ENGINEERS
and
SOCIETY IN INDIA
from C.1850 to Present Times

EHESS - PARIS
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27th-28th MARCH 2017

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Engineers and society in India, from c.1850 to present times

27th March 2017

10:00 am – 10:30 am
WELCOME ADDRESS
INES G. ŽUPANOVIĆ (CNRS, CEIAS)

10:30 am – 12:00 pm
INAUGURAL LECTURE
PETER MEIKSINS (Cleveland State University)
Constructing Engineers. How Comparative Analysis Can Enrich the Study of Indian Engineering

12:00 pm – 1:30 pm: Lunch

1:30 pm – 3:30 pm
SESSION I | SHAPING A CORPS D’ETAT: COLONIAL AND POSTCOLONIAL PERSPECTIVES
Chair: SATISH DESHPANDE (University of Delhi)
Discussion: APARAJITH RAMNATH (Indian Institute of Management Kozhikode)

Company Engineers: Water Infrastructures and the Making of a Colonial Profession
DEBJANI BHATTACHARYYA (Drexel University)
“To be sacrificed on the altar of political progress.”
Indian and British Engineers in the Bombay Public Works Department (1860’s-1940’s): Analyzing Discriminations and the Policy of “Indianization”
VANESSA CARU (CNRS, IFP)

A Study on the Reservation Effects on State Engineers’ Careers: The Case of a Water Supply Service in Contemporary India
CHARLES GADÉA (Université Paris 10 Nanterre, IDHES)

3:30 pm – 4:00 pm: Tea Break
4:00 pm – 6:00 pm
SESSION II | PUBLIC SERVICE ENGINEERS IN THE NEO-LIBERAL AREA: RECOMPOSITION AND RESILIENCE OF THE PROFESSION
Chair: STÉPHANIE TAWA LAMA-REWAL (CNRS, CEIAS)
Discussion: KAREN COELHO (Madras Institute of Development Studies)

Public Civil Engineering: An Expertise from the Past?
Ethnography of a Criticized Administration, The Uttar Pradesh Jal Nigam
BÉRÉNICE GIRARD (EHESS, CEIAS)

Colonial Modernity Shaping the Pipe Dream:
History of Water Engineering in Travancore, India (1882-1945)
D.PARTHASARATHY, N.C.NARAYANAN & GAUTAM GANAPATHY (Indian Institute of Technology, Mumbai)

Railway Engineers as ‘Real Estate Agents among Others’?
The Case of the Rail Land Development Authority and The Delhi Metro Rail Corporation
BÉRÉNICE BON (Darmstadt University of Technology)

6:00 pm: Cocktail

28th March 2017

9:00 am – 11:00 am
SESSION III | THE ROLE OF ENGINEERING PERSONNEL IN THE RISE OF NEW INDUSTRIAL SECTORS
Chair: ANNE-JULIE ETTER (Université de Cergy)
Discussion: PETER MEIKSINS (Cleveland State University)

Who’s in charge of the Howrah Bridge?
Engineering Expertise and the Political Economy of Late-Colonial India
APARAJITH RAMNATH (Indian Institute of Management Kozhikode)

State Policy, Technical Knowledge and Engineering Manpower:
General Observations and A Study of Workforces in the Automotive Industry, c. 1943-2000
STEFAN TETZLAFF (German Historical Institute London)

From Wind Tunnels to Jet Fighters:
German Émigré Scientists and Engineers and Aeronautics in India
JAHNAVI PHALKEY (King’s College London)

11:00 am – 11:30 am: Tea Break
11:30 am – 1:00 pm
SESSION IV | SOCIAL AND ECONOMIC CONSEQUENCES OF ENGINEERING EDUCATION
Chair: CATHERINE MARRY (CNRS, CMH)
Discussion: IRINA GOUZEVITCH (EHESS)

Coaching the Masses, Creaming the Engineering Elites. The Coaching Configuration at Kota (Rajasthan)
ROLAND LARDINOIS (CNRS, CEIAS)

