

## INTRODUCTION

BY SHASHI THAROOR\*

EVER SINCE CHRISTOPHER COLUMBUS set out for India and discovered America, his intended destination has remained curiously disconnected from the land of Manifest Destiny. It is only in recent years that this has begun to change with a wave of immigrants from the Subcontinent, many of whom first entered the United States as students on scholarships.

Demographic projections suggest that the next U.S. Census will find more Indian-Americans than American Indians. Any doubts I might have had about these numbers were dispelled at a dinner party I attended in the textile town of Coimbatore at just over a million inhabitants, one of India's less substantial urban centers. About 20 couples gathered on the manicured lawns of the British-era Coimbatore Club, all doctors, engineers and business people. Amidst the chitchat, it abruptly dawned on me that every single guest had a child attending school in the United States. Several had two or more. The sole exception was a couple whose daughter was too young for college. She was going to take the SATs next year.

When I was admitted to an American graduate school in 1975, I was one of three students from my university class of more than 300 who made the journey to America. Already, though, my counterparts at India's elite technological universities and engineering colleges especially those from the Indian Institutes of Technology or IITs — had begun to snap up the fellowships that American munificence (and an ever-growing economy) provided. They went on to form the creative backbone of the global information revolution with their quick minds and developed innovations that changed the way Americans live. For instance, Arun Netravali, former President of Bell Laboratories, received the Presidential Medal of Technology and pioneered a technology which enabled high definition television, HDTV and internet streaming-videos. Raj and Neera Singh, an entrepreneurial couple, pioneered the use of cell phone and pager technology in 40 countries. Mohammad Zaidi, as President of Alcoa in Germany, pioneered the first aluminum-based automobiles for various models of Audi, Mercedes, Jaguar, Volvo and Porsche.

**THE SUCCESS OF THESE IIT GRADUATES AND SEVERAL THOUSAND MORE  
TRANSFORMED THE IMAGE OF THEIR HOMELAND AND ITS PEOPLE. TO THE  
AMERICAN MIND, THE STEREOTYPICAL INDIAN IS NO LONGER A SNAKE  
CHARMER BUT A SOFTWARE GURU.**

For an aspiring Indian, nothing succeeds like the success of your compatriots. Today, an Indian student with decent grades has a better-than-even chance of admission to an American university of his or her choice with a substantial scholarship.

This blossoming of the Indian diaspora has happened because of seeds sown decades ago by the founders of great institutions like the IITs. Working, as I have been for the last couple of years, on a short biography of Jawaharlal Nehru, I became conscious of the extent to which we have taken for granted one vital legacy of his: the creation of an infrastructure for excellence in science and technology, which has become a source of great self-confidence and competitive advantage for India today. Nehru was always fascinated by science and scientists. He made it a point to attend the annual Indian Science Congress every year, and he gave free rein (and taxpayers' money) to scientists in whom he had confidence to build high-quality institutions. Men like Homi Bhabha and Vikram Sarabhai constructed the platform for Indian accomplishments in the fields of atomic energy and space research; they and their successors have

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given India a scientific establishment without peer in the developing world.

Nehru's establishment of the IITs (and the spur they provided to other institutions like Birla Institutes of Technology and Indian Institutes of Management) have produced many of the finest minds in America's Silicon Valley and Fortune-1000 Corporations. Today, an IIT degree is held in the same reverence in the U.S. as one from MIT or Caltech, and India's extraordinary emergence in new-age industries in Software, Information Technology and Business Process Outsourcing - is the indirect result of Jawaharlal Nehru's faith in scientific education. Nehru left India with the world's second-largest pool of trained scientists and engineers, integrated into the global intellectual system, to a degree without parallel outside the developed West.

Yet, the roots of Indian science and technology go far deeper than Nehru. The Rig Veda, an ancient Indian text, asserted that gravitation held the universe together 24 centuries before the apple fell on Newton's head. The Vedic civilization subscribed to the idea of a spherical earth at a time when everyone else, even the Greeks, assumed the earth was flat. By the 5th Century A.D., Indians had calculated that the age of the earth was 4.3 billion years; as late as the 19th Century, English scientists believed the earth was a hundred million years old, and it is only in the late 20th Century that Western scientists have come to estimate the earth to be about 4.6 billion years old.

India invented modern numerals (known to the world as "Arabic" numerals because the West got them from the Arabs, who learned them from Indians!). It was an Indian who first conceived of the zero, shunya; the concept of nothingness, shunyata, integral to Hindu and Buddhist thinking, simply did not exist in the West. The concept of infinite sets of rational numbers was understood by Jain thinkers in the 6th Century B.C. Our Indian forefathers can take credit for geometry, trigonometry, and calculus; the "Bakhshali manuscript," 70 leaves of bark dating back to the early centuries of the Christian era, reveals fractions, simultaneous equations, quadratic equations, geometric progressions and even calculations of profit and loss, with interest. Indian mathematicians even invented the concept of negative numbers.

The Sulba Sutras, composed between 800 and 500 B.C., demonstrate that India had Pythagoras' theorem before the great Greek was born, and a way of getting the square root of 2 correct to five decimal places. (Vedic Indians solved square roots in order to build sacrificial altars of the proper size.) The Kerala mathematician Nilakantha wrote sophisticated explanations of the irrationality of "pi" before the West had heard of the concept.

But one could go back even earlier, to the Harappan civilization, for evidence of a highly sophisticated system of weights and measures in use around 3000 B.C. Archaeologists found a "ruler" made with lines drawn precisely 6.7 millimeters apart with an astonishing level of accuracy. The "Indus inch" was a measure in consistent use throughout the area. The Harappans also invented kiln-fired bricks, less permeable to rain and floodwater than the mud bricks used by other civilizations of the time. The bricks contained no straw or other binding material and so turned out to be usable 5,000 years later when a British contractor dug them up to construct a railway line between Multan and Lahore. And while they were made in 15 different sizes, the Harappan bricks were amazingly consistent: their length, width and thickness were invariably in the ratio of 4:2:1.

These examples, whether they be of the Harappan thinkers in 3000 B.C. or India's graduates of the IITs in the 21st Century, demonstrate the great intellectual versatility of the Indian mind and their extraordinary contributions to the world.

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