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Founding Empire: James Rennell and the Eighteenth-Century Survey of British Bengal

Baijayanti Chatterjee

1 There is a general assumption among scholars that cartography and surveying were essentially western innovations introduced into India with colonial expansion. It has been argued that in the ancient Indian languages there was no contemporary equivalent for the English word "map" and map-making was therefore either covered by the word *Chitra* (painting) or it did not exist at all (Madan 134). Western scholars like Leo Bagrow have expressed the view that "India had no cartography to speak of" since religious and caste-bound disputes inhibited the growth of empirical knowledge in the subcontinent (Bagrow 207). Refuting Bagrow's views other scholars have opined that the notion of the absence of cartography in the South Asian context rests on a too narrow definition of maps. Brian Harley points out that geographical maps "are but one aspect of the wider discourse of maps which extends to embrace other genres such as cosmological and celestial representations and maps of fictional areas" (Harley 142). Schwartzberg argues that cartographic works that did not resemble known European models elicited little or no interest from western scholars and were viewed as beyond the pale of cartographic research. This was particularly the case with South-Asian cosmographies (Schwartzberg 504). While these cosmographies provided a "wider vision" of the world, cartography, measurement and surveys in the geographical sense were not altogether unknown in the Indian subcontinent. Susan Gole's recent survey has unearthed about 200 Indian maps and plans prior to the advent of European surveys which encompass pilgrimage maps of religious towns, route maps of important highways, military plans as well as topographical maps of whole provinces (Gole, *Indian Maps* 14).

2 It may be pertinent to point out here that surveys like mapping did not originate with colonial conquest. In the Mughal era, detailed inventories of territorial possessions were maintained as demonstrated in Abul Fazl's "Account of the Twelve *Subahs*" in the

imperial gazetteer *Ain-i-Akbari* (129). Based on this detailed indigenous source Col. Jean Baptiste-Joseph Gentil prepared his map of India in the European style around 1770 (Gole, *Maps of Mughal India* 3). Another Persian source – the *Chahar Gulshan* or "Four Gardens" gives a short history of India with descriptions and statistics of several provinces. The text also contains a "road-book" showing the stages on the roads leading from Delhi to the different chief towns of India (Sarkar xviii.). In a seminal paper on circulation and the emergence of modern mapping in Britain and early colonial India, Kapil Raj has argued that far from being a "geographical tabula rasa," terrestrial surveying, measuring and representation were common in South Asia (Raj 35). What was unique about the colonial encounter, however, was the large-scale utilization of maps and surveys as tools for empire and imperial expansion in the eighteenth century.

3 In Europe the rise of bureaucratic states and modern scientific practices during the Enlightenment era resulted in the proliferation of maps in the continent between 1650 and 1800. The creation of new kinds of map during this period indicated that "the producers and consumers of maps shared in the great intellectual and social changes that were then transforming Europe" (Edney & Pedley 23). The value of detailed topographical mapping of countries was also appreciated by administrators. For Napoleonic France, mapping became a prime instrument of administration, conquest and control (Thrower 114). Maps were also utilized for nationalist ends as cartography became associated with the assertion of national unity at the cost of internal diversity and for the purpose of the declaration of a state's territorial ambitions vis-à-vis another (Wintle 271). But some of the most important cartographic developments, as Norman J. W. Thrower points out, were to take place in areas away from the main population centres of north-western Europe, in regions where there were fewer restraints (Thrower 116). Surveys became particularly crucial to the governments in the newly established European colonies. As Matthew Edney very pithily puts it "to govern territories, one must know them" (Edney 1).

4 This paper argues that the East India Company's territorial expansion and the consolidation of its political authority in Bengal were sustained and bolstered by extensive surveys and mapping of a newly acquired and uncharted territory. In this sense the mid-eighteenth century colonial transition could perhaps be characterized as a "cartographic watershed." Although sixteenth-century Europe had seen some significant manuscript narratives of India from Portuguese and Spanish writers, yet until the eighteenth century geographical knowledge regarding India was largely based on tradition and tales of mariners and travellers who "in the absence of a more sure foundation [...] borrowed one from the other" their narration acquiring "variation and detail as fancy directed" (Phillimore, *Records* 1). It was political conquest however that first created the opportunity for any regular and extensive survey of Indian territories. In the mid-eighteenth century the political situation in Bengal alone was favourable for an extensive survey (Phillimore, *Records* 3). In 1765, when the English East India Company acquired revenue-rights in Bengal, James Rennell, began the survey of Bengal on the European model. Triangulation was initiated in Madras in 1802, which led to the Great Trigonometrical Survey of India begun by William Lambton and completed in 1843 by Sir George Everest. This paper attempts to underscore the long-term reciprocal relationship between political conquest, mapping and surveys in the late eighteenth century. While imperialism created the ideal conditions for the accumulation of geographical information, surveys and cartographic knowledge in turn helped "cement

