TRAVERSING THE CITY:

SYSTEMS OF CIRCULATION IN 19TH CENTURY CALCUTTA

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DECLARATION

This is to certify that the dissertation entitled *"TRAVERSING THE CITY: SYSTEMS OF CIRCULATION IN 19TH CENTURY CALCUTTA"* submitted by **Miss Shreya Goswami** in partial fulfillment of the requirements for the award of the degree of **Master of Philosophy** of this University has not been submitted for the award of any degree of this or any other University and is my own work.

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CERTIFICATE

We recommend that this dissertation be placed before the examiners for evaluation.

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To

Maa, Babi and Gogol,

For showing me what a Family should be.

&

Eric J. Hobsbawm,

For showing me what a Historian should be.

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Shreya Goswami

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List of Abbreviations

NAI: **National Archives of India, New Delhi.**

WBSA: **West Bengal State Archives, Kolkata.**

HD: **Home Department**

PWD: **Public Works Department**

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Introduction

Traversing the City is a history of the building of an infrastructure of circulation in nineteenth century Calcutta. Through this research, I have attempted to account for the emergence of the network of roadways, railways, tramways, bridges and waterways that provided the city with connectivity and its inhabitants with scope for movement. Since its conception in the 1690s, the boundaries of Calcutta expanded continuously. With this expansion, the growing density of resident & immigrant population, and also since Calcutta was the central node of a growing empire, the various transport routes converged in the city. Development and planning schemes attempting to surmount physical limits were introduced throughout the colonial period, along with schemes that tried to reduce the congestion and traffic pressures within the city. The result was the creation of radial routes as well as routes across the cross-section of Calcutta. In my opinion, this mesh of routes, characterized by different modes of transportation (and thereby different systems of circulation) emerged and established their coexistence by the beginning of the twentieth century.

Imagining these coexisting systems on the body of Calcutta suggests an image similar to that of the circulatory system of blood in the human body, where the arteries and veins have dissimilar characteristics but the same function – the movement of blood through the body.[1] Can this analogy with the human body actually establish the systems of transportation in colonial Calcutta as a single entity – a circulatory system of transport? Can such diverse systems as the waterways, roadways and railways be clubbed together to constitute a single object of study? At certain points of time in the period of my study, these systems did coexist, especially in the 19th century and while they were not conceived as interconnected systems, they achieved a degree of cohesion over time. These systems traversed the same space of the city of Calcutta, and their construction began in the late eighteenth and nineteenth centuries. Soon, Calcutta emerged as a space which was tied together and also to the rest of the country over a period of time. I have

[1] Richard Sennett, *Flesh and Stone: The Body and the City in Western Civilization*, W.W. Norton and Company, New York and London, 1994. pp. 255-7.

attempted through my research to show that these systems coexisted, and though at the level of planning they were not conceived as an uniform or integrated system, the process of construction and the manner in which they were lived and experienced, rendered them into systematic "wholes".

The history of infrastructure, and its construction, has not been central to many conventional histories of the city, yet it is an entity which has logic and a form of its own. I begin therefore with the historiography of Calcutta, identifying its limitations and opening up a space for the history of Calcutta's circulatory system. At the same time, I will identify other works which focus on the circulatory systems in other cities and regions, taking the cases of Paris in the 1840s and colonial Brazil, as represented by David Harvey and James Holston. These works, along with Richard Sennett's *Flesh and Stone: The Body and the City in Western Civilization*, provide a theoretical background to the precise characteristics of circulation in cities. However, the works of Harvey, Holston and Sennett deal with cities which are historically, politically and economically quite different in origin and development from Calcutta and therefore there are limits to which these works can be appropriated. The specific form and function of colonial Indian cities needs to be identified, and a more suitable paradigm is offered by Ravi Ahuja's study of colonial Orissa.

In the chapters that follow, I have taken up the study of three distinct but connected systems of transportation in nineteenth century Calcutta according to the chronology of their emergence. The waterways, including the River Hooghly and the Calcutta Canals system, form the routes that the Europeans had taken to reach the area which later came to be Calcutta. In the first chapter, I account for the continuance and growth of the waterways as a system of inland passage. The second chapter deals with the roadways and the boundaries of the city, where with the expansion of the latter enhanced the importance of the former. So while the first chapter explains the significance of the primary medium of movement, the second charts the emerging importance of the infrastructures that cope with and promote the existence of multiple systems of transportation.

Enter the railways, the so-called harbingers of 'modernity' in India. By the time the railways came to Calcutta, the waterways and roadways were more or less in place and both aided in the establishment of this third system of circulation – one that did more to connect Calcutta to the rest of the continent than provide unhindered connectivity within Calcutta (which is what the railways did, and still do, in Bombay). The third chapter deals with the construction of the main lines connecting Calcutta and the narrative itself suggests that though the railways might have revolutionized the face of India, they did not reconfigure the body of Calcutta in the same sense as they did to Bombay. In the city of Calcutta, the railways were just a small and comparatively insignificant part of the infrastructure of circulation formed by the coming together of the roads and waterways as well.

Calcutta: The View from the Inside

"Bengalis will be the first to approve of this new feeling: who loves Calcutta more than they do? Calcutta is their city, their only true city, the city par excellence, loaded with History, full of the resources – however meager they may be – that only a metropolis may provide. A Bengali city. An immigrant's city too. A city of refuge, a city of hope. (...) So, when looking at herself in the mirror, Calcutta, the Calcutta of the Bengalis above all, was fond of her image. Complacent pride – complacent conceit? – of Narcissus. (...)

But today, the mirror is tarnished, and Narcissus, who still loves himself, is in doubt."

\- Jean Racine[2]

It is not surprising that most historical works on Calcutta are by admirers of Calcutta, even residents of the city. I am yet to find an urban historian who is not even remotely related to the area of his study. What *is* surprising in the case of Calcutta is that the descriptions of the body of the city are completely submerged under a greater preoccupation with the socio-political and cultural events in the city. There are only a handful of historians who have dealt critically with the physical structure of the city

[2] Jean Racine, "Narcissus' Doubts: A Inside View of Calcutta in Crisis" in Jean Racine (ed.) *Calcutta 1981: The city, its crisis and the debate on urban planning and development*, Concept Publishing, New Delhi 1990. p. 2.

critically. This is the main problem with the historiography of Calcutta: sifting out details of the sequential construction of the city, specifically the construction of roads, waterways, bridges, railways and tramways, requires a deeper dig. Accounts of the municipal history of the city generally deal with issues of representation and the acts of planning, but hardly ever include the conflicts within the municipal and executive bodies which affected the implementation of development schemes.

The earliest work on the city's history, A. K. Ray's *A Short History of Calcutta: Town and Suburbs*, was a comprehensive report on municipal, sanitary and building activities in Calcutta, primarily because it was published as a part of the Census Reports of 1901.[3] Starting with a description of the geological features of Calcutta and its surroundings, Ray moved on to details of the municipal and sanitary administration of the city. His idea of "communications" encompasses roads, watercourses, tramways and bridges; he also emphasized drains, conservancy and lighting. He begins the history of Calcutta, like many others who followed him, with Charnock's proclamation in 1690 permitting the erection of houses "on any site they chose, in any portion of the waste lands belonging to the Company."[4] Ray's history of an early Calcutta is perhaps the only one which takes into account the Acts of legislation regarding construction & conservancy, plans for development, their execution by the municipal bodies & the Public Works Department, and the abandonment of schemes, while at the same time acknowledging the constantly changing boundaries of the city which made it difficult to maintain a comprehensive municipal scheme.

The limitations of Ray's work owe to his agreement with the British Imperial mentality towards urbanization, especially the urbanization of Calcutta. He attributed, exactly like most British administrators and residents, the failure of a number of plans in the 1840s and the slow rate of development schemes in the 1850s to the composition of the Municipal administration - the Board consisted of four Europeans and three 'natives', and

[3] A. K. Ray, *A Short History of Calcutta: Town and Suburbs, Census of India, 1901; Vol. VII, Part I*, First Published 1901; Rddhi Edition, Calcutta 1982.
[4] Ibid. p. 146.

the latter were the reason behind inadequate development.[5] Such a notion also explains his insufficient and partial description of the 'native' participation in and their opinions regarding the process of urbanization. While he recorded the extent of land acquisition within the city, he failed to chalk out the Indian attitude towards the process, which, while it may have attempted to hold on to personal, patriotic and semi-sacred spaces,[6] also made demands for improvement plans in the Indian residential areas.[7]

Histories of Calcutta after Ray fell increasingly silent on the communication network. Two works published in 1905, Raja Benoy Krishna Deb's *The Early History and Growth of Calcutta* and Kathleen Blechynden's *Calcutta: Past and Present*, offer depictions which are fragmentary at best. The former provided a general description of Calcutta's location, topography & population, trade & commerce, even commercial accounts,[8] but not a word was said about the means or systems of transportation on which commercial activities depended. The only mention of the streets of the city is with regard to the differences observed between the maps of 1742 and 1756: "(...) whereas in the map of 1742 there are only sixteen streets to be seen, in that of 1756 no less than 27 big streets and 52 smaller streets are clearly laid down."[9] His greater fixation, like most other historians, was with the public and private buildings of Calcutta which earned the city the designation of "The City of Palaces".

Kathleen Blechynden on the other hand, mentions streets, lanes, waterways, dockyards, etc. in association with the built areas they enclose,[10] laying emphasis on the buildings. However, she does mention the representations of the city by the painters Thomas and

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[5] Ibid. p. 166.

[6] For example, the case of the chopping off of the Boitakhana Tree at the juncture of Bow Bazar Street and the road leading to Saum Bazar around 1800. See chapter 2. Mentioned in Kathleen Blechynden, *Calcutta: Past and Present* (First Published in 1905), N. R. Ray (ed.), Calcutta 1978. p. 176. Ray does not mention the felling of the tree at all, but describes in detail the harassment to European residents around this area due to the notoriety of the people assembling around the tree. See Ray, op. cit. pp. 152-4.

[7] Grish Chunder Ghose, "Calcutta Roads and Drains" in *Bengalee*, August 19, 1863.

[8] See Chapters IV and VI regarding Topography and Population & Trade and Commerce. Raja Benoy Krishna Deb, *The Early History and Growth of Calcutta*, ed. By Subir Ray Choudhuri, Calcutta (First Published in 1905) Rddhi, Calcutta 1977.

[9] Ibid. p. 49.

[10] Kathleen Blechynden, *Calcutta: Past and Present* (First Published in 1905), N. R. Ray (ed.), Calcutta 1978. pp. 159-62.

William Daniell who stayed in Calcutta between 1785 and 1793.[11] She portrays the streets as a kind of stage where "[m]any a ghastly tragedy was enacted".[12] In retrospect, it would have been an easy graduation from the above description to a visualization of the street as a public space and a centre of significant activities, but Blechynden intones the same feeling of British success and superiority in the Indian subcontinent as generated by and in their capital city.

Following in the same tradition of Imperial structural histories of Calcutta, Dr. P.C Bagchi's *The Second City of The Empire* reiterates the picture portrayed by A. K. Ray and the Census Reports until 1935, with an enumeration of the mileage of railways, roads, sewers and drains,[13] and a partial explanation of the processes which produced the circulatory system. His idea of "Public Utilities Concerns"[14] includes the Calcutta Tramways and The Calcutta Electric Supply Corporation Ltd., but not transportation plying on the roads, railways, watercourses, or bridges. It appears as though the public utilities had no connection with these systems, while actually the trams were constructed on already existing, metalled and well-maintained roads, and the electrical lines (as is the case in all urban and even rural centres) were always put up along the length of main thoroughfares. Similarly, books like Geoffrey Moorhouse' *Calcutta* and H.E.A. Cotton's *Calcutta: Old and New, The Century in India 1800-1900*, celebrated for their in depth, and sometimes romantic, descriptions of the social history of Calcutta, fail to identify the parts of the circulatory system as public social spaces.

A gradual change in the way the city was visualized can be observed since the 1970s. Significant in this regard is Pradip Sinha's *Calcutta in Urban History*. Sinha begins his narrative with the identification of two different forms of the city – "The City as a Physical Entity" and "The City as a Mosaic – Ethnicity and Occupations in Calcutta".[15] While the latter is a general description of the people of Calcutta, the former explains the

[11] Ibid. p. 171. "In all the old views of Calcutta the street scenes are most striking, and in those executed by the Brothers Daniell the details are worked in with painstaking care, and repay close study."
[12] Ibid. p. 172.
[13] Dr. P.C. Bagchi (ed.) *The Second City of The Empire*, Twenty-Fifth Session of the Indian Science Congress Association, Calcutta 1938. p. 57.
[14] Ibid. pp. 251-4.
[15] Pradip Sinha, *Calcutta in Urban History*, Firma K L M, Calcutta 1978.

geological form and geographical location of Calcutta. His focus is on the changing features of Calcutta as the city's limits expanded over time, using maps of Calcutta to prove his point. The main argument concerns the dual character of all colonial cities, i.e. the division of the city into white and black town. Though this sort of classification was refuted by later scholarship, Sinha laid an unprecedented and equal emphasis on both these divisions, especially emphasizing on the Indian landholders in Calcutta.

Similar to Sinha's treatment of roads as enclosures of built areas, Dr. Biren Roy, in *Marshes to Metropolis: Calcutta (1481-1981)* metes out the same treatment.[16] The fact that he attempts to cover the history of Calcutta over five centuries makes his work probably the most general book on Calcutta. In the chapter named "Communications", Roy clubs together all the amenities provided to the city in a timeless description of the barges, waterways, steamers, trams, railways, telegraph, aviation and radio & television.[17] This description obviously led to sweeping generalizations regarding the nature of circulation of goods, people and information in the city. Diametrically opposite is P. Thankappan Nair's *A History of Calcutta's Streets*, which focuses exclusively on the streets of Calcutta. For him, the "evolution of streets"[18] implies not just the construction and usage of streets, but also their naming and renaming. Nair's work, though a good inventory of all of Calcutta's roads, falls short of being a critical and comprehensive history of circulation in the city.

In Sukanta Chaudhuri (ed.), *Calcutta: The Living City, Volume I and II*, the separate histories of circulation in Calcutta are studied. In *Volume I: The Past*, the chapter titled "The Railway Comes to Calcutta" by Sukanta Chaudhuri,[19] focuses on the two railway companies at work since 1854. Chaudhuri also discusses the management of the railways up to the Partition in 1947, emphasizing on the government's attitude towards the EIR

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[16] Dr. Biren Roy, *Marshes to Metropolis: Calcutta (1481-1981)*, National Council of Education, Jadavepore, Calcutta 1982.
[17] Ibid. pp.39-53.
[18] P. Thankappan Nair, *A History of Calcutta's Streets*, Calcutta, December 1987. p. 3. "The total number of streets in Calcutta was 4 in 1706, 154 in 1756, 91 in 1794, 156 in 1850, 600 in 1876, 1616 in 1924, 1996 in 1948 and 2027 in 1983." p.4.
[19] Sukanta Chaudhuri (ed.), *Calcutta: The Living City, Volume I: The Past*, Oxford University Press, 1992. pp. 238-40.

and the construction of the railway bridges across the Hooghly very briefly.[20] In *Volume II: The Present and The Future*, Monidip Chatterjee highlights the municipal history of Calcutta in "Town Planning in Calcutta: Past, Present and Future" from 1690 to the 1980s rather too briefly and similar in content to A.K. Ray's work.[21] In "Traffic and Transport in Calcutta", Sukanta Chaudhuri briefly describes the evolution of the waterways, bridges, roadways, tramways and aviation up to the 1980s.[22] The most visible limitation of these two volumes is the restricted space accorded to each and every facet of Calcutta's history.

David William Martin's *The Changing Face of Calcutta* focuses on the material aspects and the physical structure of the city more closely.[23] Selecting a few features, for example the Maidan and the river Hooghly, he focuses on the changes in the landscapes over time. Devoting entire chapters on these areas provides him with ample space to study their evolution as well as the future expansion and developments contemplated by the post-colonial government of Bengal and the municipal authorities. In one particular chapter, "Transportation for Tomorrow", Martin examines the changing use of roadways due to the rising popularity of private automobiles and the scope of expanding major thoroughfares for this inevitable practice.[24]

What Martin's work does for the whole history of Calcutta, Dr. Dhrubajyoti Banerjea's *European Calcutta: Images and Recollections of a Bygone Era* does for the colonial period.[25] Though he begins with the geological description of the city like most of his predecessors, he qualifies the city's body in the following chapters by taking up particular localities and the improvements therein. In chapters like "Lal Dighi, The Great Tank, Tank Square: Dalhousie Square to Binoy Badal Dinesh Bagh", he studies the modes of

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[20] Ibid. p. 239.
[21] Sukanta Chaudhuri (ed.), *Calcutta: The Living City, Volume II: The Present and the Future*, Oxford University Press, 1992. pp. 133-47. The work is too brief to convey any comprehensive or critical ideas. Further, the tone used to applaud Lord Wellesley and other administrators strikes as similar to the previous Imperial histories of Calcutta.
[22] Ibid. pp. 149-56.
[23] David William Martin, *The Changing Face of Calcutta*, Vikas Publication House, New Delhi, 1997.
[24] Ibid. pp. 211-6.
[25] Dr. Dhrubajyoti Banerjea, European Calcutta: Images and Recollections of a Bygone Era, UBSPD, Calcutta 2005.

movement through and the buildings located in this central area of Calcutta.[26] Of course, he too considers streets as entities enclosing buildings, but his emphasis on the public nature of all the buildings he describes successfully endows the streets with a definite public nature.

A more definite move towards charting the evolution of particular localities is in Keya Dasgupta's paper "Genesis of a Neighbourhood: The Mapping of Bhabanipur".[27] Breaking down the notion of 'the dual city' she emphasized the blurred boundaries between these conceptual demarcations. The mapping of the suburbs is seen as a method of bringing them into administrative focus and she suggests that "[a]s the urban space expanded, the component units quite often tended to interpenetrate."[28] Due to its location in the southern section, Bhabanipur was contiguous to the British residential areas surrounding it,[29] though largely inhabited by an indigenous population with very traditional settlements according to caste or familial relations and European residents on a few occasions.[30] While the built space resembled its counterparts in north Calcutta due to the increasing density of roads and holdings per road,[31] the development of a wide range of institutions like the High Court, hospitals, schools, emigration depots, etc. distinguished Bhabanipur from northern localities. Dasgupta's focus on the structural development and municipalisation of one particular locality can be adopted to the whole of Calcutta.

An important factor that has been completely ignored by the historiography of Calcutta is the conflicting spatial imaginations of the two chief categories of its residents: the Europeans and the Indians. Swati Chattopadhyay in *Representing Calcutta: Modernity, nationalism and the colonial uncanny*, highlights the distinct ways in which "colonialist

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[26] Ibid. pp. 33-98.
[27] Keya Dasgupta, "Genesis of a Neighbourhood: The Mapping of Bhabanipur", *Occasional Paper 175, March 2003, Centre for Studies in Social Sciences, Calcutta.*
[28] Ibid. p. 3.
[29] Ibid. p. 3.
[30] Ibid. pp. 6-11.
[31] Ibid. p.12.

and nationalist"[32] envisioning occurred. Her strategy of separating the approach of the colonialists, through their administrative as well as personal records from that of Bengalis as reflected in popular literature, effectively constitutes the colonial and locates it in the colonial metropolis. Her choice of Bengali literature, Durgacharan Ray's *Debganer Martye Agaman* (1880) and Amritalal Basu's *Sabash Athash* (1900) indicates the rhetorical, metaphorical as well as the subversive nature of these publications.

Despite the fact that Chattopadhyay's work is a cultural and architectural history, her approach could be adopted to new spatial histories of the same city. I agree with her remark that "the planning measures undertaken in Calcutta can only be understood when placed in the crossfire of differing opinions harbored by different groups inhabiting the city."[33] The most recent publication, Partho Datta's *Planning the City: Urbanization and Reform in Calcutta c. 1800 – c. 1940*, deals with both the physical and the social engineering that went into the creation of Calcutta. Though concerned mostly with aspects of planning, Datta elaborates its complexities, instead of just narrating a chronology of planning schemes, bringing in architectural details, the nature of land acquisitions, and larger economic considerations. However, this work does not discuss the waterways or the railways, but provides a fresh perspective to the emergence of the roadways.

The Circulatory System as an Entity

There is, therefore, an absence (and the necessity) of a complete picture regarding the production and consumption of the circulatory system of goods and people, for which there is ample historical evidence. While critically evaluating the above mentioned works, two questions came up:

1) A number of historians have commented on what appear to be parts of a larger circulatory system which is qualified as a distinct social space, though none have singled it out for study.

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[32] Swati Chattopadhyay, *Representing Calcutta: Modernity, nationalism and the colonial uncanny*, Routledge 2005. p. 3.
[33] Ibid. p. 7.

2) How can these different means of transportation plying through the city be visualized as a distinct and holistic entity, a complete system of circulation, in the city?

Most historians highlight the composition of the population and their actions in areas enclosed by the infrastructure of circulation. There is hardly any material that covers the condition of the mobile city, though the Calcuttan *in* public buildings is very well sketched out. The reason behind this is possibly the fact that most historians of Calcutta are, or have been in the past, residents of the city, in which case meanings are attached to the spaces enclosed by the circulatory system, and not the space of transition and movement itself. For the immigrant to the city, however, the identification of the area of transition is a much more significant matter, thereby a destination and a more important space.

Therefore a history of circulation in colonial Calcutta needs to be viewed from outside the private space, but not completely from within the folds of the public space either; from the point of the immigrant who needs to move through and reach, but probably not stay. This immigrant, unlike a resident of the city, is not engaged in "a mere function of motion" [34] as Sennett puts it, but engages with the fact of motion itself. It is perhaps from this point of view that the circulatory system of transport in Calcutta can be imagined. Calcutta's development spans more than three centuries, and this growth can be placed within a larger picture of imagining the urban space as being analogous to the human body. As Sennett describes, William Harvey's *De motu cordis* in 1628 presenting to the world the discovery of the circulatory system of blood in the human body coincided with the birth of modern capitalism, and thereby individualism.[35]

A new sort of city was planned as a result. A city where movement through the streets was not aimed at an object or destination (as the Baroque planner envisioned), and rendered "motion an end in itself".[36] The words "arteries", "veins", and "capillaries"

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[34] Richard Sennett, *Flesh and Stone: The Body and the City in Western Civilization*, W.W. Norton and Company, New York and London, 1994. p. 18.
[35] Ibid. p. 255.
[36] Ibid. p. 264.

were used to describe roads and streets, making the human body and the city body analogous. City planning and municipal maintenance schemes focused on the health of this body henceforth. White the mid-eighteenth century saw the paving of roads in London and Paris, Calcutta was not far behind with her expanded and paved roads and embanked watercourses in early nineteenth century. The eighteenth century gave birth to the circulatory system with its popular derivations in the form of the movement through the city as well as the movement of capital and labor. The nineteenth century, the scene of my research, saw the nurturing of this child in the form of planning and development schemes (haphazardly implemented in Calcutta's case) focusing on clean air, water and free, unhindered motion. It is the achievements of this century that I have attempted to describe.

To further qualify my image of the circulatory system of transport in Calcutta, it must be noted that Calcutta qualifies James Holston's idea of a 'preindustrial city' where the space of circulation is carved out with the purpose of enclosing the mass of buildings.[37] The natural boundaries of the city are included in this system of enclosure by making movement over them easier, as in the case of the River Hooghly. Similar to Holston's example of Rio De Janeiro, buildings in Calcutta generally face the streets and create a continuous façade of aligned buildings on some streets (as shown in Chapter 2), thereby converting these routes into 'figural voids'[38]. The case of the railway lines is analogous due to the existence of rows of buildings facing the lines on the embankments. The railway stations, car sheds, signal crossings, etc. also define the form and space of the railway lines. As for the bridges, the walls of the bridge structure give it the form of a rectangular passage and a safe, enclosed space characteristically separated from the river. There aren't too many open spaces in Calcutta into which the roads or railways or bridges terminate. *The whole infrastructure of circulation can therefore be visualized as a continuous public passage, a 'figural void' which connects as well as encloses all the*

[37] James Holston, *The Modernist City: An Anthropological Critique of Brasilia*, University of Chicago Press 1989 pp. 108-119.

[38] Ibid. p.120. "We perceive the city street as both a void and a volume of space contained by surrounding solids. As a void, it reveals these solids; as a volume it takes the shape of its container. The street thus constitutes a special kind of empty space; it is a void that that has a defined shape, usually a rectangular volume. From the context of its containing solids, the street emerges as a distinct and recognizable figure, one which is empty but has form. We may therefore consider the corridor street as a figural void."

other built structures of the city. Having defined the infrastructure of circulation in Calcutta as a unique but by no means isolated entity, we can focus on the nature of the production of this space.

The Structure of Capitalist Urbanization

In *Paris: Capital of Modernity*, David Harvey explains that modernity is always portrayed by its promoters as a radical break from the immediate past. Modernity is in fact a myth that is created to justify the radicalism of present actions, despite the presence of ample proof that the roots of this radicalism lay in the past. 'Modernity is, therefore,' he continues, 'always about "creative destruction", be it of the gentle and democratic, or the revolutionary, traumatic, and authoritarian kind.'[39] He defines 'creative destruction' as the destruction of the past inadequate systems in order to create the present modernity, while the future will destroy the present's inadequacy. This process is accomplished with the help of capital, which is invested for the development of the urban area. In *Consciousness and the Urban Experience*, Harvey goes on to describe the 'cyclical rhythms of investment and disinvestment in machinery and in built environments'[40] that produce a particular commodity or infrastructure necessary to the existence of the city.

This produced infrastructure occupies a secondary space, replacing or overcoming the space that subsisted in the past. With the definite goal of accumulating profit, the capitalist society constantly endeavors to replace natural landscapes by built landscapes, while at the same time attempting to accelerate the turnover time of capital investment. Once this turnover time is accelerated and a new commodity or infrastructure perfected within the same city space, the application of the previous infrastructure becomes redundant. Uneven development of the city's infrastructures is the obvious result, and it becomes necessary to overcome it. It is the same process of "creative destruction" which clears out the inadequacy of past investments. Harvey concludes: 'The annihilation of

[39] David Harvey, *Paris: The Capital of Modernity*, Routledge 2003, p. 1.
[40] David Harvey, *Consciousness and the Urban Experience*, The John Hopkins University Press, 1985, p. 27.

space by time proceeds apace. But it is now the created spaces of capitalism, the spaces of its own social reproduction, that have to be annihilated.'[41]

Taking the example of the Second Empire in France and the development schemes implemented in Paris by Haussman in the 1840s and '50s, Harvey demonstrates the process of "creative destruction". To what extent is this notion of capitalist urbanization applicable to the development of the infrastructure of circulation in Calcutta? The fact that Calcutta is a colonial metropolis makes the existence of someone comparable to Haussman improbable, since no single planner of a colonial city could exercise a similar amount of control over the city space, capital investment or authority over the residents of the city. Moreover, the interest in development planning and implementation was also limited in a colonial regime. Therefore, development schemes as extensive and seemingly radical as in Paris would be impossible in Calcutta. But if we reduce the scale of the reforms, we might be able to locate some parallels. The modes of production of space and capital investment in 'public works' were far more uneven in colonial India.

The Empire Creates the Colonial Urban

Ravi Ahuja's *Pathways of Empire: Circulation, 'Public Works' and Social Space in Colonial Orissa (c. 1780 – 1914)* is probably the only historical work dealing with the theory and the production of circulatory practices by the colonial government in the Indian subcontinent. The first part of his book deals with the historiography and theory of produced social space, while the second part concerns the case study of colonial Orissa. In the process of developing a theoretical background for the development of the infrastructures of transport, he derives from other theorists like Henri Lefebvre, Ernst Bloch, Stephen Kern, and David Harvey, as well as geographers like Edward W. Soja and Sunil K. Munsi. In doing so, he attempted to overcome the drawbacks in the historiography of transport in India, which had failed to develop what he refers to as 'a *social history* of circulation and infrastructure'. He enumerates these drawbacks as follows: '(i) a lack of critical reflection on basic concepts, (ii) the failure to assume a

[41] Ibid. p.28.

longue duree perspective on the history of circulation spanning both the precolonial and the colonial eras, and (iii) a narrow focus on railways.'[42]

Historians dealing with the development of transport in South Asia generally work under the assumption that improvement of infrastructure of transport was universally beneficial and hence in public interest. The result was a lack of understanding of the intricate conflicts embedded in the production of these systems, and therefore charging the British colonial administration and policies for all the delays and glitches in the infrastructure. Ahuja refers to this tendency as a combination of 'technocratic progressivism with methodological nationalism.'[43] Similarly, while other social practices like religions in the subcontinent are studied as trends encompassing long periods of time, the history of transport in specific regions of South Asia is missing. This is probably due to the shift in technologies of transport, which have been interpreted as breaks in history. This obviously leads to the third drawback of the historiography of transport in India, wherein the introduction and growth of the railways in seen as being more prominent contribution than the construction of roads and bridges.

