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Changing Borders and Realities: Emigration of Indian Scientists and Engineers to the United States

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Abstract
International migration cannot be viewed as a byproduct of globalization since people have been migrating for centuries. However, globalization has given rise to a new kind of immigration, where a growing variety of interconnected social activities are taking place among technical immigrants at a high speed irrespective of their geographical location. The advent of instant online communication and the ability to share discoveries, inventions, advances, documents, and pictures in real time, as well as safe, easy, and fast travel options have made the traditional notions of borders, immigration, and even assimilation obsolete. This paper looks at how the tenets of immigration under globalization seem to be becoming outmoded as scientific knowledge flows between India and the U.S. It is based on the review of literature on the subject and in-depth interviews conducted in 2002-2004 with 120 Indian scientists and engineers from both countries.

Keywords
brain circulation, Indian Diaspora, immigrant network, new immigration, transnational space

Introduction

The concept of international immigration is based on notions of identity as defined by nationality, which in turn is defined by a person's passport and legal status in a given country. International immigration is the physical and legal movement of people from one nation to another for lawful permanent residence. Embedded within such a movement is an assumption that social ties are irrevocably dissolved and the past is overwhelmed by future acculturation. Immigrants abandon their home country and assimilate into the country to which they have migrated. Thus, physical borders are transformed into social boundaries.

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Globalization and advances in technology, however, have given rise to a new kind of immigration. Till the mid-1980s, traveling between home and migrating countries was rather a time-consuming and expensive process. Written letters via snail mail were economical but took a long time; other means of communication, such as the telephone, were instant but expensive. These limited the flow of immigrants' communication with people in their home country. Globalization, however, has reduced geographical locations, which are typically measured in time and not in distance. With advances in communication and transportation technologies, immigrants can quickly move between home and migrating countries, can maintain instantaneous close ties with people in their home country, and do not need to fully assimilate into the migrating country. This is especially the case with the technical immigrants.

Objectives: This paper explores the issues of border and immigration as they relate to Indian scientists and engineers. First, it outlines the evolution of U.S. immigration policy toward Indians. Although the primary role of the Indian immigrant was, and continues to be, recruited labor, the form of that labor has changed from unskilled to highly specialized with a shift from a nation-centered economy to a global economy. Second, the paper discusses scholarly views on international immigration. It shows that the push-pull and brain-drain models of international immigration are outdated as they are predominantly economically driven. It suggests international immigration should be considered as an essential part of globalization. Third, the paper reports findings from in-depth interviews with 120 Indian scientists and engineers in the U.S. and in India. It shows immigration of Indians in the context of the globalization of science and engineering education and work. It suggests that geopolitical structures historically imposed on the international movement of Indian scientists and engineers are increasingly becoming irrelevant in a world dominated by virtual consumer and global labor markets. Finally, the paper concludes by developing a post-modern approach to international immigration.

U.S. Immigration Policy: From Skin to Skill

Four phases mark the history of Indian immigration to the U.S. The first phase began with the arrival of the first lot of Indians in the late eighteenth century through 1945. The U.S. immigration policy of the time was based on the exclusion of "undesirables," defined primarily by a person's country of origin (e.g., the Chinese Exclusion Act of 1882, the Gentleman's Agreement with Japan in 1907, the Barred Zone Act of 1917, and the Immigration Act

of 1924). Typically, anyone from outside Western Europe was unwelcome. As a result, emigration from India was first restricted and later banned.

In this period, the majority of Indian immigrants provided unskilled labor for America's growing industrial needs (Hess 1974). They worked on the construction of railways such as the Western Pacific Railroad and in the lumber mills of the Pacific Northwest. Some constructed bridges and tunnels, and others worked on farms in California. They took jobs formerly held by Eastern European workers. With restrictive U.S. immigration laws, Indians either kept to themselves or joined Mexican and Black communities by abandoning their turbans and engaging in intermarriage (Helweg and Helweg 1990).

The 1910 Census recorded 2,546 Indians; the 1920 Census recorded 2,495 Indians; the 1930 Census recorded 3,130 Indians; and the 1940 Census recorded 2,404 Indians (U.S. Census Bureau 1913: 126; 1922: 767; 1933: 27; 1943: 74). The majority of Indian immigrants were non-English-speaking, mostly of peasants background.