imperial power" (Chester 258). In the domain of statecraft, post-modernist thought views maps as instruments of power/knowledge and emphasises on the profitability of the geographical discourse for apparatuses of power (Foucault 74-75). Brian Harley argues that the surveyor is much like the historian. Just as the historian "paints the landscape of the past in the colours of the present" the surveyor "replicates not just the 'environment' in some abstract sense but equally the territorial imperatives of a particular political system." Maps are thus conceptualized by Harley as "weapons of imperialism" as much as guns and warships (Harley 132). Military maps were crucial to the army and the soldier as much as cadastral or estate maps were valuable to the state as a "graphic inventory," or "a codification of information about ownership, tenancy, rentable values, cropping practice, and agricultural potential." In the Foucauldian sense, surveys and mapping could very well be conceptualized as a form of surveillance by the state. In the colonial context, charts and maps of overseas areas sponsored by trading companies in the eighteenth century were often tantamount "to claiming these areas through 'superior delineation' and 'by imposition of place names of European origin" (Thrower 124).

Maps in the Era of European Rivalry

5 In the case of India, a major reason for the proliferation of maps in the mid-eighteenth century was the fact that the region had been transformed into a theatre of war between the French and the English East India Companies. D'Anville, the French cartographer in a preface to his work acknowledged that he would never have drawn the map of India had not "His Majesty's commissaries of the East India Company done me the honour to request it." Although D'Anville admits to the limitations of his map of India and hopes that it "may but prove the ground work of another more accurate and compleat [sic] one" yet with regard to Bengal D'Anville's major contribution was in filling up a vacant space in the map from the Hughli to the sea (D'Anville 30). For his map of India, published in 1752, D'Anville used a number of source books like Ptolemy's work, European travelogues, works of Jesuit Fathers as well as a an Indian geographical text in Tamil which he called Puwanasaccarum (Mukherjee 67). Accurate charts of the Bengal coast were also obtained from the survey of French navigator d'Après de Mannevilette, who published his maritime atlas *Neptune Orientale*, in 1745 (Phillimore *Historical Records* vol. 1, 14). Despite the Anglo-French rivalry over the future of the Indian empire, at an international level, Anglo-French information circulated, as Lucy P. Chester has demonstrated, "in both directions" (Chester 267). Rennell benefited from works of French cartographers like D'Anville and d'Après de Mannevilette while his own work was translated into French and published in Paris *as Recueil de Cartes Géographiques pour la Description de l'Indostan.* In his capacity as Writer and historian to the Company, Robert Orme showed particular interest in Indian cartography and was in regular correspondence with Anquetil du Perron in Paris (Gole, *Indian Maps* 7). Yet the war-time hostility inhibited to an extent the free exchange of knowledge. In the 1760s, as the Chittagong coastline was being surveyed and harbours discovered the Directors of the East India Company desired to keep their surveying activities a secret from all rival European nations (Phillimore, *Historical Records* vol. 1, 15). Geographical knowledge being considered valuable its free dissemination was sought to be restricted. R. H. Phillimore described these early years of European rivalry as times when "the secrets of the face of the land were as jealously guarded as those of the atom bomb in

these days." Geographical information was of such great value that "it had to be kept secret from all possible adversaries, and even the art of survey was not to be taught except to the Company's own trusted servants (Phillimore, *Historical Records* vol. 2, xv).

