Underlying the River Brahmaputra from the *buranjis* or the royal chronicles of medieval Asom to the contemporary representations of the river in the early twenty-first century, a long history pervades the forms of knowing and understanding it. While in some cases the knowledge of the river was an outcome of the long process of productive activities that sustained and reproduced life in its Valley, in others there were conscious attempts at producing that knowledge by studying the river. The former was a part of everyday life of the people inhabiting the river valley, where knowledge in abstraction was indistinguishable from practice, while the latter signified a division of labour that necessitated the separation of theory and practice. Specialized study of the Brahmaputra can be said to have started with James Rennell's river-surveys in 1760s, and have continued till the present. What was a subject of a single discipline of study —cartography— in that period, made way for diversified and specialised branches of knowledge such as geography, geology, geomorphology, geophysics, hydrology, meteorology, etc. during the two and a half centuries that followed. This chapter seeks to recover some of the references to Asom's physical environs in the medieval period, while also discussing the
studies undertaken to produce knowledge about the Brahmaputra river system in the late eighteenth, nineteenth and early twentieth centuries. The study of the Brahmaputra and its various facets by the colonial state in the first half of the twentieth century and subsequently by the Indian state is a theme that has been looked into in the following chapters.

A predominantly agrarian economy was well established in large parts of the Brahmaputra Valley by the seventeenth century, on the basis of which the Ahom state consolidated its political power. Development of handicrafts and a mercantile exchange kept pace with this expansion of the agrarian frontier. Agriculture, like any other form of activity required to reproduce life, demands an intimate understanding of the factors that makes possible cultivation through a transformation of the lived environment with human labour. Much of the plains of eastern Asom were transformed from forests and low-lying inundated lands to settled agricultural fields in the medieval period. To prepare the land for cultivation, fresh ground was broken by clearing jungle, the soil was ploughed and treated, arrangements were made to retain sufficient amount of water on the fields so that the seeds could be sown or seedlings transplanted. As most of the Valley was annually inundated by the Brahmaputra and its tributaries, the fields needed to be protected from it, and embankments were constructed as the primary means of flood protection. After the harvest, the grains had to be kept safe from the damage that could be caused by the river's waters, for which granaries needed to be designed in a particular way. These were some of the practices that the peasants of the Valley were adapted to. The knowledge of the climate, the rhythm of seasons, the nature of the soil and its location, the character of the seeds, as well as the variations in water and other inputs, etc., was a part of the agricultural practices. Similarly, those who made a living off fishing in the rivers and lakes of the Valley knew the behaviour and life-cycle of their catch, the skills of catching fish with suitable application of equipments and instruments, the ways of producing and applying them, of treating the catch to make it more durable and saleable. The boat-makers knew the best trees to make boats from, the ways of treating the log before using them to carve out the boats, and the best mode of propelling them in the Valley's rivers. The people entrusted
to wash gold from the rivers likewise developed the technical know-how for undertaking such a job which required specialized skills, and particular communities—like the Sonowals—had acquired the expertise after generations of practice. Such knowledge was acquired through engagement in production, through the practice of human labour, without which no knowledge was possible.

None of this knowledge which was acquired through productive activities to reproduce life was considered to be important enough to be recorded in the written form in the medieval times. The division of mental and manual labour was by then so developed and hierarchised in medieval Asom that only the knowledge and expertise of the class of kings, military commanders and priests were considered to be worthy to be written down and passed on for circulation. It was the requirements of the British colonial empire which annexed Asom in 1826 that propelled the collection and recording of information about the people and their knowledge in a systematic manner, even though census of the population and their professions was undertaken by the Ahom state as well. Nevertheless, very little information about the forms of knowledge relating to the activities of the people engaged in physical labour—the vast majority of the eighteenth or early-nineteenth-century working population of the Valley—is recorded and is accessible today. Much of this knowledge died out with the passing away of many of these occupations, like that of the gold-washing, while others have survived over time in folk traditions and oral culture of the people. Nevertheless, we do get a glimpse of the climate, terrain, and the natural environment of Asom in the Middle Ages from the royal chronicles, travelogues and tracts on military campaigns from that period, and the manner in which the people of the region used this knowledge to bear upon the outcomes of military engagements with their foreign adversaries. Here the rivers do not remain merely a setting for historical events to unfold, but plays a crucial role in influencing their outcome.
The medieval royal chronicles, military tracts, and traveller's accounts carry references to the rivers or the events that took place on and around them, the context of which was primarily the long drawn political conflict between the Ahom and the Mughal states when the former fought to defend its independence from the aggressors from its western frontiers.