Though Ahuja develops a theoretical framework for the establishment of transport infrastructures in order to eliminate the drawbacks of the historiography, he is aware of the limitations of such a line of enquiry. The creation of a framework does not mean every case under study will confirm to it once the specifics of the case are analyzed. Moreover, Ahuja's objective here is to better understand the case of colonial Orissa, which he believes to be a marginalized area compared to other sites of primary administrative, political or economic importance. Keeping this in mind, the parts of his theoretical framework (the seven sequential hypotheses: Production, Conflict, Historicity, Relativity, Compression, Disparity and Rythm[44]) can be examined. The fact that human society appropriates natural space to build a social space with spatial elements like parks, roads, houses, etc. on it cannot be doubted, but at the same time natural space does not

[42] Ravi Ahuja, Pathways of Empire: Circulation, 'Public Works' and Social Space in Colonial Orissa (c. 1780 – 1914), Orient BlackSwan, Hyderabad, 2009. p. 2.
[43] Ibid. p. 3.
[44] Ibid. pp. 25-65.

completely disappear. The constructed social elements are both locatable objects and social relations owing to their 'production'. If we consider just roads, we can assume that all pathways, streets, etc. are actually 'networks constituting, conditioning and remoulding social space.[45]

The British understanding of the same space was however different. They planned and executed "public works" with the belief that colonial space had been a *tabula rasa* before their advent, and it was due to their civilizing mission that social space was created at all.[46] The established fact here is that no constructed social space can exist or be transformed without any circulatory movement through it. This kind of movement also guarantees interaction between all the factors of social life. In Ahuja's own words: 'Social space is, therefore, at every point in time bound up with contradictory constellations of social groups; it is resource and product of historical forms of social domination and, at the same time, precondition and result of limitations of these forms.'[47] Social conflict between different social groups leads inevitably to multilayered and unequal transformation of all spaces,[48] i.e. a site is built up on several times, though the necessity to build on another more important one leads to unequal developments in different areas.

In the same way, appropriation of a natural or social space by a dominant group, say the British in the eighteenth century, does not imply immediate improvements of that area. Many colonial areas were left untransformed for long periods of time, or had to cope with abandoned plans. The abstracting of any space also leads to the denudation of previous meanings ascribed to places, and therefore to local protests against any transformation.[49] Social practices of movement over most of these areas similarly create a difference between absolute distance which is measurable in length and relative distance which is measurable in transportation time and cost.[50] Both the above processes thereby result in

[45] Ibid. pp. 25-7.
[46] Ibid. p. 27-8.
[47] Ibid. p. 30.
[48] Ibid. p. 38.
[49] Ibid. p. 43.
[50] Ibid. p. 49.

disparities in development between different regions according to the importance attributed to them and the need to provide greater connectivity to leading towns and cities. Movement is thus rendered as radial, serial or cyclical around these areas. Deriving from Marx's notion of 'annihilation of space by time', Ahuja concludes: 'Space *is* annihilated by time on *certain* routes but never to the same extent on *all* routes. Relative distance between well-connected nodal points of circulation shrinks, while other locations that are closer in terms of geometrical measurement almost vanish into a hazy distance as they are rendered comparatively less accessible in terms of transport time (or cost).'[51]

Having developed this detailed idea of the process of production of the social space of circulation, Ahuja then goes on to examine the British colonial attitude towards circulation and its construction. Delving into the area of semantics, he explores the meanings of 'communications', 'public works' and 'circulation', all of which had turned into major areas of interest around the mid-nineteenth century due to the integration of circulation with production.[52] So, 'public works' were deemed 'not only as the result of improving dynamics of private property aided by the state, but also the property of a nation (...).'[53] This particular term was used to conceal the conflicting social interests involved in 'the production of built environments for purposes of transport by asserting their 'naturalness', general utility and contribution to an assured 'common good'.'[54] At the same time, it was not only the basis for political legitimacy in India and other nations but also successfully covered up the need to specify the nature of the 'public' or the 'common'.

The implications of the above processes are immense for the history of Calcutta. As a capital city founded by the British it submerged the previous built environments in the same region. This also led to a greater conflict among the British authorities and the Indian landholding communities. The latter learned to adapt and exist within the colonial

[51] Ibid. p. 58.
[52] Ibid. 76. The process of production did not involve just the technicalities of manufacturing goods, but also to their transportation to firstly, entrepots and secondly, the markets.
[53] Ibid. p. 82.
[54] Ibid. p. 83.

framework, while at the same time attempting to protect the remains of their socio-cultural past. The city also emerged as a main target of improvement policies because of its strategic location and usefulness as an administrative and economic centre. All lines of transportation converged into Calcutta, from the rural areas as well as other presidencies like Bombay and Madras, but at varying degrees. As Ahuja himself points out, the time taken to travel from Cuttack to Calcutta was much greater than the time taken to travel from Bombay to Calcutta in the late nineteenth century. Developments within the city and around the city were thus dictated by the prominence ascribed to the city itself by the colonial power, while the rest of the country around it was rendered hazy.

The theoretical framework derived from a reading of James Holston, David Harvey and Ravi Ahuja attempts to overcome the limitations of the existing historiography dealing with a socio-political and economic approach to colonial Calcutta with minimum attention towards the development of the systems of circulation. By revealing the multilayered and unequal nature of improvement that occurs within most cities, Harvey and Ahuja problematise the circulatory system as a produced space. We know that this system in and around colonial Calcutta was a separate entity which bound, and still binds, the fragments of the city together. It grew in spurts after the 1690s, and it grew somewhat haphazardly and unequally in different sections of the city, mostly due to the politics of implementation and the way capital was invested. Inhabitants, Indian and European, dreamed of the city and claimed it as their own, playing out their private and public dreams for the city.

Chapter 1

The Last Stretch of the Ganges

"On the river, guttering lights are lit inside those tight-humped shelters on the barges, the neon sign at Shalimar begins to jerk and splutter into advertisement, the Howrah Bridge begins to dissolve upstream. As the last kite flogs itself hastily home past the fort and over the tree tops of the Maidan, the sun has become a crescent, thin as a wafer and pure blood now and the sky has almost completed its spectrum to deep mauve. The bridge has almost vanished, the opposite bank is a lurking shadow, the boats between are the vaguest shapes. Suddenly, like the throwing of a switch, darkness. And a thousand small lights, flickering over and beside the water, with a mustard glow in the sky behind as Calcutta makes ready to pass the night."

- Geoffrey Moorhouse, *Calcutta* (1971).[1]

Situated at nearly the end of the course of the Ganges, Calcutta's significance arises from the presence of the river. Every bit of Calcutta's early history, from pilgrims coming to Kalighat to Job Charnock's coming down a creek one fine afternoon, is associated with the river and the manifold channels (natural and man-made) around her. Calcutta's survival completely revolved around her waterways until the 1850s, when the railways came to India and the Public Works Department was established. Even after the 1850s, the river Bhagirathi / Hooghly and the Calcutta and Eastern Canals system continued to operate, though constantly contending with the growing strength of the railways for a little bit of attention and care. The dependence on the river and the Ganga-Brahmaputra delta never really ceased. Moreover, the River Hooghly remained the natural and municipal western boundary of Calcutta.

This chapter is a study of this system of waterways located in and around Calcutta between 1780 and 1900. Not only does this period witness slow, successive and

[1] Cited in Laura Sykes (ed.), *op.cit.* p. 13.

overwhelming physical changes in the courses, depth and water volume of the river and her channels, but also a change in outlook. From being the most valued channel of communication, the waterways later declined to the second ore even third position as a network of circulation. I have attempted to explore the reasons for this change during the colonial period. The chapter is divided into three sections. The first section gives an account of the developments surrounding the river Hooghly: its embankment, municipal bodies attempting to control it, and the bridge that was thrown across it.

The second section deals with the Calcutta and Eastern Canals system, which was a pre-colonial network of circulation and had to be reconstructed and expanded due to its changing courses, silting, etc. in the colonial period. The stretch, embankment and the bridges over the channels of this network is discussed at length here. The third section combines both the river and the canals to give a holistic account of riverine navigation in the region; including a brief account of the trade over the waterways and the associated problem of piracy and policing.

I. "Binding the River"

"The Hughli always puts me in mind of a self conscious, guilty dog, resting with its tongue out after a particular feat of mischief – dancing eyes and a naughty wink: expectant of a scolding, but resolved nonetheless that it will do the same thing again, if for nothing else than merely to tease you. You can see from its expression that the scolding is having not the slightest effect whatsoever. The worst of it is that it knows you have not the least power to compel it to heed your wishes. Were it a pet dog you might punish it: but you cannot punish a river."

- R. J. Minney, *Round About Calcutta* (1922).[2]

Minney was not misplaced in his comparison. The further we go back, the wilder and more uncontrollable the river seems to be. The earliest British record of Hooghly's wrath was probably the following found in the *Calcutta Gazette* dated 29th September, 1785:

[2] R.J. Minney, *Round About Calcutta*, Oxford University Press, 1922. p.43.

"We are sorry to learn, by letters from Moorshedabad, that in consequence of the unusual height of the river, (which has been such as was never known in the memory of man,) the great river had overflowed its banks, and laid the country between the city and Bogwangolah entirely under water, and had, by the channel of the Ackbarpore Lake, even penetrated the eastern parts of the city (...)."[3] (See Fig 1.1 and 1.3 for views of the banks of River Hooghly) In Calcutta, this fury was frequently exhibited in the flooding of the banks, overturning of boats due to river storms, etc. A perfect example is the report on the 9th of October 1794 of an accident on the river where 17 people died when their boat capsized due to "a violent squall of wind."[4]

Fig. 1.1. The River Hooghly from the Strand Bank, Calcutta
(Photographer Johnston and Hoffman, 1885.)

At the same time, the river had been the location of many skirmishes between the Portuguese and the British, as well as the French and the British. Since the river was the only entrance into Calcutta, and its attendant trade, this was also the first place where the British wanted to safeguard their foothold. Silting and inundation were the main problems with the river's stretch near Calcutta, but it was not seen as a major issue till

[3] W.S. Seton-Karr, *Selections from Calcutta Gazettes, Vol. I*, Military Orphan Press, Calcutta 1865. p. 165.
[4] W.S. Seton-Karr, *Selections from Calcutta Gazettes, Vol. II*, Military Orphan Press, Calcutta 1865. p. 395.

about the middle of the 19th Century. J.G.R. Forlong, the Superintending Engineer of the Presidency Circle of Bengal between 1860 and 1862, discussed the results of his surveys and constructions: "Everywhere our engineering staff were constructing roads, irrigation channels, embankments and civil and military buildings, and my attention was constantly drawn to establishing, if possible, the best substrata on which to found all ordinary foundations."[5] (See Fig. 1.2)

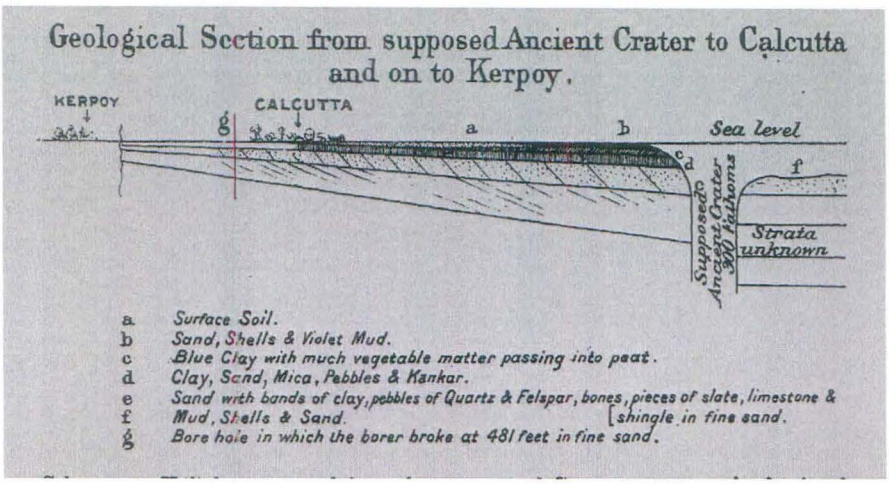

Fig. 1.2. J.G.R. Forlong's (Superintending Engineer of the Presidency Circle of Bengal, 1860-1862) Report on the substrata of soil in Calcutta.[6]

Predicting that the river Hooghly would dry up in another century or two, he determined the geological section through Calcutta to be too unstable for the foundations for heavy buildings, and that the commercial importance of the city would decline with the absence of the river.[7] As the voice of impending doom, he concluded: "(...) if Adria was, as history relates, the station of the fleet of Augustus Caesar, and is now 20 miles from the sea, the Ganges delta must have advanced some hundreds of miles within the same time. Hence the certainty of the death of our great capital on the Hugli."[8]

[5] J.G.R. Forlong, "The Life of Calcutta as a Seaport and the Mercantile Capital of Asia" in *The Geographical Journal, Vol. 16, No. 2, August 1900.* p. 238.
[6] Ibid. p. 240.
[7] Ibid. p. 240.
[8] Ibid. p. 241.

Forlong's wasn't the only pessimistic voice about Calcutta's fate. Residents and visitors had repeatedly emphasized the futility of the location of the capital of the British Empire in the east. Rudyard Kipling, in one of the best poetic representations of the city, wrote:

Thus the mid-day halt of Charnock – more's the pity!
Grew a city.
As the fungus sprouts chaotic from its bed
So it spread –
Chance-directed, chance-erected, laid and built
On the silt –
Palace, byre, hovel – poverty and pride –
Side by side;
And, above the packed and pestilential town
Death looked down.
Lest the city Charnock pitched on – evil day! –
Go Her way
Though the Argosies of Asia at her doors
Heap their stores,
Though Her enterprise and energy secure
Income sure,
Though 'out-station orders punctually obeyed'
Swell her trade –
Still, for rule, administration, and the rest
Simla's best.[9]

Despite her importance as an entrepot, Calcutta remained a city built on silt, and was therefore unstable as well as unhealthy. The summer capital of the British in India, Simla, had more to offer, while Calcutta's destiny was foretold, thanks to Job Charnock's selection of such unsuitable land for the founding of the city. Perhaps this is the reason why most historical works begin with the coming of Charnock; the city's certain demise was predicted, and its history cannot be told without the mention of this inaugural

[9] Rudyard Kipling, *A Tale of Two Cities*, MacMillan, London 1891.

mistake. Yet the population was far smaller in the late eighteenth century, and the annual flooding was still capable of naturally scouring the shipping channels and of pushing the huge quantities of silt before it, down to the sea.[10] The absence of government or municipal control over the river body is also reflected in its embankment, especially when we take note of the 39 ghats on the river in 1792 (See Appendix for Table No.1).[11]

Eighteen of these ghats were private, four of them owned by Europeans. There was no government or municipal control over these ghats, until 1807, following the formation of the Town Improvement Committee after Lord Wellesley's Minute[12] when a survey of the bank of the river was ordered by the Mint Master and the Magistrates.[13] Public works, in the strictest sense, were irregular and infrequent in the first half of the 19th century, and indeed we find no evidence of anything being done till about 1820, when the Strand Road was constructed parallel to the river. Existing riverside roads, like Bankshall Street, were widened around 1810.[14] The lands around most ghats, along with the privately owned ghats themselves, were taken over by the Town Improvement Committee in quick succession, beginning with W. Larkin's "alluvial land" on the bank of the river.[15] The "Nawab's ground on the banks of the River near Clive Street"[16] (synonymous to the Nawab's Ghat mentioned above) was taken over in 1821.

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[10] David William Martin, *op.cit*, p. 66.
[11] Harisadhan Mukharjee, *Kolikata Sekaler O Ekaler*, Calcutta 1915, pp. 666-7.
[12] Monidip Chatterjee, "Town Planning in Calcutta: Past, Present and Future" in Sukanta Chaudhuri (ed.), *Calcutta: The Living City, Volume II: The Present and Future*, Oxford University Press, 1992. pp. 134-6. Delivered on 16 June 1803, the Minute commented on the defects of Calcutta as a city (like unplanned building, inadequate drains and water-courses, etc.). He proposed a Committee of thirty members for the maintenance of the city. This was the Town Improvement Committee which was also known as the Lottery Committee due to its chief means of obtaining funds.
[13] WBSA, 25th June, 1807, No. 1.
[14] Ibid. 13th November. 1810. No. 21.
[15] Ibid. 8th December, 1820, No. 8.
[16] Ibid. 5th October, 1821. No. 12.

Fig. 1.3. River Hooghly from the Calcutta High Court
(Photographer Johnston and Hoffman, 1885)

Negotiations with Indian ghat owners, like Nitanund Baboo. Dyle Chund Addy and Neelmony Chanda,[17] were also undertaken. However, residents were still allowed to build private *ghats* on certain conditions, as proved by the permissions granted to Mauzoram Mouhumd and Baboo Rammohun Mullick. In the case of Baboo Rammohun Mullick, the Government clearly stated that the "request was complied with on the understanding that the *ghat* is not to encroach upon the River and that when built it will be entirely and freely open to public use."[18] Mullick was then granted 20 cottahs of land attached to the Old Board of the Trade Office to extend his *ghat* and aid in its construction.[19] The ghats built by Englishmen like Mr. Allen were, on the other hand, public and largely used for steam ferries.[20] The pressure to complete the construction of the Strand was increased when the proposals for the London Strand were placed in 1826. An article in the *Calcutta Gazette* dated November 13th, 1826, evaluated the situation:

[17] Ibid. 6th Dec. 1822, No. 17.
[18] Ibid. 8th Nov. 1836, No. 13-19.
[19] Ibid. 6th Dec. 1836, No. 3-4.
[20] Ibid. 18th June 1851, No. 30.

'Although however, in point of appearance, the Calcutta Strand will not admit of a comparison with that of London, its local conveniences are not less sensible (...) A drive along the river-side to Garden Reach, for instance, would be a vast improvement upon the monotonous uniformity of the course (...) It would also much facilitate the intercourse between town and the shopping at Cooly Bazar, and would be public benefit as well as an ornament to the city. The construction would be attended with little difficulty or expense, as the line of bank is already unbroken, and unoccupied by buildings, and to our unmilitary observation, it does not even seem calculated to interfere with the defences of the Fort, or the communication between the ditch and the river, which might be maintained with the same facility as at present.'[21]

It's a different story altogether that the Strand was only completed in the late 1830s,[22] largely due to financial problems. At around the same time, concern was presented by some private individuals regarding the lack of sufficient burning ghats for Hindus in the city. Correspondence in the *Calcutta Gazette* dated June 26, 1826, mentions the areas reserved within the city for Christian and Muslim burials as well as the locations of Armenian interment, and demands the demarcation of larger spaces encroaching on the bank of the river Hooghly for Hindu cremations. Though this demand was met to some extent in 1827,[23] it is doubtful whether this area sufficed. This might be a dominant cause behind the flotation of dead bodies in the river, a problem faced by the government even in the 1860s.[24] The above mentioned article also emphasized the methods used by the poor to dispense of their dead relations, especially during epidemics. Though it was a means of dispensing the bodies in some form of holy water, it is doubtful that only Hindus took recourse to the immersion of the dead during epidemics.

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[21] *Calcutta Gazette. The Days of John Company: Selections from Calcutta Gazette, 1824-1832*, ed. Anil C. Dasgupta, Calcutta 1959. p. 160.

[22] Problems of finance were rampant, and in 1828 the subscribers who had privately volunteered to finance the Strand's construction under the Lottery Committee backed out. Offers were then made to ask the public for the money. Ibid. pp. 316-7. *Calcutta Gazette* article dated August 18, 1828.

[23] Ibid. p. 196, *Calcutta Gazette* article dated January 22, 1827.

[24] NAI, HD, Public Branch, 7th March, 1868, No. 56. Correspondence with the Bengal Government "relating to the establishment employed for the sinking of corpses found floating within the limits of the Port of Calcutta and payments for the general Revenue of the cost for the same."

Through all this time, the affairs of the Calcutta Port and the river banks were managed by the Government Marine Department. In 1870, the Port Trust was constituted under special enactment and the whole management of the affairs of the Port was given into their hands. The Port Trust originally consisted of a body of twelve Commissioners (including a Chairman and a Vice-Chairman) who were appointed by the Provincial Government. In 1887, this number was increased to thirteen, of whom eight were appointed by the Local Government, five were elected, four by the Chamber of Commerce and one by the Trades Association. Further changes were made in 1890.[25] In 1870, when the Port Trust took over, they had six screw pile jetties (four in working order and two under construction) six cranes, and four sheds for the accommodation of the sea-going trade. The Commissioners undertook the improvement of the river bank after taking over the Strand Bank lands, thereby laying the foundation of the present Inland Vessels Wharves.

The number of the jetties was raised to eight, with eight sheds and 27 hydraulic cranes. Soon after, in 1876, the Port Trust came up with its own railway line connecting the Inland Vessels wharves and the Jetties with the Eastern Bengal Railway at Chitpore, and also serving the local traffic between the jute presses and the Jetties.[26] Around 1880-81 the Commissioners took over six vessels and the responsibility for lighting the river Hooghly. They also conducted surveys of the river, and published sketches and maps of the river and the other channels.[27] In fact, the whole infrastructure of the port, including the number of ghats, increased along with the other facilities. Ghats with religious associations, for example the burning ghats and the ones within temple compounds like Dakshineshwar, were reserved and only small boats stopped them. The larger and more strategically placed private ghats were taken over by the government, while the rest left alone, and in some cases, as in that of the burning ghats, aided by the government.

[25] A. K. Ray, *op.cit.* p. 265.
[26] Ibid. p. 271.
[27] Ibid. p.273.

Around this time, the Port trust came into major conflict with the East Indian Railway Company over the construction of a bridge over the river. (See Figs.1.4 – 1.7 for images of the Hooghly Bridge) It would be pertinent to take up the matter here, since bridging the river Hooghly was a concern for all Calcuttans, and the body of the river truly came under human control after the bridge was constructed.

Fig. 1.4. The Hooghly Bridge from the Calcutta bank
(Photographer Unknown, 1878)

Edward Thornton, writing in 1854, explains the need to build a bridge in the vicinity of the East Indian Railways terminus at Howrah in order to facilitate the transport of people.[28] In 1848, an anonymous writer, calling himself 'a London Missionary' wrote about his journey on the river Hooghly into Calcutta, described all that he saw, and specifically what he did not see: "There are as yet, however, no bridges across [the river], nor even a steam ferry, though one like that of Portsmouth harbour has long been spoken of . It is the habit of the people of Calcutta, to speak of any plan of improvement for a great many years, and then wait for many more, till the government, or some wealthy patriot, carries it into effect."[29] Anticipating the added pressure of the migrating

[28] P. Thankappan Nair (ed.), *Calcutta in the 19th Century (Company's Days)* (Calcutta, 1989). p. 990.
[29] Ibid. p. 917.

population once the extended section of the Howrah-Bandel railway line got completed; Edward Thornton predicted that "a less tedious mode of crossing the river will be then indispensable. Railways and ferry are not links of the same chain. The latter will doubtless give way, and its place be shortly occupied by a substantial bridge thrown over the river in the immediate vicinity of the terminus."[30]

Traveling over the Ganges in the mid-1850s, Sidney Laman Blanchard commented on the disadvantages caused by the lack of the bridge: "In the first place [the traveler] will remark that it is extremely unpleasant, or a great bore, or a disgusting nuisance, or a confounded shame – according to his temper at the time and general mode of expressing himself – that there is no bridge over to Howrah where the railway station is situated. That there is not is undoubtedly a great public inconvenience; but I am not quite sure that it is so 'disgraceful to the authorities' as I have heard some enthusiasts remark. The idea has been entertained 'time out of man' (...). But there are natural difficulties in the way, which engineers have not hitherto been prepared to grapple with, when brought to the point: whether these are ever likely to be overcome still remains a question."[31]

These anticipations were anything but random. T. M. Robinson, during the Bengal Legislative Council debate on the construction of the Hooghly Bridge in 1871, commented on the previous considerations of the same issue.[32] He observed that a committee had been formed back in 1855 in Lord Dalhousie's time, and as a member of that previous committee, he discovered that the British Indian Association had unearthed two prior attempts at the construction of the bridge around the same area. Apparently, in 1838, a floating bridge across the Hooghly had been proposed, but had failed due to lack of funding. Soon afterwards a suspension bridge was proposed, for which Indian investors like Dwarka Nath Tagore and Joykissen Mookerjee had volunteered liberal contributions since it was a public utility that had become quite a necessity. The previous failure dampened this effort too, and the projectors gradually withdrew their enthusiasm.

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[30] Ibid. p. 990.
[31] Sidney Laman Blanchard, *The Ganges and the Seine: Scenes on the Banks of Both*, Chapman and Hall, London 1862, p. 5.
[32] *Supplement to the Calcutta Gazette, No. 18, May 3, 1871*, p. 259.

Fig. 1.5. The Hooghly Bridge, central view from the Calcutta bank (Photographer and date unknown)

As a result, the Association concluded, with the exception of small and ill-provided steam ferries, "the communication between the banks of the Hooghly, although an absolute want and necessary of daily life to vast numbers of people, has been left to the chance provision of poor native boatmen, without progress or improvement of any sort, instead of advancing wit, and becoming adapted to, the social and commercial advancement of the Empire, and especially of Calcutta."[33] It was in 1863 that this proposal was reconsidered. Under Section 13 of the Act XXII of 1863, another Commission was given the task of enquiring into the whole matter of the construction of the bridge, where it would be constructed and what should be done about the funding.[34] The report of the Commissioners was submitted in July 1868, after which the Lieutenant-Governor of Bengal, Sir W. Grey, and the Secretary of State for India had both sanctioned the construction of the bridge by April 1869, while this "work of public utility" was provisionally registered under Section XIV of the Act of 1863.[35]

[33] Ibid. p. 259.
[34] NAI, *P.W.D,, Buildings and Roads Communications, March 1870, No. 5.*
[35] Ibid. *No. 6.*

This sanction in turn led to a number of deliberations and suggestions over the exact location for the bridge. In a letter from the Justices of the Peace for the Town of Calcutta, Chairman S. S. Hogg suggested that the temporary floating bridge should be constructed as close to the proposed site of the permanent bridge, in which case new approach roads would not have to be constructed for the permanent bridge.[36] The idea of a temporary, low cost bridge followed with a more permanent structure, was not new. The issue had been settled in favour of a temporary structure as an experiment in 1869, and by 1871, with the exception of the Commissioners of the Port Trust, hardly anybody related to the official line believed the idea of a permanent structure feasible in the near future. This is evident in the official correspondence in 1871, when the Port Trust Commission came into a clash with the East Indian Railway Company over this topic in the Legislative Council debate.

This clash was over which party could provide the government with a better guarantee for returns for the primary investment. Since the government finally went with the Railway Company's proposal, the Port Commissioners came up with an alternative plan and location for the bridge. But in 1870, the decision was made to construct the bridge near the Armenian Ghat, right opposite the Howrah railway terminus and about 100 metres south of where the Howrah Bridge stands today. The other stakeholder in this concern was the East Indian Railway Company, which connected Calcutta with Bombay, the United Provinces and the Punjab – all focal points of British authority in India. Further, a branch of the railways crosses the Hooghly river at Naihati, 25 miles up the river, providing access to the docks at Kidderpore and the Eastern Bengal State Railway terminus of Sealdah.[37] The Eastern Bengal State Railway connected Calcutta with North and East Bengal and Assam, and with Diamond Harbour. The Jubilee Bridge was constructed in 1887 linking Bandel and Naihati, so that up-country railway freight traffic could run through to the Harbour, with a charge being paid to the East Bengal State Railway for the use of its tracks.[38]

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[36] Ibid. *No. 7.*
[37] *The Imperial Gazetteer of India, Vol. IX*, Oxford , Clarendon Press, 1908. p. 271.
[38] Sukanta Chaudhuri (ed.), *op.cit, Volume I: The Past*, Oxford University Press, 1992, p. 239.

Fig. 1.6. View from the right side of the Hooghly Bridge, Calcutta Bank (Photographer Unknown, 1881)

By mid-1870, the government was already considering Bradford Leslie's designs for the Hooghly Bridge, and was estimating the finances required for this purpose. The new Lieutenant-Governor, Sir George Campbell, sanctioned the amount of £150,000 which was not to be exceeded, for the construction of the bridge. But according to Leslie's estimates, the cost of the bridge went up to £184,000, a sum that the Government of India did not want to invest without assured returns on its investment. The Government initially intended to approach the Port Trust Commission to undertake this liability by charging extra on the regular port dues of Calcutta. But since this would burden the shipping companies for all time, the Government believed that the Port Commissioners would shy away from taking on this liability. Hence they approached the East Indian Railway Company.