Early British Surveys

6 Meanwhile with political conquest and territorial acquisitions in India, London encouraged the East India Company to survey its new possessions in the districts of 24 Parganas, Burdwan, Midnapore and Chittagong in Bengal. But there was a lack of skilled and enterprising surveyors experienced in terrestrial surveying. After the recapture of Calcutta and the acquisition of the 24 parganas, one of the first measures was to have it surveyed. But there being no competent surveyors the Government applied to Admiral Watson. The latter however replied that as surveying was "a work requiring so much care and exactness, I know none in the squadron capable of it." Eventually, a Mr. Frankland was appointed and embarked on a five months' survey tour, in which he collected much valuable information (Phillimore, *Historical Records* vol.1, 13). Surveys during this early period were generally carried out with a threefold objective: first, to ascertain the extent of the land and the value of their revenues; second, to ensure the safety and regularity of communication both by sea and river and third, to defend the passes of the western frontiers of Bengal (Phillimore, *Historical Records* vol. 1, 1). With these aims in view the following early surveys were carried out by the officials of the East India Company on its immediate acquisition of territories in Bengal.

Table 1: Early Surveys of the English East India Company

Year	*Surveyor*	*Area Surveyed*
1758	William Frankland and later Robert Barker	24 Parganas
1761	Batholemew Plaisted	Survey of the River and Coasts near Chittagong
1761	Hugh Cameron	Survey of the 24 parganas
1765	De Gloss	Survey of Burdwan District
1765	Plaisted	Survey of River Meghna
1766	Plaisted	Balasore and Channel Creek

R. H. Phillimore, *Historical Records of the Survey of India: Eighteenth Century*, vol. 1, (Dehra Dun, 1945) and *The Oriental Navigator* (Fleet Street, 1801).

7 These early British surveys were far from being thoroughly accurate or complete. Even after Plaisted's survey of the coastline of Bengal, many dangers remained near the coasts that had not been "described with sufficient precision for the security of navigation" (Phillimore Historical Records vol. 1, 15). The instruments of the surveyors consisted of the Hadley's Quadrant used for determining latitude, while longitude was fixed with any degree of accuracy only after 1761 with the use of the chronometer (Gole, *Indian Maps* 71). In 1760 Rennell wrote that a quadrant and the book entitled the East India Pilot would together cost him £ 3-10-0 (Phillimore Historical Records vol. 1,

200). Distance was measured by chains and the perambulator which was "a small wheel attached to a handle which marked up each mile as it was wheeled along." The length thus traversed was then "adjusted for twists and turns in route" and rough estimate of distance travelled obtained (Gole, *Indian Maps* 70). The price of a perambulator in 1787 was Rs. 130 (Phillimore, Historical Records vol. 1, 199). Besides these equipments, a pocket compass was carried by most officers and surveyors.

8 The East India Company's parsimony in purchasing good surveying instruments continued to plague the Company's surveyors well into the nineteenth century. Back in 1768 the survey with its expenditure between 5,000 to 10,000 rupees monthly "called forth a remonstrance of the Court" (Long 1). Equipments for a government expedition in the late eighteenth century could be procured only by "borrowing a sextant here, a watch there, and a quadrant in another quarter, from different officers at Calcutta who happened to possess them." Markham mentions an instance where Reuben Burrow, in starting upon a Government survey, had to borrow his tools, and complained that among them was a "wretched quadrant" from Captain Ritchie. This was described by Markham as "an instrument as Bruce took with him to Abyssinia, which it required four men to carry." Colonel Hodgson, during his surveys, also had instruments and books of his own to the value of Rs. 13,000, and nothing belonging to the Government. As Surveyor General, he considered this to be a better system than the method of supplying instruments by contract for these generally proved to be of bad quality and "were not such as a good observer would consent to use" (Markham 139).

9 Another source of cartographic error before Rennell's time was the fact that the longitude of a place was determined by using the prime meridian of either Paris or Greenwich. Greenwich's position as 0° baseline was the result of the International Meridian Conference held in Washington DC in October-November 1884. Prior to that period, European countries, from what Edward Gibbon termed as their "absurd vanity" (Withers 26) used different prime meridians in each country. This practice obviously complicated the calculation of longitudes. Irfan Habib argues that since it was difficult to fix the longitude of countries in Asia in reference to so distant a line in Paris or Greenwich, "map-makers accepted degrees of longitude worked out by different observers for the different cities on the basis of assumptions of different longitudes (east of the prime meridian in Europe)" (Habib "Foreword" in Gole, *Early Maps* 11) This implied that "a particular longitude for a place might continue to be accepted, while the point in relation to which this had been determined might be assigned a fresh one." Habib suggests that if the surveyors had accepted a place in India for fixing 0° longitude it would have been much easier to determine longitudes of places in relation to the place on the prime meridian. For his Bengal Atlas, Rennell however took as his prime meridian the longitude of Calcutta which ensured the greater accuracy of his maps (Habib in Gole 11). With Rennell, "the founder of scientific geography in India," thus begins a new phase in the history of colonial cartography, one with which the subsequent sections will attempt to engage.

