OK. Let's get started. One announcement is a reminder. There is a paper due on April 4, and Michaela will be sending out a formal assignment about that within a day or two. So you can get started on that whenever you like. And we can talk about it more next week after the assignment comes out.

But for the most part, what it's going to look like is an assignment to do a little more digging and some research into, basically, people, place, or thing in the part of the history of MIT that we've covered so far. So take a particular person-- maybe one of the signers of the charter or one of the early professors or an early student here-- a place, one particular building from the period up to 1915 or so. And we say thing, but I think that could be an instrument or a laboratory that is of interest and do a little profile of that about what was it used for, what were people studying in the laboratory, and how were people being taught-- and basically, to focus on the first 65 years or so-- 50 years or so.

The 50th anniversary of MIT is 1911, so something from that early period that interests you. There's a lot of material, both online, but also in the MIT archives, in the libraries. Actually, a really good source is just, of the books that we've been assigning pieces of, you can just look further into those books. And Michaela will help you with that and actually have maybe a special session on some of the research methods and what to expect for that.

So that's coming along. And next week, we'll have Ros Williams in, who will talk about a combination of things. She's a historian of technology as well. She's written about the history of MIT and the chemical engineering department, which happens to have been founded by her grandfather, who had a lot of interesting personalities on campus and things he was involved in.

Today, we are lucky to have Ross Bassett with us who is a colleague of ours from NC State, has written a very good book on the history of CMOS technology and the equation of the semiconductor integrated circuits. And now, he's working on this book part of the assignment, which was the reading today on the Indian students at MIT. And he's going to talk to us a little bit about that.

And over lunch, it was just becoming clear how many of the issues that were raised both in the readings and also in the response papers for today are, as some of you pointed out, relevant for issues on campus. We happened to be sitting two tables down from Tom Mangnati, who's the former dean of engineering here and the president of the new university in Singapore that MIT has founded based on the principle of organizing around design.

And so as many of you will have heard from a variety of things, MIT's relationships with the rest of the world-- its profile abroad is very much a topic of conversation at MIT these days. How many of you work in a lab that has some connection with Singapore or some other international research group? So a few of you do. And how many of you were born and raised in the US versus-- so yeah. Undergraduates-- very much more American-based. The undergraduate population is capped at about 8% international students, whereas the graduate student population is probably-- I don't know the exact number-- 50% or 60% international students.

But even of the US-born, US-raised undergraduate students, many come from families, first generation immigrants or whatnot. We've talked about that a little bit before. So Ros will talk to us a little bit about Indian students at MIT. It's a very interesting case. There's a lot of interesting reasons to be interested in India and MIT's relationships there-- but also not necessarily typical, but representative of MIT's relationships with Japan, China, Iran, Middle East-- lots of different places around the world. All of them are a little bit special, but they're certainly part of a longer story here.

So he's going to talk for a little bit, put the article in the context of a larger project

that he's working on, and then we can pick up the discussion there. And I think that'll naturally segue into also this particular period that we've come into-- turn of the century up through the beginning of World War II, the technology plan, relationships with industry. Again, so many of the issues from the reading that were on the table in 1915, 1930 are still issues that are on the table today in some form or another.

**ROSS BASSETT:** Thanks, David and Roe and Michaela. I think it's a good strategy to start out by sucking up to your audience. So let me do that. I've got my Ph.D. from Princeton. And there was a Professor, Michael Borden, who went to Harvard. And when he went to Harvard, he had a roommate at Harvard who was of Indian ancestry. And Michael reported that his roommate told him how all his family back in India were all so proud that they had someone in their family who went to a school near MIT.

And it gives you an idea, I think, of what the sense of MIT is in India. And so I've been to India a lot and I've seen that first hand. So a couple things, just to put this in context and why I'm interested in this. I've been interested in India for a long time, and I'm also interested in globalization, of course. That's a big buzz word these days.

But one of the ways I think about history and how we can find interesting history topics is sort of a thought experiment. Imagine, say, what would surprise someone coming to the year 2011 from, say, 100 years ago? Say, President Maclaurin-- what would surprise them about the world today if they saw it? And so I think about that, I guess, especially with regard to India. And let me just say some of the things that I think would be pretty surprising.