Muslim Engineering Colleges in Bangalore: Negotiating Community Interests and Profitability
AMINAH MOHAMMAD-ARIF (CNRS, CEIAS)

1:00 pm – 2:30 pm: Lunch

2:30 pm – 4:30 pm
SESSION V: ENGINEERING THE LABOUR MARKET
Chair: CATHERINE MARRY (CNRS, CMH)
Discussion: CAROL UPADHYA (National Institute of Advanced Studies)

Labour Market Integration and Careers Paths: The Case of IIT’s Alumni
ODILE HENRY (Université Paris 8) & MATHIEU FERRY (ENS Cachan)

Learning Gender Equity from India? Comparative Studies of the IT Sector in India and the UK
PARVATI RAGHURAM, CLEM HERMAN, ESTHER RUIZ-BEN & GUNJAN SONDHI (Open University)

“Imagined Technologists”? The Evolution of the IT Engineer as an Occupational Category in India
AMIT PRAKASH, BALAJI PARTHASARATHY AND SUPRIYA DEY (Indian Institute of Information Technology Bangalore)

4:30 pm – 5:00 pm: Tea Break

5:00 pm - 6:00 pm
CONCLUDING REMARKS
SATISH DESHPANDE (University of Delhi)
Company Engineers: Water Infrastructures and the Making of a Colonial Profession

In this paper, I propose to analyze the development of early colonial engineering as a discipline forged at the intersection of military work (primarily in building infrastructures of the empire) conducted with the help and knowledge of unnamed Indian “workers and helpers” as well as resistance from the indigenous population whose properties came under the purview of these various infrastructural projects of the East India Company. By focusing on the history of fortification, embankment and irrigation in and around Calcutta, I document the history of colonial engineering from 1748, with the creation of the post of Engineer, then headed by Captain Alexander Delavaux, to 1847, by which time engineering emerges fully as a field of professionalization within British India with the founding of Thomason College for civil engineering in Roorkee. By examining the extensive archives of the Royal Bengal Engineering, Bengal Army and the diaries of surveys housed at the British Library (UK) and the Proceedings of the Territories, Survey, Irrigation and Sanitation Department housed at West Bengal State Archives (Kolkata, India) and National Archives of India (Delhi, India) the paper charts the nebulous growth of the profession by exploring the range of activities carried out by the Royal Bengal Engineers, ranging from riparian surveys in a tidal basin, to irrigation works and the building of ports, harbors and docks from the mouth of the Bay of Bengal to the Calcutta, one of the principal Factories of the East India Company through the eighteenth and nineteenth century.

Indian and British Engineers in the Bombay Public Works Department (1860’s–1940’s): Analyzing Discriminations and the Policy of “Indianization.”

As early as the 1840’s, engineering institutions were created in India to train local manpower and from the 1860’s Indian engineers have been recruited in the Public Works Department (thereafter PWD) and granted the same title as their European colleagues. India can therefore appear to be a notable exception, especially when compared to other European colonies, where technical knowledge was perceived and ascertained as a white man’s monopoly. The fact that the British domination in India rested on a wide range of racial discriminations does not need demonstrating though and this paper is more specifically interested in analyzing how these discriminations...
operated within the Department and how the British managed to maintain their hold on highest posts till the end. We will therefore assess the evolution of the position of the Indian engineers within the PWD of Bombay Presidency from the 1860’s to the 1940’s and hence question the notion of “Indianization” which is widely used in the literature to describe it. Despite the strong capacity of collective mobilization the Indian personnel demonstrated from the 1910’s, the paper argues that the process of “indianization” was correlated with a leveling down of the status within the Department, which served political and economic interests in the context of the constitutional reforms.

CHARLES GADÉA (Université Paris 10 Nanterre, IDHES)

A Study on the Reservation Effects on State Engineers’ Careers: The Case of a Water Supply Service in Contemporary India.

