Indian origin, he stated. Clinton also extolled such expatriate superstars as Vinod Khosla, who helped elevate Sun Microsystems to its present technological status, and Vinod Dahm, who masterminded Intel's Pentium chip. On stage with Clinton was Ramalinga Raju, chairman of Satyam Computer Services, the first Indian information technology company to be listed on the Nasdaq exchange. Satyam has entered into an agreement with TechnologyNet.com,

one of several high-tech US–India business ventures.

With India's economy growing by 6% a year, and with 10% growth in sight, some of the country's skilled computer and software engineers and scientists are leaving Silicon Valley and returning home as entrepreneurs or as professors at Hyderabad's Indian Institute of Information Technology, which is already being compared with MIT and Carnegie Mellon University. "What we see is a movement from brain drain to brain gain," said Clinton.

During Clinton's visit, Lane and India's science minister, Murli Manohar Joshi, agreed to set up a forum to promote greater scientific collaboration among government research centers, universities and industry. The forum will consist of seven members from each country and is expected to commission studies on issues involving science and technology and to initiate joint research projects. The US is contributing \$4 million to operate the forum, using unspent funds from a moribund US–India Fund that was scuttled when India tested nuclear weapons in 1998. Scientific cooperation between India and the US peaked in the 1980s with the launching of some 250 collaborations. It went downhill in the 1990s over issues of patent protection and intellectual property rights, and came to a halt after India's nuclear tests.

In her talk in Hyderabad, NSF's Colwell spoke of the "rich potential for science and technology" in India. "Indeed, we can envision a time when young scientists from our country and other countries will pursue research and advanced training at centers of excellence throughout India," she said. The forum, said Colwell, is a new beginning of "a vibrant partnership for our nations."

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