I guess anything involving Indians in the United States would be surprising, because they were actually laws limiting Indians from staying permanently in America. It was very questionable whether an Indian, someone from India, could even become a citizen of the United States until 1920. Until 1965, the United States had laws which basically said, we really don't want Indians in the United States. There was an annual quota of 100 people.

But let me tell you some things about the world of 2011 that is sort of surprising in

that regard. Silicon Valley-- my apologies-- but the most dynamic technological area in the world. It's commonly said that Silicon Valley runs on ICs. And that doesn't mean integrated circuits. It means Indians and Chinese. People understand that Indian and Chinese entrepreneurs are some of the key figures who really start businesses successfully, help move the technology along.

I think of that school down the road a bit. They just appointed a new dean of their business school. His name is Nitin Nohria, an Indian who came to Harvard. MIT itself, the former dean of engineering, Subra Suresh, also from India. Now he's the head of the National Science Foundation, one of the leading funders of science and technological research in the United States, setting the agenda for scientific research.

I think of-- do you know the building that's right across Vassar Street from the Stata Center, the Institute for Brain Research, that the train tracks go through the middle of? That was designed by Charles Correa, an Indian, someone who's the leading Indian architect. And so he lives in India. This was his first commission ever in the United States for an American client. And so the point of this is that Indians play a very prominent role in technology in the United States today, which I think would have been very, very surprising to anyone 100 years ago.

And then if we look at India itself, there are a number of things, I think, that are surprising as well. We're used to seeing everything that we buy from Walmart or Target or whatever having a "made in China" stamp on it. We can't really judge the provenance of software code or something like that. But if could, we'd probably be surprised at how much software would have the tag "coded in India."

And I was in India in October and visited a place where they made transmission components for Fords and GMs in a place in Pune, India. Another big Indian company is set to, I think this year, begin selling its model SUV in the United States. So India is playing a remarkable technological role in United States. We might have considered that inconceivable 100 years ago or so.

So that's what I've been interested in looking at. And the way I decided to do this

was I was trying to look for some way to understand the relationship between the United States and India. And the way I finally decided to do it was that I found that MIT has a series of commencement programs that they publish with every commencement that lists every graduate. And they've listed the hometown of every graduate.

And so they have these available for the whole 20th century. So what I did is I made a database. I went through these and pulled out every single Indian who graduated from MIT in the 20th century. So I have this database, and I kind of think of this as a filter. India is a country with a population now of a billion people or so. We can't look at all 1 billion people. So what I'm looking at is those Indians throughout the century who came to MIT.

And so again, we can't look at every student at MIT from the 20th century. But we can look at-- this is a rather small group. It's about 1,500 people or so. And so let's look at these students and say, how did they end up getting from India, 7,000 miles away, to MIT? How did that happen? And then what happened to them afterwards? What did they do? Did they make any difference in India? What were their careers like?

And so that's what I've been doing. And so in the last five years or so, I've been running around India trying to track down Indian graduates of MIT, their family and so on, just to find out some things about them.

And so a couple of general themes that come up from this-- one is the idea of a technological nationalism, I would say, and then also the development of the information technology industry in India and globalization. Then also-- in *Star Trek*, they have this tractor beam that sometimes will pull things into the spaceship. You could say MIT has been a tractor beam for global talent, that it's pulled international talent into the United States, and very often it's stayed in the United States after it's gotten there.

So these are some of the things that I'm touching on in what I'm doing. And so one of the things that you do see is students who went to MIT in the early 20th century--

very often, going to MIT, you could say, was a nationalist act. India was a British colony, and most people, in some ways, the intuitive thing to do would be to make ties with the British, British society, with Britain. So those who went to MIT were in some ways doing something that didn't make a lot of sense in some ways, having ties with the British. And so that that's a big theme that I've discovered.

And one of the other aspects of this that has been kind of intriguing-- what do you think of when you think of Mahatma Gandhi? What sorts of things come to your mind? What sort of images? What kind of things do you think of?