The Era of James Rennell

10 Major James Rennell (1742-1830), became Surveyor-General of Bengal in April 1764, and Surveyor-General of India on 1st January 1767. Sir Edward Thackeray in his *Biographical Notices of the Royal (Bengal) Engineers*, describes James Rennell as "a unique figure," "a

calm disinterested man of science" "among his eager fortune-seeking countrymen" (Thackeray 16). Yet Rennell himself does not claim to be an objective pursuer of scientific geography, but as surveyor to the Company's possessions in India, he, himself was an avid supporter of the East India Company's "splendid territorial aggrandizement" (Edney 12). In his Map of Hindustan, of 1782, the cartouche depicts the British nation asserting itself over its burgeoning empire in the figure of the lion dominating the globe and the figure of the female warrior Britannia is also depicted as receiving, the sacred books of the Hindus, presented by the Pundits, or Learned Brahmins which is an probably an allusion to the benevolent British indulgence for the customary laws and practices of the natives. Britannia is also seen as standing on a pedestal, in which British military victories are engraven. Ships are seen sailing in the background asserting British dominance over the seas. Michael Wintle has argued that in mapping the colonised parts of the world, a process of othering and creation of national identity was also involved. In India, Britain's cartographic activities in the eighteenth century not only bolstered imperial administration and control, but "they also asserted the national identity by imposing order and science on the unruly Indian landscape, replete with symbols of British national identity" (Wintle 278). Chester further argues that under Rennell the tradition of colouring maps "became more than an aesthetic addition and took on imperial significance." In nineteenth and twentieth century imperial maps, red was used as a code for British imperial hegemony. According to Chester, Rennell may well have begun this tradition of denoting British imperial possessions in red. For all these reasons the era of James Rennell may be distinguished from the period of early British surveys.

Hydrographical Surveys in the Bengal Waterscape

11 In Europe, after 1750 there was a burgeoning interest in coastal mapping and modern hydrography (Edney 110). The rise of marine trade, marine warfare and growth in overseas empires probably accounted for this growing interest. Young Rennell had served in the Navy between 1756 and 1763 and his training as a naval officer probably imbued him with patriotic sentiments as well as his love for geography. While in the navy, Rennell had engaged primarily in Marine Surveying which was reflected in his work on the rivers of Bengal (Hirst and Ascoli 3). His first task in Bengal was to survey the River Ganges to find a waterway for up-country traffic from Calcutta that would be navigable throughout the year (Phillimore *Historical Records* vol. 1, 2). Rennell considered the great rivers of the Ganga-Brahmaputra delta as "keys" to the geography of the country. Hence, "year after year...he studied the great river-systems [...] watched their behaviour in the mighty floods of each rainy season, measured the new silt islands which they deposited, and mapped out their altered courses in the dry weather, until he wrested from them their secrets as land-makers and land-destroyers [...]" (Thackeray 16).

12 It was no accident that the headquarters of the Surveyor-General were at Dacca (Thackeray 13). Dacca was located at a convenient central position from the point of view of the Surveyor and was also surrounded by a perfect network of fluvial highways, the city itself being situated on the banks of the River Buriganga. From April 1764 to December 1765, Rennell completed a detailed survey of the Ganges from the Jalangi to the sea and of the Brahmaputra from the sea to more than 20 miles above Goalpara, in

addition to several other tributary rivers streams (Phillimore, *Historical Records* vol. 1, 20). Rennell found that the Ganga-Brahmaputra rivers together with their numerous branches and adjuncts intersected Bengal in such a manner as to form the "most compleat [sic] and easy inland navigation" that was most conducive to trade and commerce. In a letter dated 15th March 1772, Rennell writes:

> I send inclosed [sic] a small Map of our Territories, divided into Supravisorships, according to the present Mode of collecting the Revenues. [...] Besides the Maps there are compleat Tables of Roads, and Directions for navigating the Rivers. All the Rivers in the Plan that have no Lines drawn across them [...] are navigable. By this you may judge how finely the Country is adapted to inland Trade. (Cook 159)

13 In his Atlas of Bengal, Rennell described in all 510 water routes (Hirst 3). In his map of inland navigation, Rennell used separate symbols for rivers that were perennially navigable and those which were only navigable during the rains. Certain rivers were also indicated as tidal where the tides were an active agent in navigation. From all this there is little doubt that Rennell's hydrographical surveys were inspired by the commercial interests of the East India Company and was an instance of what has been distinguished as colonial or "imperial mapping." Mathew Edney argues that states and empires engaged in similar methods of cartography. But the crucial difference between "state mapping" and "imperial mapping" lay in the fact that while the former entailed "a dialogue [...] among people with a stake in the subject of mapping" the imperial map of a territory, "was not made for the benefit of the territory's inhabitants" but for a "knowing empowered and imperial audience" (Akerman 6). Rennell's hydrographical surveys, intended to increase the Company's commercial prospects was thus a case of imperial mapping par excellence.

Route Surveys by Rennell

14 Like his hydrographical surveys Rennell's "route surveys" in Bengal were equally extensive and made to cater to the politico-military needs of the East India Company. The route surveys were distinguished by the fact that their "immediate purpose was the survey of the marches of a body of troops or a political mission, rather than the complete survey of a particular area or boundary" (Phillimore, *Historical Records* vol. 1, 27). In a letter dated August 1765, Rennell writes that he had been "constantly employed in surveying the Country," so that his "new Map of Bengall begins to make a figure," and that in course of his expeditions he was in sight of the Tartarian Mountains [Himalayas] (Cook 159). In 1765 on the request of Clive another officer – Ensign W. Richards was appointed to the survey of Bengal as Rennell's assistant. Rennell and Richards set out "to survey the countries between the Bonaash River (Manas R.) and Rangamatty (Rangamati)." On entering "the Boutan Countrey" however they found the natives hostile to their progress. They surveyed "a line across the north of Rangpur district" and went so far to the westward as Purnia and Morung. In a letter dated 30 August 1766, Rennell again writes:

> I have within this Month past formed a Map of part of Bengal for Lord Clive. It reaches from 21°30' to 27°North Latitude and from 88° to 94° East Longitude, on a scale of three inches to a degree...I imagine Lord Clive will publish it [...] for the old Maps are shocking. (Cook 158)

15 In addition to the inadequacies of the old maps, Rennell in making his route surveys was further confronted with significant problems of measurement. The Indian itinerary

measure called the *coss* varied "depending on what was fixed as the length of coss by the different emperors." Hence, "unless all the measures of the different regions were reduced to a uniform standard it was not possible to figure out the relative size of each of the regions." Rennell however believed the problem to be something not unique to India for "the miles" he observed varied "much more in their proportions, in the different parts of Europe" (Kalpagam 88).

16 In 1767, Rennell was appointed Surveyor General of India, with the rank of Captain, and a salary of Rs. 300 per month "in consideration of his merit and the labour of that employ." Justifying the high salary granted to Rennell the Bengal Council wrote to the Court of Directors on the risks undertaken by surveyors in venturing into areas previously unexplored and underscored the significance of surveys "both in military operations" and in "coming at a true knowledge of the value of the Company's possessions" (La Touche 2). In 1778, Rennell's *Book of Roads* in Bengal and Bihar was printed as a useful guide for the Company's servants. The book gave a description of roads radiating from the four principal cities of Calcutta, Murshidabad, Patna and Dacca together with their distances, names of rivers and *nullahs* to be crossed as well as an account of even the fords and ferries. It was thus a perfect panopticist guide, for the Company's servants of an unknown land where trusted informants were not readily to be secured or often found to turn hostile (Rennell, *A Description* i).