The Railway Company immediately decided to put a tax on all goods coming out or passing through the Howrah station for the benefit of the bridge. Whereas the amount in receipts from the tolls on the bridge was a mere speculation at this point, and therefore a somewhat indefinite quantity, the Government already had accounts of the quantity of goods that passed through the station. In the meantime, with the publication of the details

of the Council debate on the 15th of April, reactions of the people of Calcutta were coming through fast and the Justices of Peace for Calcutta and the British Indian Association in particular reacted strongly against the proposed clause. Yet both criticisms were as the Lieutenant-Governor, put it to the Council on the 29th of April "(...) there was undoubtedly, on the part of the community of Calcutta, a very strong wish to have a bridge, but at the same time there appeared to be an extreme disinclination to pay for it."[39]

The Justices of Peace and British Indian Association further criticized the Railway Company for demanding the opening and shutting of the bridge should be set according to the railway timetable. The Commissioners commented that "this depends in a great measure upon the state of the tides, which do not remain constant as an East Indian Railway Time-table (...)."[40] The Commissioners resolved to advise the Government of India to pursue the plans for the construction of the permanent bridge, although this plan was ultimately disregarded, and the Government went ahead with the construction of the floating Hooghly Bridge.

This follows from Ravi Ahuja's argument that many studies of transport history in India "combine technocratic progressivism with methodological nationalism. A social neutrality, linearity of technological change and priority of the national scale are assumed, while conflicting social interests that emerge from concrete historical contexts and entail diverging needs, preferences and practical alternatives with regard to transport policy are considered only in passing if at all." [41] This tendency is generated by the lack of critical observation of the idea of 'public works'. However, as evident from the discussion above, the cost of producing these works was directly related to the transportation charges of the goods or people that would be transported. There is no doubt as Ahuja concludes that: 'The desirability of a built line of communication was hence, from the perspective of political economists and administrators, increasingly determined by its ability to "pay for itself", to offer a profitable investment opportunity or

[39] *Supplement to the Calcutta Gazette, No. 18, May 3, 1871*, p. 256.
[40] Ibid. Part 6.
[41] Ravi Ahuja, *op.cit*, p. 3.

to meet at least the cost of its construction and maintenance.'[42] The investment in 'public works' increased after the 1840s,[43] and after 1857, the state pursued a much more active and coercive policy.

Coming back to the construction of the Hooghly Bridge, it was well known that Bradford Leslie had a good 21 years of active service as a civil engineer, eleven of those in India, before he designed the Hooghly Bridge in 1869.[44] His initial plan for the bridge, which was hardly altered, was as follows:

'The Bridge consists of a roadway for carriages 40 feet wide, with two footways, one on either side, of five feet each in width, making a total width of Platform 50 feet.
The Platform will be of teak wood, protected by lagging formed by transverse bars of flat iron about one inch wide by one quarter of an inch in thickness, placed with intervals or space of one inch between each bar, to afford foot-hold for horses, oxen, or other cattle.
(...)
Method of opening for passage of shipping:
(...) the stationary barges adjacent to the movable sections of the Bridge will be held by moorings of double the ordinary weight and strength. (...) In order to clear the movable sections from the stationary portion of the Bridge, the projecting portion of the Platform next adjacent to the movable barges will be capable of being withdrawn by means of a counterpoise after the manner of a drawbridge. The two movable sections will then be warped up or down stream as may be most convenient, and being disconnected will be sheared athwart the stream, and temporarily moored 200 feet apart in such a manner as to leave the opening quite clear of all warps and moorings. (...)'[45]

That this initial design was actually followed through is evident in the photographs we have of the bridge.

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[42] Ibid. pp. 90-1.
[43] Ibid. p. 93.
[44] NAI, *P.W.D, Buildings and Roads Communications, March 1870, No.2, Memorandum by B. Leslie, dated 28th December 1869.*
[45] Ibid. *Floating Bridge across the River Hooghly – Descriptive Specification*, pp. 13-5.

It was due to the modifications suggested by the Officiating Chief Engineer for the Public Works Department, Bengal, H. Leonard that the original estimate of £150, 000 was exceeded, as Leslie explained in a further communication to the Secretary to the Government of Bengal in the P. W. D.[46] (See Appendix, Table No.3 for the details of the early estimates) According to his estimates, the charges for "interest on Capital and Working expenses (...) leaving the local goods traffic untouched as a margin for unforeseen contingencies" came to a sum of £ 21, 970 (See Appendix, Table No. 2 for the relevant details).[47]

The government's investment in the whole project required some form of security for the returns. Leslie pledged his professional reputation as security, which the Lieutenant-Governor did not think held very strong. Sir George Campbell in turn finalized the security offered by the East Indian Railway Company, thus leading to the debates in the Legislative Assembly in April-May 1871.[48] The construction work was commenced after the East Indian Railway's assurance was received, and it took more than 3 years for the bridge to be completed.

On the 20th of March, 1874, two sections of the bridge were destroyed in an accident. The steamer *Egeria* broke away from her moorings in the river, and came into collision with the bridge, damaging and sinking three pontoons, and completely destroying two hundred feet of the superstructure, especially the main truss-girders.[49] The opening of the bridge thus got postponed, and Messrs. Handyside and Co. was fined Rs. 2, 600 for the girders that were destroyed.[50] It was reported on the 23rd of October that the bridge had been opened to the public free of charge "pending the receipt of instructions from Government. Probably no tolls will be levied until the Bridge is formally opened by His Honour the Lieutenant-Governor of Bengal in the middle of next month."[51] By this time, passengers had already begun complaining about the conditions in vicinity of the bridge. One

[46] Ibid. *March 1871, No. 12, dated 2nd March 1871.*
[47] Ibid.
[48] Ibid. *No. 15, dated 14th March 1871.*
[49] NAI, *P.W.D,, Communications, April 1874, Nos. 1-4.*
[50] Ibid. *July 1874, Nos. 8-10.*
[51] Ibid. *Friday, October 23, 1874.* p. 2.

particular complaint pertained to the jamming of passing carriages on the approach road on the Howrah side.[52]

Fig. 1.7. Another view of the Hooghly Bridge from the Calcutta Bank (Photographer Unknown, 1881)

Complaints also started pouring in about the administration of the bridge by the end of that year, mainly about the inconveniences caused by the opening of the bridge to let the ships pass thrice a week. Baboo R. N. S. Thakoor directly complained to the Secretary to the Government of Bengal, Public Works Department.[53] Others expressed their concerns through the papers. For example, 'A Daily Passenger' wrote in to the editor of *The Englishman* on 12th November 1874, complaining that if the ferry steamers were removed, how were the railway passengers to cross over to either side during the stipulated times of opening the bridge, namely "from 3 to 6 P.M. on 17th instant, and from 7 to 11 A.M. on 20th instant (...)?"[54] Regardless of these issues, the Port Commissioners succeeded over the next two years in perfecting the system of opening

[52] Ibid. *Thursday, October 20, 1874*, p. 2.
[53] NAI, *P.W.D, December 1874, No. 4.*
[54] *The Englishman, Friday, November 13, 1874.*

the bridge for the passage of ships, as well as its general maintenance. The construction of approach roads to the bridge was increased by the end of 1874 itself.[55]

A rather different view of this bridge after its opening is given by Durgacharan Ray in his *Debganer Martye Agaman*. [56] While the reports on the railways by Varuna (the god of water) in general appear to be sensational, those describing the condition of the river Ganga,[57] a divinity herself, creates an anxiety in her father, Brahma, who decides to visit her. When the gods finally reach Howrah via the railways, they realize that nothing they see is their creation. As for Ganga, one cannot see her at all since she is covered by riverine traffic, and when she is finally summoned, she immediately blames her immobility on the bridge that binds her.[58] Varuna describes the bridge at some length. He also adds that a cyclone had been sent by the gods to destroy the bridge while it was under construction.[59] The fact that there was a major cyclone in Bengal around that time is undisputable. *The Hindu Patriot* reported "the ravages of the cyclone of the 15th ultimo. Calcutta had fortunately the tail end of it. The centre of the cyclone passed over Burdwan and Midnapore."[60] The cyclone was thus portrayed as one last attempt by Providence to stop the binding of Ganga.

The condition of the river, in her own words, had worsened since, and had been exacerbated by the presence of the other wife of the ruler – the railways. The railways had not only taken away the bulk of the population in her grip, through employment opportunities, speedy delivery of goods, etc., but also aided in creating the bridge that did

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[55] NAI, *P.W.D, Railways, December 1874, Nos. 322-31.*

[56] Durgacharan Ray, *Debganer Martye Agaman* (Originally published in 1881; Reprinted in 2009, Dey's Publishing, Kolkata).

[57] Ibid. p. 12. "*There is no end to Mother's sorrow. She is carrying the freight for Calcutta. Previously the mount Airavata could not stop her flow, now that flow is defeated at the hands of the British. The British are digging and taking her wherever they want. Moreover, they have bound her near Howrah and Hooghly.*" The latter part refers to the canals dug by the British from the 1850s. Howrah and Hooghly are refered to here as districts, with the bridge near the former being the floating bridge, while the one near the other is the Naihati railway bridge.

[58] Ibid. p. 266.

[59] Ibid. p. 266. "*When this bridge first appeared, we sent Cyclone to destroy it; but apprehensive that applying full force might destroy the land of Bengal, he did not use much force at all.*"

[60] *The Hindu Patriot, Monday, November 2, 1874.* p. 508.

not let her sleep due to its open passage night and day.[61] Brahma promises to relieve Ganga of her predicament and takes her leave. Nevertheless, the gods cannot stop praising the bridge and the might of the British and their superior technology that defeats all the challenges that nature, rather the gods, throw at them.[62] This includes the rising tide and floods, against which the bridge is well-equipped because it floats. While crossing the bridge, they observe the large ships docked at the seven jetties and wonder how these could pass the bridge, at which point Varuna describes the process of opening the bridge from the middle at certain times of the week to facilitate the crossing of ships that could not pass under it.[63] Ray's text can be taken as representative of the anxiety as well as the admiration that Indians had for the new constructions and changing uses of familiar spaces.

Highlighting the loss of divinity in the case of Ganga due to her mundane appropriation for the purpose of carrying freight, facilitating agriculture through canal irrigation, and using her banks as suitable sites for industries, was only one aspect of this account. The nineteenth century British understanding of nature excluded her portrayal as a benign, nurturing force as well as her violent, destructive disposition. She had been perceived, for some time now, as an inert, exploitable object; a hindrance in the development of man and his means; a natural barrier which needed to be overcome. It does not naturally conclude that storms or cyclones were now controlled, but technology attempted at adapting to these tricks of nature. These contesting views on the river and her banks are highly problematic, as sufficiently shown through the opinion on and characterization of the river in *Debganer Martye Agaman* and Minney's account. While the former looks at her as a helpless benevolent mother, the latter compares the river with an uncontrolled or untrained pet. Neither talk about her wrath.

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[61] Ibid. 267. "*This binding – there is no respite from it, be it day or night – vehicles move constantly and men travel from bank to bank. (...)If I try to catch some sleep with my aching body at night, the wagons moving on my chest wake me up immediately. They have further established so many factories with jute, oil and gadgets, that I nearly feel the pain of death due to their noise and smoke.*"

[62] Ibid. p. 268. "*Pitamaha said, justified is the brilliance of the British, justified is their strength! Otherwise I had last seen Ganga bound this way in the Treta Yuga, as I am seeing it now in the Kali Yuga!*"

[63] Ibid. p. 268.

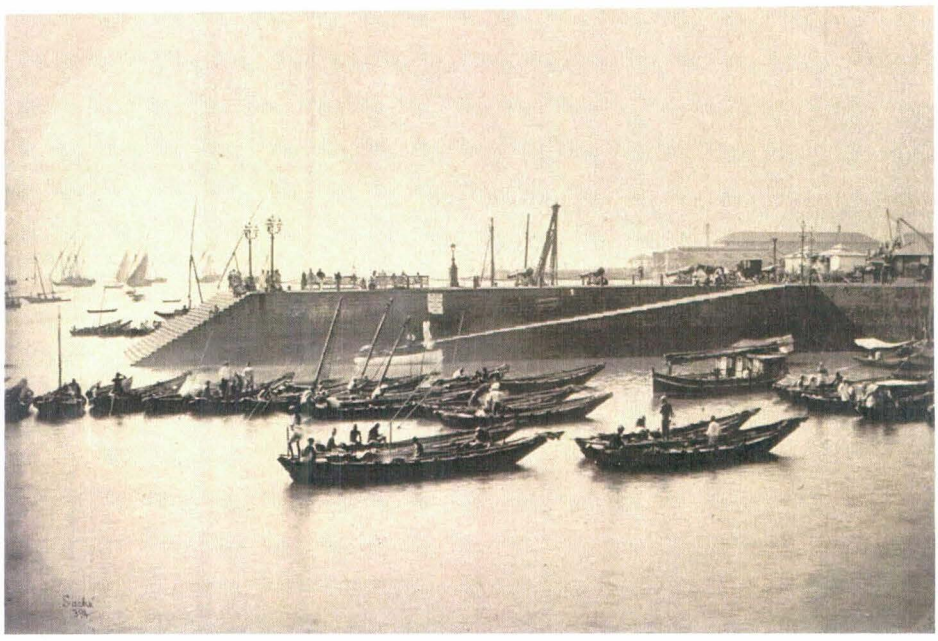

Fig.1.8. Railway Jetty, Howrah Bank.
(Photograph by John Edward Sache, 1866)

The same contradictions are seen with the embankment issue, where private ownership and the religious importance of ghats were being undermined by the need to control the embankment better. The breaking point was with the coming of the railways in the 1850s. The embankment itself had to be modified to provide access to the railway station at Howrah, and circulation progressively faced the railway lines, rather than the port and the jetties. The photograph above (Fig. 1.8.) provides an insight into this new site that was located on the banks; the very site which had to be facilitated further with a temporary bridge, connecting not just the two banks of the river Hooghly, but Calcutta to Howrah railway station.

II. Canals: Acquisition, Construction and Expansion

East of the river Hooghly, the navigable channels consist of the Circular and Eastern Canals or Calcutta and Eastern Canals. According to the *Bengal District Gazetteers: 24-Parganas*, this is "one of the most important systems of river canals in the world, judging by the volume of its traffic, which averages a million tons per annum, valued at nearly

four million sterling."[64] This is, to the present day, a system of natural channels, connected by a few artificial canals, in the districts of the 24-Parganas, Khulna, Faridpur and Backergunge, which carry the produce of Eastern Bengal and the Brahmaputra Valley to Calcutta. They have a total length of 1, 127 miles, of which 47 miles are artificial canals.[65] (For a list of canals at present under the charge of the Executive Engineer, Circular and Eastern Canals Division, see Appendix Table No. 4.)

These inland channels were constantly shifting as the deposit of silt raised their beds; the great estuaries near the sea-face were not navigable by country boats from June to October, due to the strong sea-breezes which still prevailed during the south-west monsoon. Owing to these constraints, a system of channels was devised in order to allow country boats to pass from the eastern districts to Calcutta by a direct inland route. The main concern had always been to keep the natural cross-channels clear of silt, and to connect them with each other and with Calcutta by a system of man-made canals. In the pre-colonial setting, the courses of these natural channels, as well as their volume, had been large enough to help commerce run its own course. But as mentioned before, silting was a constant issue, and without any (known) investment in the clearing of silt and expansion of these natural channels, a decline in commerce and navigation set in.

When the British first established their foothold in Calcutta, they had no option but to invest in the construction of connecting channels, especially due to the absence of railways and safe land routes. The same factors which aided the eminence of the river Hooghly, assisted in the utility of the canals. To establish a brief chronology of construction would be easy here, since these have been well-documented over time. Tolly's Nullah was excavated around 1775-77 by Major William Tolly to transport food and other merchandise from the rural areas around Calcutta and east Bengal.

[64] L.S.S. O'Malley, *Bengal District Gazetteers: 24-Parganas*, Logos Press, New Delhi 2009. p. 158.
[65] Ibid. p. 158.

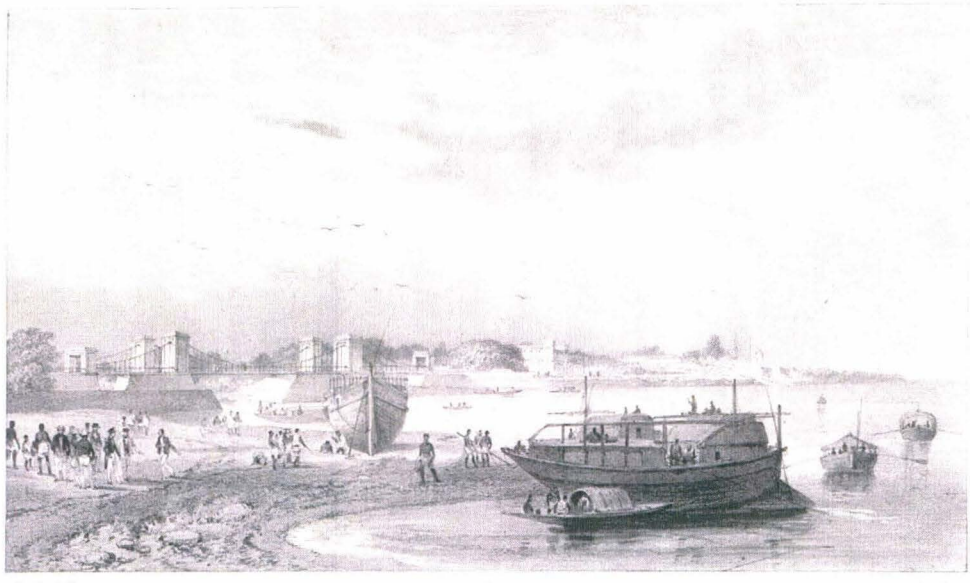

Fig. 1.9. Tolly's Nullah

(Lithograph by L.P.A Bichebois, 1840-52)

This canal (See Fig. 1.9) was 17 miles long and connected to the Hooghly at Kidderpore. Tolly started the process of tolling the boats on this waterway, the right to which was taken over by the Bengal Govt. in 1804.[66] The first mention of a bridge to be constructed with government sanction over Tolly's Nullah dated back to 1853,[67] although the actual construction (a suspension bridge) was completed around 1858-9.[68] In an attempt to improve the approaches to Calcutta, an old channel through the Salt Lakes was extended and led westwards by the Belliaghata Canal in the neighborhood of Sealdah.[69] Between 1826 and 1831, a new route was opened between Calcutta and the Yamuna river, following the same direct easterly course as the present Bhangar Canal. The object here was to relieve the pressure on Tolly's Nullah. A number of tidal channels were utilized and connected by six cuts to form a continuous eastern route.

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[66] Dr. Biren Roy, *op.cit.* p. 40.
[67] NAI, PWD, 10th Dec. 1853, No.1-2.
[68] Ibid. 10th Dec. 1858, No. 147.
[69] L.S.S. O'Malley, op. cit. p. 159.

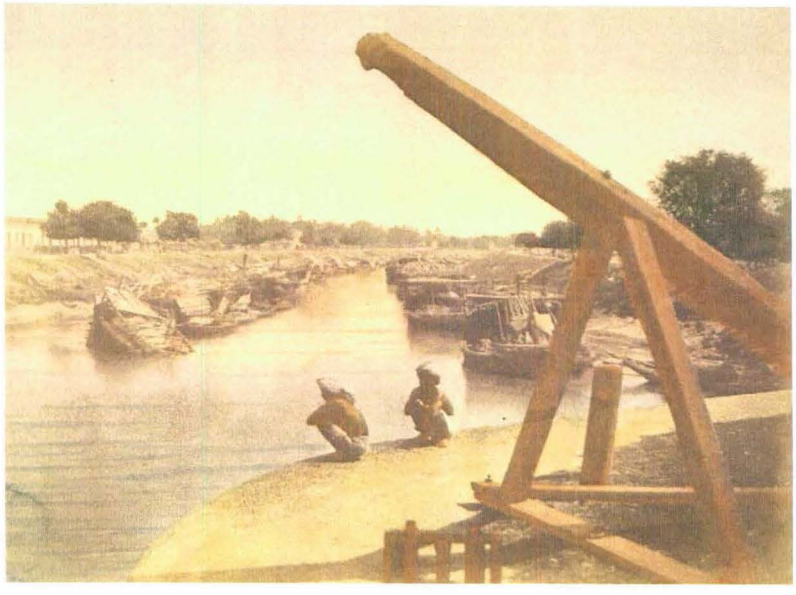

Fig. 1.10. The Circular Canal

(Photographer Frederick Fiebig, 1851)

The Circular Canal (See Fig. 1.10.) was a Lake channel through the Salt lakes and the Belliaghata Canal and the Marhatta Ditch completed between 1830 and 1833. The plan of this canal was drawn up by Major J.A. Schalch, and the proposals for bridges over the canal were floored at the same time as the one over Tolly's Nullah.[70] Considering the traffic congestion in the other canals, the New Cut canal was proposed in 1856.[71] It was finally opened in 1859, leading south from Ooltadangah on the Circular Canal to Dhappa on the Belliaghatta Canal.[72] After this, the Bhangur channel was canalized in 1899 for a length of 15 miles, thus completing the inner channel which had been commenced in 1831.[73] Constructions extending and maintaining these canals continue up to date. Coming to the specifics of the canal constructions mentioned above, it would seem like Major William Tolly and Colin Shakespear had more to do with the canals and the bridges over them, than any other planner, administrator or private individual.

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[70] NAI, PWD,15th Dec, 1855, No. 59-60 and 20th Aug. 1856, No. 21-22.
[71] Ibid. 8th March 1856, No. 29.
[72] The Imperial Gazetteer of India, Vol. IX Bomjur to Central India (Oxford at the Clarendon Press, 1908), p. 288.
[73] L.S.S. O'Malley, op. cit. p. 159.

William Tolly is widely believed to be the pioneer of the Calcutta Canals system due to his instrumental role in excavating the old river, Adi-Ganga, which ran near Kalighat temple in south Calcutta, and making it into the main connection between the Hooghly and Bidyadhari rivers. Some time between 1775 and 1777, Tolly undertook this private venture when he was granted land in this area.[74] Keya Dasgupta has explained the role played by Tolly's Nullah in the genesis of Bhabanipur: "The natural inclination of settlements to take up the high ground or levee along river courses is a well-known fact. In the case of Calcutta such land in the northern segment was settled prior to the arrival of the British. In the south, similar high land was found along the Adi Ganga/Tolly's Nala. The expansion of settlement, as a result, was likely to be towards the south along the Hooghly, and southeast along the Adi Ganga, rather than towards the east."[75]

She also cites W.W. Hunter's observation that Adi Ganga had religious importance for the Indians of the region,[76] and the fact that the temple of Kalighat (a major Sakta pilgrim centre) lay on the banks of this dying river only adds to its significance. We will study the navigational role of Tolly's Nullah at a greater length in the next section, but the tables listing the number of ghats along the Nullah in Bhabanipur and Kalighat (For the tables, see Appendix, Table No. 5 and 6.) goes to some extent to show the popularity of the embankment.[77] As we see, the total number of ghats was actually increasing with time, despite the diminishing importance of Tolly's Nullah as a navigational link. The precise reasons behind this development are not clear, though there was no displacement of *ghats* from the Hooghly banks to the Nullah either.

What we do know is that the ownership of the Nullah and the right to levy tolls from passing ships/boats changed hands quite often since Tolly's time. The *Calcutta Gazette* of 18th March 1790, announced the sale by public auction of the "remainder of a term of a certain lease from Anna Maria Tolly to John Hooper Wilkinson of a certain creek or nullah, commonly called or known by the name of Tolley's nullah or canal, together with

[74] Keya Dasgupta, *op.cit.* p. 25.
[75] Ibid. p. 4.
[76] Ibid. p.4.
[77] Ibid. *Appendix 5.*

all and every its appurtenances [perhaps meaning the *ghats* and the temporary bridges]."[78] Anna Maria Tolly was William Tolly's widow, and had to sell her husband's lease two years after his death. Once it changed hands, the need to keep this canal from silting up still continued, as is proved by the following advertisement in the *Calcutta Gazette* on the 8th of September 1796:

"Notice is hereby given that it being necessary to clean and excavate the Tolly's Nullah, the work will begin on or after the 1st of November next, and that from the said 1st November until this work is finished, no boats will be allowed to pass or repass through the Nullah. There will be free passage for all boats from the Salt Water Lake to within a mile of Gurriah.

N.B.-All boats that may be lying in the Nullah are desired to quit it on or before the 1st November."[79]

It must be noted that most of the canals were privately owned before 1800. Only with the rising interest in the planning of the city and its administration did the municipal bodies take over construction and maintenance of the watercourses. Discussions over the Circular Canal had begun at the time of the Committee for Improving the Town, established at Lord Wellesley's insistence.[80] In 1808, the Board of Revenue approved Colin Shakespear's plan for the new canal, along with his report and estimated expenses for the same.[81] Grounds were purchased not only to extend the canal, but also "for opening and widening some of the avenues from it to the Town."[82] By 1810, the plan for a bridge over the Circular Canal, new roads in its vicinity and revised regulations for levying tolls were all implemented.[83]

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[78] W.S. Seton-Karr, *Selections from Calcutta Gazettes, Vol. II*, Military Orphan Press, Calcutta 1865. p. 509.
[79] Ibid. p. 602.
[80] Monidip Chatterjee, op.cit. pp. 134-36.
[81] WBSA, 29th January, 1808, No. 23.
[82] Ibid, 20th November, 1809, No.33.
[83] Ibid. 23rd February, 1810, No. 39.

Colin Shakespear was also credited for the construction of a famous bridge on the Tolly's Nullah (See Fig. 1.11), a model of which was gifted to Maharaja Ranjeet Singh, who was looking for an example to use for the bridges he planned.[84] This bridge was a celebrated feat of engineering nevertheless. Although it was basically "a rustic bridge of tension and suspension, for foot passengers, light cattle, carriages, & c."[85] the Society of Arts in England rewarded Shakespear's "ingenuity with their gold Vulcan medal."[86] This bridge was completed in March 1823, and in 1824 Shakespear made his plans available for further bridge proposals in the country.[87] This kind of a bridge was not the only kind to be thrown across the canals. The Native Papers reported an accident on the Chain-bridge at Kalighat where "the bridge was much shaken, in consequence of which a little boy lost his footing, and fell from the bridge into the nullah."[88]

Fig. 1.11. Shakespear's Suspension Bridge, Tolly's Nullah
(Painting by Charles D'Olyly, 1848)

In 1853 "a wooden bridge over Tolly's Nullah at an estimated cost of Rs. 22, 005"[89] was approved, though the estimates rose to Rs. 50, 217 in 1854.[90] The construction of this

[84] *Calcutta 200 Years: A Tollygunge Club Perspective*, Tollygunge Club Ltd., Calcutta 1981. p. 64.
[85] *The Naval and Military Magazine, Vol. 1*, 2nd Edition, T. Clerc Smith, London 1827. p. 90.
[86] Ibid. p. 90.
[87] Announcement on Thursday, May 27, 1824 by Collin Shakespear in the *Calcutta Gazette*. *The Days of John Company: Selections from Calcutta Gazette, 1824-1832*, ed. Anil C. Dasgupta, Calcutta 1959, p. 4.
[88] Announcement on Monday, August 14, 1826 in Ibid. p. 151.
[89] NAI, PWD, 10th December, 1853, No. 1 and 2.

bridge was not completed even in 1855, though at the same time work on the bridges over the Circular Canal and Tolly's Nullah were commenced at Barrackpore and Kidderpore respectively.[91] The passage of elephants and carriages was prohibited over the temporary bridges while the new bridges were under construction.[92] In 1856, we find no updates regarding the previous project, yet two more bridges were planned "over Tolly's Nullah at Kidderpore and another near the Circular Canal at Bulliaghutter, the former at a cost of Rs. 47,531 and the latter at a cost of Rs. 33, 652."[93] (See Fig. 1.12) Bridge building was therefore undertaken during this period, though very little was done to systematize the heights or designs of all the bridges before 1858.

It appears that a number of accidents, which have not been described except for a brief mention of the breaking of the Narcoldangah Bridge, led to the dismantling and re-erection of a number of bridges in 1858. Following the accidents, a debate raged between the Board of Revenue of the Bengal Government, the Collector of Tolls and the traders and boatmen using the canals over the heights of the bridges and the boats traversing the canals. The Collectors of Tolls over various divisions of the Calcutta Canals were of the opinion that the height of boats should be fixed for their safe passage under the bridges and fines be collected for defaulting this fixed height. The Board finally decided that they "do not consider that any fixed rule, as to the height of boats to be attended with advantage. It would rather, they think, be likely to lead to constant disputes and references, and prove incompetent and unfair to the Traders and Boatmen."[94] Instead, the height of the bridges was fixed.