**AUDIENCE:** Small, peaceful man.

**ROSS BASSETT:** Small, peaceful man. Anything else you think of about Gandhi?

**AUDIENCE:** He was fairly well to do and then he gave it all up.

**ROSS BASSETT:** He was a very wealthy lawyer, gave it all up.

**AUDIENCE:** Spiritualism.

**ROSS BASSETT:** Pardon?

**AUDIENCE:** Spiritualism.

**ROSS BASSETT:** Spiritualism. Anyone else? So we have those images of Gandhi. One of the intriguing things about this research-- when I look at the Indians who went to MIT in the 1920s and 1930s and try to look at the networks of people they're involved in, where they come from, one of the things that I find is, if I try to identify where is the heart of these people-- what sort of, again, networks are they involved in and so on-- if you look at a large number of them, you get connected back to Gandhi, that a large percentage of Indians were from the part of India where Gandhi was from.

A large number of them actually had connections with Gandhi. One young man who grew up in Gandhi's ashram went to MIT. And so this has been the intriguing thing. And it's suggested some things to me. I've gone back and looked at Gandhi's papers. And Gandhi has often been, I'd say, captured by political historians-- most

people who are interested in him are people interested in political history, Gandhi's spiritualism, his philosophy, his philosophy of nonviolence, and things like that.

But Gandhi was very interested in technology himself. Maybe the most common image of him being interested in technology, of course, is handspinning. And it's easy to see that as very regressive, you might say-- very archaic.

But he was really very interested in efficiency, as he was interested in spinning. If you were a contemporary of Gandhi's and you told him you spun, he would ask you what your production rate was. And he was very concerned about increasing production. His magazine had statistics all the time about what people's spinning production was and so on. And so it seems like Gandhi had this-- and I think this term has come across before in some of your other readings. He was almost tailoristic is taken some of his ways, that he was very concerned about efficiency.

He once wrote a piece in his newspaper-- 20 rules that anyone who was going to meet him at the railroad station should follow. And he was kind of upset in this that he said, a lot of people who met him at the train station would block his path of going out of the train station. He said, normally, it should take me five minutes, but now all these people are there. It's taking me 30 minutes. I'm wasting all this time.

And so he was very frustrated with that. And so he was very interested in efficiency. And it seems one young man who grew up in Gandhi's ashram basically said later on, I became an engineer at the hands of Gandhi. Gandhi made me an engineer. And again, it seems, in some ways, fairly counterintuitive. But that was what he said he saw and that was how he became an engineer.

And so many of these people went to MIT as this act of technological nationalism. They saw that if India was going to be an independent country, they needed to have a technological base. They needed to have technological capabilities so they wouldn't be relying on British people, Americans, that they could develop their own technological infrastructure. And so that seems to have been a very big theme among Indians who went to MIT in the early part of the 20th century.

I want to flip through some of these--

**PROFESSOR:** We can if you want.

**ROSS BASSETT:** Sure, that'd be great. This is Alfred Marshall, the British economist. One man had studied at Cambridge-- an Indian man-- and Alfred Marshall told him, as I mentioned in the paper, that he thought Indians should not be going to Cambridge, but instead should be going to MIT.

This is [INAUDIBLE] who I mentioned in the article. He started a chemical works in Western India. This is a drawing of the chemical works in the small town of [INAUDIBLE] in Kathiawar. You can just flip through that. This is a picture of Mahatma Gandhi and [INAUDIBLE] So here's Mahatma Gandhi and this is [INAUDIBLE].

So this is in 1950. Gandhi had just come back from South Africa. And [INAUDIBLE] was this person who was very interested in sending people to MIT, sent a number of his family members to MIT.

And this is a young man I mentioned in the paper. Again, Gandhi was present at his wedding. And then, the next year, he went to MIT. And he was in the cooperative program in electrical engineering and he got a Bachelor's and Master's degree in electrical engineering and then returned to India.

And in India, he had this double life, you could say. I would say he was probably one of the best trained engineers in electrical engineering in India, having this Master's degree in electrical engineering. But if you were to look at his career from a purely technical standpoint, he kind of under-utilized his education. He was very much involved in the Nationalist Movement. He was thrown into jail for his participation in the Salt Satyagraha. He later led a large strike at one of India's leading steel plants and was thrown into jail for 18 months after that.

If you can just hit the next slide. Here's a picture of him at MIT again. He apparently got training in the military cadet program. And again, it was kind of intriguing to me-- after he was in jail for 18 months, he still maintained very good relations with his

former MIT professors. He kept in touch with them, exchanged letters. So he didn't see some sort of dichotomy between his role as a protester for freedom, as a Gandhian, and his career as an engineer at MIT, or as MIT-trained engineer.