The exigencies of World War II ushered in a second phase that lasted from 1946 through 1964. The U.S., as a gesture toward Allied supporters in Asia, allowed in a trickle of immigrants from that region. Initially, the U.S. introduced the 1946 Luce-Cellar Act, which provided for an annual quota of 100 and gave Indians naturalization rights. In 1952, the Immigration and Nationality Act combined the multiple laws that governed immigration and naturalization in the U.S. into one comprehensive statute. The new statute allowed a quota of 100 immigrants per country, with a ceiling of 2,000 on most countries in Asia. It also allowed naturalized American citizens to bring spouses to the U.S. as non-quota immigrants. Most importantly, it introduced a system of selective immigration by giving preference to workers whose skills were in great demand.

Lifting the iron bar facilitated an increase in Indian immigration. Between 1946 and 1964, the U.S. admitted about 5,500 immigrants from India (U.S. Department of Commerce 1975: 107). Often, the number of non-quota immigrants (spouses, children, and other dependents of American citizens) equaled, and sometimes even exceeded the number admitted under the annual quota. The majority of those who immigrated under the new law were professional men and their families. The growing Indian community now consisted of both unskilled laborers, who had migrated earlier, and the newcomer professionals (Hess 1974). The actual number of Indians in the U.S. in the 1950s and 1960s is not known since the U.S. census included them in the "other" category.

The enactment of the 1965 Immigration Act ushered in the most important phase of Indian immigration. This act placed Asian nations on an even

plane with other countries. The 1965 Act set a 20,000 immigrant per year/per country limit. It called for the allocation of all immigrant visas on a first-come, first-serve basis, subject to the preference system: First Preference to unmarried sons and daughters under age 21 of U.S. citizens; Second Preference to spouse and unmarried sons and daughters of alien lawfully admitted for permanent residence; Third Preference to professionals, scientists, and artists of exceptional ability; Fourth Preference to married sons and daughters over age 21 of U.S. citizens; Fifth Preference to brothers and sisters of U.S. citizens; Sixth Preference to skilled and unskilled workers in occupations for which labor is in short supply; Seventh Preference to refugees or other displaced persons fleeing as a result of political, religious, or racial persecutions; and Non-preference to any applicant not entitled to one of the above preferences.

One of the most important aspects of the 1965 Act for the Indian immigrant was that it explicitly gave priority to the economic needs of the U.S. by admitting immigrants based on their technical knowledge or ability to do jobs that U.S. employers had been unable to fill with U.S. workers. This change in immigration policy coincided with the advent of the Sputnik program in the Soviet Union, the growth of high-technology industries and its corresponding demand for technically proficient labor, and a perceived shortage of skilled workers in the U.S. The justification for U.S. immigration shifted from "skin" to "skill." These requirements made it difficult for unskilled or semiskilled workers to come to the U.S. unless they had relatives willing to sponsor them.

The number of Indian immigrants admitted grew from 467 in 1965 to 2,293 in 1966; 4,129 in 1967; 4,165 in 1968; 5,205 in 1969; and 8,795 in 1970 (U.S. Department of Commerce 1975). Between 1971 and 1980, 164,134 Indians were admitted and between 1981 and 1990 another 250,786 were admitted (U.S. Immigration and Naturalization Service 2003). The 1980 Census recorded 387,223 Indians, and the 1990 Census recorded 815,447 Indians, an increase of 125% from 1980 (U.S. Census Bureau 1983, 1993). The vast majority of Indian immigrants, who arrived after 1965 were professionals.

The final phase of immigration began with the Immigration Act of 1990 when the government approved the high-skilled temporary worker visa (H-1B) program. In the 1980s, high-technology companies in the U.S. suffered intense competition from Japan and Europe, which had rebuilt their war-ruined economies. The U.S. industry could not remain dominant technologically or commercially in the race to manufacture high-technology goods such as transistors, radios, televisions, videocassette recorders, steel, automobiles, fax machines, and numerically controlled machine tools (Reich 1988; Dertouzos, Lester, and Solow 1989). Foreign suppliers increasingly provided

high-technology products to the U.S. domestic market. Skilled labor was seen as an essential factor for the U.S. to remain competitive in the now-global market of high-technology products (Johnston and Packer 1987). The U.S. industry and government officials called for immigration to be more responsive to the country's labor needs for skill work.