In the 'Description of Asam' by Mohammed Cazim who accompanied the invading army of the Mughal emperor Aurangzeb in the seventeenth century, the River Brahmaputra is said to divide the country of Asam into two parts. While the region on the north bank of the river was called Uttarkul, the southern bank was described as Dakshincul. The river was the main conduit for the Mughal army to enter Asom, and an important site for decisive battles. Proximity to the rivers provided better mobility and strategic advantage, and thick forest-cover and foliage provided protection from enemy predation. Therefore, even though the Uttarkul surpassed "Dakshincul in population and tillage, [but] as the latter contains a greater tract of wild forests, and places difficult to access, the rulers of Assam have chosen to reside in it for the convenience of control, and have erected the capital of the kingdom".2 Garhgaon, the city of the royal seat of the Ahoms, was at that period located across the River 'Dhonec', a principal tributary of the Brahmaputra. Also, "the Raja's palace stands upon the bank of the 'Degoo' [Dikhow], which flows through the city." Cazim informs that the Dikhow on which Garhgaon was located, was "lined on each side with houses, and there is small market, which contains no shopkeepers except sellers of betel. The reason is that it is not customary for the inhabitants to buy provisions for daily use, because they lay up a stock for themselves, which lasts them a year."3

Cazim notes that the rivers of Assam were goldmines endowed with riches, at times literally so. "Gold and silver are procured...in the whole country of Asam, by washing the sand of the rivers." For the rulers of Asom, this was one of the

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1 Henry Vansittart, tr., 'A Description of Asam by Mohammad Cazim, Translated from the Persian' Asiatic Researches, Vol. II, p.130.
2 ibid., p.131.
3 ibid., p.135
major sources of revenue.\(^4\) According to this account, approximately 12,000 to 20,000 inhabitants were employed in gold-washing at that time, and every such person was to pay, by regulation, a tax of one tola of gold a year to the royal treasury of the Ahom kings.

The terrain and the peculiarity of the environs rendered the Valley difficult to be acquired and retained by invading forces, their progress to the country being "obstructed by thick and dangerous bushes, and broad and boisterous rivers".\(^5\) Taking advantage of the terrain and a better knowledge of it, the Rajas of Asom had "curbed the ambitions, and checked the conquests of the most victorious princes of Hindustan... [W]henever an invading army has entered their territories, the Asamians have covered themselves in strong posts, and have distressed the army with stratagems, surprises, and alarms, and [also] by cutting off their provisions." In doing so, "they have declined a battle in the field, but have carried the peasants into the mountains, burnt the grain, and left the country empty." This was nothing but the practice of the principles and methods of what later came to be known as guerilla warfare, a method of war whereby weaker and smaller armies took on bigger adversaries by using the terrain to its advantage, and by avoiding frontal battles on the field, by preserving ones own army while destroying the enemy in parts over a long period of time.

By the time the rainy season had set in, and swelling flood-waters inundated the routes of retreat for the advancing enemy, the Raja's men "watched their opportunity to make excursions, and vent their rage; the famished invaders have either become their prisoners, or been put to death. In this manner powerful and numerous armies have been sunk in that whirlpool of destruction, and not a soul has escaped."\(^6\) Following the tactics of attrition rather than of conventional wars, the rulers and military generals of the armies of the region could deal heavy blows on an invading army far superior in numbers, weapons and tools of war by involving the entire able-bodied male population into the conflict. Even in such

\(^4\) ibid., p.133.
\(^5\) ibid., p.138.
\(^6\) Henry Vansittart, tr., 'A Description of Asam by Mohammad Cazim, Translated form the Persian' \textit{Asiatic Researches}, Vol. II, p.130, pp.136-137.
asymmetrical wars, the use of the terrain to the advantage of the weaker defending army made the latter victorious. The use of naval warfare to favourably influence the outcome of a battle was common, a form where the Ahom army held its forte.