This is the diwan, sort of the prime minister of a princely state of India in Bhavnagar in Western India. This man was an associate of Gandhi. India had these princely states, and he paid for a number of Indians to go to MIT. And then this is a kind of intriguing meeting in the late 1930s. The diwan, Prabhashankar Pattani is sitting down there in the turban.

He came to MIT and he hosted all the Indian MIT students to have lunch at the Ritz Carlton Hotel. And so here they all are. One of them was married to an American woman. So you see this small collection of Indian students there at MIT around 1939.

And then this is a young man, Bal Kalelkar. He was the young man who was raised in Gandhi's ashram. Here's Gandhi right here. And then this is Kalelkar right behind him.

This is a letter that Kalelkar wrote. And Gandhi was a famous editor. He was an editor of a newspaper. And Kalelkar wrote this letter to GD Birla, who was one of India's richest businessmen. You might think of him as an analog of Bill Gates at the time.

And Kalelkar wrote GD Birla, asking him to fund his education at MIT. And Gandhi edited the letter, helped him make the right approach. Gandhi was a friend of this man. And so he went through and make corrections and so on. This is something that I found in India, and this is the next part of it. This is, again, Gandhi's editing. He tells Kalelkar, incorporate these changes and send it off.

But the point is, I would have thought the natural tendency of Gandhi would be to not be so enthusiastic about someone going to MIT. And he obviously could have refused to support him in seeking this funding. But Gandhi supported him to get this funding.

Once, Gandhi had asked his friend to provide funding, once he had given him this letter, it would have been fairly hard for this person to resist. So Gandhi did not see someone going to MIT as a betrayal of his movement, as someone who was turning his back on him. He was willing to support him.

And this is four Indians at MIT in about 1940 having fun in the snow and having a snowball fight. There was a fairly rich social life among the Indians in 1920s and 1930s. There are records of a number of pranks that they did on each other and so on. After one of them completed doctoral examination, he invited a number of friends out to a restaurant out west of Cambridge. And then he and his friend snuck out and drove back home and stiffed everyone else and left them both rideless and having to pay the bill. And this caused a number of repercussions afterwards.

This is a cartoon of Anant Pandya, who was the first Indian to get a Ph.D. from MIT. And then he became the first Indian principal of an engineering college in India. This was at college near Calcutta called the Bengal Engineering College. And again, it's hard to imagine what this would have meant. I think, generally, the Brits had to the general idea that they were superior, that in some ways, one of the aspects of colonialism was that the British, the Europeans were superior in technology. And that was in some ways the basis for colonialism.

Once people like Anant Pandya came out and were able-- Pandya won this position as a principal of this college in an open competition with Brits-- and Brits then worked under him, it really made a statement that technology was not just something that was limited to Europeans and Euro-Americans.

I mention in the paper, again, that one of the key moments before independence-- you think about technological nationalism-- was that, as India stood on the brink of independence, Indians began to say, we need something like an MIT for India. And so this was the committee report that established the Indian Institutes of Technology, which were, again, India's institutes analogous to MIT. Two Indian MIT graduates sat on this committee and helped establish this committee.

This is, again, a picture of Anant Pandya. He had a position as the head of the

major Indian aerospace company, and again, was the first Indian director of that. And then he died, tragically, in a car accident. And then he was at memorialized in a magazine that was talking about his career and his connection with MIT. And this seems to have had a big effect on a number of people, just making them want to become engineers and also making them want to go to MIT.

Now, I just want to say a little bit about India and IT. One of the interesting things, I think, about globalization is I'd say globalization is, in some ways, based on similarities and differences between countries, that if you think of the boundary conditions-- if every country was exactly the same, there'd be no point in globalization, because India would be just like United States. There would be no point in moving work or doing things between countries.

But if countries were diametrically opposed and had nothing in common, then they couldn't relate. They couldn't communicate technologically. They couldn't have this technological work done between them.

And I guess what I'd say is that Indian graduates of MIT, especially in the 1950s and '60s and 1970s, were the key people who connected the United States and India in a technological way, that they had this possibility of joining these two countries together. They had knowledge. They were often from upper class parts of Indian society, had a lot of knowledge of India, and then, by virtue of their education, the United the States. They had a great knowledge of America and understanding of American technology.