The 1990 Immigration Act placed an annual numerical ceiling of 65,000 on admissions of temporary specialty occupation workers—aliens entering under the H-1B nonimmigrant visa to fill jobs requiring a baccalaureate degree or equivalent work experience. The temporary visas are valid for three years, but can be extended for stays of up to six years. In 1997 and 1998, the U.S. quota of 65,000 H-1B visas for temporary employment of foreign workers with technical skills was exhausted well before the end of each of those fiscal years. U.S. high-technology sector, especially the Information Technology Association of America, a trade association representing about 11,000 companies, led an aggressive campaign to increase H-1B quota. Congress responded by twice increasing the numerical limits. The American Competitiveness and Workforce Improvement Act of 1998 increased H-1B visa quotas to 115,000 for the fiscal year 1999; 115,000 for the fiscal year 2000; 107,500 for the fiscal year 2001; and 65,000 in each succeeding fiscal year. The American Competitiveness in the Twenty-First Century Act of 2000 increased H-1B visa quotas to 195,000 for each of three fiscal years (2001, 2002, 2003), and then returned them to the original 65,000 per-year limit thereafter.

According to the U.S. Immigration and Naturalization Service, Indian workers have been taking half of the H-1B visas. With Indians traveling on H-1B visas to fill high-technology jobs in the U.S., they doubled their population in the U.S. Between 1990 and 2000, the Indian population as a whole increased from 815,447 to 1.9 million (Barnes and Bennett 2002). Almost 70% of these Indians are foreign-born. Most Indians in the U.S. are well educated and skilled; almost 60% of all employed Indians in the civilian workforce are in management, professional, and related occupations (U.S. Census Bureau 2000: Table 86).

This section has shown that the immigration of Indians has been inimically connected to commercial and economic concerns of the U.S. The rising demand for a technically savvy workforce for the U.S. industry to compete successfully in the global market has vaulted the Indian immigrant scientists and engineers into the ranks of the desirable foreigners.

Scholarly Views on Immigration: A Critique

Over 150 years ago, Karl Marx argued that the imperatives of capitalist production inevitably made the bourgeoisie to invest in new methods of production, improve technical developments, and establish connections all over the world. Despite capitalist exploitation of workers at home and colonies abroad, industrial expansion compressed geographical locations and increased human interaction across borders. Scholars building on the Marxist framework have argued for one world capitalist system in which the core (developed countries) and the periphery (developing countries) have gone through different stages of development leading to the growth of the core and the degeneration of the periphery into distorted underdevelopment (Frank 1967; Griffin 1969; Rodney 1974; Amin 1976; Wallerstein 1980). Without a strong internal market, the periphery remains dependent on the core for its development; the core, on the other hand, enjoys a strong internal market and therefore has an exclusive capitalistic mode of production.

With the unequal development of capitalism at the global level, scholars use what can be best characterized as the push-pull model to explain the causes of migration of people from developing to developed countries (see Sjaastad 1962; Burki and Swamy 1987; Portes 1987; Khadria 1999). The key assumptions of the push-pull model are: (1) individuals desire a better life; (2) individuals will move away from places where economic, political, and social environments are poor; (3) individuals will move to places where better economic, political, and social environments can be gained; (4) better economic conditions mean high wages and the higher standard of living; (5) the better political environment is democratic; and (6) better social conditions are those which foster personal freedom. Based on such assumptions, the typical push-pull model postulates that migration of people is a function of income differentials, job opportunities, the working environment, living conditions, and the cost of travel.

Though applicable till the 1970s or so, the push-pull model has become outmoded under globalization. First, unskilled poor people are not the only ones who leave their countries; developed countries seem to be competing with each other for skilled labor in much the same way that they previously competed for raw material from the colonies (Glanz 2001). Second, there is evidence that economic factors do not always dictate the migration of skilled workers. For example, both Mexico and India have highly unequal income distribution patterns, yet the number of Mexican scientists and engineers migrating to the U.S. is much smaller compared to India (Alarcon 1999). Third, developed countries like Canada and Australia also experience large-scale emigration of skilled workers (Saravia and Miranda 2004). Fourth, there

are several non-economic factors like changes in immigration laws, companies' policies for recruiting skilled workers from abroad, and national security considerations that play an important role in immigration.