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[90] Ibid. 8th June, 1854, No. 1-3.
[91] Ibid. 15th December, 1855. No. 59-60.
[92] Ibid. 15th December, 1855, No. 61.
[93] Ibid. 5th May, 1856, No. 13 & 14.
[94] Ibid. 29th January, 1858, No. 15 A.

Fig. 1.12. The Kidderpore Bridge
(Photographer Frederick Fiebig, 1851)

The Tollygunge and Manicktollah Suspension Bridges were the first to be dismantled and re-erected following the "necessity of adopting an uniform height at which the Bridges (...) should be constructed (...)".[95] The estimate for the Manicktollah Bridge over the Circular Canal was Rs. 4, 812,[96] and that for the Tollygunge Suspension Bridge over the Tolly's Nullah was Rs. 4, 855.[97] These re-erections were overseen by Hugh Leonard, Executive Engineer of the Circular and Eastern canals. With an increased interest in maintaining and bridging the canals, the Calcutta and Eastern Canals provided a complete system for circulation.

III. Navigating the Waterways

In the previous sections, we studied the developments on the river Hooghly and the Calcutta Canals system separately. This section will focus on how the waterways worked together as a whole system. Navigation over both the river and the canals was conducted

[95] Ibid. 29th January, 1858, No. 18 A.
[96] Ibid.
[97] Ibid. 19th February 1858, No. 13/15 A.

mostly by country boats before the coming of steam communication. Of these, the *pansi* was the smallest (See Fig. 1.13.), the *budgerow* was larger (See Fig. 1.14.) and the *mayurpankhi* the fastest. The former two were used for trading and traveling, the latter just for traveling.

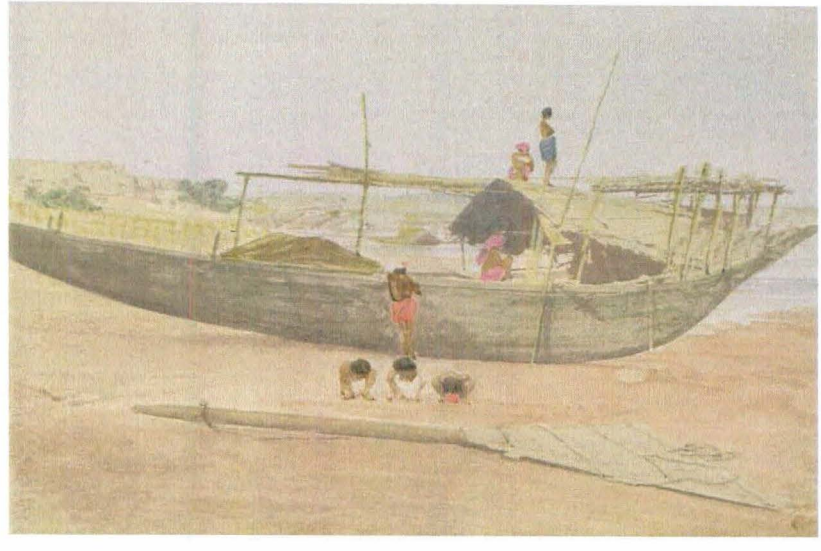

Fig. 1.13. A *pansi* on the Hooghly
(Photographer Frederick Fiebig, 1851)

The *mayurpankhi* was famed for its beauty as well as speed. Lord Valentia, Lord Wellesley's guest in 1803, described the boat: "This vessel has gold work and various beautiful pictures on it. There is a gold-gilded eagle at the forefront of the boat. A picturesque lion on the back. Twenty people can easily fit into this boat and travel in considerable comfort."[98] All the boats were controlled by the Boats Division of the Police Department. An advertisement by the Police Department, dated 10th March, 1781,[99] recorded the charges for hiring boats (See Appendix, Table No. 7.). The same kinds of boats also delivered letters all over the country (See Appendix, Table No. 8 for a list of *dawk* routes and charges.). [100]

[98] Harisadhan Mukharjee, op.cit. pp. 708-9.
[99] Ibid. p. 652.
[100] Ibid. p. 649.

All of the country boats were lighter compared to sea-faring vessels, and hence easily capsized while traveling. As has been mentioned in the first section, accidents were rampant till the middle of the nineteenth century. A few examples would suffice here. On the 12th of September, 1784, Mr. Hugh Austin and his head bearer drowned, while the *manjee* and *dandees* absconded, when Austin's budgerow "was unfortunately driven by the tide against a French Snow below Chandpaul Ghat, and immediately overset."[101] On the 15th of July, 1826, a number of people in three boats, including women and children, drowned when the boats overturned in quick succession near the Bagbazar Ghat.[102] The worst case was perhaps of the accident on the 25th of April, 1827, where not one soul survived the capsizing of a boat due to a violent wind off Burrabazar Ghat.[103] Strangely enough, fewer accidents were reported in the *Calcutta Gazette* once steam navigation was introduced in Calcutta.

Fig. 1.14. A Budgerow on the Ganges
(Painting by Balthazar Solvyns, 1791-96)

[101] W.S. Seton Karr, op. cit, Vol. 1, p. 25.
[102] *Calcutta Gazette. The Days of John Company: Selections from Calcutta Gazette, 1824-1832*, ed. Anil C. Dasgupta, Calcutta 1959, p. 151.
[103] Ibid. p. 211.

The first Steam Vessel was brought to Calcutta by Captain Johnston in 1826, [104] and the steam vessels of *Burrampooter* and *Hooghly* were introduced in 1828 by the government.[105] The former was built by Messrs. Kyd and Co. and the latter by the Howrah Dock Company. Some Tug-Vessels with steam engines were introduced in 1829 after the Marine Board's advertisement in the *Calcutta Gazette*:

'The sum of 1,000 Rupees will be paid for the best Plan and Specification, of a Vessel capable of being used as a Tug with Engine on the low Pressure Principle, of the power and description of those now on board the *Hooghly* and *Burhampooter*, the particulars of which may be ascertained at the Office of the Board.
A similar Sum of 1,000 Rupees will be paid for the best Plan of a Tug Vessel with Steam Engine on the high Pressure Principle, including a Specification of the Weight, Power and Description of the Engines.
The tests of Excellence to be – adaption for Speed, Manageability, and small Draft of Water.'[106]

A Steam Navigation Meeting on the 24th of June, 1830 resolved that Steam Communication between Calcutta and London & Liverpool by the way of the Cape of Good Hope would be attempted. [107] Following this, the first steamers that traversed the Indian Ocean and made their way up the river Hooghly, the *Ganges* and *Diana*, arrived from Rangoon in 1831.[108] Though the prospects of steam communication between India and England were temporarily darkened, steamers became more and more visible on the Indian waters. The first trip of mails and passengers to London took place from Bombay on 1st October, 1845 and reached London on the 31st of the same month.[109] As faster steamers were put on the route and the Suez Canal was opened in 1869, the travel time came down to 15 days. Steam Pilot services were regularized over the Hooghly after

[104] Ibid. p. 155.
[105] Ibid. pp. 278-9 and p. 305.
[106] Ibid. pp. 350-1. Government Advertisement dated 4th July, 1829.
[107] Ibid. pp. 536-8.
[108] Ibid. p. 640-1.
[109] Dr. Biren Roy, op.cit. p. 39.

1869, when the River Pilot Establishment for negotiating the Hooghly safely was established. This establishment was later controlled by the Calcutta Port Trust.

At this point, the waterways played multiple roles as a network of communication. Not only was the emphasis on connecting with the administrative capital of the British colony, but also with the major pilgrim centers thrown across the whole stretch of the Ganges. In fact, the whole 'reversed' pilgrimage made by the gods in *Debganer Martye Agaman* was through a number of centers beginning with Haridwar to Vrindavan, Benaras, Allahabad, Patna, Monghyr, Moorshedabad, Bally and finally Calcutta. Though the gods traveling in the 1880s use the railways, it is notable that most of these centers were connected with Calcutta through the river Ganges before the railways, and are mentioned as major stops on all the ferry networks. The same goes for the stretch of Tolly's Nullah, and other canals connected to it: being the safer mode of reaching the Kalighat temple.

Trade was the other feature of this network. The articles of trade that were carried over the waterways to and from Calcutta around 1836 are listed in A. K. Ray's *Short History of Calcutta.*[110] It is surprising to see rice in both the imports and exports list, but Calcutta worked as an entrepot where rice was concerned, transporting the bulk of its import from Eastern Bengal and Moorshedabad to the provinces in the west and north. Being the long standing staple in Calcuttan diet, scarcity of rice was felt whenever there was a slack in trade or inflation. The following notice in the *Calcutta Gazette* proves this point: "We are sorry to find that the price of rice in Calcutta is getting high again. It may be ascribed, perhaps, to the transportation of the supplies to the westward, in consequence of the failure of crop in Benaras and the Upper Country."[111] Whatever the case may be, the trade over the waterways was quite prosperous, itself indicated by the frequent phenomenon on the river as well as the canals of dacoity.

[110] A. K. Ray, op.cit.p. 263.
[111] W.S. Seton-Karr, Vol. 2, op. cit. p. 263.

Dacoity existed on the Hooghly even before the British arrived. The Mugs and the Portuguese were known for their piracy in the Bay of Bengal. Once the British had a considerably strong presence in Bengal, they realized that dacoits infested the lands and waterways throughout their trade routes, especially the river channels (later canals) between Dacca, the Sunderbans and other prominent stops before Calcutta. The problem seems to have been exacerbated in the 1780s. In 1788, for example, a certain Mr. Burgh's boat was attacked by fourteen armed boats near Buckergunge on 2nd November, where Mr. Burgh was killed, his merchandise plundered and his wife went missing since. The same dacoits then moved on to Dacca on the 4th and looted the wares (even the clothes) of two European gentlemen in budgerows, and further on in Sylhet where they robbed Mr. Willes' boats, wares and provisions (including bottles of liquor).[112]

To counter these outrages, the Police Department endeavored to hire boats and patrol the river and canals (See Appendix, Table No. 10 for a list of 16 boats of different denominations supplied to the Police Office in Calcutta on 1st April, 1785.).[113] Despite these measures, dacoities continued. In 1829, a Traveller wrote a scathing letter to the *Calcutta Gazette*, describing how he was robbed near Moorshedabad by dacoits who pretended to be Toll Collectors. To suppress piracy, he suggested all boats plying on the waterways should be registered, so that uncertified boats could be better located and traced to pirates.[114] It is not known whether this idea was implemented right then or not. Policing the rivers and waterways remained a major issue even in the 1860s. The Lieutenant-Governor of Bengal, C.E.Buckland authorized the establishment of Patrol Boats through Act V of 1864. The Act was passed for the improvement of the lines of navigation, and if the new "tolls enforced under it are not burdensome, its introduction would seem not only unobjectionable, but by keeping a registry of all boats on the line, to contribute to the prevention of dacoity."[115]

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[112] Ibid. Vol. 1, pp. 269-70.
[113] Ibid. p. 77.
[114] Anil Dasgupta, ed., op. cit. p. 360.
[115] NAI, HD, Police Branch, 11th January 1868, No. 14-16.

It is probably impossible to completely control any kind of crime. But what is evident here is the growing appreciation of the fact that the waterways were too important to be left without the policing of the routes. It may be that the river and the navigable channels were later put on a second footing compared to the railways, but, while it was developing, it was a complete system which ruled trade, traffic and even social life up to a point.

Conclusion

The latter half of the 19th century observed the gradual decline of inland navigation in and around Calcutta. There were a number of reasons for this development. The first was the construction and repair of the Grand Trunk Road between 1839 and 1842. Secondly, a serious deterioration occurred in the upper reaches of the Bhagirathi / Hooghly owing to an alteration in the course of the river Damodar. With the diversion of this tributary, the Hooghly channel began silting up. The consolidation of the banks and extension of jetties into the stream all along the industrial area below Tribeni accentuated the process by obstructing the natural flow of flood-tides causing accretion along the banks and diminishing the swing of the ebb-tides. Thirdly, as indicated by the *West Bengal District Gazetteer*, even in the late nineteenth century "the prevalence of riverine dacoities and the inability of the Government to prevent them"[116] aided the decline. Finally, the already restricted traffic on the Hooghly and the Calcutta and eastern Canals further declined with the coming of the Railways.

A certain Mr. Johnston, cited in the Gazetteer mentioned above, wrote in 1861: "Not every destination is at or near the river bank....The railway provided the reliable means of transport required and the result was a gravitational change of commercial centres from the river bank to the railway lines....The railways made possible traffic in small consignments of miscellaneous goods – a sort of traffic which was quite outside of the scope and capacity of country boatmen, who never dealt in less than a boatload at a time. In the absence, of onward delivery arrangements for such small consignments, the boatmen could not hope to compete in this class of traffic even if they had ever

[116] *West Bengal District Gazetteers: Hooghly*, by Amiya Kumar Banerji, Calcutta, 1972. pp. 374-5.

contemplated starting it."[117] This citation appropriately sums up the death knell sounded by the railways to inland navigation via the river Hooghly and the Calcutta and Eastern Canals.

Unlike anxieties that were generated in the case of the Hooghly Bridge, the waterways did not produce as great a concern. Apart from demands for steps to control piracy, the only complaint that could be brought against the navigability of the waterways was the inadequacy of the canal boats and the limited expansion of the vital statistics of the canals. Dependence on modes of transportation that shortened travel time, like the railways, increased while the use of ferry boats and steamers decreased. It would perhaps be wrong to adapt David Harvey's use of the term 'creative destruction' to a colonial setting, since we would find no proof of a sudden surge in capital or labor investment for the development of these networks of circulation in India. The very nature of 'public works' in colonial India denied such an event, as Ravi Ahuja has explained.

Yet, Harvey's insights are not completely without value. For example: "Space can be overcome only through the production of space, of systems of communication and physical infrastructures embedded in the land."[118] Whether intended through the establishment of the railways or not, the fact remains that the use of the waterways declined since the 1850s. Is it supposed to be coincidental that the railways, though owned by private companies, as well as most well maintained roads ran parallel to the waterways and sometimes cut short the need to frequent some cities on river banks through railway bridges and other bridges? Providing an example from within the city, the Circular Road runs parallel to the Circular Canal (which is today just a *khal* or dead canal) while the Tollygunge Circular Road runs parallel to the Tolly's Nullah, and the Strand Road and a stretch of the Eastern Bengal Railways run parallel to the river Hooghly.

[117] Ibid. p. 375.
[118] David Harvey, op.cit.. p. 27.

With time, the waterways were rendered redundant for travelling. Quicker and more efficient ways of enabling circulation were adopted; even the roadways were more extensively constructed, well maintained and made safe. Mr. Wyman of the Traders Association announced during the Bengal Legislative Council debates in 1871: "We had not to deal only with the existing traffic. We knew that facilities for traffic created traffic."[119] Once the railways were established and the roadways constructed and maintained more extensively, the volume of traffic and the technology related to these modes developed faster, while the waterways languished. What the English East India Company had perceived, throughout the 18th and half of the 19th century, to be the best option available for trade and travel was gradually superceded by the roads and railways.

[119] *Supplement to the Calcutta Gazette, No. 18, May 3, 1871*, p. 261.

Chapter 2

Tracing Roads, Defining Boundaries

> "In space, what came earlier continues to underpin what follows. The preconditions of social space have their own particular way of enduring and remaining actual within that space. Thus primary nature may persist, albeit in a completely acquired and false way, within 'second nature' – witness urban reality."
>
> - Henri Lefebvre[1]

Cities, as built spaces, consist of layers of construction and associated practices. What this city space accommodates and what it neglects comes out through the occupation of the built area. While dealing with just a portion of this built environment, in the shape of circulatory system for communication and transport in colonial Calcutta, it becomes important to identify the main agent at work here – the resident of the city. The Calcuttan may be the resident, planner, administrator, or executor of plans. The Calcuttan is the subject, to derive from Henri Lefebvre's idea of the spatial subject, "in whom lived, perceived and conceived (known) come together within a spatial practice."[2] But it is necessary that we qualify the nature of the colonial Calcuttan. The presence of a very diverse population in this city since the establishment of the city in 1690 provides a background to the processes of planning, construction and representation of Calcutta. The colonial Calcuttan was at the same time the British planner, surveyor and legislator, the Engineer or the poet concerned with the impending doom of the city, the 'native' resident anxious regarding the destruction of 'landmarks' or the inadequate amenities provided by the municipal bodies, and the group of British and Indian people who were actually involved in the process of construction.

This chapter discusses the stages of planning, construction & representation, and the conflicts embedded in them, through a study of the changing borders and the roads within

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[1] Henri Lefebvre, *The Production of Space*, Translated by Donald Nicholson-Smith, Blackwell, Oxford 1991.p. 229.
[2] Ibid. p. 230.

the city of Calcutta roughly from the 1790s to 1900 CE. (See Fig. 2.1 for an aerial view of Calcutta in 1945) The first section deals with the changing borders of the city and the earliest constructions and land assessments of the city. Planning, constructing and representing all imply a certain degree of containment which is embodied in the city space. Specifying the boundaries of the city simultaneously delimits the population that would be governed by the municipal and judicial authorities. It is important to note here that the municipal bodies governing Calcutta changed throughout the 19th century. Mapping, as a tool of marking out these limits and divisions, has its own politics, as I hope to point out in this chapter. The actual act of construction by an established organization, which in this case involves the Public Works Department, also points out who can legally construct and how. The second section will give a brief account of how the PWD conducted its works in Bengal, and more specifically in Calcutta. A history of road construction in Calcutta is discussed in brief here.

Fig. 2.1. Aerial View of Calcutta. (Photograph by Clyde Wadell, 1945)

Visualizing the roads and streets of Calcutta as a single public entity involves the separation of the public and private built spaces of the city, while identifying 'landmarks' and their interpretation as 'obstacles' to circulation indicates the tendency of the colonial authorities to contain the socio-economic practices of the subject population. This

particular theme will be examined in the third section, where I have examined James Holston's idea of the 'corridor street' through the cases of a few streets. Considering these themes spatially can show how they overlap. While the processes of defining boundaries, mapping, visualizing and constructing roads would fall under the category of conceived spaces, the aesthetic element engendered by the façades (natural and man-made) could be categorized as perceived spaces and the idea of representing both of the categories above through spatial practice would categorize representation as a lived experience. I have not followed this thematic scheme due to a lack of sufficient evidence supporting each category, specifically the last one. This chapter will provide a base to such a narrative structure in later works.

I. The Changing Limits of the City

Nearly every account of colonial Calcutta starts with the arrival of Job Charnock at the banks of Sutanutee in 1690. The implication, perpetrated by generations, is that Calcutta before 1690 was a space of just a few villages, with Sutanutee, Gobindapur and Kalikata prominent among them. In A. K. Ray's *A Short History of Calcutta: Town and Suburbs*, as well as Monidip Chatterjee's "Town Planning in Calcutta: Past, Present and Future" in *Calcutta: The Living City*, this founding moment is followed by a description of the municipal bodies of the city, which began with Zephaniah Holwell's *zamindari*.[3] The repairing of old roads and drains was among the duties of the *zamindar*, although the amount spent on these works annually was insignificant. As Ray points out, substantial and lasting municipal works were only carried out after the appointment of the Justices of Peace in 1794 and the formation of the Lottery Committee in 1817.[4] Lord Wellesley's Minute in 1803[5] marked the commencement of a phase of improvement schemes involving the drains, roads, streets and buildings of Calcutta, out of an emphasis on proper planning.

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[3] A. K. Ray, op.cit. p. 147.

[4] Ibid. p. 147.

[5] Monidip Chatterjee, op.cit.pp. 134-6. Delivered on 16 June 1803, the Minute commented on the defects of Calcutta as a city (like unplanned building, inadequate drains and water-courses, etc.). He proposed a Committee of thirty members for the maintenance of the city. This was the Town Improvement Committee which was also known as the Lottery Committee due to its chief means of obtaining funds.

Public opinion in England condemned the method of raising money for public works through lotteries around 1833, which led to the replacement of the Lottery Committee with the Fever Hospital Committee in 1836. The main aim of this committee was to improve the sanitary conditions in the city, especially the drainage, cleansing, ventilation and 'communications'[6] on the recommendations of Dr. James Ranald Martin, the chief surgeon of Calcutta.[7] The Committee submitted a report on public health and conservancy in 1847, which led to the formation of a Board of seven Commissioners, four of whom were to be elected under Act XVI of 1847. This was the first experiment with local self-government, followed by other attempts through various Acts of 1852, 1854, 1856, 1863, 1870, 1876, 1888 and 1889, which also formed the basis of the Calcutta Municipal Corporation. While the Acts of 1856, 1863 and 1876 contained provisions for improving the line of streets by setting buildings forward or back, the Act of 1888 empowered the Commissioners to prepare and publish the alignment of projected streets, to which all building and rebuilding had to conform.[8]

Nevertheless, the complete execution of these plans is doubtful, since E. P. Richards complained about the irregularity and congestion of roads and sections of the city even in 1913.[9] Finally, in 1902-3, all further plans were suspended in order to form a Calcutta Improvement Trust with large revenue of its own to carry out a comprehensive programme of city development and street improvement, to reclaim insanitary and congested areas, and to provide for the rehousing of the displaced population. This whole effort was owing to the critical situation of the city revealed by a medical enquiry about the outbreak of plague in 1896. A similar effort, though larger and more brutal in implementation, was carried out in Bombay due to the plague that struck the city between 1896 and 1914. In both cities, in fact with all colonial cities, the idea of "the disease took on the character of a plague

[6] In the early colonial period, 'communications' referred to a whole system including transportation: roadways, telegraph, railways, etc. See Ravi Ahuja, op.cit.
[7] Ibid. p. 161.
[8] Monidip Chatterjee, op.cit. p. 138.
[9] E. P. Richards, Calcutta Improvement Trust, Report of the Trust on the Condition, Improvement and Town Planning and Contiguous Areas, Hertfordshire, England, 1914, pp. 96-9.

of the poor, it came to be seen as endemic."[10] Therefore the planning of the city and the rehousing of the poor took a forefront in municipal administration.

This was also a direct result of what Narayani Gupta in "Urbanism in India in the Colonial Period" refers to as "the first urban crisis in India", basically during the period between 1880 and 1921.[11] The urban crisis had two features - a sudden perception of threat to public health, and a battle over public space. "Increasing urban populations also led to conflict for the control of public space – the urban riots (labeled by administrators as 'communal') from the 1880s were between rival groups seeking to dominate streets or plazas. (...) With increasing numbers of urban-dwellers, for the first time in India, *urban land became marketable.* As its real-estate potential increased, so also the practice of illegally 'squatting' on disputed, public or vacant land."[12]

Along with these changes in the municipal bodies, there were changes in the way the streets themselves were perceived in the city. These perceptions continue affecting the way the history of Calcutta is written till date. For example, in Kathleen Blechynden's *Calcutta: Past and Present*, streets are mentioned only *in association with the buildings they surround.* The emphasis here is, as in the case of most other works on colonial Calcutta, on the buildings and not the roads. The streets, in accounts like these, appear to have no function but to mark the outer wall of the domain of public and private buildings. Blechynden's work will be discussed again in the context of visualizing the social space of the street in the last section. What is established is the fact that very few works look at the effect of changing borders on the nature of the city. Partho Datta, one of the few historians to have considered this aspect, attributes the increasing extent of the city, especially since Wellesley's Minute, to the need to "adapt Calcutta to the growing needs of a mercantilist state."[13]

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[10] Rajnarayan Chandavarkar, Imperial Power and Popular Politics: Class, Resistance and the State in India, c. 1850-1950. (Cambridge University Press, 1998). p. 239.
[11] Narayani Gupta, "Urbanism in India in the Colonial Period" in Hiren Chakrabarti (ed.) *An Urban Historical Perspective for the Calcutta Tercentenary, Victoria Memorial, Calcutta 1993.* p. 35.
[12] Ibid. pp.35-6.
[13] Partho Datta, op. cit. p. 19.

The first attempt at fixing the limits of the city of Calcutta was made in 1794, though Warren Hastings had proposed the fixing of boundaries in 1774 for policing purposes.[14] (See Fig. 2.2 for the phases of Calcutta's growth) Policing remained the main purpose behind fixing the boundaries throughout the colonial period. The Act of legislation that established the Justices of Peace in 1794, extended to an extensive assessment of "the boundaries of Calcutta, (...) the owners and occupiers of houses, buildings and grounds and the municipal arrangements of that place."[15] The boundaries were fixed with "the Mahratta Ditch to the north, the Circular Road to the east, the river Hooghly to the west, and the Kidderpore Bridge and Tolly's Nullah to the river, including the new Fort and Cooly Bazar to the south."[16] The Mahratta Ditch was a particularly intriguing feature of the city. Half-dug in 1742 in a semi-circular shape, about seven miles in length, as a strategic defense against the attacking Mahratta hordes, it remained incomplete and developed as a limit as well as a dumping ground.[17] The Ditch was filled up in 1799 and in its place the Lower and Upper Circular Roads were built.

[14] Dr. Dhrubajyoti Banerjea, op. cit. p. 34.
[15] *Legislative Department, Original Law Consultation, 28th April and 15th September, 1794.*
[16] Ibid. *12th December, 1794.*
[17] Dr. Dhrubajyoti Banerjea, op. cit. p. 34.

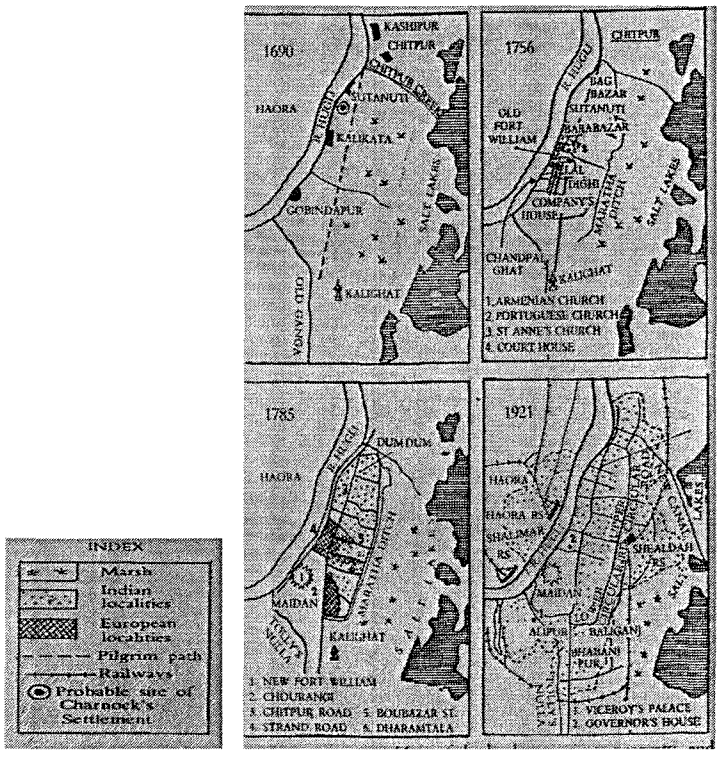

Fig. 2.2. Four stages of the growth of Calcutta[18]

The next assessment was made in 1834,[19] though the exact details are unknown. The Salt Lakes were beyond the city limits, and as such most Europeans did not cross the Mahratta Ditch. But the Lakes did constantly provide a physical limit to the eastern side of the city, and there was ample anxiety regarding the activities in the area. For example, in the report of the General Committee of the Fever Hospital and Municipal Improvement (1837-40), a part of this peripheral area is thus described: "Not more than forty years ago the Salt Lake was much nearer to Calcutta than at present. At a village called Ramkrishnapore, a mile from the high road leading to Dum Dum, is a mound or tumulus of about thirty feet in height, surrounded by two venerable *peepul* trees (...). This mound which retains its native name of Dum Dumma, not forty years ago, was on the edge of the Lake; (...) The Lake has now receded nearly a mile from its foot, and the whole circumference has been gradually contracting in a similar way for many years. The

[18]Sukanta Chaudhuri ed. op. cit. *Vol. I* p.12.
[19] *Legislative Department, Original Law Consultation, 3rd March 1834; Regulation I of 1834.* Files not traced in the National Archives of India, New Delhi.

South – Eastern Bengal South Railway line, Russa Road, Tollygunge Circular Road, Shahpur Road, Goragatchia Road up to Nunakmahal Ghaut.
West – Hooghly River.[22]

While the suburban areas were earlier seen as demarcating the limits of the city earlier, by 1899 the very same were identified through roads, railway lines and the River Hooghly. This was evidence of the increasing importance placed on the modes of circulation. Significantly, every newly established municipal body remarked on the irregular pattern of urban growth and constructions, recommended changes and expanded the municipal boundaries of the city through acts of legislation. Borders and roads were therefore linked to each other in colonial Calcutta because the changes in the former reconfigured the nature and need of the latter. This also portrays a vicious circle of planning, limited implementation and re-planning with the transformations in the funding patterns and agenda of municipal bodies. It is evident from this account of the changing limits of the city that as the area expanded, so did the concern of the Municipal bodies regarding communications and maintenance of these areas. Policing is just a part of the process of limiting a city's extent. The Municipal divisions and sub-divisions of the city were assessed and represented in maps, which the Survey of India published throughout the colonial period.