The English traveller Ralph Fitch who visited the Koch kingdom in eastern Assom in the mid-sixteenth century, verified that the topography and seasons peculiar to the region was used by the defending army to its advantage. He notes, "All the country is set with bamboos or canes made sharp at both ends and driven into the earth, and they can let in the water and drown the ground above knee-deep, so that [neither] men nor horses can pass. They poison all the waters if any wars be."7 A similar portrayal of the country and its physical environment including the rivers is found in the renowned Chinese scholar Hiuen Tsiang's description, who visited the region during the reign of King of Kamarupa, Kumara Bhaskara Varman in the first half of the seventeenth century. Though he found the climate of the country "soft and temperate," the country to the east of it through which lie the route to the Szechuen Province of south-west China, a journey of two months, "the mountains and rivers present obstacles, and the pestilential air, the poisonous vapours, the fatal snakes, the destructive vegetation, all these causes of death prevail."8 The rivers and boats on them provided the more easy means of movement, as "the roads are difficult to pass, insomuch that a foot-traveller proceeds with the greatest inconvenience." In Cazim's observation, "[T]here is one road wide enough for a horse; but the beginning of it contains thick forests for about half a coss. Afterwards, there is defile, which is stony and full of water. On each side is a mountain towering to the sky."9

Niccolao Manucci, the royal physician to the court of Aurangzeb, recounts the famous story of Mir Jumlah, the Mughal military general, who was deputed to "undertake the conquest of Assam."10 The task assigned to Mir Jumlah was "to open to Aurangzeb a door for entering China. For that seemed an easy thing after

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9 ibid., p.139.
the acquisition of Assam... [W]ith it as a base they could take Pegu, and through it enter into China.” He would thereby “secure to himself immortal fame.” Aurangzeb, though might have had different ideas, for “it was the common belief that Aurangzeb ordered Mir Jumlah into Assam that he might be got rid of,” the later being a formidable political opponent to the Emperor, seeking “occasion to excite internal commotions”. Mir Jumlah was not expected to return alive from the Asom campaign, and he never did. It was so because, Manucci believes, “if it had been easy to get into, it was very difficult to get out of this country, owing to the floods, also to the ambushes laid by the natives.”

With forty thousand horsemen, and accompanying infantry, Mir Jumlah left Dhaka, and “[B]y way of the river he sent a large fleet commanded by Portuguese.” After taking the frontier post of ‘Aso’ [Hajo] between Bengal and Assam, the combined forces “marched for twenty-eight days into the territory of Assam.” The “Assamese”, on the other hand, “believed that if the fleet were destroyed it would be easy to eat up the land army. For it would suffice to block the way to supplies, and then the army would waste away.” This, to Manucci, was very easy to accomplish, as the country was mountainous and its paths very narrow. For this purpose, Manucci goes on, a very powerful Ahom fleet appeared one day, and coming down with the stream in its favour, “it looked as if it would swallow up all the Portuguese and their boats.” But the latter managed to ward them off, and the force of the current carried

the Assamese past their goal, the Portuguese meanwhile making a great din with their mortars and matchlocks. When the Assamese had passed their enemy they veered, the Portuguese fell upon them with such impetuosity that in a little [time] the whole of that fleet was destroyed, some ships sent to the bottom, some captured, and altogether great loss being inflicted on the Assamese.