Most importantly, the push-pull model assumes that the migration of skilled workers is similar to those of unskilled labor. Though there may be similarities between the migration of unskilled labor and that of skilled, there are important differences as well. Migration of the latter is related to developing countries' economic well being in the global economy, as well as to the phenomenon of science becoming global in its access and application. This complicated relationship has generated extensive debates among scholars in both developing and developed countries, as well as in international organizations such as the United Nations.

Accordingly, the brain-drain model postulates that developing countries are negatively impacted by the emigration of their best brains—the scientists, engineers, and medical professionals. The brain-drain is understood as a one-way movement or exodus that points to migratory flows of highly skilled professionals from the South to the North, or from the developing to the developed countries, and benefits only the developed (host) countries (Gaillard 1991). The brain-drain model holds that the flow of skilled labor from developing to developed countries creates a paucity of skilled and professional expertise for the continued development of the country, thereby making a poor country poorer. Returning to the home country has been viewed as part of the normal sequence of international immigration. Not returning is considered a breach of duty, lack of nationalism, and just short of being unpatriotic (Gaillard, Krishna, and Waast 1997). Nevertheless, only a few skilled workers return. It was, therefore, asserted that developing countries were in reality subsidizing the developed countries by educating and training workers who then took their skills elsewhere.

Although the brain-drain model speaks from a developing country's perspective, it is still grounded on assumptions similar to the push-pull model. The thrust of the brain-drain argument is that developed countries are unfairly using their economic power to lure skilled labor like scientists, engineers, and medical professionals from developing countries. Further, the brain-drain model presents the situation from one side only; it does not take into account potential benefits for source countries resulting from brain-drain such as remittances, transfer of capital and technology, and reverse return of skilled labor. Also, with underemployment among skilled laborers in several developing countries, it is not clear whether migration of skilled personnel can be viewed as an exodus. Most importantly, international immigration has become far more complex for both developing and developed countries. Many countries (e.g., Taiwan and South Korea) are experiencing a reverse flow of skilled

labor (Finn 2003). Canada loses a lot of its skilled workers to the U.S., while it gains skilled workers from other countries. Similarly, Brazil also has many of its doctoral graduates emigrating, but this is balanced by an influx of professionals from other countries in the region (Saravia and Miranda 2004).

In recent years, scholars have recognized the important role of migrant social networks, interpersonal ties that bind migrant and non-migrant people within a maze of mutual responsibilities that make possible entry, employment, and adaptation at the destination in international migration (Portes 1995). People within a migrant social network exchange ideas, information, and resources that are not available in other systems of information transfer (e.g., contracting companies, lawyers, and immigration services). Knowing someone who has migrated creates a migratory information feedback loop (Boyd 1989). New members feel indebted to others in the migrant social network for sharing with them information and resources, so they extend the same courtesy to incoming members of the migrant social network.

Though social networks play an important role in international immigration, it is not clear if this is the leading cause of immigration. Instead, social networks impart information, which makes the movement of people and their adjustment to a new place rather uncomplicated. Apart from the effective presence of kinship, caste, ethnic, linguistic networks to smoothen the immigration process and the subsequent adjustments, new types of professional networks have come to operate among the Indian immigrants in the US, particularly among the scientific and technical professionals. The most conspicuous among these are the networks of alumni of IITs (Indian Institutes of Technology). The ex-IITians not only formally maintain alumni associations, at respective IITs, but also meet in regular intervals in the US. Even these networks flourish in extending cooperation to fellow IITians for professional and employment purposes. Of course, this itself could be a subject matter of systematic sociological investigation.

Embedded within the push-pull, brain-drain, and social network models of international immigration is the assumption that the world is a distinctly fragmented composite of nations, isolated from one another through all-encompassing geographic borders. Globalization, however, has brought multiple fundamental changes in economic, social, and political arena. It has spread new forms of social activities via telecommunication, digital computers, audiovisual media, rocketry and the like irrespective of the geographical location of people (Scholte 1996). Further, it has transformed the human organizations by expanding and linking human activities across the world (Held, McGrew, Goldblatt and Perraton 1999). Most importantly, globalization has proliferated high-speed communication, information, and transportation technologies in human activities (Eriksen 2001).