Accompanying each and every one of the above mentioned Acts of legislation was a map published around the same time. For example, the Act of 1794 can be associated with A. Upjohn's map published in the same year, defining the very same limits later resolved as the boundaries of the city. The dedication of the map is also significant: "To the British Inhabitants of Bengal. This Map of Calcutta and its Environs is respectfully inscribed by their most obedient humble servant – A. Upjohn, 2nd April 1794."[23] Similarly, Major J. A. Schalch's map published in 1830-32 is linked to the Lottery Committee: "Map of the City of Calcutta and its Environs for the use of the Lottery Committee containing all their

[22] Ibid. p. 272.
[23] Map no. F. 43/12 in the Cartography Section, National Archives of India, New Delhi.

Improvements with additions from the Surveyor General's Office."[24] The Act of 1849, which first brought the 'suburbs' under Municipal administration was followed by the map published in 1852-56 by the Surveyor's Office under Captain R. Smyth, and portrayed "the Government Estate of Punchunnogram with Alipore, Khiderpore, Garden Reach, Seelepoor, Howrah and Sulkia."[25]

These maps were institutionally produced and obviously served institutional agendas. Keya Dasgupta sums up situation thus: "The production of maps on the city therefore very clearly coincides with the changing requirements of colonial power, the purposes of survey differing from one to the other. Each survey is a reflection of either a particular historical event or a phase in urban planning."[26] As one municipal body replaced the other, the projection of the city changed. With the above mentioned institutional changes, the idea and the location of 'suburbs' also transformed. Which bodies of the population should be considered as subjects, and which were to be allowed to run independently or along the lines of village councils at least on paper was decided, as shown before in the case of Cooly Bazar. Improvement plans and building of civic amenities was as expensive as policing, especially when funding was the major problem the administrators of Calcutta faced constantly. Every newly established municipal body remarked on the irregular pattern of urban growth and constructions, recommended changes and expanded the municipal boundaries of the city in rather ambitious acts of legislation.

Obviously, every municipal body failed to achieve all of its goals and was criticized by its successors, and this trend continues to this date. This scenario shares certain similarities with David Harvey's example of Paris during the Second Empire. Haussman's 'radical' plans for the reconstruction of the street system after 1853 appeared 'radical' despite the fact that there had been precedents of urban renewal initiatives throughout the 1840s.[27] Harvey is of the opinion that Haussman and Louis Napoleon had

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[24] Map no. F. 43/26, Ibid.
[25] Map no. F. 43A/57, Ibid.
[26] Keya Dasgupta, *Mapping Calcutta: The Collection of Maps at the Visual Archives of the Centre for Studies in Social Sciences, Calcutta*, September 2009.

[27] David Harvey, *Paris: The Capital of Modernity*, Routledge 2003. p. 8.

to perpetuate this "myth of a radical break" because "[i]t created a founding myth (essential to any new regime) and helped secure the idea that there was no alternative to the benevolent authoritarianism of Empire."[28] Though the planners and administrators of Calcutta never embarked upon schemes as large in scale as Haussman's, they did work at creating an image of 'benevolent authoritarianism'. At the same time, each municipal body competed with the previous one and created a picture of unprecedented improvement on their establishment. Mapping was an exceptionally influential tool in this regard, and support for the municipal authorities reflected the transference of 'native' inadequacy without the presence of the British planner and administrator.

Baron Dowleans, writing in 1860, commented on the inadequate uniformity in urban planning throughout the city, indulged in the division of the city into the northern 'native' town and the southern 'white' town.[29] Applauding the Municipal Act of 1857 which made the taxation of all residents of Calcutta compulsory, he believed that "European private contributions"[30] could aid very little in Public Works within the city. "The natives have done absolutely nothing for their own city, and indeed the very few improvements which have taken place of late, though hardly worth mentioning, are the result of compulsory laws rather than of voluntary undertakings."[31] The idea was to perpetuate the regularity and urbane development of south Calcutta, while the northern sections languished because of the "natives'" unhygienic tendencies.[32]

Grish Chunder Ghose, writing three years after Dowleans, however, considered most parts of the city, except Chowringhee and Dhurmtollah Bazar, to be in a rather bad state. If a tourist were to move out of Chowringhee into "native Town, or that part of Calcutta – not far distant from Chowringhee – which is occupied by the actual owners of the palaces which excited his admiration, he would observe a change in the landscape as violent as

[28] Ibid. p. 10.
[29] Baron Dowleans, "Calcutta in 1860" in *Calcutta Review*, Vol. 34, 1860.
[30] Ibid. p. 62.
[31] Ibid. p. 63.
[32] James Ranald Martin. "Medical Topography of Calcutta" in *Calcutta Review*, Vol. V, 1846; and "The City of Calcutta and its Municipal Constitution" in *Calcutta Review*, Vol. 70, 1880.

any that can be conceived by the imagination."[33] Ghose blamed the Municipal Corporation's sanitation drive, which subordinated the drive towards better civic amenities like metalled streets (and not hard brick ones), for this condition of the city.[34] If the municipal divisions of the city had such an effect on the mindset of the residents, the effect of the mapping of the physical boundaries and the changes observed in these was of a different nature altogether.

The silting of the Hooghly river, the constant western boundary of the city, was another alarming feature. It not only changed the depth, current as well as the flow of the river. While it is true that the river Hooghly continued to be a permanent boundary of the city, its very nature changed (as shown in the first chapter). These changes had some bearing on the constructions conducted within the city limits, as J.G.R. Forlong's reports showed in the previous chapter. It is for this reason that Calcutta was a city built on silt.

II. The Roads of Calcutta: Building a Legacy

> "Circulatory practices produce their own institutions and material environment by way of repetition. Circulation beats, in other words, its own tracks: It generates more or less permanent channels of communication and transport as well as the social arrangements for their upkeep and 'fossilises', finally, into built environments (...)."[35]

The evolution of the system of roads running through Calcutta was intricately linked to the evolution of the municipal boundaries of the city: this is a fact. As in the case of most colonial cities, Calcutta's roadways constitute a portion of her legacy. The idea of a 'living city' does not pertain to just socio-cultural or economic concerns, but engages with the sense of the city body as a being in itself. While the former is an underlining feature of most works on Calcutta, the latter had been dealt with in a few instances, especially where roadways are concerned. P. Thankappan Nair's *A History of Calcutta's*

[33] Grish Chunder Ghose, "Calcutta Roads and Drains" in *Bengalee*, August 19, 1863. p. 2.
[34] Ibid. p. 2.
[35] Ravi Ahuja, op. cit. p. 79.

Streets is monumental in this regard since he gives a descriptive account of the history and development of all the streets or Calcutta. A similar description of the construction of each and every road therefore becomes redundant. What I intend doing in this section is to chalk out a history of roads not through the municipal or planning records, but a history of road building largely through the agents of construction – the Public Works Department – in order to gain a better understanding of the process by which the roadways were constructed.

To begin with, the roads of Calcutta around the 1790s were *kutcha* constructions, though these were still the favourite passages of the populace. Metalling of roads began roughly around 1799 with the Circular Road, which ran on the edges of the Mahratta Ditch, the eastern boundary of the city.[36] This was the road commonly referred to as the Bytockunah or Boitackhana Road, commencing from Russapagla road at the corner of Chowringhee and terminating at Chitpur Bridge. Mrs. Eliza Fay, a resident of Calcutta in the 1780s, commented briefly on the rough state of roads in the city as compared to Madras, where she had lived previously.[37] The latter, in her estimation, was a better constructed city. As the population of Calcutta increased and the limits of the city extended further, a system of metalling roads with an annual budget of Rs. 25,000 was adopted in 1820, and an aggregate length of 170 miles of roads was constructed up to this time.[38]

It would be mistaken to assume that a system of roads connecting the various 'villages' which later came under the Municipal boundaries of Calcutta was non-existent. The roads that already existed needed to be more well-maintained, and as the demands of 'communications' increased with the increasing population of Calcutta new roads came to be constructed along with water channels, railway lines and telegraph lines. It would be interesting to take a note of the process of land acquisition for the construction of roads within the city. Even when the Justices of Peace took control as a municipal body

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[36] A. K. Ray, op. cit..p. 156.
[37] Eliza Fay, *Original Letters from India (1779-1815). With introductory and terminal remarks by E. M. Forster*, Leonard and Virginia Woolf at Hogarth Press, London 1925. p. 190. Letter dated 26th May, 1781 from Calcutta.
[38] A.K. Ray, op.cit. . p. 160.

in 1794, the major concern was connectivity to and from the Old Fort William. The Indian residents of Calcutta who owned lands within the limits of the city were left undisturbed. This trend changed with the coming of the Lottery Committee and the new plans for road development. I have accounted for two cases of land acquisition, and both seem to point at the same direction.

The first was the petition of Madhuram Mullick and Ramchund Mullick of Machuabazar in 1818, who owned a piece of land northward of the Chitpore Road, described as "the Honourable Company's Public Road".[39] A part of the land was forcefully taken away by the Surveyor of the Company's Roads in 1811 in order to expand the public road and the drains attached. They requested the Company Government to grant them "either the value of the same or some other parcel of ground from the Company, as an indemnification for their great loss."[40] The measure of land acquired, according to the Mullicks was 22 Cottahs, and they demanded compensation at 300 Rs per Cottah (total 6,600 Rs), which was the current market price of land. The Lottery Committee's enquiry, however, concluded that the road near the premises had not been widened, but a small quantity of ground of about 2-3 Cottahs was used to widen the drain that surrounds the Mullick's property.[41] Deciding in 1818 that the actions of 1811 were for public advantage through the enlarging of drains and having no connection to the expansion of Chitpore Road, the Government paid the Mullicks a compensation of 900 Rs for 3 Cottahs.[42]

The second case was the petition of Chunder Seker Mitter and Bholanauth Mitter of Aurpooly, near Bow Bazar, in 1822. The petitioners prayed against an encroachment on the ground and tank of their hereditary residence in order to construct a new Central Road (probably a stretch of Bentinck Street) on the basis of the fact that "it was expressly commanded in their Shastras not to dispose of any part of such property as should be denominated Bhodrason."[43] They requested that the line of the proposed street be curved around their tank, thereby sparing the tank itself. The Lottery Committee responded that

[39] WBSA, Judicial (Criminal) Branch, Consultation No. 6 dated 4th September 1818.
[40] Ibid.
[41] Ibid. Consultation No. 9 dated 4th September 1818.
[42] Ibid. Consultation No. 10 dated 4th September 1818.
[43] Ibid. Consultation No. 35 dated 22nd August 1822.

to make such a deviation would incur a very heavy additional expense and inconvenience the project, since it had been formed keeping in mind the location of a masjid near Bow Bazar and a temple further along the line. "(...) this is not a case on which any well-founded religious scruple can exist."[44] The Mitters' petition was thus rejected.

Both these cases reveal the loss of private land for 'public advantage' of having roads running straight with enough space for drains. These events were contemporary and similar to the acquisition of private *ghats* on the River Hooghly for the construction of public *ghats* with jetties for ferries and the Strand Road running parallel to the river, as seen in Chapter 1. While there is a chance that the Mullicks had lost more than 3 Cottahs of land, and the Mitters' tank could have been spared, the colonial records give only one side of the story, with no chance of ever knowing the validity of the arguments made by the Indian residents. It would appear however, that the construction of roads and drains took precedence over other considerations. We can now move on to an account of the infrastructure that undertook the projects of road construction.

The nature of the organization which undertook the work of construction changed and became more complex as the need for a better network of 'communications' arose. As mentioned before,[45] the idea of 'public works' was a colonial construct and was interpreted as a necessity throughout the colonial period. To begin with, construction was carried out by the Military Board under the Public Department up to the beginning of the nineteenth century. For example, in the case of the filling up of the Mahratta Ditch and construction of the Circular Road, provisions were made "for a Tent for the sepoys to remain under, whilst the building is carrying on."[46]

Since the details of the sepoys engaged in the construction is not known, it is not known whether construction was actually carried out by just Indian soldiers or a mixed group of European and Indian soldiers cannot be determined. Even when the Public Works Department was established some time in the late 1850s, it was the Military Board that

[44] Ibid. Consultation No. 38 dated 22nd August 1822.
[45] See page 16, para 2.
[46] *Legislative Department, Original Law Consultation*, dated 20th March, 1800. Nos. 1 – 6.

undertook the work of construction. For example, the long distant routes between Calcutta and Oolabariah, Oolabariah and Panch Kooree Ghaut, and Panch Kooree Ghaut and Midnapore were "put into good order and metalled" in 1850.[47] It was in 1853 that an amount of Rs. 91,426.62 was requested "for metalling with kun kur the road between Calcutta, Shaum and Baugh Bazar and Pultah Ghaut."[48] With this effort at repairing and metalling roads the conflicts over funding emerged between the Governor-General's Council (since 1853, the Council of the Lieutenant-Governor of Bengal was added to this equation) and the PWD.

A Court order in 1851 prohibited the local governments "from passing estimates for repairs of works exceeding 10,000 Rs.,"[49] and the same was applied to cases of ordinary periodical repairs. Considerable confusion arose on a few occasions when the Military Board authorized sums exceeding the stipulated Rs.10,000 without the prior approval of the Governor-General in Council, as occurred while the repairs of the road between Calcutta and Barrackpore was in progress in 1852.[50] Issues of this kind were probably resolved after considering the necessity of completing the works. Significant in this regard is the speed at which the estimates for "exceeding annual repairs of 1855-56 to the suburban roads and excavations of main drains in the Moocheekollah, Intally. Ballygunge and Burranagore Divisions of the Town of Calcutta (...) and of the probable expense of making the annual repairs to the suburban roads in the Howrah Division"[51] were sanctioned. This implies that emphasis was laid on the completion of constructions and repairs within the city limits in the mid-1850s.

It was also around the same time that a greater autonomy was granted to the local governments in their dealings with the PWD. To be precise, the local governments were held competent enough to "act without reference in respect to the dismissal and replacement of subordinate grades; and further that in this respect local governments are

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[47] PWD Proceedings, 20th March 1850. No. 15-16.
[48] Ibid. 30th June 1853, No. 1.
[49] Ibid. 14th November 1851. No. 12A.
[50] Ibid. 11th November 1852. No. 2 and 3.
[51] Ibid. 14th February 1856. No. 63. The request for the sanctions (No. 4) went out on the 11th day of the same month.

at liberty to act themselves, or to delegate their powers to Chief Engineers."[52] The PWD Code was published and circulated in 1855-56, though unfortunately none of the copies are available. The construction of a circulation system was definitely formalized in this period, and the growing demands for supplying a permanent establishment of labor, both skilled and unskilled were also gradually met.

Skilled labor in the form of Civil Engineers was imported from England. In 1854 itself, 12 Civil Engineers from England[53] were given the responsibility of 'public works' throughout the subcontinent, although local officers were made in charge of the works since the funding for these works was provided by the local governments.[54] That these demands were dictated largely by the introduction of the railways in India, and the need therefore of a greater work force engaged in construction activities. In order to cut down the costs of importing the whole hierarchy of engineers involved in 'public works', proposals were placed for Civil Engineering Colleges in Calcutta and other parts of India.[55] The initiative taken in this regard by railway enthusiasts in India, especially R.M. Stephenson, will be discussed in the next chapter. Non-commissioned Overseers and Assistant Overseers were trained at Thomason Engineering College (established in 1847, now IIT Roorkie) and then employed on the availability of commissions.[56] A number of Indians were employed as Assistant Overseers in the PWD,[57] and the demand for Indian Sub-Overseers was quite high.[58] Higher still was the requirement of a fixed pool of unskilled laborers which could be drawn from.

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[52] Ibid. 12th December 1855.
[53] Ibid. 22nd June 1854. Nos. 49 and 50.
[54] Ibid. 11th July 1854. No. 53.
[55] Ibid. 5th August 1854. No. 34 and 35.
[56] Ibid. 18th May 1854. No. 12.
[57] Ibid. 10th December 1855. No. 44 mentions the promotion of Sub-Overseer Madhub Chunder Chatterjee to the grade of Asst. Overseer and then posted to the Northern Hidgellee Division.
Ibid. 21st January 1856. No. 35 mentions the recruitment of Punnah Lall Johary as a permanent Asst. Overseer right after he passed his qualifying exams for the PWD.
[58] Ibid. 5th December 1855. No. 21 forwards a letter from "Chief Engineer, Lower Provinces requesting to be supplied annually for 3 years with 30 young men/Natives as Sub-Overseers from the Thomason Engineering College."

To meet this need, the Governor-General in Council permitted the use of convict labor since 1855 for 'public works' in general,[59] though there are traces of convict labor being used before this period in Bengal.[60] If coolies were employed by the PWD or the Military Board prior to the 1850s, its details are unknown. Recurring discussions on the scale of payment, compensation, etc. begin in 1856.[61] The rate of salary in areas of Bengal where coolie labor was in high demand, like in Arracan, went up to Rs.7 per month.[62] The scale of compensation for injury or loss of life is not discussed with regard to Bengal, but in the case of the Kistnah-Amicut works following an earthquake, the Government of Fort St. George recommended that "pensions amounting in all to Rupees 17.6 per mensem may be granted to the nine Coerced Coolies or their representatives, and that gratuities of 12 months' pay may be granted to the eleven Voluntary laborers or their representatives, the latter involving a disbursement at the rate of 2.93 each per mensem of Rupees 340.5."[63]

The Nokur Coolie Establishment, dealing exclusively with the maintenance of roads in Bengal, was established in 1859 under the guidance of Captain. C.B. Young, Officiating Chief Engineer, Lower Provinces. The permission for such an establishment was granted by the Government of Bengal when Young showed that the outlay required for its maintenance would be easily provided by the annual repair estimates for all the years to come.[64] Young also provided a general guideline for the way the Nokur Coolie Establishment was to be employed, supervised and paid.[65] The extent to which this establishment was successful is unknown, but obviously a number of changes must have been instituted over time. This account of the operation of the Military Board and PWD indicates the emergence of this organization as the major executer of development schemes which were introduced in colonial Calcutta. Until the establishment of the

[59] Ibid. 14th September 1855. No. 29 and 5th October 1855. No. 52-55.
[60] Ibid. 26th October 1855. No. 24: "Report on the origin of Convict Labor in Bengal and the general rules under which it was administered."
[61] Ibid. 28th December 1856. No.30. Responding to a query regarding the regularity of paying the coolies: "recommends the plan of monthly wages absolutely necessary to keep the men together."
[62] PWD, Public Branch, 28th September 1855. No.22.
[63] PWD, Revenue Branch, Consultation dated 9th November 1855, no. 173.
[64] PWD, General Branch, 21st October 1859. No. 46.
[65] Ibid. Employment was restricted to metalled roads only. Repairs had to be finished before the onset of the monsoons. The Sirdars or Road Inspectors were to be paid "a good salary of 8 rupees a month for the whole year."

Calcutta Improvement Trust, there weren't too many changes in the way the PWD operated. But the operation of the PWD as such implied the legal institution of a body that oversees construction, separating it completely from private initiatives of public building, thereby making it easier to mark out cases of encroachments and illegal construction within the city space.

III. Visualizing Façades, Landmarks and Obstacles

The view that a walk through colonial Calcutta generates is determined by the presence of public and private buildings lining the streets. What is only subconsciously registered is that the streets appear to *enclose* the buildings, as the scholarship on the history of the city perpetuates constantly through its emphasis on the space of the buildings, but not the streets. But can the *enclosing body* be visualized as an *enclosed body*? Such an envisioning of the architectural configuration of the city would involve the revaluation of the idea of containment. The aim of this section is to reverse the definitions of the *enclosing* and *enclosed*; the buildings are seen as giving form to the streets, and not the other way round. Since such an idea has not been examined in the Indian context, I intend borrowing the theoretical framework James Holston uses for the 'corridor streets' of 'pre-industrial cities' of Brazil.

Holston defines the 'corridor street' as the basic factor constituting the architectural context of the outdoor public life of cities. It provides a contrast between "the street system of public spaces and the residential system of private buildings."[66] This process is a continuous one – as the city space expands, the areas within are gradually filled in while maintaining the spatial sense of enclosure that the street defines. If we look at the architectural configuration of the street, we'll find that the space of the street is open to the sky, the façades of the buildings provide the walls for the street, and the floor of the street gives it grounding. "The interplay of the expansion of this floor and the height and character of the surrounding buildings gives the impression that the sky has a defined

[66] James Holston, op.cit. p. 104.

height."[67] This continuous characteristic pattern is visible throughout the city, and the architectural frame is similar in each case. All buildings are aligned to each other and mark out the pavements and sidewalks. This solid front of buildings separates the domains of interiors of the buildings from the public outside.

"Thus, the street façade's function is complex: it defines by containment and separation interior and exterior, private and public, house and street (and all that is associated with these contrasting domains of social life) and yet provides for numerous kinds of passages between them."[68] The street façades therefore form a 'liminal zone', a boundary where negotiations take place and where landmarks command public attention. The street façade is "on the one hand the exterior wall of the private domain and on the other the interior wall of the public."[69] Negating the private domain from this picture, we are left with just the public domain in the form of the street, which can now be seen as a rectangular room with its own furnishings. In urban plans and maps, the street might be considered as a continuous void through which traffic passes, but in the above context it is transformed into a 'figural void'.[70] It has a shape and an implied volume, and it contains solids of a very public nature.

This theoretical framework is applicable to some specific examples of the public streets of colonial Calcutta. A walk through this city keeping this framework in mind definitely brings out the similarities. For this purpose I have taken up the examples of a few streets, some of which adhere to Holston's definition of a 'corridor street'. The following two photos (Figs. 2.3 and 2. 4) show different sections of the Chitpore Road.

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[67] Ibid. p. 109.
[68] Ibid. p. 118.
[69] Ibid. p. 118.
[70] Ibid. p.120. "We perceive the city street as both a void and a volume of space contained by surrounding solids. As a void, it reveals these solids; as a volume it takes the shape of its container. The street thus constitutes a special kind of empty space; it is a void that that has a defined shape, usually a rectangular volume. From the context of its containing solids, the street emerges as a distinct and recognizable figure, one which is empty but has form. We may therefore consider the corridor street as a figural void."

Fig. 2.3. Chitpore Road (E.P. Richards, 1914)

This photograph (Fig. 2.3) shows the central section of the road, between Harrison Road and Bow Bazar Street in 1914. This photograph is facing Bow Bazar Street. The second photograph (Fig. 2.4.) shows the northern section, between Harrison Road and Manicktolla in 1945. The photograph is facing the Harrison Road, and shows the facades of some of the educational institutions and public buildings located on this road. These are two continuous sections of the road, and though captured in film at different times, the façades have not undergone a sea change. S.N. Mukherjee mentions 17 different categories of house owners on this road, including Europeans, Government, Muslims, Muslim Prostitute, Non-Bengali, Hindu Prostitute, Brahmins, *Gandhavanik*, *Subarnavanik* or Goldsmith, *Kalu*, *Kayastha*, *Moira*, *Pod*, *Sunri* and *Telli*. A number of self-descriptive localities also emerged along this road: Kasitola, Jorasanko and Kumortulli for example. By the mid-nineteenth century, there were 367 residential and 263 non-residential premises on this road.[71]

[71] S. N. Mukherjee, op. cit. p. 15.

was enacted",[73] some of which she describes: the passing of "haggard penitents", the victims of cholera who were "thrown in terror by those who should have performed the last rites", migrants from famine struck areas who "sought the town in hope of succour, only to fall exhausted (...), the dead and dying lay where they fell, a common prey to ravening bird and beast", and the execution of criminals near the scene of their crime or at the cross-roads between Chitpore Road and Bentinck Street at Bow Bazar.[74]

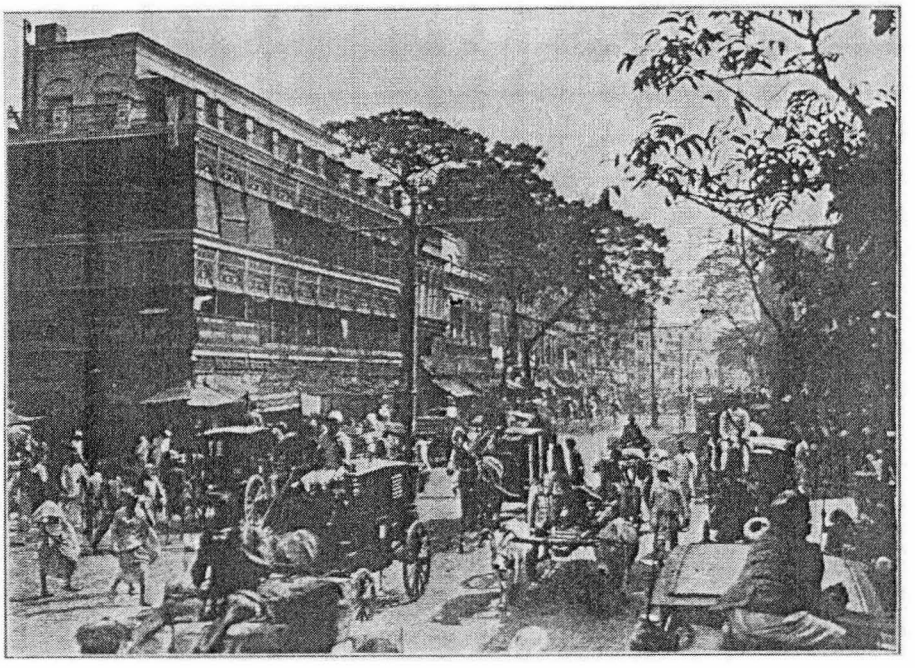

Fig. 2.5. Harrison Road (E.P. Richards, 1914)

The next set of photographs show two sections of Harrison Road. The first photograph (Fig. 2.5) shows the stretch leading to the first Hooghly Bridge. The second photograph (Fig. 2.6.) shows the intersection of the Harrison Road near Burrabazar, and faces the entry to Burrabazar. The proposals for the construction of Harrison Road first came forward in 1884,[75] when the Commissioners of the Town of Calcutta appointed a new Town Improvement Committee. The details of the construction will be discussed at length in the next chapter.

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[73] Ibid. p. 172.
[74] Ibid.
[75] Atis Dasgupta (ed.), *Select Documents on Calcutta: 1800-1900)*, Directorate of State Archives, Govt. of West Bengal, 2011. p. 122.

on Chitpore Road, which exist despite the fact that these are some of the major roadways within the city. While the notion of a continuous passage of roadways with an architectural configuration of its own is indeed charming, *the main function of a circulatory system cannot be negated. Movement is the main aim and circulation is its intended function.* Holston's work basically emphasizes the conflicting ways of imagining of urban centers in the colonial and post-colonial period. But since the experience of colonialism varied in different parts of the world, under colonial regimes quite unlike each other as well as in dissimilar policies within parts of one colonial regime. In the Indian colonial context, as Swati Chattopadhyay has shown, the perception of 'medieval' as redundant and 'modern' as necessary was completely different. The British administrators and planners of colonial Calcutta constantly disagreed with the Indian population of the city over almost every issue, including sanitation and land acquisition and their claims over the built spaces.

In most cases the colonial authorities held an upper hand, and the notion of 'benevolent authoritarianism' was perpetuated by the popularization of 'public works' conducted by colonial authorities as the only means of municipal construction within the limits of the city. Ravi Ahuja explains that this particular term was used to conceal the conflicting social interests involved in 'the production of built environments for purposes of transport by asserting their 'naturalness', general utility and contribution to an assured 'common good'.'[76] At the same time, it was not only the basis for political legitimacy in India and other nations but also successfully covered up the need to specify the nature of the 'public' or the 'common'. This vague idea of 'public' or 'common' property changed with the changing subject-hood of people situated within the city limits and the necessity of conducting 'public works' needed for their well being (as perpetuated by the 'benevolent authoritarianism' of the governing bodies).[77] Though the details of every debate over public landmarks identified as public property within the city are not known, there are two which can be studied at some length.

[76] Ravi Ahuja, op.cit. p. 83.
[77] See page 10.