Surveys of Frontier Tracts

17 Rennell's other significant contribution was the survey and mapping of Bengal's hitherto unexplored frontier tracts. Since the grant of *Diwani* (the revenue-collecting rights over Bengal, Bihar and Orissa) the Company was becoming increasingly anxious for the protection of its western frontiers so that Captain Huygens was instructed "to examine the several passes into the province from the Hills of Tilliagurry, quite down to Midnapore." Rennell also prepared a map of the jungleterry districts which was published as early as 1779 (McPherson 9). The jungleterry denoted a tract of low forest land in the districts of Curruckpoor (Kharakpur), "Bauglepoor", Colgong, Birbhum and "Guidore" (Wilson 231) that was considered as inaccessible and unknown. According to Hastings' 1774 minute it served as "a receptacle for robbers" (McPherson 27). The Mughals had never explored nor subdued this tract of country and around 1765, road communication between Bengal and Bihar by way of the Sakrigali and Teliagarhi passes was seriously interrupted, on account of the raids made by the mountaineers. Even navigation on the Ganges was interrupted, for it was "unsafe for boats to moor at night on the river banks." The administration of this frontier district was first placed in the hands of Captain Brooke and then in the hands of Captain Browne between the years 1772 and 1779. Rennell's map of this region was the most valuable index to the condition of the country in the first years of British administration. The map of the Jungleterry as administered by Captains Brooke and Browne had been marked with a thick blackline thus isolating the Company's possessions in the settled areas of Bengal from the mountainous and forested tracts.

18 As in the turbulent western frontier, the services of the surveyor were also requisitioned in the fluid eastern frontier. In 1774, at the request of Richard Barwell, Rennell reported on the condition of the Khasi-Jaintia territory to the north-east of the district of Sylhet, although it does not seem likely that Rennell penetrated very deep

into these parts, for the Khasi country in general, and its western parts in particular, are described by Rennell as "woody and almost impenetrable" (West Bengal State Archives/ Provincial Council of Revenue Dacca/ 21st February to 1st September 1774, 8th February 1774). Of the Garo Hills to the west and of Tripura to the east Rennell possessed no knowledge (Phillimore, *Historical Records* vol. 1, 83).The relationship between surveys, mapping, and political authority is most clearly borne out in case of the frontier tracts of Bengal. In these mountainous and forested tracts where surveyors found it difficult to penetrate owing to geographical obstacles political authority continued to be fractured. For "the map," as Bernhard Klein points out, was expected "to create the image of a rebel free landscape, a plane space subject to the imperial gaze." "Pre cartography" by contrast had the rebel roaming free, the wild and unconquered terrain (Klein *Maps and the Writing of Space*, cited in Mukherjee 69). In this context our next section would attempt to assess the limits to the Company's cartographic vision and its ability to 'discipline' the Indian landscape within the scope of maps (Edney 334) and surveys.

Conflict and Negotiation at the Local Levels

19 We have already noted that maps and surveys were not essentially new in the Indian subcontinent though their deployment on a large scale for imperial aggrandizement may have been an eighteenth century innovation. James Rennell himself acknowledges the assistance he derived from a Persian manuscript map of the Punjab "that was drawn by a native and preserved in the archives of the government in Hindoostan." The Persian names of this map were translated by one Major Davy and the map gave a good account of the tract included in the whole *soubah* (province) of Lahore and a great part of Multan proper conveying "a distinct general idea of the courses and names of the five rivers." With the assistance of this map, Rennell acknowledges to have been "enabled to give the road from Wizierabad [...] through the Retchna Doabah" (Phillimore, *Historical Records* vol. 1, 111-114).

20 That the value of maps and surveys in establishing political authority was well understood by Indian political powers is evident from the resistance that the East India Company encountered in implementing its first surveys. Between 1770 and 1775 several unsuccessful attempts were made to persuade the Nawab of the Carnatic to allow a general survey to be carried out over the whole of his dominions. The English argued with the Nawab that an accurate survey of his dominions would greatly facilitate the operations of the English armies in his service, but the Nawab declined to give his permission to the undertaking on the pretext that a survey of his territories would cause "a diminution of his dignity and honour in the eyes of the neighbouring powers and foreigners" (Phillimore, *Historical Records* vol. 1, 3). Even though in Bengal, the political context was favourable for extensive surveys the surveyors still faced difficulties in gathering information and intelligence from the local populations. In 1774, after completing a series of provincial maps of Bengal Rennell lamented:

> I will not pretend to say that every particular part of these Maps is perfectly accurate [...] [for there is] the difficulty of securing Intelligence of any kind; as has often happened in places where the natives either through fear desert their habitations, or through obstinacy refuse their assistance. (Phillimore, *Historical Records* vol. 1, 33-34)