“Glorious and triumphant,” Mir Jumlah believed that this victory would eventually ensure “the whole of Assam in his grasp”, though such euphoria was

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12 ibid, p.171.
short lived. He commanded his forces further eastward, and captured Garhgaon, the Ahom capital. The Rajah "retired" to the mountains "of the kingdom of Lassa"\textsuperscript{13}, and "awaited the coming of the rainy season, in which the floods cover the low ground, for which reason the cities and villages are placed upon heights." Being unable to follow the Rajah in his flight into the mountains, "Mir Jumlah continued to amuse himself in the said city." Stray skirmishes and raids against the invading forces continued meanwhile, "until the arrival of the rainy season, which also fought for [the Rajah]." The forces of the Mir started depleting, less from enemy attacks but from diseases and scarcity of food. He was eventually compelled by these adverse circumstances to undertake a forced retreat. On the way back, "[W]ith great difficulty he reached the fortress of Aso", and soon died of illness "on the 31st [of] March, 1663 at Khizarpur in Kuch Behar."\textsuperscript{14} Manucci attributed the elements of Nature to this inglorious downfall of the great Mughal army, as he concluded the narrative of the campaign by noting that "[I]t was not for want of courage nor of determination that he left to the Assamese their indigenous king, but the mountains of the interior cannot be overcome, and the seasons were against him."\textsuperscript{15}

Francois Bernier's narrative of the same event too has something to suggest about the influence of Nature's elements in foreclosing the fate of Mir Jumlah's enterprise. Once Garhgaon was occupied and the enemy dispersed, the invading forces had to face heavy downpour which fell "sooner than is customary," inundating "every spot of ground, with the exception of villages built on eminences."\textsuperscript{16} In the mean time, the Ahom Raja ordered to clear the whole country around the Emir's position of cattle and every kind of provision, so that "ere the rains ceased the army was reduced to great and urgent distress, notwithstanding the immense reaches which it had accumulated." There was a stalemate in the progress of the Mughal general, who found it equally difficult to advance or to retreat. The mountains in front presented "impracticable" barriers, while a retreat was prevented not only by the waters and deep mud, but also by

\textsuperscript{13} Bernier, Travels, p.172.
\textsuperscript{14} ibid., p.173.
\textsuperscript{15} Manucci, Storia, p.75.
\textsuperscript{16} Bernier, Travels, pp.172-173.
the acts of sabotage ordered by the Raja to break down the embankment-cum-highway which formed the road to Chamdara. The Emir therefore was forced to wait out in his camp during the whole of the rainy season, and by the time dry weather set in, his men were so dispirited by the incessant ambushes, fatigue and long privations, that he abandoned the idea of conquering "Acham".

Though the endeavour was in the end a failure for the Mughals in terms of territorial conquest, the spoils of war in boatloads were sent to Bengal by Mir Jumlah. Manucci accounts the captured boats of Asom that he saw in Dhaka, on which these were sent down the great river. These "huge boats...had extremely high poops, [which were] carved with ugly, fear-inspiring faces. Their armament was of small pieces, swivel-guns (trilhoens) and petrechos of bronze, of which the muzzles whence the ball issues were fashioned into shapes of animals- tigers, lions, dogs, elephants, and crocodiles."17

The decimation of invading armies in a land into which if one ventured, "he has not leave [sic] to return,"18 further finds mention in Cazim's narrative. He stops short of mentioning the fateful outcome of Mir Jumlah's expedition, preferring only to portray its early successes. He also finds precedence to such defeats for the Mughal army in the region in the past. "[F]ormerly, HUSAIN SHAH, a king of Bengal, undertook an expedition against Asam," and carried with him a formidable force in cavalry, infantry, and boats. The campaign started successfully. He entered the country, and erected the "standard of superiority and conquest." The Raja being unable to encounter him in the field, evacuated the plains, and retreated to the mountains. Husain Shah left his son, with a large army to keep possession of the country, and returned to Bengal. But as with Mir Jumlah, soon misfortune followed for this army too, as with the coming of the rainy season the roads were closed by the inundation encircling and trapping the camps. The Ahom army then descended from the mountains, surrounded the Shah's army, "skirmished" with them, and cut off their provisions till they were

17 Manucci, Storia, p.75.
18 Vanistart, 'A Description of Asam by Mohammed Cazim', p.137.
reduced to such straights that they were all, in a short time, either decimated or made prisoners.\textsuperscript{19}