Reservation quotas are widely measured and discussed, but there is little work on their effects on the careers of public employees to which they apply. This paper presents a study of the careers of 1040 engineers from a public water supply service, trying to locate the respective roles of degree, gender, seniority, position held at the time of recruitment, and to compare them to the influence of the group to which the engineers belong in the reservation system. The results suggest that the quotas manage quite well in neutralizing the disparities of opportunities due to castes, although in an uneven way according to the group of quota.

SESSION II

PUBLIC SERVICE ENGINEERS IN THE NEO-LIBERAL AREA: RECOMPOSITION AND RESILIENCE OF THE PROFESSION

BÉRÉNICE GIRARD (EHSS, CEIAS)

Public Civil Engineering: An Expertise from the Past?
Ethnography of a Criticized Administration, The Uttar Pradesh Jal Nigam

Created in 1975, the Uttar Pradesh Jal Nigam (UPJN) is in charge of water supply and sewerage in the State of Uttar Pradesh. This public agency, mainly composed of a technical labour force, became a central actor in sanitation in 1985, with the launching of the Ganga Action Plan. This centrally-funded programme released important funds to build and/or renovate the sewerage systems of the largest towns along the Ganga River. In the 1990s, environmental activists started criticizing the technical plans of the UPJN and rumours of large scale corruption became widespread. The launching of a new programme in 2008, partly funded by the World Bank, allowed for a very symbolic clean break with former modes of conception, implementation and management. Based on a long-term ethnographic study, this paper will focus on the evolutions of the day-to-day work of the UPJN engineers, provide insights on how the engineers attempt to resist the reforms and question the consequences of these reforms on the engineers’ professional and social self-representations.
Colonial Modernity Shaping the Pipe Dream: History of Water Engineering in Travancore, India (1882-1945)

The gravitation water supply scheme, which emerged in Britain in a specific context, was transplanted far and wide in the empire during the latter half of the 19th century. This essay focuses on the dissenting voices of a section of local engineers against replicating the gravitation scheme in Trivandrum and investigates the historical path dependence of a number of contemporary urban water issues including coverage, tariff mobilisation, duration of supply and approach towards traditional water sources. The article argues that introduction of gravitation scheme in Trivandrum as an ‘up to date’, modern piped water supply system marks the advent of colonial modernity in Travancore. The local engineers disagreed with the proposal to provide 24X7 water supply in a place where people predominantly used traditional modes of resource mobilisation, introduce fire protection (which increased overall cost by a third), close down community wells as well as quantum of per capita projected consumption which was based on the European or other colonial Indian city’s experience. In the universal plan for Trivandrum, the preference for nucleate dwellings among the majority, custom of the elite to have large gardens and use of alternate mode of water supply were not considered although some of the engineers flagged these issues especially on the issue of profligate use of resources. The paper later argues that the dissent by local engineers to the replication of gravitation scheme can still inform contemporary criticisms to the dominant paradigm of supply side hydrology from the vantage point of equity and sustainability.

Railway Engineers as ‘Real Estate Agents Among Others’? The Case of the Rail Land Development Authority And The Delhi Metro Rail Corporation

There is a shift today in the mode of capitalizing transport infrastructure projects through land. This paper focuses on the recently created authorities of the Indian Railways and the Delhi Metro Rail Corporation in charge of real estate development. Our analysis shows that monetisation of land opens up a new professional territory for railway engineers. It introduces new norms, new procedures, new forms of partnerships with private sector actors. It also wrestles with ways of problematizing urban issues, the structure of the organization, its historical legacies and rationalities.
APARAJITH RAMNATH (Indian Institute of Management Kozhikode)

Who’s in charge of the Howrah Bridge?
Engineering Expertise and the Political Economy of Late-Colonial India