21 There thus remained a wide gap between the ideology and practices of mapping in early colonial India. As Matthew Edney argues there was a "multilayered conflict between the desire and the ability to implement the perfect panopticist survey, between what the British persistently thought they had accomplished and the hybrid cartographic image of India which they actually constructed [...]." The complexity of the situation was summed up by Robert Kelly in 1782 thus:

> In the course of nine or ten years service on the Coast, I could not avoid observing the many bad consequences which arose from the want of accurate Maps of the country [...] an officer's sole dependence [...] was necessarily placed on his *Hircarahs*, a race of designing knaves, whose Ignorance of the Country, Treachery, or Cowardice in the time of danger, had often caused the miscarriage of the best planned expeditions. (Phillimore, *Historical Records* vol. 1, 241)

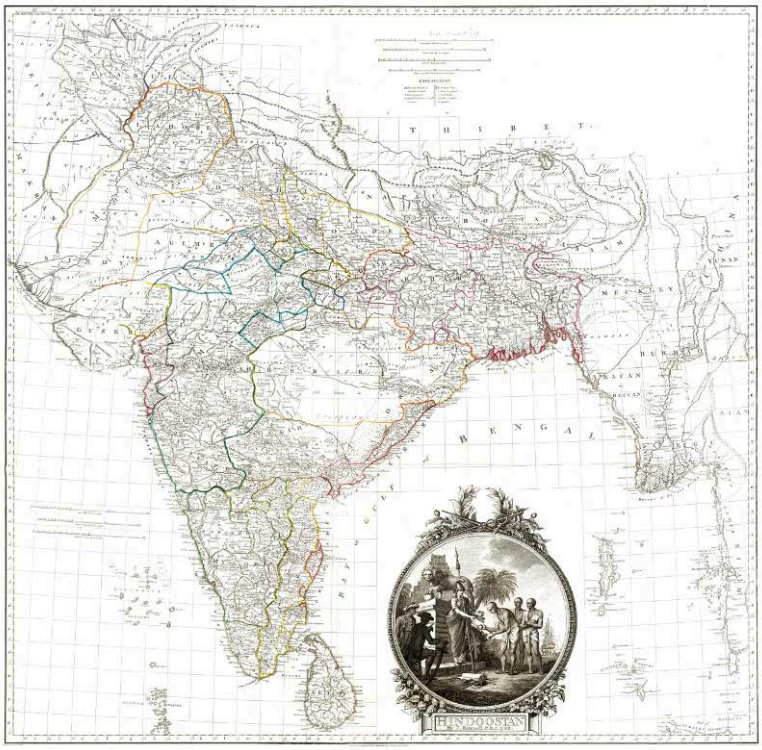
22 It was on account of the difficulty of gathering intelligence and information that by the turn of the century native surveyors and informants were increasingly relied on by the Company. The native informants were known as *harkaras* who were employed to collect information on specific routes. Sometime later, the matter was officially put forth by the surveyor general before the government, when he asserted that the native surveyors worked hard for small pay and could penetrate into parts of the country inaccessible to Europeans (Phillimore, *Historical Records* vol. 2, 353). Despite official distrust therefore, natives continued to be enlisted by surveyors for special purposes. In 1794 the first Surveying School was started by Michael Topping at Guindy (Madras). In Bengal, Mathematics and trigonometry were also made part of the curriculum of the Hindu College, Calcutta and the Calcutta *Madrassa* (Sangwan 213). In 1839, the Governor General in fact is said to have expressed his genuine gratification "at the number of native youths" who were "qualifying themselves [...] for useful and distinguished employment in every department under the Government" (National Archives of India, Letters to the Court of Directors 1839). In the field of survey, the qualifications and merits of a native youth named Radhanath Sickdar, sub-assistant to the great Trigonometrical Survey deserves mention. Radhanath's great ambition was to be a Deputy Collector under the East India Company government but official records and correspondence indicate that the young man had proved himself so indispensible to the survey department that the surveyor general proposed to raise his salary to that of a Deputy Collector in order to secure his continuance under the survey department (National Archives of India, Letters to the Court of Directors 1839). Thus with the turn of the century surveys and cartography seem to have become a major collaborative enterprise between Europeans and natives under the British Government. As Ronald Robinson would argue it was this "collaborative mechanism" which was crucial to establishing European authority over large parts of the world both economically and without the aid of massive numbers of troops (Robinson 117-40).