This is the first Indian IT company. It was called Tata Consultancy Services. And it was founded by three MIT graduates. They were basically in their early 20s. Tata is a large Indian business company that has a number of different business enterprises. And they said, we'd like you to start a computer business here.

And they didn't really know what exactly they were going to do. They thought of it like an Arthur D. Little-- if you know what that is-- a consulting firm. So they started this. And you can see it. They started it almost on an American model, and it didn't work very well initially.

This is their operation in Bombay. Again, they thought of it almost like as a very academic-oriented thing. And it wasn't too much concerned with profit making And finally, the Tatas got a little bit frustrated with it. And these three guys left. And they ended up hiring as the head of it another MIT graduate.

This is a man by the name of FC Kohli, who is sometimes considered one of the key figures in the development of the information technology industry in India. And what he had was-- he had studied at MIT. He had a lot of connections in the United States by virtue of his time at MIT. But also, he understood India and was able to really develop a successful business doing software work in India for American companies. And so that stood him in very good stead and helped him become very successful.

And one of the things I'd say about him is that when India started thinking about computer technology, a lot of Indians thought in terms of, let's try to make our own computers. Let's try to make our own computer business. Let's try to build all the hardware ourselves.

And Kohli didn't think that way. I think he understood what American industry was capable of, and he knew India could never compete with United States in building computers-- that it was a very capital intensive business, that they would never have the volumes that America would have. And so it was a losing proposition to try to think of doing something like that.

And he had the idea of, let's just write software. Let's not try to do all the computing work. Let's do software. That's something where we have an advantage. Our labor costs are much less than American costs. We can do that. And he had connections in America. I think people in America were willing to trust him because of his connections, because of his MIT education. And so he got a lot of business for this company, Tata Consultancy Services from the United States.

This is another early IT information technology pioneer in India. His name is Narendra Patni. And again, he did a great job of connecting India and the United

States at a time when there weren't a lot of connections. A lot of people in America didn't know that much about India.

I could imagine-- this is in the late 1960s, 1970s-- that if you said I'm from India, I would like to do computer business for you, I think that's a pretty big stretch for a lot of people-- what they knew about India, what sort of confidence they have in Indians. But again, Patni had come to MIT. He had work with Jay Forrester, who was, as a great academic entrepreneurian, involved in a lot of things. And so he had the contacts that really enabled India to get this sort of business.

And I think I have one final slide. So you see Bill Gates on the left there. And then the person on the right is named Narayana Murthy. And he's the founder of another big Indian IT company called Infosys. And Narayana Murthy never went to MIT, but he was influenced by MIT in a lot of ways. He went to this Indian Institute of Technology at Kanpur. And there, his mentors were Indians who had gone to MIT.

Then he went to another school-- the Indian Institute of Management-- where his mentor there was another man, Indian, who had gone to MIT. Then he worked for Narendra Patni, the person that I had mentioned before. In a form to an American would appreciate, after he had worked with Narendra Patni for a while, he got tired and quit and started his own business. And this became Infosys.

The point of this is he never could have done that on his own, but after he had worked with all these Indians who had gone to MIT, who had a lot of connections to the United States, he had these connections himself. And they really helped him to develop those connections.

One other point-- in some ways, it's easy to see this is a great success story, the development of the Indian IT industry. One other point I feel like I have to mention as well-- the greatest industrial accident in world history happened in India at Bhopal in 1984. Union Carbide had a plant making methyl isocyanate. And there was a leak at this plant, and it killed-- we're still not exactly sure how many-- maybe 10,000 people.

The manager of this plant was also an Indian graduate of MIT. And again, the point of this is in the 1960s and 1970s and 1980s, where the United States and India were linked together in technology, generally speaking, you would often find an MIT graduate somewhere there. And so you see them in both of these contexts.

And so finally, just one other thing I want to mention is MIT, as I said, has become for 50 years or so, a tractor beam for talent coming to the United States. Many Indians, as they go to school in the Indian Institutes of Technology, want to pursue their education. And for them, they see the best possible place to go to continue their education is MIT. You see it as a dream for them.