"In the same manner," Cazim states, "MOHAMMED Shah, the son of TOGLUC Shah, who was king of several of the provinces of Hindustan", sent a well-equipped army of a hundred thousand cavalry to conquer Asom. But they were "all devoted to oblivion in that country of enchantment; and no intelligence or vestige of them remained." To avenge this disaster, enforcement was soon dispatched from Bengal, but when they came back, "they were panic-struck, and shrunk from the enterprise." Such experiences rendered "[t]he natives of Hindustan [to] consider [the people of Assam] as wizzards [sic] and magicians, and pronounce the name of that country in all their incantations and counter-charms. They say, that every person who sets his foot there, is under the influence of witchcraft, and cannot find the road to return."\textsuperscript{20}

The above narratives of war and military campaign indicate the advantages of an intimate knowledge of Nature, the merits of adaptability and acclimatisation to the terrain and its environs, and the ability to use the elements to ones favour. In this regard, the superior knowledge of the indigenous people of the Brahmaputra Valley in comparison to that of their adversaries is clearly in evidence, and with favourable social and political factors, they could repeatedly repel invasions and defend their independence. The powerful European trading companies that vied for establishing domination over the eastern markets and trade-routes from early seventeenth century onwards were only too aware of the advantages of superior knowledge of the people and places they engaged with, and spent considerable resources and energy in acquiring them.

One of the important components in unraveling the terra incognita was a better knowledge of the rivers of the East. These rivers were avenues to enter the hinterland as opposed to the oceans which were the medium of inter-continental trade, and the control of both was of crucial strategic and commercial

\textsuperscript{19} ibid., p.137.
\textsuperscript{20} ibid., p.137, emphasis added.
importance. For effective political and military control of these routes, a reliable corpus of information was to be built up, which came to be understood as those forms of standardized data that were acquired by the application of scientific methods of knowledge production. But this was not a simple matter of applying in colonies the methods of scientific and objective technique that were developed in contemporary Europe. As we shall see in the case of European attempts at ‘discovering’ the Brahmaputra, which spanned over centuries and are briefly recounted here, the drawing of a sharp line between the scientific and non-scientific forms of knowledge or for that matter between native and European knowledge was not always feasible for the colonial men of science. The triumph of the present-day imagining of the Brahmaputra shaped by maps that portray it as a single river originating in the Himalayas and emptying itself in the Bay of Bengal—which is essentially a product of the colonial pursuit of knowledge and hardly older than a century—is all pervasive today. So much so that it may sometimes lead us to ignore the fact that there were other equally powerful and socially acceptable imaginings of the river that existed in the past, and that the distinction between the scientific and the non-scientific, the objective and the subjective, was not always as sharply drawn out as it may appear today. The pursuit of scientific knowledge in the colony was deeply integrated with imperialism, which not only eclipsed other imaginings of the river in particular and of Nature in general, but was also instrumental in the domination of peoples, societies and Nature. So much so that one may be too blinded to believe that this process too had a history. To decolonise non-European science from its colonial past and its imperial present, an attempt at retelling this history may be a reasonable starting point.
The mountains presented a formidable barrier to all knowledge, and it was not until the 17th century that the first Jesuit missionaries made their adventurous journeys [across the Himalayas], endeavouring to establish mission posts in these inhospitable regions, and sending back accounts of their travels, and descriptions of the mountains, country, and people. They did not make their journeys for the sake of exploration or geography, but to carry the Gospel into the far lands.21

- R. H. Phillimore

The narratives of royal chroniclers, travellers, explorers, missionaries, mendicants, etc. of the 'Middle Ages', and also the Buranjis, the royal chronicles of the Ahom court, has much to offer towards the knowledge of the terrain, the landscape, and much of what was to be the objects of interest to the disciplines of science. They were 'discovered', studied, translated, published, and debated in journals dedicated to the study of the Orient subsequently in the colonial period. They were part of a desire to know the unknown across the frontier.22 Yet they were to stand out as different from what was termed the scientific, from such forms of knowledge as produced by Major James Rennell, 'the father of [our] Indian Geography,'23 during his extensive surveys of the territory under the East India Company, including many of its major river-routes.