This paper traces the history of the iconic second Howrah Bridge, or Rabindra Setu, inaugurated in 1943. Spanning the Hooghly to connect the commercially important city of Calcutta with Howrah (the city’s western industrial suburb and crucial rail link), this was a project of great economic and political significance. What is not often noted is that before its construction began in 1936, the design of the bridge was debated keenly for nearly three decades by engineers, politicians, colonial officials and big business. The two main options considered were a floating bridge and a (more expensive) cantilever bridge, each with its own champions. Reconstructing these debates in detail, this paper asks: Who was deemed to possess engineering expertise, and how was it articulated? What were the relative roles and status of metropolitan as opposed to local engineers, of ‘European’ as opposed to ‘Indian’ engineers, in the political economy of late-colonial India? I argue that unlike in the public works, railways and manufacturing industries, which were noticeably Indianised during the interwar years, Indian engineers did not, on the whole, play a prominent role in the Howrah Bridge debates or its construction. Instead, two types of expert were central: the metropolitan representatives of a purportedly universal science of bridge-building (in the shape of British and American consulting engineers) and those who claimed special knowledge of ‘local conditions’ (such as Calcutta-based engineering firms, and British engineers who had served for a long period of time in India). Further, the Howrah Bridge debate was not just a case of alternative technical visions. Engineers’ expertise, though frequently invoked, was in the end subordinate to economic and political considerations. The questions of cost, taxation, the relationship between the Bengal government and the central government, and the interests of metropolitan, expatriate and indigenous business all played a significant role in shaping the debate and its outcome.

STEFAN TETZLAFF (German Historical Institute London)


The paper analyses the interdependency between a new state policy, resulting demands on technological knowledge and new manpower requirements to industrialize India between the late colonial period and the present. The initial part of the paper makes several general observations on how the relationship of these aspects changed in India after the Second World War and specifically sketches how the state altered technical education for engineering personnel. The second part of the paper then focuses on the emergence of India’s automobile industry and the differential trajectory in the creation of a suitable workforce, consisting of managers, engineers and technical workers.
JAHNAVI PHALKEY (King’s College London)

From Wind Tunnels to Jet Fighters: German Émigré Scientists and Engineers and Aeronautics in India

I wish to explore the stories of German émigré scientists and engineers in India through the history of India’s first jetfighter, Marut – HF 24. For this, I selectively study three separate waves of German emigration to India from the 1930s to the 1950s and trace their links to the development of facilities for advanced research and education in aeronautics and aerodynamics, and eventually, to, manufacturing of aircraft. Two aspects of this story are significant: the transnational networks of German speaking aeronautical engineers and scientists, including that of Indian students trained in Germany; and, second, the constraints of Cold War geopolitics as they shaped the conditions under which the aircraft could be manufactured. My arguments are twofold: the first concerns the nature of state power in India after independence; and the second is about the specific configuration of the military-industrial-academic complex in India, an idea that is yet to receive substantial attention and physiognomy.

SESSION IV

SOCIAL AND ECONOMIC CONSEQUENCES OF ENGINEERING EDUCATION

ROLAND LARDINOIS (CNRS, CEIAS)

Coaching the Masses, Creaming the Engineering Elites.
The Coaching Configuration at Kota (Rajasthan)

My paper investigates the structure and the development of coaching centers in the city of Kota (Rajasthan). Every year, thousands of students come to Kota in order to register in a hundred of coaching centers that provide preparatory courses for entrance exams for engineering and medical colleges. The specificity of Kota is that coaching is organized on a residential basis making the city an educational cluster. Boys and girls of school ages come and stay at Kota for a period of one to three years, from class Xth onwards according to their program, thus spending a long span of time far from their home at an early stage of their formative life. My paper focuses on the structure and way of functioning of this educational space, its origins and development at Kota since the 1980s. Coaching centers have profoundly impacted the whole education system of the city as their offers compete with the programs taught in schools. The intense competition to enter engineering and medical colleges put a high pressure on teenagers who are left alone at Kota in order to achieve the dreams of their parents. Consequently, for the past five years, fifty seven children failed to succeed and killed themselves at Kota. Using quantitative and qualitative data, fieldwork interviews with all kinds of stakeholders, from parents to teachers, from heads of centers to students, but also literary testimonies, my paper try to answer the question: what does the figure of the engineer do to transform to such an extreme situation the Indian social fabric.
AMINAH MOHAMMAD-ARIF (CNRS, CEIAS)