Many of them, when they come to the United States, don't imagine that they're going to stay in the United States, but often they end up staying in United States. Sometimes their education, I'd say, unfits them for work in India. Sometimes they just get so caught up and see the opportunities in United States. But that seems to be a major trend. Now, there are some questions if it will continue, that there are enough opportunities in India that maybe Indians wouldn't feel such a strong need to come to the United States for graduate school.

So these are some of that the basic themes. Most of it will be on the people who came from India, though. It wasn't until 1965 that there were immigration laws that really let Indians come to the United States on any sort of a fair basis. So you see Indians who are Indians Americans or second generation Indians-- you only see them starting to come to MIT in any numbers in the '80s. And then it is ramped up as more and more Indians are in the United States. So it's sort of a later part of the story.

The two most prestigious fields you can go into are medicine or engineering. And in India there is, I'd say, almost an idea-- you don't think of what you want to do. You think of what you can do. And if you can get into an IIT, then you should do it, even if you were thinking you don't have an interest in engineering-- that you should just do it.

But they're very, I guess I would say, focused on things that will make you a

remunerative career. And there is a lot of skepticism, I would say, generally, that liberal arts will make you a remunerative career. There are some good liberal arts schools, but relatively few people go that route. Most people feel, in a country of a billion people, that competition is just so fierce for jobs that everyone feels the need to get into some area where they're sure that they'll have a good job.

I spoke to a professor at one of the Indian Institutes of Technology whose daughter wanted to go into economics. And he was kind of horrified that she wanted to do this. And he wanted me to explain to him what economics was, what kind of job she would get. And he was half-convinced afterwards. He said, well, OK, maybe I'll let her do economics, but I'm never going to let her do liberal arts. That's drawing a line that that's not going to happen.

And there's a very strong feeling that way, that engineering-- and even within engineering, there's a certain hierarchy. Computer science is at the highest level. And so these Indian Institutes of Technology-- entrance to the schools is determined by one exam called the joint entrance exam.

You get a score on it and there might be 100,000 or it might be 300,000 people who take this exam. Your score on it is a rank. So you're ranked one to 300,000, say. And the person who scores one can choose their seat major in any of these Indian Institutes of Technology. And then the person who gets the last seat is forced to go wherever there's an open seat in a major.

And so invariably, the number one student would take computer science. That's just what they do. And then there's a hierarchy of computer science, electrical engineering, chemical engineering, mechanical engineering-- civil engineering is one of the lowest of the engineering. And then there's naval architecture, which is a bit lower than that, too.

**AUDIENCE:** In these institutions, the Indian Institutes of Technology, they're all funded by development or are they privately funded?

**ROSS BASSETT:** So these are funded by the government< and the tuition is pretty low. And it's been

kind of a political issue in India. One issue is how many seats should be reserved for people from what's called the scheduled caste or backward caste? So it would be a bit analogous to affirmative action, say. And so this has been very controversial. How many seats should be reserved for them?

And then also people in the middle class have been clamoring for access to these. A lot of people have been shut out. There were originally five of these Indian Institutes of Technology. Then there were seven. And now, recently, they've doubled that. Each one has become the mentor to a new Indian Institute of Technology. And they've done this for political reasons, because there's such a great demand and so many people want to enter into these institutions.

And it's very controversial. A lot of people associated with the Indian Institutes of Technology think they'll never be able to maintain the same quality in doubling the institutions that they've had so far. And so there's worry of brand dilution, if you use a business term of what that's going to do to these schools.

More stay in India now, and more of the leaders, I'd say, from now have been mostly educated in India than in the '50s and '60s and so on. But the system is still-- at these IITs, they're very good undergraduate institutions. But if you want to do serious graduate research, there's no question that they are not at all competitive with MIT. There is this hierarchy.

It turns out that at an IIT, if you go there, the best students are the undergraduates, and then the graduates are usually actually worse students than the undergraduates. They're students who are sort of percolating up from less prestigious institutions, and as they go to graduate school, they go to these IITs. But the people from the IITs who want to go to graduate school almost invariably go to the United States to go to graduate school. There's a clear understanding of-- they don't have research funding that American institutions have that would enable them to do the same kind of research that would be done in the United States.

The system in both politics-- in politics, I don't think you would ever go to an IIT, because it's more about connections within India. And it's more about being a

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political player. In business. the environment is so dynamic, I don't think you need to have gone to an IIT There's many institutions where you can go to. The IIT-- you clearly can get into an American institution.