Globalization has created opportunities for technical immigrants to be connected with people in their home country as well as for the reverse and temporary immigrations: "In the global society, brainpower flows relatively easily across national boundaries, seeking promising opportunities" (Singhal and Rogers 2001: 151). The mobility of scientists and engineers is now referred to as "brain circulation," since a cycle of study and work abroad is followed by a return to the home country to take advantage of emerging high-level opportunities (Cao 1996). Brain circulation creates specific international "epistemic communities," which allows them to serve as conduits for the diffusion of new ideas and paradigms back to the home country's domestic sphere (Kapur 2004). Even without brain circulation, immigrant scientists and engineers remain available as a valuable resource to their home country in the form of intellectual, monetary, trade, and moral support.

International immigration has become an essential part of globalization. The case study of Indian scientists and engineers in the next section shows that the development of advanced communication technologies like the Internet, faster and safer transportation, and multinational trade scenarios have blurred national boundaries and created a virtual global scientific and engineering community. Indian scientists and engineers maintain ties with India; instead of assimilating completely, they are creating transnational culture in the U.S.

Diaspora of Indian Scientists and Engineers

This section draws immigration-related findings from Varma's book, *Harbingers of Global Change: India's Techno-Immigrants in the United States* (2006). It is based on in-depth interviews with 120 Indian scientists and engineers that were conducted in the years 2002 to 2004, including 82 Indian scientists and engineers working in the public and private sectors inside the U.S. The sample includes 26 respondents from 24 academic institutions, 39 respondents from four high-technology industrial companies, and 17 respondents from two national laboratories. In addition, 38 interviews were conducted with Indian scientists and engineers who studied and worked in the U.S. for some time and then moved back to India and worked in three academic institutions and one research laboratory.

Respondents were asked why did they choose to come to the U.S.? Their reasons for emigration ranged from greater educational and career opportunities to social networks. Each of these reasons is in itself a complex subset of reasons bound by historical factors, the current social, economic, and political climate in India, as well as major development strides in science and technology. As Table 1 shows, the existence of greater educational opportunities was the main

reason cited for migration by the majority of respondents (65%), and was cited as the sole reason by 39%. Even though the sample of female respondents in academia was small, all of them cited greater educational opportunities as their reason for moving to the U.S. Another noteworthy fact is that 80% of the respondents who returned to India said that seeking greater educational opportunities was one of their main reasons for going to the U.S., with 45% saying it was the sole reason. Most of these respondents wanted to go to cutting-edge schools in the U.S. for advanced degrees; after they earned a master's degree in a science or engineering field in India, going to the U.S. was the "natural thing" for them to do. Over 40% of respondents offered better career opportunities as a key reason to go to the U.S., with 23% citing it as the sole reason. This motive was more predominant among respondents from national laboratories (59%) than from academic institutions (47%) or industrial companies (43%). Although few respondents (10%) mentioned social connections as a sole motivation to immigrate to the U.S., an additional 15% mentioned education and career opportunities along with knowing someone in the U.S. or in India who had ties in the U.S.

Table 1

Why Indian Scientists and Engineers Move to the U.S.

Reasons to come to U.S.	Industry		Academia		National Lab		Returned to India		Total
	M	F	M	F	M	F	M	F	
	%		%		%		%		%
Education	33	33	45	50	31	25	47	25	39
Career	30	22	41	0	38	0	9	0	23
Network	10	33	0	0	0	50	9	25	10
Education and career	10	0	9	25	23	0	9	25	11
Education and network	7	0	0	25	0	0	21	0	8
Education, career and Network	7	11	0	0	8	25	6	25	7
Other	3	0	5	0	0	0	0	0	2
Number of respondents	30	9	22	4	13	4	34	4	120

Reasons why Indian scientists and engineers move to the U.S. show the globalization of science and engineering (S&E) education and work. The standard for educating and training scientists and engineers in India is modeled after that of Western countries. Science and engineering departments in India rely on Western curricula and standards, use Western textbooks, and adopt Western scientific methods. After World War II, the U.S. emerged as the preeminent destination for S&E higher education, with the enormous financial resources to attract and retain foreign graduate students in S&E. In addition, the globalization of science and industry has transformed scientists and engineers in India into a highly mobile work force. It is relatively easy for Indians to find employment in the U.S. because their S&E knowledge can be transferred across national borders. Also, they are well versed in English, and closely connected with American society through their studies at U.S. universities or employment in American companies in India. The globalization of S&E allows Indian scientists and engineers to study or work anywhere in the world.