The important question here is to identify what is a 'landmark' and what is an 'obstacle' to circulation. A 'landmark' is a physical entity which has some popular history of its own, which endows the neighbourhood with certain socio-political or cultural characteristics and its location is seen as the identifying mark for the whole area. While in the medieval European towns, the squares and fountains were generally seen as 'landmarks', in colonial Calcutta the same term was used for tanks, parks, shrines, etc. Most of these were indigenous in production and usage, and hence predated the colonial authorities' approach towards urban spaces. The 'native' usage of tanks had been remarked upon constantly as inadequate and unhygienic,[78] to the extent that public bathing, washing, etc. was prohibited. I am not going into this particular aspect because it does not concern the circulatory system I'm concerned with in this paper, but the circulation of safe drinking water throughout the city.

There had been a general paucity of open greens in the city of Calcutta, except for the Maidan. Shrines and smaller temples & mosques were once again seen as 'landmarks'. This brings us to the question of 'obstacle' to circulation. Shrine land, or even houses or shops encroaching on the public street is a constant issue with Municipal authorities, whether it be the Shovabazar temple situated in the middle of the Upper Chitpore Road, or the location of 'landmarks' like Gita Mandir, Lal Darwaza, Teen Darwaza, etc in Ahmedabad. In these cases, 'landmarks' are easily transformed into 'obstacles' due to the very same locative importance that popularized their usage by the inhabitants of the city. Locative importance is seen as a hindrance here, especially when linked with a number of other socio-political and commercial activities which are considered to be illegal. The moment a 'landmark' compromises or endangers the notion of safe passage through a thoroughfare; it can be perceived of as an 'obstacle'.

The controversy over the famous Boitakhana or Baitacannah Tree illustrates this well. The locality of Boitakhana is described by Kathleen Blechynden to be "at the Circular Road end of Bow Bazar"[79] while the Controllers working for the Public Works

[78] Baron Dowleans, op. cit. p. 65-72.
[79] Kathleen Blechynden, op. cit. p. 175.

Department located the tree at the juncture of the main road leading to Shaum Bazar. We have here three different descriptions of the area which feed into one single narrative of the importance of the tree and the reasons behind its felling in 1799. The veneration of the Tree was associated with Siraj-ud-Daulah's siege of Calcutta in 1756. It was popularly believed that at some point during the siege, the *nawab* had conducted a small *baitakh* or royal meeting under the Tree. Blechynden mentions that the Tree "stood on the edge of the Mahratta Ditch just opposite the Avenue, as Bow Bazar was called, and must have commanded a clear view of the old Fort, to the main gate of which this wide road led."[80]

The area around the landmark of Boitakhana Tree gained notoriety by the end of the eighteenth century. A. K. Ray mentions the locality particularly for this reason: "The native inhabitants on the roads leading to the Boitakhana Tree were, we are told, in such general alarm of dacoits that from eight or nine o'clock at night they fired off matchlock guns till daybreak, at intervals, to the great annoyance of the neighbouring Europeans. Murders were common and one of the roads of the quarter – Fordyce's Lane – is still known by its old name of '*Galakata gully*'."[81] When the Mahratta Ditch was filled up in 1799 with the aim of widening the Circular Road, the locality came under the scanner for a number of encroachments by the 'native' landholders of the area as well as the shops which were described as "receptacles for vagabonds of every description, who here purchase Bang, Ganja, and other intoxicating drugs."[82] The Tree was therefore chopped off, and, according to Blechynden, the act caused quite consternation among the 'natives'.

"The circumstance was reported to the Governor-General, Lord Mornington, who desired that the tree should be spared, but found that it had already been cut down."[83] While the Boitakhana Tree was indeed situated right in the course of the new road, its felling can be seen as a part of a larger drive towards curbing encroachments in the area. The general

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[80] Ibid. p. 175.
[81] A.K. Ray, op. cit. p. 152.
[82] *Legislative Department, Original Law Consultation*, dated 20th March, 1800. Nos. 1 – 6.
[83] Kathleen Blechynden, op. cit. p. 176.

nuisance caused around the 'landmark' was added to the fact of encroachments by four 'natives': Gour Mullick, Rampersaud Dhur, Bulram Chund and Netty Chand Dass Tanty.[84] In the assessments of the lands occupied by these individuals, the Boitakhana Tree plays a major role as a landmark. For example: "The main Road to the South of the Boitacannah Tree is 143 feet in width but to the North of it, the total width is only 84 and if these 33 are occupied by the buildings [constructed by the above mentioned 'natives'] leaving only 51 feet of Road and these 51 feet are reduced to only 40 from the occupiers of these Godawn spreading their firewood upon it (...)."[85] The Tree is used fully as a landmark in this case, though the result of this assessment is to get rid of the 'landmark' itself.

The example of the Baitakhana Tree exhibits how the 'landmark', a physical spatial entity, is perceived as an 'obstacle' due to social usage. Another case in point is the tramways of Calcutta. To give a brief history of the tramways, we begin in 1872 when the first attempt was made to run a 2.4-mile (3.9 km) tramway service between Sealdah and Armenian Ghat Street.[86] The service began on 24 February 1873, but due to the extension of the Eastern Bengal Railway line up to the Chitpore river front, the all goods traffic was diverted to the railways and as S. W Goode has explained, "an isolated tramway, barely two miles in length, could obviously not be expected to pay with passenger traffic alone."[87] The tramway ran at a loss of Rs. 500 per month and was discontinued on 20 November, 1873. The project of tramways was not completely abandoned and schemes for a system of tramways running throughout the city were proposed in 1878.[88]

The Calcutta Tramway Co. Ltd was formed and registered in London on 22 December, 1880 and "granted the right to construct and maintain tramways with single and (except in certain streets) double lines, (...) on eight routes, and between such other places as

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[84] *Legislative Department, Original Law Consultation,* dated 20th March, 1800. No.1.
[85] Ibid. No. 6.
[86] WBSA, Judicial (Judicial) Branch, Consultation No. 136 dated August 1872.
[87] S. W. Goode, *Municipal Calcutta: Its Institutions in Their Origin and Growth* (MacMillan, Kolkata Municipal Corp. 2005; First Published 1916). p. 325.
[88] Ibid. p. 326.

might subsequently approved by the Corporation and Government."[89] Tram tracks were laid from Sealdah to Armenian Ghat via Bowbazar Street, Dalhousie Square and Strand Road. The route was inaugurated by the Viceroy, Lord Ripon, on 1 November 1880. The tram cars were horse drawn to begin with, but due to the high mortality rate, steam locomotives were allowed a test run since May 1882 on the Chowringhee line.[90] Despite the fact that there were six accidents during this run, the method of steam haulage was adopted by the Company with an attempt at regulating the running of steam locomotives without any inconvenience to the residents.

This attempt was stopped since the Calcutta Municipal Corporation was not in charge of the tramways and could not effectively curb any hindrances that might occur to the residents or passengers. By the end of the nineteenth century the company owned 166 tram cars, 1000 horses, seven steam locomotives and 19 miles of tram tracks. It was only in 1896 that Messrs. Kilburn and Co. proposed electric propulsion as an option. This system was finally introduced by December 1902.[91] Till this period, the major complaint against the tramways was the faulty maintenance: by 1881, the tram rails stood up 2 inches above the roadway and despite constant warnings, the tramway company made no changes, leading to the subsequent ultimatums in 1885, 1889 and 1890.[92] Improvements were finally made in 1890. Though the Calcutta Tramways ran through the middle of the roads and could be seen as 'obstacles', the fact that they facilitate movement and not hinder it rendered them as viable means of transport and landmarks to the history of Calcutta.[93]

With this brief look at the Calcutta Tramways, this section as a whole traverses the length of urban visualization through façades, landmarks and obstacles. However, this account of representation and visualization would be incomplete without taking stock of the

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[89] Ibid.
[90] Ibid. p. 328.
[91] Ibid. p. 329.
[92] Ibid. p. 327.
[93] The notion of the Trams as obstacles and a nuisance is quite recent. Public opinion against trams goes back to the 1930s when the automobile boom occurred. Most tram lines across India (for example those in Kanpur, Chennai and Delhi) were closed down by the 1960s. The ones in Calcutta serve more as relics rather than viable means of transport today.

factors involved in the process of actual construction. The process of defining the boundaries of the city was as conflicting a process as its mapping, and this was because of the changing Municipal bodies of the city and the ambitions of each successive body. The case of the Baitakhana Tree shows that planning the new limits of the city to be a Circular Road, stretching from the north-west section to the south-west & circling the entire eastern limit, on paper was a matter completely different from the complications of actually executing the plans. While the former was conducted by an Act of legislation,[94] the latter fell within the working of the Public Works Department.

Conclusion

The discussion of the themes involved in the process of planning, construction and representation boils down to an appraisal of the notion of containment, which is in turn linked to circulation within a city and the obstacles to this circulation. Though the above sections explore the way in which the colonial authorities in the city defined and exercised control over their selected subjects, it is an account of circulation via the roadways and the perceived hindrances. The politics of mapping creates municipal boundaries for the city thereby demarcating the extent to which circulation through the roadways was possible. While investments were made for the construction of long-distance roads connecting the various towns of Bengal to Calcutta, greater emphasis was laid on the development of 'communications' within the city. We have observed how the nature of land acquisition for the 'public advantage' of good roads and drains was conducted, along with the details of how the PWD constructed these roads over both long distances and short.

Similarly, giving the street the architectural form of an ornate living room through Holston's framework of the 'corridor street' does render it as an entity separated from the buildings it seems to enclose but this also has its optic limitations. It is generally to natural and man-made façades of considerable importance that we attribute the characteristics of a 'landmark'. These 'landmarks' in turn can be interpreted as threats to safe circulation, which makes their destruction a matter of political, legal and social

[94] See page 8.

imperative for the colonial authorities. This is amply displayed by the example of the Baitakhana Tree and the Calcutta Tramways. Spanning from 1800 to 1900, the landscape of Calcutta transformed: its municipal limits gave it a slightly Paramecium-like shape, while the system of roadways provided for complete circulation within and beyond the city.

Chapter 3

Raising the Rails in Colonial Calcutta

"(...) we should regard it as highly glorious to the British Crown and honorable to the British people, to enstamp on India and Asia this most characteristic symbol of the civilization of the nineteenth century, which at the same time is peculiarly British."

R.M. Stephenson, 'Our Indian Railway', *Calcutta Review, March 1847.*[1]

"There is no place in this world where [the English] do not have a colony. There isn't any colony under English control in *swarga*, but I believe very soon even *swarga* will be under the English hand."

Varuna to Indra, Durgacharan Ray, *Debganer Martye Agaman*[2]

In the last decade of the nineteenth century, the face/body of Calcutta looked radically different from the moment of its inception in the 1690s. There were radial and gridiron roadways through and around the city, as well as flows of canals and natural waterways; but the most prominent feature of the cityscape was the railways. (See Fig. 3.1 and 3.2. for the changes brought about by the railways to the environs of Calcutta) The iron rails, the steel locomotives and coaches, the railway fences, the sounds of *chug chug*, the whistle blowing regularly, the smell and touch of coal dust and smoke – all these formed a cohesive assault to the senses of all women and men who inhabited the city. Not only were the railways a novel sight in the nineteenth century, but views on what the railways signified were also expressed in many forms, varying from appreciation of the might of the British in literary works to the destruction of railway works during violent rebellions. Calcutta, however, did not see the latter within its boundaries.

[1] S. Settar (ed.), Railway Construction in India: Select Documents, Volume I (1832-1852), ICHR 1999. p. 280.
[2] Durgacharan Ray, op.cit. p. 9.

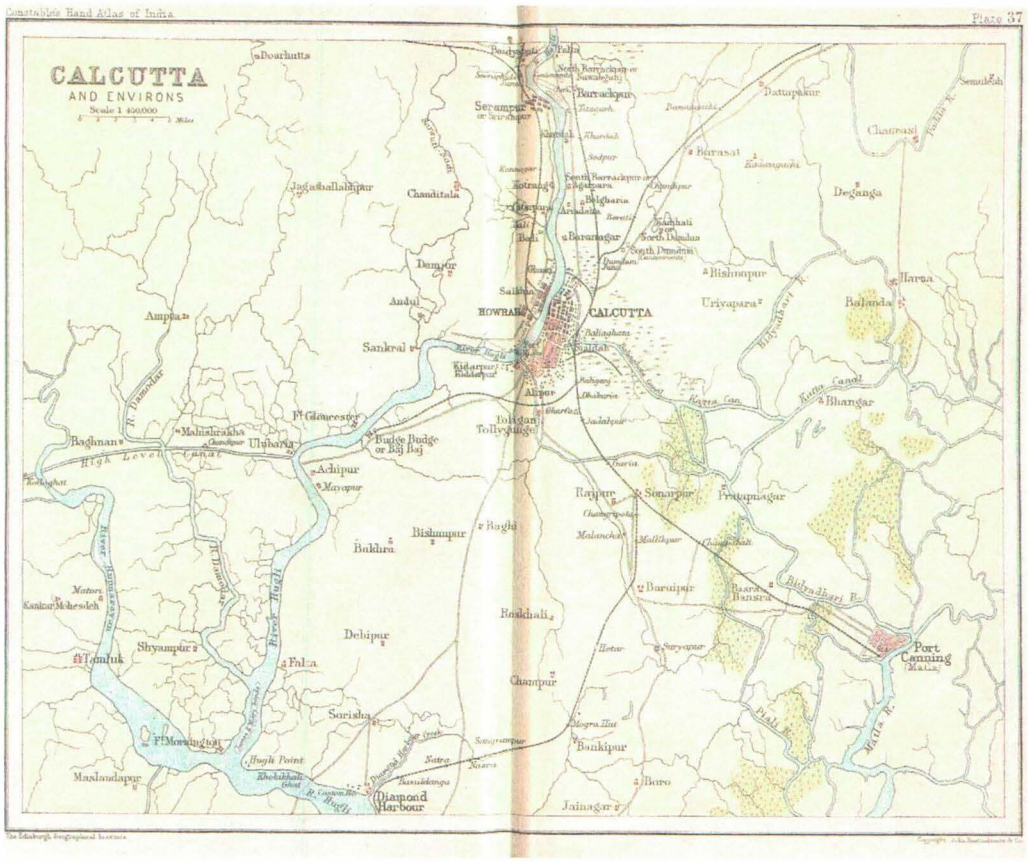

Fig. 3.1. Calcutta and its Environs in 1893

While the railway lines did not have a circular route in Calcutta, they did provide the city with circulation by connecting long distances with the city. In this sense, they soon made travel through the waterways redundant. They thereby formed a vital part of the circulatory system in Calcutta. This chapter is an attempt at understanding the factors which influenced railway construction. The first section focuses on the policies adopted to execute the construction of the railways in Calcutta, and involves the politics over the same both in Britain and India. The second section is a brief account of the construction of the major railway lines that were completed by 1900, and an attempt at understanding the labor, mostly skilled, that executed the many facets of the construction of the railways in India. The third section deals with the perception of railways in India (especially Calcutta), before and after their construction. One Bengali travelogue, *Debganer Martye Agaman* by Durgacharan Ray, which deals with this theme is also discussed at some length.

It would be useful here to start with a brief description of the main railway lines connected to Calcutta by 1900. There were three major lines that connected to Calcutta by the 1900s. The East Indian Railway (henceforth EIR) line was constructed and run by the company by the same name. This company's first train steamed out of Howrah station on 28th June, 1854. The first line ran from Howrah to Raniganj, though the first few trains only ran up to Pandua. Regular services ran twice a day from 15th August 1854. The main stations between Howrah and Hooghly were Bali, Serampore and Chandenagore. The line was extended north and westward, and linked to Varanasi by 1862. The Booking Office was initially on the Calcutta bank of the Hooghly, and the fare ranged from three rupees by first class to seven *annas* by third class. This fare covered the ferry charges to the station. The government acquired the assets of the EIR in 1879, though the management remained with the company. The Howrah station, on the opposite bank of the river Hooghly, was at first a tin shed and "a single line flanked by narrow platforms, somewhat to the south of the present station building."[3] The building used today was constructed between 1901 and 1906 on the site of a former Catholic orphanage.

[3] Sukanta Chaudhuri (ed.), op.cit. *Volume I*, p. 238.

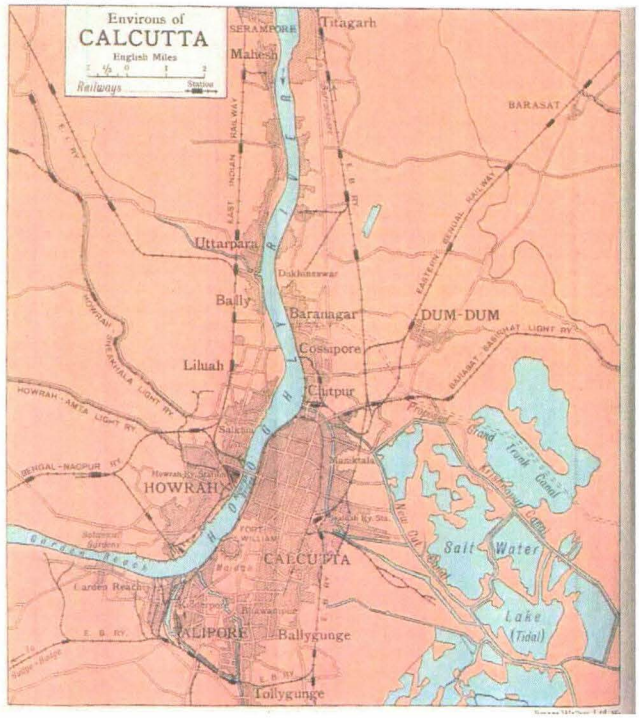

Fig. 3.2. Calcutta and its Environs in 1924

The Eastern Bengal Railway (henceforth EBR) Company, which constructed and operated the second line beginning at Sealdah within Calcutta, was formed in 1857 to lay a track along the east bank of the Ganges to Kushthia and then across the river to Dhaka. The line was opened in 1862. It was taken over by the government in 1887. The Sealdah Station was initially a tin-roofed station in Calcutta, later developed as a proper station in 1869 and expanded further in the 1970s with the phenomenal rise in the suburban traffic. The Calcutta and South-Eastern Railway line (henceforth CSER), the third line, opened in 1862. This railway had only one line from Beliaghata Station and Port Canning. The line was taken over by the government in 1863, and all railway services east of the river Hooghly were united under the Eastern Bengal State Railway and, after further amalgamation in 1942, the Bengal Assam Railway.

These railway lines did not have radial routes through Calcutta. Both the EBR and the CSER connected Calcutta with her suburbs on the eastern bank of the river Hooghly, all the way up to distant areas like Assam. The EIR connected Calcutta (through Howrah) to the city's suburbs on the western bank of the river Hooghly. Quite like the waterways, the

railways did not connect every part of the city. In fact, running parallel to the waterways, the railways, due to their speed and travel fares, soon replaced the waterways as the chief means of travel and co-opted the roadways as an ancillary means of connectivity. This chapter is an attempt at tracing the rise of the railways in Calcutta, and the links it fashioned with the waterways & the roadways, thereby creating three concurrent systems of circulation in Calcutta by the end of the nineteenth century.

I. Envisaging the Railways

"India is, and always has been entirely dependent on the Government for Public Works – and the Committee are satisfied that there does not exist the means thereof raising the funds for an undertaking of the nature."

George Larpent, Chairman of the East Indian Railway Company[4]

The railways were radically different from previous modes of transportation due to the very different nature of its construction. The waterways were naturally in existence and had to be expanded, extended and maintained by private investors and later the Government of Bengal. The canals that were constructed within Calcutta's limits were primarily private ventures, but were very soon invested in and maintained by the government too. The roads within the city had always been planned, constructed and maintained by the city's municipal bodies, while major trunk lines were a government concern throughout. The railways however, were initially invested in, constructed and maintained by private companies established in England (with the greatest number of shareholders in that country) with Government guaranteed interest. While the Government did take over some lines around 1869 by classifying them as political/military concerns, the task of investment and construction was still carried out by the companies and their shareholders.

[4] S.Settar, Vol. I, p. 108.

This was the reason why the introduction of railways in India and railway policy was considered to be a public concern in Britain, and its construction was rife with constant debates over a number of issues. The financial and technical difficulties were of primary importance. The initial reports dealing with the viability of railway construction in India had to deal with questions of comparison with the existing modes of transportation, the comparative expenses of constructing and maintaining railway lines, expected traffic, etc. As Joseph Locke mentioned in 1843, "It is not fair to judge of the present traffic on any single mode of transport as a scale by which to measure that which would be, were better communication provided, as in the case of a railway, were in existence, the concentrated traffic of the present modes by land and water would be transfered to it."[5]

Calcutta, before the coming of the railways, depended entirely on communications through land and water, as we have already seen. While movement within the city was not affected radically by the railways, all communications from the city to the rest of the continent were surely revolutionized. The location of Calcutta and its connectivity to the rest of the continent was a vital consideration for the policy makers, and hence the railway companies too had no qualms about approaching the Government of Bengal for investment. If the investment capital for railways could have been raised easily from the shareholders, these initial plans would not have needed to rely on Government guarantee.

All that was originally expected from the Government, as R.M. Stephenson pointed out in 1844, in case a company to construct lines from Calcutta was to be formed, was undisputed free land to construct the railways on and the appointment of some Directors of the railway company on government recommendation.[6] Further demands made on the East India Company and its government permitted Civil and Military officers engaged in Government service in India to become Directors or Committee members, since their professional expertise and experience of residence in India was invaluable for the construction and promotion of the railways. The first request for Government guaranteed

[5] Ibid. p. 19.
[6] Ibid. p. 23.

interest for shareholders was also put forth.[7] It was believed that the railway company operating in Bengal would be able to repay the loan incurred by this guaranteed interest within twelve months of the opening of the Calcutta – Rajmahal line.

Similar requests were made well into the year 1845 by the owners of the East Indian Railway Company.[8] To pacify the government more and to emphasize on the substantial character of their venture, the EIR Company increased the portion of shares to be allotted in India "in order to secure the concurrence and co-operation of all persons by whom the undertaking can be advanced and promoted."[9] Around the same time, a number of competitors for the EIR Company emerged[10] – the Great Western Bengal Railway Company, the Great North of India Railway Company and the Northern and Western Railway Company of Bengal – all of which proposed to construct the same line from Calcutta to Rajmahal. The EIR Company, however, emerged as the company that would undertake the construction of the railway line from Calcutta. Deliberations over the guarantee issue continued, as the Court of Directors of the East India Company responded that although they were happy to provide the assistance and cooperation needed to construct and manage the line, the yields from this investment in the railway companies were uncertain and they would charge an interest and expect full repayment of their investment from the 'Railway Receipts'.[11]

A suitable agreement was reached at the end of these discussions and the Government agreed to a system where a guaranteed rate of interest ranging from 4½ to 5 per cent would be supplied by the government, and the companies would utilize half of their surplus profits earned to repay the government any sums by which they might have had previously to make good the guaranteed rate of interest. In return, the government

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[7] Ibid. p. 103. Dated 30 December 1844.
[8] "The State of India is, in all respects so different from that of any other part of the British dominions that the Committee submit that the course to be adopted in the construction of the first Indian Railway can have no bearing on the practice to be adopted in similar work in this country. (...) Indeed considering that the Government itself would probably make very considerable use of the Railway for the conveyance of mails, of Government stores, and troops, the guarantee might fairly be considered as a payment for their services." Ibid. pp. 108-9. Dated 19 March 1845.
[9] Ibid. p. 126. Dated 10 June, 1845.
[10] Ibid. p. 127. Dated 21 June 1845.
[11] Ibid. p. 207. Dated 3 February 1847.

In spite of all these internal issues, the lines were opened (See Fig. 3.3.), although at a great expense and resulting in the continued indebtedness of the Railway Companies to the Government since the returns were never enough to meet the guaranteed interest and cancel outstanding loans. The Court of Directors of the East India Company took the liberty of suggesting regulations for railway management: for example, it was decided that "all railways constructed in India shall belong to one of two classes – the first or the second class."[14]

In the hope that railway construction, as well as all other public works, would be made more organized, Lord Dalhousie proposed the establishment of a separate Public Works Department, staffed with qualified officers equivalent in status to Secretary and Assistant Secretary, for the effective conduct of public works, especially railway construction.[15] Dalhousie believed this would also change the public perception, both in Britain and India, regarding the losses that the Government of India was purportedly incurring every year due to the failure of public work schemes.[16] Apart from organizing railway works more thoroughly, the PWD placed great emphasis on all 'public works', including those related to the roadways and waterways.

Despite the rebellion of 1857-8, railway construction continued apace, probably because Calcutta was not directly targeted by the rebels, and railway construction was anyway regulated from the city that was the main seat of the Government and the place where the main office of the EIR company was located. All the correspondence and stipulations for the EIR Company passed through Calcutta. The railway fares and rates were regulated by the Government and changes could only be effected by the Railway Companies with its assent. By 1867, it was well known that the Railway Companies were "bound, under the contracts, to convey the mail and Post Office servants free of charge, to take military officers in first class carriages at second class fares, and soldiers when on duty in second

[14] Ibid. p. 49.
[15] Ibid. p. 88. Dated 12 July 1854.
[16] Ibid. p. 90. "The Public has seen nothing of the details of Indian finance, but it has had the results set each year before it. It has had us knowledge of the items, but it has been fully informed of the ultimate adverse balance whereupon it has been periodically to represent the Government of the East India Company, as bankrupt by mismanagement and to revile it for its supposed inability to spend money upon public works by reason of its adverse balance erroneously (...)"

commercial loss (covered by Government investments), the Government should take over these lines and construct them for their own purpose.[20] This proposal was accepted and the major railway lines connecting Calcutta, Bombay, Madras and Lahore were taken over.[21] From 1869 onwards, therefore, the Government started managing these trunk lines, thereby also making the Railway Branch of the PWD a powerful organization. Of the total railway mileage of 8.998 at the end of 1879, 2,175 miles (nearly a fourth) had been directly constructed by the Government and the rest by the companies.[22]

At this stage, the Governor General renewed the lease of the Railway Companies' guarantee system for another 25 years, instead of purchasing them. This was in return for a concession of the part of the companies, which stipulated that the surplus profit over and above 5 per cent would be equally divided between the company and the State. This proposition was highly unlikely where the railway companies barely made 3 percent profit. Similarly, the policy of construction of railway lines by the government had to be modified in 1879,[23] owing to the lack of funds and severe famines as well as the Afghan War which followed. The specifics of the role that the railways played during and after the famine will be discussed in the last section of this chapter.

With the aid of the Famine Commission of 1880, it was decided that while the new productive and profitable lines should be left entirely to the Railway Companies, the Government should undertake the construction of railways, which, through their unprofitable character in a commercial sense, or other causes, could not be built by private agencies. The lines constructed by the Railway Companies were declared to be the property of the Government of India, who could renew contracts every 10 or 25 years. Interest rate was fixed at 3½ per cent and the Government retained a much larger share, usually 3/5 of the surplus profits. From 1907 onwards, after all the major lines had been purchased by the Government and leased for the purpose of management to

[20] Ibid. p. 285.
[21] Ibid. p. 288. Dated 24 January 1868.
[22] G.S Khosla, *Railway Management in India* (Thacker and Co., Bombay 1972). p. 13.
[23] Ibid. pp. 13-14.

surmountable and believed that a "judiciously selected and well-constructed line" [25] with proper fencing of the embankments and proper maintenance works could successfully face everything from periodical rains and inundations, insects as well as unprotected tracts of land. They proposed three possible lines that could connect Calcutta to the North-West Frontier Province, two of which were to begin on the Calcutta side of the Hooghly bank.