IITs in some ways, for a long time, were paths to the United States-- the paths to American graduate school. Now, they're paths to American graduate schools, but they're also paths to Google in India or Microsoft in India or other multinational companies in India. So their paths to those types of jobs. But if you wanted to be an entrepreneur or something, many of them come from some of the wide diversity of other schools in India.

PROFESSOR: And also, on that question, I think a little bit about one of the themes from your paper about different kinds of modernity. And it's interesting that we've talked a little bit about how, in this country, engineering is not as high social prestige as-- even to this day, to some degree-- law, possibly medicine are, and that the kind of modernism of this country coming out of the American Revolution had as much to do with both philosophy, legal philosophy, commerce, and that America was considered a very industrializing country in the 19th century. But it was still unprofessionalized.

Whereas, as you see through this period of the 20th century, where one of the big issues for a developing country like India is how modern is it, how is it going to catch up with the West? And through these mechanisms, the whole idea of nationalism and building the country literally has this kind of engineering connotation. And I think that generated that level of prestige. It's interesting. I told an anecdote from Bob Siemens, who is an MIT grad, who came here about 1940, who was from an elite family and did his undergrad at Harvard. And his parents said, upper class boys just don't go to MIT.

And here you have these students who are upper class boys from India coming to MIT during the '30s when most of the other students would have been pretty middle class, if not even still kind of blue collar. Did you see anything as far as differences? They look very finely dressed in the photographs you show. And they would, in

addition to not having not been American, feel out of place in some way in that way during those years.

**ROSS BASSETT:** So you do have very many wealthy Indian families sending kids to MIT. India has this system of family businesses, where the business is passed down from generation to generation. And the next generation takes very active part in managing the business.

And very often, in the '50s and '60s, what some of these business families would do would be to send the heir apparent to the business to MIT to prepare them. So these people were billionaires and so on. And so you have, again, these people who are really of the highest social standing in India coming to MIT and studying, really, in some ways quite a bit differently, than American families.

**PROFESSOR:** Are there questions, comments?

**AUDIENCE:** I'd like to ask a question about the five IITs that are founded in India in the late '50s, early '60s. The interesting thing was that each of them was sponsored by a different country. And that raises a question with me about-- we talk about, in this discussion, MIT being the focal point for many of the elite young people that were coming here.

But given the fact that the Indian government in 1946 is proposing that you sample from around the world, it's curious that the selections they made were so un-American in many ways. And what was the reasoning? Was it just that they wanted to see what was out there and then to draw the best?

**ROSS BASSETT:** So it seems like part of it was maybe a strategy of-- India had this policy of non-alignment that they weren't going to really fly under the American flag or the Soviet flag. They were going to say we're not allied. There was this Cold War, but we're going to chart our own path. But part of it was using that to coerce a variety of countries to support them.

So when they started this Indian Institute of Technology in Kanpur, the United States engineers at MIT and nine other schools supported it. And there was really the idea of we are going to make this the preeminent IIT. It is going to be the best.

And so there was this competitive aspect.

And I think the Indians purposely promoted this to get each of these countries to the table. For example, when the Brits supported their Indian Institute of Technology, they had the idea that if we can train Indian engineers according to our system, then maybe when they're out in companies, they'll buy British stuff and that will help us. And so they had that idea. That was part of why they were doing it.

And the Soviets, I think, had the idea that this would be a model, that this would be a foot in the door into a way for them to influence the development of technology. So each country, I think, had that idea. And India encouraged them to have that idea.

**AUDIENCE:** Why not the French? They're left out. And yet, the Grands Ecoles are there.

**ROSS BASSETT:** So I think if you had the money and were willing to do it-- so I think it must have been that they weren't willing to put up the bucks--

**AUDIENCE:** Post war.

**ROSS BASSETT:** Yeah.

**AUDIENCE:** Yeah.

**ROSS BASSETT:** The British we were always complaining that they didn't have the money to do anything on a scale that United States did. And so I could imagine that the French didn't either. I mention this in the article. There was a bit of an irony that the British were supporting the an IIT, because the British themselves admitted they had no MIT in Britain. So they were kind of trying to do in India what they hadn't done in England in a certain sense.