Table 2

Attitude of Indian Scientists and Engineers on Returning to India

Intending to return to India	Industry		Academia		National Lab		Total
	M	F	M	F	M	F	
	%		%		%		%
No	23	22	45	50	85	75	43
Yes	53	44	23	0	8	25	33
Undecided	23	33	32	50	8	0	24
Number of respondents	30	9	22	4	13	4	82

A question of importance is, why do Indian scientists and engineers continue to live in the U.S. after completing their studies or acquiring their initial goals? Respondents working in the U.S. were asked if they would like to move back to India to live. As Table 2 shows that even though a large majority of respondents (43%) did not want to go back to India, a significant number of respondents (33%) did want to return, while 24% of respondents were undecided. The national laboratory respondents were most likely not to want to move back to India, followed by the academia respondents. Conversely, more industry respondents preferred to move back to India than did academia and

national laboratory respondents. The academia respondents (35%) had the highest percentage of being undecided compared with industry (26%) and national laboratory (6%) respondents. Slightly more female respondents were undecided (29%) than male respondents (23%). These responses show that the emigration of Indian scientists and engineers is still not permanent.

Table 3

Attitudes of Indian Scientists and Engineers on "Not" Returning to India

Reasons for not wishing to return to India	Industry		Academia		National Lab		Total
	M	F	M	F	M	F	
	%		%		%		%
Family assimilated in U.S.	57	100	80	50	55	66	66
Better opportunities in U.S.	71	0	60	0	45	66	51
Connection to India from U.S.	86	50	40	100	27	0	46
Other	0	0	10	0	18	33	11
Number of Respondents	7	2	10	2	11	3	35

Respondents provided more than one response, thus percentages do not add up to 100.

Respondents who did not want to return to India to live were further asked reasons behind their choice. As Table 3 shows, respondents did not want to move back to India because their family members were assimilated in the U.S. (66%), the U.S. offered better educational and career opportunities for them and for their children (51%), and they believed in a shrinking physical distance with India (46%). Almost all respondents in industry said that having strong connections to India kept them from feeling the need to return; only 21% of national laboratory respondents offered the same reason. Most respondents were able to maintain their Indian connections while remaining in the U.S. They indicated that they make periodic visits to India, attend conferences and workshops held there, and give lectures and short courses at Indian institutions. Some even have collaborative projects with their peers in India funded by U.S. organizations.

Table 4

Attitudes of Indian Scientists and Engineers on "Yes" Returning to India

Reasons for wishing to return to India	Industry		Academia		National Lab		Total
	M	F	M	F	M	F	
	%		%		%		%
Family in India	63	75	60	0	100	100	66
With better job in India	38	0	60	0	100	0	37
Better social life in India	31	0	40	0	0	0	26
Give back to India	13	25	20	0	0	0	15
Other	0	25	0	0	0	0	4
Number of respondents	16	4	5	0	1	1	27

Respondents provided more than one response, thus percentages do not equal 100.

Respondents who did want to return to India to live were also asked reasons behind their choice. Among those with intentions to return to India, as Table 4 shows, 66% mentioned family obligations, 37% said better career prospect, 26% glorified India for social/cultural values, and 15% expressed patriotism. Family obligations were more prominent among female (80%) than male (60%) respondents. Similarly, 46% of males gave better jobs in India as a reason for returning, yet no females cited this motivation. While 32% of males cited a better social life as their reason for wishing to return to India; no females cited this as a reason. Interestingly, most respondents said that if they moved back to India, they wanted to return for work in the U.S. at regular intervals. Many respondents also expressed their desire to accept a temporary job for a short duration in India. Respondents who returned to India after working in the U.S. did so because they were offered faculty or research positions in prestigious institutes.

In addition, respondents who worked in the U.S. and then moved back to India were asked if they would like to return to the U.S. The overwhelming majority of respondents (over 70%) reported that they did not want to move back to the U.S. They valued the work and social life in India, and had the best

of both worlds with the ability to travel to the U.S. regularly to attend conferences and workshops or take interim summer work. If not visiting the U.S., they regularly kept in touch with their American colleagues via electronic networks.