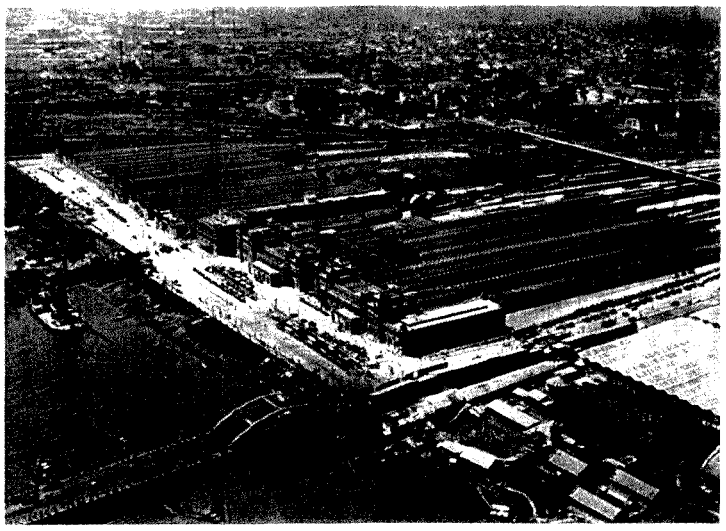

Fig. 3.4. Howrah station in 1940 (Photographer Unknown)

The engineers decided that it was easier to terminate the railway line at Howrah (See Fig. 3.4.), and the construction of a railway bridge connecting to Calcutta would be rather expensive.[26] As we already know, the first bridge across the river Hooghly was constructed in 1874 and lacked railway lines due to its design. Once these plans were accepted, and their execution was supposed to begin, debates related to the issue of guaranteed interest and the diversion of funds to relief work for the Great Famine of 1847 in Ireland delayed the works. [27]

[25] Ibid. pp. 142-3.
[26] Ibid. p. 146.
[27] Ibid. p. 245.

constructed.[31] Hence, the construction of the lines was given over to private contractors, although the results were not always satisfactory. A letter from G.H. Lushington, Railway Commissioner, to J.P. Grant, Secretary, Government of Bengal, dated 23 January 1851 states that while on reaching the site of construction in Catarparah, Lushington "found that the contractors had already commenced throwing of earth works and cutting down trees, without receiving any authority for entry upon the land and in direct opposition to repeated requests made to Mr. Turnbull, the Chief Engineer that he would refrain from making a commencement until my proceeding should be brought to a close and the lands be formally made over to him."[32]

On further investigation Lushington discovered that permission for this activity had come down from Turnbull through Mr. Stutor, the Resident Engineer at Howrah, to the contractors. Lushington concluded, "But if the same system of taking possession of lands without authority in direct opposition to my wishes and to the provision of the law is permitted to go on, injustice must be done to the owners of property, additional expense much incurred by Government, and the enquiries necessary for the decision of the claims must be spent out to an inaccessible length, and prove in the end insufficient and unsatisfactory."[33] This document shows the lack of coordination between the officials of the Government of Bengal and the EIR Company, and the ground level irregularities that were an everyday occurrence during the actual construction of public works. So it is probable that these irregularities continued despite warnings from the government, thereby widening the gap between private construction and government policy.

At the same time, this sort of concern seems to be unique if we consider the way land acquisition was carried out in the case of both the waterways and roadways in Calcutta. Government documents rarely showed such concern over ground irregularities. Construction of the line continued undisturbed after this, and was successfully opened in 1854, and further extensions began. There was some delay in the completion of these works because of the events of 1856-57. In a Memorandum addressed to the Government

[31] Ibid. p. 450.
[32] *National Archives of India, Home Dept., Public Branch*, Pros. No. 39, dated 31 January 1851.
[33] Ibid.

consequences must be felt for some time to come, although the actual damage done to the works appears to be less than might have been anticipated."[37] These delays were not located anywhere near Calcutta, and the Howrah-Pandua line opened in 1854 operated completely unaffected by these disturbances.

The delays due to natural difficulties were not really experienced extensively and were easily overcome through the opening of bridges, viaducts, tunnels, etc. Following this, the first Administrative Report on Railway submitted by the Secretary, Railway and Telegraph Department, Government of India to the Secretary of State for India, dated 12 March 1860,[38] was published and contained detailed reports of works accomplished.

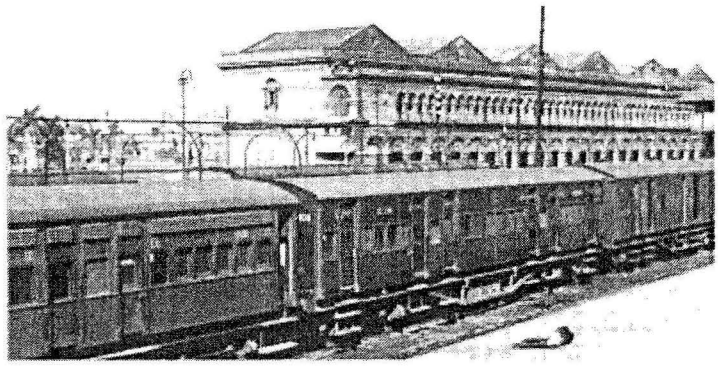

Fig. 3.6. Sealdah Station in 1944 (Photographer Unknown)

The following accounts were provided for: "A return of the number of persons employed on the completed section in Bengal only, on the 1st October last, shows there were 3,051 in all, whom 261 were Europeans and 2,790 natives (...) The capital required for the whole undertaking, including the Jubbulpore line is estimated at £19.000.000, but, until more accurate estimate are received from India, authority has only been given for raising £14,000,000. Of the sum already subscribed, £13, 372, 644, was raised in England, and 239, 213, in India. On the 31st December last there were 5,857 shareholders, of whom 2,672 were holders of stock or share of the value of 1,000 and upwards. The expenditures of England for materials, & c. has been 4, 293, 205 and in India, for

[37] Ibid. p. 103.
[38] Ibid. p.106.

were there three operating railway lines connecting the country from all directions to Calcutta, but the ancillary infrastructures - the Hooghly bridge, jetties for loading & unloading goods/freight of all kinds, feeder roads within the city – were all in place to assist in the formation of an active circulatory system of communication.

If the planning and construction of the railways in India is quite dissimilar from that of the waterways and roadways, so is the labor involved in constructing these systems. In the case of the railways, skilled labor was a necessity. The engineers who submitted the aforementioned report on the practicability of introducing railways in India suggested that Indian young men should be sent to England to train as engine drivers and can later work in India under the supervision of English engineers.[43] For this purpose, a number of Indian men did start their training, aided by an establishment started by R.M. Stephenson.

But Stephenson reported in 1847 that, discouraged by the delays in the commencement of the railway works, a number of these trainees left midway.[44] The predominant opinion in this regard was, however, in favour of importing engineers and skilled labor from Britain and reserving secondary jobs for Indian skilled laborers. Commenting on this sort of an opinion presented by the engineers in their report (1846) mentioned above, Stephenson commented in his article in the *Calcutta Review* (March 1847) that once proper teaching of "Architectural and Mechanical Drawing and the principles of Surveying and Mensuration" [45] was imparted to people in India, a considerable number of skilled laborers could be provided from within the country. Stephenson had himself seen the dedication with which Indian men trained at his establishment despite the dropouts.

This suggests that, at least on the part of the EIR Company, an attempt was made at utilizing local labor, instead of depending on the metropolis for everything. The Company's opinion in this regard was more clearly stated by Stephenson, who insisted that common work be transferred to contractors since in the long term "there would be more skill, more capital; more public works, more improvements, and of a better kind

[43] S. Settar, Vol. I, p. 143. Dated 13 March 1846.
[44] Ibid. p. 213. Dated 10 February 1847.
[45] Ibid. p. 249. Dated March 1847 in the *Calcutta Review*.

both in design and execution", [46] therefore a skilled labor force. This was, of course, wishful thinking on the part of Stephenson. As we already know, there were instances where the contractors did not complete their task in time and also illegally captured land near Calcutta to start the construction of their assigned lines. The other fact was that the upper echelons of the railway works, both the contractors and Government or Company appointed civil engineers, were basically European.

One of the minor conflicts within the workforce was due to the fact that Government policy dictated the employment of military men as overseers of railway works and civil engineers.[47] There are few records of the exact number of Indian laborers, whether skilled or unskilled, available, though the detail of Europeans employed by several Railway Companies, as well as the annual mortality amongst them, was well documented.[48] (For the table showing the employment of Europeans by the Railway Companies, see Appendix, Table No. 4.) A history of construction labor, therefore, is rather difficult to place in its entirety since the exact details of the labor employed as well as their conditions are missing. Ian J. Kerr, in *27 Down: New Departures in Indian Railway Studies,* discusses the problems with the construction of this history at length, also admitting that any attempt at a labor history would only be general to begin with.

On the railway workforce he writes: "Circulating labor was used heavily in the construction of the railways. Indeed, construction work was inherently mobile because once a line was built, construction workers had to move to the next construction site unless they could not do so – as could be the case for those recruited as casual labor from the local lumpen agricultural production during the slack periods in agricultural work."[49] Kerr focuses on the railway workshops and the work force employed there. His case study of the North Western Railways takes us far from the area of this chapter, but a few general ideas that he provides are significant. For example, of the 145 railway workshops

[46] Ibid. p. 250.
[47] S. Settar, Vol. II. p. 102.
[48] Ibid. p. 126. Dated 12 March 1860.
[49] Ian J. Kerr (ed.), *27 Down: New Departures in Indian Railway Studies* (Orient Longman, Hyderabad 2007)., p. 232.

that he maps, the ones at Calcutta, Kharagpur and Asansol would be more relevant to the surmises to be drawn in this paper.

The domination of the European and Eurasian officers within the workforce in NWR also provides a good comparative scale for further work. The changes brought about by the existence of the railway worker population in a city like Lahore also indicates the rise of a conscious labor force which had to adapt to not only a new technology, but also a new work environment hitherto alien to them. While it would be merely speculative to draw similar conclusions about railway workers around Calcutta, their reaction to this new system, technology and work environment must have been parallel.

As for the issue of construction material, Hena Mukherjee, in her work *The Early History of the East Indian Railway: 1845*-1879, throws some light on how the actual construction work was commenced. The total length of the EIR lines and branches was estimated to be 1,338 miles in 1860. Mukherjee notes that the railways depended largely on the waterways and roadways for the transportation of raw materials, from iron rails to carriages, during its construction phase in India. This supply was, however, slow and uncertain, and resulted in delays. It was due to all these delays owed to the construction material that the entire distance from Calcutta to Delhi was traversed by the EIR by 1865, 16 years after the construction of the first stretch of this line.

III. Perceiving the Railways

"As a proof that without the intervention of British enterprise and British science the soil might remain a desert for ever, glance at the state of communication throughout India at this moment, and save a few instances where the roads have been opened by Government, what is it?"

Joseph Locke, *Englishman*, Calcutta, 11th February 1843.

"It is only because they don't know the path to *Indralok* that the English haven't been able to come here, but the resourcefulness and determination I have observed in them indicates that they won't rest till they have found a road here."

Varuna to *Indra*, Durgacharan Ray's *Debganer Martye Agaman.* [50]

Locke's words confirm the notion that the British considered the colonial space as a *tabula rasa* before their advent. It was due to their civilising mission that a social space was constructed over the 'desert' that was India. As Ravi Ahuja points out, the historiography of transport in colonial India emphasizes irrigation and railways as the greatest achievements, without giving much prominence to roads and bridges.[51] The railways were seen as *the* mode of transport that would revolutionize the face of India. In this section, I have attempted at understanding the expectations and motives which lay behind the process of railway construction and the extent to which the railways did revolutionize the face of this country. The ultimate question to answer here is: did the railways revolutionize the body of Calcutta to the extent that they could be deemed the most prominent feature of the city?

To grasp the expectations that rode on the introduction of the railways in India, we have to start at the very beginning with the first proposals that came in support of the coming of the railways in India. It was in 1838 that the first proposal for a line connecting Howrah and Rajmahal came through.[52] Comparisons with the existing modes of communication were brought up as a good reason for the establishment of railway lines. Joseph Locke, our acquaintance from the quote above who was an eminent British railway engineer-cum-promoter, wrote in the *Englishman* on 11th February 1843 regarding the benefits of the railways in the Bengal Presidency:

"To the merchant, the planter, the agriculturalist, it would afford the command of any particular market in Calcutta, it might be their object to secure, with no deterioration of

[50] Durgacharan Ray, *op.cit.* p. 9.
[51] Ravi Ahuja, op. cit. p. 3.
[52] Ibid. p.15.

goods by the way, and far less insurance, risk, cost, and trouble than by the present uncertain mode through the means of the crazy country boat at present in use."[53]

He also insisted that railway expenses in India would not be as high as in Europe because save the concerns over embankments, tunnels, and etc. all the other attendant charges would be greatly reduced.

As for traffic he said: "(...) if a line was opened in Oroonookoo traffic could be drawn on to it, so natural is it for all classes to avail themselves of those means which are the most certain, the most direct, the quickest, and, withal, the least troublesome."[54] Locke's speculations were proved right, and he inspired R. M. Stephenson, the pioneer of Indian railways and founder of the East Indian Railway Company, to take an interest in the issue. Stephenson observed that Indian entrepreneurs like Dwarkanath Tagore were also interested in railway construction in Calcutta, especially connecting to the coal mines Burdwan,[55] thereby solving the fuel issues that the railways might have. But it was not just the perks of a lively economy that entertained the enthusiasts who sided in favour of the introduction of the railways in India. That the railways would ensure military and strategic security was undoubted.

Lord Hardinge, the Governor General, in his first minute in 1846 on the issue of railway construction opined: "In this country where no man can tell one week what the next may produce, the facility of rapid concentration of infantry and artillery and stores may be the cheap prevention of an insurrection, this speedy termination of a [section illegible] or the safety of the Empire."[56] Most revealing of the East India Company and the British Government's motives behind railway construction in India have been discussed by James Ward in a note written in 1847: "The primary and almost exclusive object which they have in view is to render the military defence of the north-western frontier more effectual and economical. They are unable to see a railway in any other light than as a

[53] Ibid. p. 19.
[54] Ibid. p. 18.
[55] Ibid. p. 26.
[56] Ibid. p. 174. Dated 28 July 1846.

new system of fortification. Strip it of its advantages except as a rapid line of military and other official communication, and they would vouchsafe it but a very different reception."[57]

The Legislative Council of the British Government did couch the introduction of railways in India as a part of a 'civilising mission' but the meaning of *civilizing* was quite different here. Explaining the words of Mr. Cameron, member of the Legislative Council, Ward says, "By civilizing semi-barbarous subjects he means nothing more than keeping them in orderly as well as nominal subjection (...) Thus a railway with Mr. Cameron, beyond its military uses, is chiefly valuable to the Government as an instrument of Police; and its commercial advantages are only desirable so far as they will contribute to support it."[58] Though this sort of a concern might have been prominent, Stephenson himself was more interested in exploiting the needs of the 'semi-barbarous subjects'.

In an article published in the *Calcutta Review* in March 1847, Stephenson mentioned that the proposed EIR railway line from Calcutta, when connected to Delhi via Rajmahal, would do more than just fortify the Empire. Mentioning all the commercial centres that would fall on the line, he integrated the commercial aspect. Also: "Then there are the pilgrims to Muttra, Benaras, Gaya, Puri, and other less known places with shrines less celebrated: it will depend on the railroad companies themselves whether they will convey the poorer (...)."[59] Therefore the civilizing mission was multi pronged. It primarily focused on the strategic advantages provided by connecting Calcutta to the rest of India via railroads. The interest in policing the subjects better was secondary, and the commercial aspect tertiary. These motives went haywire over time, as the commercial aspect slowly took a forefront, but with the events of 1857, the military and policing aspects gained even greater weight.

All these motives were flimsily veiled under the garb of glory. Stephenson wrote: "Age after age, did the greatest of India's monarchs strive to perpetuate the memory of their

[57] Ibid. p. 233. Dated 11 March 1847.
[58] Ibid. p. 233.
[59] Ibid. pp. 278-9.

name and rule, by lavishing on 'Paynim' mosques, and idol temples, and proud mausoleums, those treasures of 'barbaric pearl and gold,' that were cruelly wrung from the tears, the cries, and the miseries of a suffering people. Let it now be the glory of Imperial Britain, to confer on the same people a boon of inestimable value, in the form of a work of the greatest extent and utility which the world has yet seen; a work, which, by the multifarious influences thus called into action, and the varied salutary tendencies thus enduringly impressed, shall, as an auxiliary to all reformative agencies, lend its effective aid in contributing to raise long prostrate India from the dust, and exalt her to her rightful position as one of the most magnificent empires under the sun."[60] Once railway construction was actually executed and the lines opened to the public, the Indian public must have been in awe of their colonial rulers.

It was probably this audience that could provide us with an idea of the extent to which the railways transformed the face of colonial India. While there are a number of journals and travelogues which describe in detail the nature of railway journeys, their effect on the landscapes, etc, I believe Durgacharan Ray's *Debganer Martye Agaman*, published in 1881, to be an appropriate work portraying the scenes of the railways in Calcutta. Ray's work is basically a travelogue in the form of a reversed pilgrimage: generally Hindus start off from their homes to pilgrim centres using the railways to reach these places. If a Hindu in Calcutta was to go on a pilgrimage, she/he would start from Calcutta, visit centres like Gaya, Benaras, Mathura, Vrindavan, Amravati, etc. in that order. In *Debganer*, this pilgrimage is reversed because, after learning of Calcutta, the capital of the English, the Gods in *swarga* decide to travel to this city.

They begin their journey on the EIR trunk line and are awed by the brilliance of the British at every turn, especially in Calcutta. Not only is the fact that they travel by the railroads significant, but the experiences of the journey are quite interesting to behold. The following is a passage that describes the Gods' entry into Howrah:

[60] S. Settar (ed.), *op. cit.* pp. 280-1.

"Eventually the train slowed down with the sounds *jhan jhan jhanat*. The Gods see innumerous rail lines all around. A freight train has come and stopped on one of the rails. Another train is preparing its departure with passengers. A mechanic is driving an engine on another rail with its whistle blowing away. Some rails have trains standing on them. In one place, broken trains are being repaired. In another, a train is being painted. That place is black with smoke. Varuna said, we are arriving at Howrah. Calcutta lies on the bank opposite Howrah. At this point, the train stopped at the platform with the sound of *kang konch jhanat*. (...) The Gods see that there is no limit to the hustle bustle at the station. Innumerous *sahibs*, *mems*, Bengali *babus* are walking around on the platform. The *coolies* are carrying the luggage of passengers from one end to the other of the station on carts with two legs and two wheels; the calls of '*chai paan*', '*chai jalkhaoar*' resound from all directions. The cleaners are running around with brooms tucked under their arms. (...) They turn around and see that all the passengers have prepared their luggage and waiting to get off the train. Since none of them have had a bath for two three days, an extraordinary odour emanates from them, and they all resemble ghosts because their attire is layered with coal dust. (...) As soon as the train doors are opened, countless English, Bengali, Muslim, Jew and Kabuli passengers alight as if just freed from a prison and move towards the gates. (...) Seeing many sacks lined up in the station, Brahma says, Varuna! What do these contain? Varuna replies, Rice, grain, linseed, etc. Brahma says, to be precise, the trains have looted the wealth of the kingdom and brought it here."[61]

This passage exhibits a few things: a) the awe-inspiring nature of railway journeys where large distances are covered in a short time, b) the strangeness of the sights and sounds associated with the lines as well as the stations, c) the coming together of a large number of people from varied backgrounds and races, with varying interests, and d) the commercial aspect of the railways in India which is presented very blatantly at the site of transition – the railway station. This produces a feeling of awe as well as doubt that the Indian public must have felt while facing these journeys. However, the extent to which

[61] Durgacharan Ray, *op.cit.* p. 263-4.

the looting of the nation's wealth of food grains can be ascribed to the railways alone was more debatable.

While it is true that the transportation of food products via the railways was more visible because of the passenger traffic witnessing it, the railway returns in two years, 1874 (the year a famine was anticipated and preventive measures taken in time) and 1886, show that there was actually a decline in the Merchandise and Mineral Traffic over time.[62] In the year 1886, the toll receipts from the major Calcutta canals were substantial too.[63] Therefore, in the case of merchandise and minerals being transported to Calcutta, the railways and waterways both lent a hand although the railways won hands down where passenger traffic was concerned. And the scenes describing the multitude and diversity of the passengers and station workers appear to be more captivating. It is also largely due to the people the Gods encounter on the trains that they form an adverse idea of Indians in the 1880s.

In this case, the railway journey provided the Gods with enough arsenal to propose the destruction of *martya* at the end of the book, when they report back at *swarga* and relate the degeneration of the Indian masses (especially women) to the inhabitants of heaven. They even insist that after the destruction, all the dead should be transported to *swarga* on either trains or steamers! *Brahma*, however, dissuades these plans with the following words:

"Gods! We have indeed been dissatisfied by our tour of *martya* due to the reasons we have mentioned; but we have been satisfied by the administration of the English kingdom. Our rule fades in glory when compared to the English rule. In fact, *Indra* has

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[62] EIR receipts for Merchandise and Mineral Traffic for 1874– Rs. 140, 35, 779. and for EBR – Rs. 10,56,721. *Supplement to the Calcutta Gazette, June 10, 1874*, p. 1407. Similarly, EIR receipts for Merchandise and Mineral Traffic for 1886 – Rs. 80,72,117 and for EBR – Rs.5,56,378. *Supplement to the Calcutta Gazette, April 7, 1886*, p. not visible.

[63] Receipts from tolling cargo boats carrying merchandise like rice, salt, jute, coal and coke, etc. at the Circular Canal (Chitpore Toll station) was Rs. 6, 47, 850, and (Dhappa toll station) Rs. 51, 69, 295, while at Tolly's Nullah it was Rs. 11, 77, 869. *Supplement to the Calcutta Gazette, April 7, 1886*, p. 602-4.

shown an interest in following the English example in some cases. I bless – may the English rule forever!"[64]

So, although doubt has been expressed at the plunder of the wealth of the land, British administration itself is portrayed as a blessing and the railways as their chief agent aiding in their rule. Ray's work thereby shows that even the gods of old have conceded the right to rule forever to the British. This, more than anything else in this book, signifies the coming of the modern and the withdrawal of the ancient, the replacement of gods with brilliant mortals with the railways and steamers as their weapons of might. The rise of the modern is therefore linked to the railways.

Similar motifs of placing the modern in conjunction with the railways are present in a number of recent works on the Indian railways. In his work on the Indian railways, *Railways in Modern India*, Ian J. Kerr puts the credit for the creation of Modern India squarely on the development of the railways. He explains the term 'Modern' as a "shorthand synonym for 19th and 20th century India. Modern India is simply India as it had become at any particular point in time: 1883, 1933, 1947 or whenever. Modern is never a fixed condition."[65] He does not completely agree with the '*triumphalist*' view that the railways as a technology brought about the greatest progress witnessed in the Indian subcontinent, but continues to believe that the conception, construction and use of the railways created India as we know her today.

Kerr says: "For some aspects of modern India, probably few aspects, unless one embraces hard technological determinism, railways may have been both the necessary and sufficient cause of their making."[66] This sort of understanding of the railways and their impact has its benefits as well as problems: it provides any scholar working on railway history with an immense amount of secondary as well as primary data, but at the same time diminishes the value of other transport infrastructures, as did all the motives behind railway construction mentioned above. It is true that the scale in which the

[64] Ibid. p. 448.
[65] Ian J. Kerr (edt.), *Railways in Modern India*, Oxford University Press, 2001. p. 7.
[66] Ibid. p. 9.

railways affected landscapes and cityscapes is immense, but that can be explained by the monumental and 'alien' nature of the railways in any landscape. These changes did further diminish the lower scale in which the waterways and roadways affected the same landscape, making them look even more non-revolutionary as infrastructures. The coming of the modern was and still is seen as the replacement of the waterways and roadways by the more modern railways as a system of communication.

The final question still remains. The answer is actually simpler. The railways in the Calcutta landscape were just as revolutionary as anywhere else in India. But the fact is that the railways, if you consider their lines, coaches, embankments and stations, seem to be fenced away from their surrounding landscapes. This was, as we have seen in the second section of this chapter, one of the major concerns of the engineers who surveyed the land and saw unprotected tracts of land as a major threat to railway works, justified to some extent by the attacks on the same works in some parts. The result was that except for the areas near the railway embankment, much of the city remained unaffected by the railways. Here we go back to the initial assessment that unlike the roadways, the railways did not have radial courses through Calcutta. The effect that the railways had on Calcutta's landscape were quite less revolutionary than say in Bombay, where almost all the areas and islands are connected via the railways.

We must take into account the fact that the railway stations of Howrah and Sealdah did not directly inspire a vision of monumentality. In the case of Howrah station, it was only with the opening of the new station building in 1906 that the station itself acquired the stature of a colonial landmark. Then again, it was dwarfed by the monumental construction of the new Howrah Bridge in the 1940s. Once the gods entered the city in *Debganer*, they did not look back at the railways or mention their singularity within the city (not even when they embarked on their return journey via the railways). The railways were vital, but other features of Calcutta (the Hooghly Bridge, the Town Hall, the Post Office, and other buildings) seem equal in prominence.

The railways were definitely revolutionary due to their physical features, speed and efficiency. It is also undoubted that the railways ran in association with the roadways and slowly made transport over the waterways redundant over both long and short distances. But as far as the landscape of Calcutta is concerned, public and private buildings, parks, political and cultural events, etc have enthralled visitors, residents and historians alike. Whether revolutionary or not, the harbinger of modernity or not, the railways in Calcutta have been as neglected in the city's histories until recently as the roadways and waterways.

Conclusion

Though the motives of the British in introducing the railways in India were manifold, the most important were its strategic and military uses. The commercial uses, as we have seen, were undermined to some extent due to the events of 1856-58, and quite understandably so. These motives were not completely missed out by the Indian public, as *Debganer Martye Agaman* shows. Nevertheless, the awe at the sight of the railways was predominant, as it still is for people using them. Railway policy in India indicated the level of involvement of the Government, engineers and the public, both in the metropolis and the colony. The system of guaranteed interest gave the Government an upper hand in all these transactions, but they were never beyond criticism from the public as well as the Railway Companies. The process of construction made the involvement of Indian workmen and small establishments of contractors mandatory, while the import of the necessary iron works, etc from Britain continued for the longest time due to the rising demand and cost of the same in India.

All these factors indicate that several levels of control over the processes of policy making and construction of the lines existed. There was, of course, a hierarchy within this huge system, but there is enough evidence to prove that the higher levels/ the Government did not always exercise complete control over the process of actual construction. This is not to imply that the same control was complete and all pervasive in the case of the waterways or the roadways construction, but the nature of the establishments which were involved in railway construction – from shareholders in

Britain and India, to the British Government and the East India Company's Government in India, to the mixed group of European engineers and Indian and Eurasian workmen – point to the fact that in the lower levels of this hierarchy/ the ground level of construction, orders from above were disregarded from time to time. The middle level in the hierarchy, the Railway Companies, their Directors and engineers, attempted to affect the policy of railway construction, or at least offered ample criticism of Government plans.

Thus not only was railway construction accomplished, but a sophisticated, multi-layered railway infrastructure emerged. With the formation of a centralized Public Works Department, this infrastructure became more regulated than before. Modernity was not just aimed at by the introduction of the railways in India, but by the way it was planned, constructed and maintained. This was definitely at the cost of the circulatory system of communication provided by the waterways, but less so in the case of the roadways. While the railway lines ran mostly parallel to the waterways, made their way over them through bridges, carried a larger number of passengers than the waterways could ever hope to, and did so with hitherto unforeseen speed and security, the roadways continued to be a supplementary and important system of communication. This was because, in most cases, they fed into the system of railways by transporting passengers and goods to and from the railway stations. That British motive of achieving glory by imprinting the Indian landscape with a monument of unanticipated and momentous value was thus accomplished.

Endnotes:-

1. The first Administrative Report on Railway submitted by the Secretary, Railway and Telegraph Department, Government of India to the Secretary of State for India, dated 12 March 1860.[67]

[67] S. Settar, Vol. II, pp. 118-120.

"EASTERN BENGAL RAILWAY

The Eastern Bengal Railway Company was formed in 1857, for the purpose of affording railway accommodation to the districts lying north and east of Calcutta. The line sanctioned is from Calcutta to Kooshtee on the Ganges, opposite Pubnah, where it will intercept the large traffic proceeding downwards. It will also enable merchants to send up their goods from Calcutta without encountering the dangers and delays of the navigation of the Soonderbunds, It is intended eventually to carry the railway to Serajgunge and Dacca; and, upon the strong recommendation of the Government of India, the immediate prosecution of the surveys has recently been sanctioned, and they are now being proceeding with. The districts traversed are rich in agricultural produce, which consists of indigo, sugar, oil-seeds, rice, and other grain; and they are thickly populated, containing upwards of 500 inhabitants to the square mile."

"INCORPORATION ACT

The Company was incorporated by Act of Parliament in August 1857, and a contract was entered into on the 30th July 1858, between the Railway Company and the East India Company, under which the line to Ganges is being constructed. By this agreement, interest at the rate of five per cent, is guaranteed, upon the usual terms, on the capital required for the work, which was at that time estimated at £1, 000, 000. This amount will, however, be exceeded. Although the contract only guarantees five percent on the capital which may be required for the first section of the line, which is 109 miles in length, it provides that the railway shall ultimately be carried to Dacca, & c. for which extensions fresh capital will have to be raised (...)"

"The amount of capital paid into the Government Treasury by the Railway Company to the 31st December last in England, and in India, was £427, 458, leaving £572, 452 still to be raised. Of the above sum, £424, 733 was subscribed in this country, and £2, 685 in India. The capital, subscribed in this country was held by 425 shareholders, of whom 113 held shares of the value of £1,000 and upwards. The capital raised in India was held by 31 shareholders, none of whom held shares of the value of £1, 000. The expenditures of the Company to the 31st December was, in England for management, materials, and freight, 130, 219; in India, for construction, £46, 481; making a total of £176, 700 and leaving a balance of £250, 758 standing to the credit of the Railway Company in the hands of Government (...)

The date at which Government can first exercise its right of purchase will be in August 1883.