*

23 This paper has been concerned with the cartographic encounter between Europe and India in the mid-eighteenth century. In this context the paper has attempted to disprove any pre-existing notions of absence of surveying and cartography in India. Moving away from a Eurocentric perspective of colonial cartography as "a majestic imposition of an imperial vision" (Foliard 266) this paper has attempted to examine it as a process involving both contestation and negotiation. It is surprising that despite

the "recognized significance" of maps and surveys in bolstering political authority in the colonies "the material cultures of European colonial cartography in former overseas territories and dominions around the globe" has remained "undervalued and overlooked" by many historians of cartography (Lilley 150). This paper has attempted to address this historiographical lacuna through the study of the cartographic endeavours of the East India Company in eighteenth century Bengal. In this respect the paper has focussed on the efforts of Major James Rennell in laying the foundations of British authority in Bengal by means of his extensive surveys. As a "conceptual unifier of geographical knowledge" Rennell's maps were eclectic in character drawing from both indigenous and European sources (Mukherjee 74). His *Bengal Atlas* (1780) was the chief publication to result from his Bengal map-making which was followed by the first approximately correct map of India, with a Memoir containing a full account of the plan on which the map was executed. Although maps and surveys were not essentially new in India yet under British colonial administration, cartography acquired a new scale and importance, extending to the whole subcontinent (Kalpagam 87-98; Virmani 108). James Rennell's cartographic surveys were a decisive turning point in this regard. Although obliged to leave India in 1777 on account of ill-health, Rennell blazed a trail which others followed eagerly (Sandes 186). Markham observes that the labours of Rennell and his school were not only useful at the time but they also served as incitements to encourage a generation of Company's surveyors and cartographers. From Rennell and his four assistants in the eighteenth-century seem to have sprung up the vast edifice of the "Survey of India," which later came to employ nearly 150 Europeans besides a large army of native Surveyors (La Touche 2). Despite infrastructural constraints as described in this paper, Rennell's surveys were found to be tolerably accurate. At the turn of the century triangulation and detailed topographical surveys inaugurated a new phase in colonial cartography but the era of James Rennell had its own lasting significance.

Fig. 1. Map *of Hindoostan*, 1782 by James Rennell



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ABSTRACTS

This essay attempts to analyse the impact of the colonial transition (i.e. the mid-eighteenth century political transformation from Mughal to East India Company administration) on cartographic traditions existing in India. Specifically, the essay focuses on French and the early British mapping of Bengal as a result of colonisation and imperial expansion in the mid-eighteenth century. Rather than viewing colonial map-making as a "unidirectional exercise" of authority, this essay focuses on the dynamic interaction and negotiation between indigenous and colonial cartography. It analyses the efforts of Major James Rennell and the Surveyors of the East India Company to establish their political authority in Bengal using surveys and mapping as tools for imperial expansion. The trials and tribulations of these early surveyors form the subject matter of this essay.

Cet article tente d'analyser l'impact de la transition coloniale (à savoir, le transfert du pouvoir qui eut lieu au milieu du XVIII^{e} siècle entre l'empire Moghol et l'administration de l'East India Company) sur les traditions cartographiques de l'Inde. Plus précisément, l'article se concentre sur les cartographies française et britannique du Bengal qui accompagnèrent la colonisation et l'expansion impérialistes du milieu du XVIII^{e} siècle. Plutôt que d'envisager la cartographie coloniale comme un « exercice unidirectionnel » d'autorité, cet article s'intéresse à l'interaction

et à la négociation dynamiques entre les cartographies indigène et coloniale. Il analyse les efforts déployés par le Major James Rennell et les cartographes de l'East India Company en vue de l'établissement de leur autorité politique au Bengal, grâce à l'usage de la cartographie comme instrument d'expansion coloniale. Les épreuves et les tribulations qu'on connues ces cartographes constituent le sujet de cet article.

INDEX

Mots-clés: Bengal, dix-huitième siècle, relevés, cartographie, East India Company
Keywords: Bengal, Eighteenth Century, Surveys, Mapping, East India Company

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