One of the main reasons why Indian scientists and engineers in the U.S. do not feel a need to move back to India or those who had returned to India do not want to move to the U.S. has to do with the advances in transportation and communication technologies. In the last decade, there has been an exponential growth in electronic networks in India, so those outside India can easily connect with those inside India. The electronic network has opened new spaces for people to communicate and collaborate. Unlike unskilled or skilled manual laborers, scientists and engineers are highly connected with their peers in the U.S. and India. Electronic networks have not only facilitated communication and the exchange of information between American and Indian scientists and engineers but have also led to collaborative projects. Further, they have face-to-face contact through conferences and workshops sponsored by professional associations to which scientists and engineers in the U.S. and India belong. With the emergence of new ways of networking, communicating, and collaborating, the return of scientists and engineers to India no longer seems imperative. Indian scientists and engineers in both countries believed that electronic networks have brought India and the United States closer.

Discussion: A Postmodern Approach

Indian scientists and engineers have been migrating to the U.S. in significant numbers since 1965. They have long enjoyed some connection with their colleagues in India. However, earlier linkages were not well developed and institutionalized. The communications revolution and changes in the Indian government's attitudes have forged systematic linkages between national and expatriate scientists and engineers. At the beginning of the twenty-first century, this process has accelerated, with India's desire to become what Joseph Nye, dean of John F. Kennedy School of Government at Harvard University, has called a "soft power." India is hoping to play a major role in international affairs through its culture, ideas, and people. It is actively mobilizing to reconnect with its scientists and engineers living in the U.S. and other countries. Indian scientists and engineers are living in the country of their choice, but being sought to contribute to India in some way.

Immigration, in a postmodern sense, is a process of attaining a socially ascribed identity, finding its expression in financial and legal rules and regulations, even while discovering a personal identity that transcends national

boundaries. Immigration is blurred by "presence" through virtual communication networks and frequent travel to the home country. Transnational social spaces are configurations of social practices, artifacts, and symbol systems that transcend constructs of nation-states or bi-nations, and remain just that—transnational. Transnational space for a community is defined by its geographical nodes, like the cultural hearth (or the origin of the community), diaspora node (or the node in a geographical space other than origin), and new center (when a migrant community moves away from the hearth and develops a new center of cultural affiliation) (Voigt-Graf 2004). What is assumed is that negotiation of physical realities of space creates transnational connections for the migrant community. But with the spread of information technology, the very concept of space is blurred. Thus, a person may be in the U.S., but due to daily communication via telephone, Internet chats, or through web cam, that person participates in the everyday life of his/her family in India. In the mental world, the nation-state space collapses and a form of long-distance nationalism emerges. It is, therefore, no surprise that many respondents interviewed saw themselves as "global citizens" rather than "Indian citizens" or "U.S. citizens."

Some scholars dispute the concept of unbounded transnational nation-states and argue that recent Hindu nationalist discourse of "the motherland and her estranged sons" rhetorically creates boundaries within the existing nation-state identities (Walton-Roberts 2004). Others have disputed the concept of the unbound transnational state in light of post 9/11 policies and political rhetoric, and theories that these concepts are "experiencing a kind of rebound." They have also argued that borders are real because first, transnational communities are more the exception than the norm of current global order and, second, crossing international borders remains a very difficult proposition for much of the world's population (Cunningham 2004: 332, 333).

The U.S. has been employing many techniques to regulate immigrant selection and exclusion. The term "migrants" itself creates an image of an outsider coming inside and disrupting the sovereignty of the country; immigrants walk a tight rope between the national self and the foreign other. Yet, the U.S. is simultaneously relaxing barriers to the flow of legitimate skilled labor to compete successfully in the global market. Consequently, migrants have been moving faster than ever because the U.S. is more interconnected with other countries than ever before. The Smart Borders—complex advances in security and surveillance technologies—deployed in the U.S. mark the integration of countries into the global information systems that surpass them. Irrespective of the politics of the process of U.S. immigration, the boundaries of the nation state have been materially altered and blurred, at least in the case of a privileged migrant population who generally face few difficulties obtaining

work permits and visas, and whose mobility is not strictly regulated by nation-states.

To sum up, immigration as characterized for the past several centuries no longer applies to the scientific- and technology-driven culture moving between India and the U.S. The movement of Indian scientists and engineers is no longer a one-way journey, as information, money, resources, and people travel freely and frequently from the new or temporary home to the country of origin and back again. The decreased distance and better communication facilities have in turn created a postmodern identity for the "Indian immigrants," in which not only are they never socially completely identified as Americans, but also their personal identity is complicated by the real influence of both countries—India and the U.S.

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