It is possible that the operations of this Company may not be confined to those above described, for it has been decided, in accordance with the recommendation of the Government of India, that should a line to Darjeeling be at any time sanctioned on the guarantee system, they shall be entrusted with its execution."

"CALCUTTA AND SOUTH EASTERN RAILWAY

The Calcutta and South Eastern Railway was registered, under the provisions of the 'Joint Stock Company's Act of 1856', for the purpose of constructing and maintaining a railway or railways in India, and particularly a line from Calcutta to the Mutlah River, together with such wet docks and works as might be deemed necessary. Certain powers similar to those granted to Companies which have been incorporated, were conferred on this Company by Act of Parliament, in July 1857."

"After an unsuccessful attempt to obtain capital for the undertaking, without the assistance of a guarantee of interest, that aid was conceded by the Secretary of State in Council. The operations of the company are limited to the line between Calcutta and the Mutlah. The rate of interest guaranteed is 15 per cent per annum on the capital required for this work, which is estimated to cost 250,000. A contract, embodying the usual conditions was entered into between the Railway Company and the Secretary of State in Council, on the 15th march 1859 (...)"

"The amount of capital paid up by the Railway Company on the 31st December 1859 was £120, 278, leaving £120, 700 still to be raised. On the above date the capital was held by 842 shareholders, of whom, 40 were proprietors of shares to the value of £1, 000 and upwards. The expenditure of the Company has been £71, 410, of which £56, 183 was disbursed in this country on stores, freight, and management, and £14, 597 in India. The amount standing to the credit of the railway Company on the books of the Secretary of State on the 31st December was £57, 868."

"The first period at which the Government can exercise the right to purchase is in March 1884."

Conclusion

It is by planning and constructing "public works" over a century that systems of circulation within Calcutta the waterways, the roadways and the railways emerged. I have followed up a number of themes throughout the three chapters dealing with the emergence of these systems. Though I have focused on policies for planning the city to some extent, I have emphasized more on the aspect of land acquisition for construction, thereby linking my research more prominently with the act of construction than planning. Land acquisition for the waterways and the roadways were more or less simultaneous, and in the case of both, as I have substantiated, the municipal bodies implementing planning schemes came into direct conflict with the Indian residents. Though the land owners were compensated according to the prevailing market prices, constructions of the city's infrastructure was carried on quite ruthlessly ignoring or sidelining private or religious concerns of the residents, though ample sympathy was expressed for them.

Of course, with changes in municipal bodies and introduction of planning and financing issues, the implementation of these plans was haphazard at best. As for the issues related to the act of construction itself, which is the second theme I have traced through this research, I have attempted to provide a picture of the ground realities of construction. Without a complete history of construction labor the picture remains incomplete. I have tried to fill this gap through a description of the skilled labor involved in the construction of various parts of these systems of circulation. With regard to bridge-building itself, the figures of Colin Shakespear and Bradford Leslie are discussed at some length in the first chapter, and R.M Stephenson and George Turnbull's contribution to the construction of the railways in India and the training of skilled labor for the same is discussed in the third chapter.

The fact that chief engineers in charge of the construction processes were imported from England is underlined time and again, and the practice did not end even with the establishment of civil engineering colleges in India. Due to restrictions on Indian employment, Indian engineers could not hold the highest offices in the nineteenth

century. While looking at the end result of these constructions and discussing their representations in works of contemporary literature, I have been more selective. Travellers to Calcutta in the nineteenth century, like R.J Minney and Sydney Laman Blanchard, had very different views about the River Hooghly. J.G.R Forlong proved through his work as an engineer in Bengal that Calcutta was doomed because the river (especially silting) would lead to its ruin, a sentiment reflected by Kipling. Harisadhan Mukharjee, in *Kolikata sekaler o ekaler*, seems more optimistic about Calcutta's prospects, and while Durgacharan Ray zeroes in on the plight of the river in *Debganer Martye Agaman*, in effect he puts forward the idea that British rule would be good for the people of the subcontinent.

Similarly, Baron Dowleans, James Ranald Martin and Girish Chunder Ghose, writing in contemporary papers like the *Calcutta Review* and *Bengalee*, emphasized the need for the uniform development of roads and sanitation within the city. In the case of the railways, however, the writings to which I have referred are of a more general in their perspective, and though their main aim was to see through the introduction of the railways to the benefit of the capital of the British Empire in the east, they do not talk about Calcutta exclusively in their works. It is only through *Debganer* that we get a good idea of the setting of the railways in the city. Ray's description is the only one I have which locates the viewer inside the Howrah station, any details of which are quite scattered apart from the few fragments found through some secondary sources.

So, between 1800 and 1900, there were three circulatory systems of transport that provided the city with internal and external communications, overcoming natural barriers like the River Hooghly and municipal & provincial barriers. At the same time, barriers to circulation within the city, like the Baitacannah Tree or private properties, were obliterated. Movement, movement with speed to be precise, was facilitated, and with the coming of the automobiles in the twentieth century Calcutta's body was transformed into a healthy body with an overall circulatory system consisting of three different modes and medium of travel – the waterways (which continued diminishing as a medium for passenger transport), the roadways (which were bolstered to revolutionary extents) and

the railways (which brought the suburbs of Calcutta close together due to increased numbers of daily passengers with time).

Transformations of this circulatory system in the twentieth century require further research: what kind of changes were enabled by the Calcutta Improvement Trust and with what long term effects on new and old circulatory systems, like the Calcutta Metro, can be studied. Clearly, an enterprise such as this work has to take into account that the acts of changing a city space through planning and construction have been and always will be destructive to begin with. As Partho Datta puts it towards the end of his recent work on the city, "The history of state planning, however, is a long and unending story of intervention and assault on settlements. This kind of planning, far from being benign, has often been extremely violent."[1] I do agree that planning and its implementation has often taken the form of ravages to the city, and in fact still does.

Another recent publication, Amit Chaudhuri's *Calcutta: Two Years in the City*, deals with this particular aspect of 'modernity',[2] while discussing two Calcutta's – the first from Chaudhuri's past (a city that was engaging) and the second from his present (between 2009-11, a city where old buildings disappeared and globalization changed the landscape of the city even further). Though I have not been a resident of Calcutta for long, it was a similar disjuncture between Calcutta's glorious past as I gleaned from Bengali public memory and Calcutta's present 'insensate' (as Sennett puts it) state that I perceived, that opened the doors for this research. This thesis has been my attempt at tracing just a part of what seems to be Calcutta's long and unending movement towards 'modernity', a city that was considered doomed and yet continued growing through the process of 'creative destruction'.

[1] Partho Datta, op.cit. p. 292.
[2] Amit Chaudhuri, *Calcutta: Two Years in the City*, Penguin, UK 2013.

Bibliography

National Archives of India:

Public Works Department

Public Branch

Revenue Branch

Railway Branch

Communications Branch

Buildings and Roads Branch

Home Department

Public Branch

Police Branch

Marine Branch

West Bengal State Archives:

Judicial Branch

Cartography Section (National Archives of India)

Map nos. F.43/1 to F.43/57.

Newspapers and Magazines:

The Englishman

The Hindu Patriot

The Naval and Military Magazine, Vol. 1, 2nd Edition, T. Clerc Smith, London 1827.

Books and Articles:

Ahmad, Dr. Sir Ziauddin. *Indian Railways* (The Evergreen Press, Lahore ?).

Ahuja, Ravi. *Pathways of Empire: Circulation, 'Public Works' and Social Space in Colonial Orissa (c. 1780 – 1914)*, Orient BlackSwan, Hyderabad, 2009.

Aitken, Bill. *Exploring Indian Railways (*OUP, Delhi 1994).

Bandyopadhyay, Bhabanicharan. *Kalikata Kamalalay*, in Dr. Saumendranath Sarkar, *Bhabanicharan Bandyopadhyay O Bangla Sahitya*, Kolkata 2001.

Banerjea, Dr. Dhrubajyoti. *European Calcutta: Images and Recollections of a Bygone Era*, UBSPD, Calcutta 2005.

Bagchi, Dr. P.C. (ed.). *The Second City of The Empire*, Twenty-Fifth Session of the Indian Science Congress Association, Calcutta 1938.

Benjamin, Walter. *The Arcades Project*, Harvard University Press, 1999.

Biswas, Oneil. *Calcutta and Calcuttans: From Dihi to Megalopolis*, Firma K L M, Calcutta 1992.

Blanchard, Sidney Laman. *The Ganges and the Seine: Scenes on the Banks of Both*, Chapman and Hall, London 1862.

Blechynden, Kathleen. *Calcutta: Past and Present* (1905), N. R. Ray (ed.), Calcutta 1978.

Calcutta 200 Years: A Tollygunge Club Perspective, Tollygunge Club Ltd., Calcutta 1981.

Chakrabarti, Hiren (ed.). *An Urban Historical Perspective for the Calcutta Tercentenary, Victoria Memorial, Calcutta 1993.*

Chandavarkar, Rajnarayan. Imperial Power and Popular Politics: Class, Resistance and the State in India, c. 1850-1950. (Cambridge University Press, 1998)

Chattopadhyay, Swati. *Representing Calcutta: Modernity, nationalism and the colonial uncanny*, Routledge 2005.

Chaudhuri, Sukanta (ed.). *Calcutta: The Living City, Volume I: The Past* (Oxford University Press, 1992)

- (ed.), *Calcutta: The Living City, Volume II: The Present and Future*, Oxford University Press, 1992.

Cotton, H. E. A. *Calcutta: Old and New, The Century in India 1800-1900*, First Published 1909, Nitish Ranjan Ray (ed.), Calcutta 1980.

Dasgupta, Anil C. (ed.). *Calcutta Gazette. The Days of John Company: Selections from Calcutta Gazette, 1824-1832*, Calcutta 1959.

Dasgupta, Atis (ed.). *Select Documents on Calcutta: 1800-1900)*, Directorate of State Archives, Govt. of West Bengal, 2011.

Dasgupta, Keya. *Mapping Calcutta: The Collection of Maps at the Visual Archives of the Centre for Studies in Social Sciences, Calcutta*, September 2009.

- "Genesis of a Neighbourhood: The Mapping of Bhabanipur", *Occasional Paper 175, March 2003, Centre for Studies in Social Sciences, Calcutta.*

Datta, Partho. *Planning the City: Urbanization and Reform in Calcutta c. 1800 – c. 1940*, Tulika Books, Delhi 2012.

Dowleans, Baron. "Calcutta in 1860" in *Calcutta Review*, Vol. 34, 1860

Fay, Eliza. *Original Letters from India (1779-1815). With introductory and terminal remarks by E. M. Forster*, Leonard and Virginia Woolf at Hogarth Press, London 1925.

Forlong, J.G.R. "The Life of Calcutta as a Seaport and the Mercantile Capital of Asia" in *The Geographical Journal, Vol. 16, No. 2, August 1900.*

Ghose, Grish Chunder. "Calcutta Roads and Drains" in *Bengalee*, August 19, 1863.

Ghose, S.C. *Organization of Railways* (Calcutta University, 1927).

Goode, S. W. *Municipal Calcutta: Its Institutions in Their Origin and Growth* (MacMillan, Kolkata Municipal Corp. 2005; First Published 1916)

Green, Leslie and Datta, Abhijit. *Special Agencies in Metropolis Calcutta: A Comparative Study* (Institute of Public Administration, New York 1967).

Harvey, David. *Consciousness and the Urban Experience* (The John Hopkins University Press, 1985).

Holston, James. *The Modernist City: An Anthropological Critique of Brasilia*, University of Chicago Press 1989.

Johnson, Dr. J. *The Economics of Indian Rail Transport* (Allied Publishers, Bombay 1963).

Kerr, Ian J. (ed.). *Railways in Modern India* (OUP, New Delhi 2001)

- (ed.), *27 Down: New Departures in Indian Railway Studies* (Orient Longman, Hyderabad 2007)

Khosla, G. S. *Railway Management in India* (Thacker and Co., Bombay 1972).

Kipling, Rudyard. *A Tale of Two Cities*, MacMillan, London 1891.

Lynch, Kevin. *The Image of the City*, MIT Press, Cambridge MA 1960.

Mackay, John Charles. *Light Railways for the United Kingdom, India and the Colonies* (Crosby Lockwood and Son, London 1896).

Martin, David William. *The Changing Face of Calcutta*, Vikas Publication House, New Delhi, 1997.

McDermott, E. R. *Railways* (Methuen and Co., London 1904).

Minney, R.J. *Round About Calcutta*, Oxford University Press, 1922.

Moulton, Harold G. *Waterways Versus Railways* (Houghton Miflin, Chicago 1912).

Mukharjee, Harisadhan. *Kolikata Sekaler O Ekaler*, Calcutta 1915.

Mukherjee, Hena. *The Early History of the East Indian Railway: 1845 – 1879* (Firma KLM, Calcutta 1994).

Mukherjee, S. N. *Calcutta: Essays in Urban History*, Subarnarekha Calcutta 1993.

Nair, P. Thankappan. *A History of Calcutta's Streets*, Calcutta, December 1987.

- (ed.), *Calcutta in the 19th Century (Company's Days)* (Calcutta, 1989)

O'Malley, L.S.S. *Bengal District Gazetteers: 24-Parganas*, Logos Press, New Delhi 2009.

Ray, A. K. *A Short History of Calcutta: Town and Suburbs, Census of India, 1901; Vol. VII, Part I*, First Published 1901; Rddhi Edition, Calcutta 1982.

Ray, Durgacharan. *Debganer Martye Agaman* (Originally published in 1881; Reprinted in 2009, Dey's Publishing, Kolkata).

Richards, E. P. Calcutta Improvement Trust, Report of the Trust on the Condition, Improvement and Town Planning and Contiguous Areas, Hertfordshire, England, 1914.

Roy, Dr. Biren. *Marshes to Metropolis: Calcutta (1481-1981)*, National Council of Education, Jadavepore, Calcutta 1982.

Saxena, K.K. *Indian Railways – Problems and Prospects: A Study in the Management and Working of Indian Railways* (Vora and Co, Bombay 1962).

Sen, Ranjit. *A Stagnating City: Calcutta in the Eighteenth Century*, Institute of Historical Studies, Calcutta, 2000. (For pre-1850 situation of connectivity)

Sennett, Richard. *Flesh and Stone: The Body and the City in Western Civilization*, W.W. Norton and Company, New York and London, 1994.

Seton-Karr, W.S. *Selections from Calcutta Gazettes, Vol. I and II*, Military Orphan Press, Calcutta 1865.

Settar, S. (ed.). *Railway Construction in India: Select Documents, Volume I (1832-1852)*, ICHR 1999.

- (ed.). *Railway Construction in India: Select Documents, Volume II (1853-1873)*, ICHR 1999.

- (ed.). *Railway Construction in India: Select Documents, Volume III (1873-1900)*, ICHR 1999.

Singha, Kaliprasanna. *The Observant Owl: Hootum's Vignettes of Nineteenth Century Calcutta*; Kaliprasanna Singha's Hootum Pyanchar Naksha/Translated from Bengali by Swarup Roy with a Foreword by Partha Chatterjee, New Delhi, Black Kite, 2008.

Sinha, Pradip. *Calcutta in Urban History*, Firma K L M, Calcutta 1978.

Sykes, Laura (ed.). *Calcutta: Through British Eyes 1690 – 1990*, Oxford University Press, 1992.

The Imperial Gazetteer of India, Vol. IX Bomjur to Central India (Oxford at the Clarendon Press, 1908)

The Imperial Gazetteer of India, Vol.XIII, Oxford , Clarendon Press, 1908.

Tiwari, Ramaswarup D. *Railways in Modern India* (New Book Co., Bombay 1941).

West Bengal District Gazetteers: Hooghly, by Amiya Kumar Banerji, Calcutta, 1972.

Appendix

Chapter 1: The Last Stretch of the Ganges

Table No. 1: List of 39 ghats on the river Hooghly in 1792.

(Harisadhan Mukharjee, *Kolikata Sekaler O Ekaler*, Calcutta 1915, pp. 666-7.)

1. Old Powder Mill Ghat	14. Gokul Babu's Ghat	27. Hazuri Mill's Ghat
2. Raghumir Mitra's Ghat	15. Katma's Ghat	28. Nayan Mullick's Ghat
3. Kashiram Mitra's Ghat	16. Pathuria Ghat	29. Balram Chunder's Ghat
4. Banamali Sarkar's Ghat	17. Giri Babu's Ghat	30. Burrabazar Ghat
5. Kitoya Ghat	18. Shibtollah Ghat	31. Ross Saheb's Ghat
6. Batatala Ghat	19. Hat-tollah Ghat	32. Barretto Saheb's Ghat
7. Sutanuttee Ghat	20. Harinath Diwan's Ghat	33. Jackson Ghat
8. Aheeritolla Ghat	21. Shobharam Basak's Ghat	34. Foreman's Ghat
9. Manik Basu's Ghat	22. Nawab's Ghat	35. Blither Saheb's Ghat
10. Madan Dutt's Ghat	23. Baishnab's Das' Ghat	36. Old Court Ghat
11. Tumbu Babu's Ghat	24. Kashinath Ghat	37. New Work Ghat
12. Nimtollah Ghat	25. Kadamtollah Ghat	38. Kanchaguri Ghat
13. Jorabagan Ghat	26. Kashinath Babu's Ghat	39. Chandpal Ghat

Table No. 2: Bradford Leslie's estimate for the construction of the Hooghly Bridge.
(NAI, *P.W.D Proceedings, Buildings and Roads Communications, March 1871, No. 12, dated 2nd March 1871.)*

"(...) the charges for interest on Capital and Working expenses:-

	£
Total cost of bridge, say	1, 84, 000
Interest at 5% per annum	9, 200
Sinking Fund	5, 000
Maintenance of roadway, establishment & working expenses per annum	6, 000

	Rs.
Tax upon East Indian Railway traffic agreed to at meeting of 27th Jan 1871	1, 57, 655
21, 707 local passenger daily, at 1 and ½ pie each per annum	62, 050
	£ 21, 970

Table No. 3: Hooghly Bridge Estimate of Engineering Charges for Designing, Supervision and Execution of Works.

(NAI, *P.W.D Proceedings, Buildings and Roads Communications October 1872, Nos. 4-5, Letter from B. Leslie dated 16th August, 1872.*)

	£
Expenses previous to May 1872 (date of commencement of work)	1, 750
1 Assistant Engineer in England, 10 months, @ £400	334
2 Inspectors in England, 1 year, each	260
6 Passages to Calcutta and back, @ £180	1, 080
4 " to " " @ £ 100	400
1 Inspecting Engineer to take charge of English work subsequent to my departure for India, including Mr. Batho's charges to date, 12 months, @ £500	500
Travelling expenses of inspection in England	150
Office rent, furniture, stationery, Draughtsmen, Corresponding and Account Clerks, fuel, lights, & c. in England and India	1, 470
1 Assistant Engineer in India, 2 years, @ Rs. 450 per annum	1, 080
1 Sub-Assistant Engineer in India, 1½ years, @ Rs. 300	540
3 Supervisors in India, average time 1½ years, @ Rs. 250 each	1, 350
Chief Engineer, 3 years, @ Rs. 2, 500 per annum	9, 000
Total	17, 914

Table No. 4: List of canals at present under the charge of the Executive Engineer, Circular and Eastern Canals Division.

(L.S.S. O'Malley, *Bengal District Gazetteers: 24-Parganas*, Logos Press, New Delhi 2009. p. 163.)

Name	Length in Miles
Circular Canal (including Baliaghata Khal)	5 ½
New Cut Canal	4
Lake Channel (from Dhapa to Bamanghata)	5 ½
Eastern Canals (from Bamanghata to Basantpur)	42
Outer Boat Route	4
Ditto (from Samukpota via Matla river to Basantpur)	54
Tolly's Nullah	17
Kaorapukur Khal	20
Sundarbans Steamer Route	172

Table No. 5: Ghats in Bhabanipur along the Adi Ganga/ Tolly's Nala.

(Keya Dasgupta, "Genesis of a Neighbourhood: The Mapping of Bhabanipur", *Occasional Paper 175, March 2003, Centre for Studies in Social Sciences, Calcutta.* *Appendix 5*. For the tables, see Appendix, Table No. 5.)

Early 20th Century	Late 19th Century	Mid 19th Century	Early 19th Century
Chamru Chaudhuri's Ghat	Joggeswar Laha's Ghat	Juggusur Laha's Ghat	Lochun Mukherjee's Ghat
Abhoy Charan Das's Ghat	Balaram Bose's Ghat	Do	Gorachund Mukerjee's Ghat
Babu Madhab's Ghat	Becharam Barujjer Ghat	Jaikisto Mukherjee's Ghat	
Madan Mohan Pal's Ghat		Puddosh Chackerbutty's Ghat	
Narsing Prasad Dutt's Ghat		Govind Banerjee's Ghat	
Upendra nath Ghose's Ghat		Govind Chand Mookerjee's Ghat	
Jadab Doctor's Ghat		Balaram Bose's Ghat	
Golak Chandra Koal's Ghat			
Ramnarayan Banerjee's Ghat			
Haran Chandra Mukherjee's Ghat			
Jadu Nath Mukhopadhyay's Ghat			
Balaram Bose's Ghat			

Table No. 6: Ghats between Bhabanipur and Kalighat.

(Keya Dasgupta, "Genesis of a Neighbourhood: The Mapping of Bhabanipur", *Occasional Paper 175, March 2003, Centre for Studies in Social Sciences, Calcutta. Appendix 5.* For the tables, see Appendix, Table No. 6.)

Early 20th Century	Late 19th Century
Giris Chandra Banerjee's Ghat	Tarasankar Babu's Ghat
Tara Sankar Rai Chaudhuri's Ghat	Rani Rasmani'r Ghat
Rani Rasmani's Ghat	
Sen Bahadur's Ghat	
Trikoneswar Shib's Ghat	

Table No. 7: An advertisement by the Police Department, dated 10th March, 1781, recorded the following charges for hiring boats.

(Harisadhan Mukharjee, *Kolikata Sekaler O Ekaler*, Calcutta 1915. p. 652.)

Destination (from Calcutta)	**Time**	**Kinds of Moats and Budgerows**	**Daily Charge (in Sicca Rupees)**
Berhampore	20 days	8 Oars	2
Moorshedabad	25 "	10 "	2.10
Rajmahal	31 "	12 "	3.10
Monghyr	45 "	14 "	5
Patna	60 "	16 "	6
Benaras	75 "	18 "	6.10
Cawnpore	90 "	20 "	7
Faizabad	105 "	72 "	7.10
Maldah	31 "	24 "	8
Rangpore	52 "	Loaded Vessel	
Dacca	37 "	250 Maunds	29
Laxmipore	45 "	300 "	34
Chittagong	60 "	400 "	40
Goalpara	75 "	500 "	50.10

Table No. 8: A list of *dawk* routes and charges over the Ganges.

(Harisadhan Mukharjee, *Kolikata Sekaler O Ekaler*, Calcutta 1915. p. 649.)

From Calcutta	Charge	From Calcutta	Charge
Chandernagore/ Ghiretti,	24.10	Rajmahal	257
Chinsura, Hooghly	46. 1	Bhagalpore	354
Bansberriah, Mirzapur	76	Monghyr	406
Berhampore	159.10	Patna	540
Kalkapore	"	Bankipore	"
Maidapore	"	Danapore	553.10
Cossimbazar	159.10	Buxar	664
Moorshedabad	"	Benaras	764
Mooradbag	"		
Suttee	208		

Table No. 9: The articles of trade that were carried over the waterways to and from Calcutta around 1836 are listed below.

(A. K. Ray, *A Short History of Calcutta: Town and Suburbs, Census of India, 1901; Vol. VII, Part I*, First Published 1901; Rddhi Edition, Calcutta 1982. p. 263.)

Exports	Imports
Rice	Rice
Goor, sugarcane and dates	Mustard-seed, gram
Sugar	Peas, moong
Paun-leaf	Salt
Tobacco	Indigo seed
Indigo	Linseed
Cloth	Iron and Steel
Silk	Goor, sugarcane
Mats	Brass and copper utensils
Curds	Ghee
Vegetables	Spices
Fish	Cloth
Pottery	Thread
Bamboos	Coconut Oil
Straw	Brass ornaments
	Umbrellas
	Pedlars' Wares

Table No. 10: A list of 16 boats of different denominations supplied to the Police Office in Calcutta on 1st April, 1785.

(W.S. Seton-Karr, *Selections from Calcutta Gazettes, Vol. II*, Military Orphan Press, Calcutta 1865. p. 77.)

		Rs.Annas
For a Budgerow of	8 dandees, per day	2.0
	10 ditto ditto	2.8
	12 ditto ditto	3.8
	14 ditto ditto	5.0
	16 ditto ditto	6.0
	18 ditto ditto	6.8
	20 ditto ditto	7.0
	22 ditto ditto	7.8
	24 ditto ditto	8.0
For a Woollock of	4 ditto, per month	22.0
	5 ditto ditto	25.0
	6 ditto ditto	28.0
For a Boat of	250 maunds	29.0
	300 ditto (7 dandees)	34.0
	400 ditto (8 ditto)	40.0
	500 ditto (10 ditto)	50.8
To go to	Burrampore	29 days
	Moorshedabad	25 ditto
	Rajamahal	37 ½ ditto
	Mongheer	15 ditto
	Patna	60 ditto
	Benaras	75 ditto
	Cawnpore	90 ditto

	Fyzabad	105 ditto
	Maldah	37 ½ ditto
	Rungpore	52 ½ ditto
	Dacca	37 ½ ditto
	Luckipore	45 ditto
	Chittagong	60 ditto
	Goalpara	75 ditto

Table No. 1: The probable demands on the Government on account of guaranteed interest in 1866-70.

(S. Settar, *Railway Construction in India: Select Documents, Volume II (1853-1873)*, ICHR 1999. p. 197.)

Years	Total Guaranteed Interest (£)	Net Receipts (£)	Moiety of Surplus Receipts Payable to Shareholders (£)	Net Receipts Retained by Govt. (£)	Net advances on Account of Guaranteed Interest (£)	Net Advances including Loss & Gain by Exchange (£)
1866	3,200,000	2,100,000	85,000	2,015,000	1,185,000	1,448,636
1867	3,550,000	2,750,000	100,000	2,650,000	900,000	1,013,636
1868	3,812,000	3,200,000	215,000	2,985,000	827,000	763,364
1869	3,962,000	3,700,000	400,000	3,300,000	662,000	416,545
1870	4,035,000	4,000,000	500,000	3,500,000	535,000	216,819

Table No. 2: George Turnbull's summary of the tender received for the Howrah-Pandua line, dated 6th of August 1850.

(S. Settar ed. *Railway Construction in India: Select Documents, Volume II (1853-1873)*, ICHR 1999. p. 444.)

	Rupees
Tender A	2,870,171
" B	4,071,500
" C	5,153,341
" D	2,269,650
" E	2,445,647
" F	2,174,933

Table No. 3: The proposed construction of the Harrison Road in three stretches in 1880.

(Atis Dasgupta (ed.), *Select Documents on Calcutta: 1800-1900)*, Directorate of State Archives, Govt. of West Bengal, 2011. p. 131.)

Section of Roadway	**Estimated Cost (Rs)**		
	Of entire premises to be acquired	Deduct estimated price to be realized from surplus lands resold	Net Cost (Rs)
From Strand Road to Chitpore Road	19,00,000	12,00,000	7,00,000
" Chitpore Road to College Street	9,00,000	8,00,000	1,00,000
" College Street to Sealdah	6,50,000	4,30,000	2,20,000
Total	34,50,000	24,30,000	10,20,000

Table No. 4: The number of Europeans employed by the Railway Companies in India over a period of 11 years (1859-1869).

(S. Settar ed. *Railway Construction in India: Select Documents, Volume II (1853-1873)*, ICHR 1999. p. 126. Dated 12 March 1860.)

Year	East Indian	Great Indian Penin-sula	Madras	Sind	Punjab	Indus Flotilla	Bombay, Baroda and Central	Eastern Bengal	Great Southern India	Calcutta and South-Eastern
	No. of Staff	No. of Staff	No. of Staff	No. of Staff	No. of Staff	No. of Staff	No. of Staff	No. of Staff	No. of Staff	No. of Staff
1859	8	11	-	-	-	-	-	-	-	-
1860	12	11	-	-	-	-	-	-	-	-
1861	20	10	-	-	-	-	-	-	-	-
1862	67	21	11	-	-	-	14	-	-	-
1863	130	44	25	-	-	-	14	-	-	-
1864	165	51	57	7	-	-	28	-	-	-
1865	167	60	84	18	7	-	35	-	-	-
1866	197	111	107	35	7	-	53	-	-	-
1867	104	135	218	40	32	2	82	13	-	-
1868	104	135	218	40	32	2	82	13	-	-
1869	326	212	128	45	28	131	22	18	-	-