Muslim Engineering Colleges in Bangalore: Negotiating Community Interests and Profitability

The Indian Constitution gives religious minorities the right to establish their own educational institutions (article 30). As per this provision, most religious minorities have established colleges in various specializations all over India. South India in general, Karnataka in particular and Bangalore even more so, have been especially active in setting up such institutions. This paper will examine three major Muslim colleges in Bangalore and its vicinity delivering graduate and post-graduate degrees in engineering, Islamiah Institute of Technology, Ghausia college of engineering and HKBK. After presenting these colleges in a historical and sociological perspective, I will examine how they attempt to strike a balance between the concern for the upliftment of a minority group and for a profitability ensuring their survival in the highly competitive environment of engineering colleges in Bangalore.

SESSION V
ENGINEERING THE LABOUR MARKET

ODILE HENRY (Université Paris 8) & MATHIEU FERRY (ENS Cachan)

Labour Market Integration and Careers Paths: The Case of IIT’s Alumni.

This communication aims to lay groundwork for a better objectivation of the careers evolution carried out by IITians since the establishment of such institutes in the early 1950s. Based on an in-depth survey undertaken in one of these IITs (one of the most famous and older), we firstly interrogate the rationales of the job placement of the current graduated students within the private sector. We will particularly interrogate the differences in the school-to-work transition (in terms of salary and social properties of the firms) between the students, according to their major, degree, marks and reservation status. On the basis of in-depth biographical interviews with alumni and current faculty members from this IIT, we will secondly attempt to clarify the rationales of labour market investments and to provide the historical trends that are necessary to their contextualization.

PARVATI RAGHURAM, CLEM HERMAN, ESTHER RUIZ-BEN & GUNJAN SONDHI (Open University)

Learning Gender Equity from India? Comparative Studies of the IT Sector in India and the UK

While Information Technology (IT) is seen as central to the knowledge economy women constitute less than 16% of IT specialists in the IT industry in the UK (BCS 2014). Moreover, the number of women in IT is declining. This is a pattern that is repeated across much of Europe as well as in the US. Migration is often seen as the answer to meeting IT skills shortages with IT consistently appearing as the primary occupational sector for which Tier 2 visas are awarded. However, the
figures for female participation in the sector are much more promising in India. For instance, female enrolments in science and engineering education (around 65%) and IT labour force participation (around 25%) are considerably higher in India compared to other countries studied in an OECD survey (Salvi del Pero and Bytchkova 2013). Moreover, 33% of women in IT are in technical roles (NASSCOM & Mercer 2009) and these numbers are rising. These different stories of women in IT led us to undertake a comparative study between the UK and India on which this paper is based. The paper uses the experiences of women leaders in the tech industry in India to explore how gender and race are performed in transnational contexts. What happens to the differentially gender coded IT worker when they come into contact and work together in global IT workspaces?

AMIT PRAKASH, BALAJI PARTHASARATHY AND SUPRIYA DEY (Indian Institute of Information Technology Bangalore)

“Imagined Technologists”?
The Evolution of the IT Engineer as an Occupational Category in India

This study investigates the evolution of the “IT engineer” as an occupational category in India using an analytical framework from the sociology of work. Although few engineers are explicitly awarded a degree in information technology (IT), the term "IT engineer" is widely used and socially accepted, especially as the country has become the largest exporter of software services. Drawing on interviews conducted at IT firms and engineering education institutions, this study explains how the evolution of the category was shaped by the education system and the IT industry between 1985 and 2015. Since the findings indicate a vast gap in the relationship between the formal education system and the heterogeneous material practices of the industry and, by extension, the IT engineer, the paper argues that the occupation is perhaps better understood as “imagined technologists”.

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