The earlier works of cartography that depicted the geography of the region seemed to stand on the verge of the fabulous and the metaphysical to the later day scientists. Herman Moll, writing in the early eighteenth century, mentions that the lake of 'Chiamay' lies in 'Acham' from where the River Brahmaputra ensued, and ran into the Bay of Bengal after passing through several kingdoms. It was by sailing up this river that the 'Moguls' first discovered the country, he adds. Most of the early representations of the land beyond the eastern frontiers of East India Company's Bengal depict this Lake Chiamay as the source of major rivers of the region, including the Brahmaputra, the Ganges, and the Irrawaddy.

22 Cazim's description of 'Asam' for example, was translated and published in the Asiatic Researches, "because our government has an interest in being as well acquainted as possible with all the nations bordering on the British territories." Editorial Note to Vansittart, tr. 'A Description of Assam', p.130.
23 As referred by J. D. Herbert, Deputy Surveyor General of India, 1829-31, in Phillimore, Historical Records, p.67.
Gerhard Kremer, a "mathematician and geographer", published an atlas in the year 1612 from Amsterdam, named Mercator's Atlas, where he depicts four rivers beyond the Ganges originating from this mysterious lake, which was later identified to be the Brahmakund of eastern Assam. Wilford, for example noted in late eighteenth century, that "The Chiamay Lake was said to be 180 miles in circumference... Four rivers are supposed to spring from this lake, but except the Brahma-putra, the others must issue from it through subterraneous channels."

Though such maps illustrated in detail the location of places situated in the coasts and islands on the sea as well as the more accessible areas inland; the hinterland and especially the region beyond the frontiers of Bengal however remained scant in detail. The maps of a land such as Assam about which nothing much could be known by the outsiders till that period, thus represented a space which to the later day practitioners of science appeared variously from being inaccurate and unreliable to simply being fabulous, imaginary and superstitious.

D'Anville's map, published in 1733, was the first to challenge the contemporary impression that the Brahmaputra originated from the Chiamay Lake. His map was prepared from surveys made by the "lamas" of Tibet, under the instructions of the Jesuit missionaries in China for the Emperor of that country. He showed the River Brahmaputra to emanate from the frontiers of Tibet. Yet, he believed it to be not more than 500 miles long, flowing north to south as it entered the Mughal territory in Bengal. The maps prepared by Jesuit travellers in Tibet, like the one drawn up by Father Desideri in 1715, were regarded as "sadly wanting in geographical interest." Walker on the other hand thought that "the lamas' maps are generally very meagre, and only reliable in the vicinity of the principle roads between Lhasa and Pekin [sic]; in parts they are very misleading, and must have been compiled at best from rude estimates of distance and direction, and

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24 Cited in Phillimore, Historical Records, p.78. Francis Wilford (1750-1822) of the Bengal Engineers, described as "a gentleman of the first Geographical abilities in India." In April and May 1782, he surveyed the river channels between Khulna and Dacca, and early next year he surveyed those of the Ganges, "giving in his journal a most interesting discussion on the silting up of the rivers of Bengal and their possible control."

possibly even from mere hearsay or conjecture."\textsuperscript{26} The fabulousness of such geographical presentations were self-evident, concurred the European reviewers and men of science in the middle of nineteenth century. A similar view was expressed with reference to Desideri's cartographic map in a proceeding of the Royal Geographical Society of London in 1868:

The most important feature, for instance, in Desideri's account was his description of the way in which he crossed the rivers, by holding on a cow's tail. Having nothing else to commemorate, he filled pages of his narrative in insisting on the absolute necessity of cows to enable travellers to cross the rivers. Such was the style of geographical record and description with which the Jesuit accounts teemed. \textit{It was different with the English officers who were sent to Tibet by Warren Hastings}.\textsuperscript{27}

In contrast to the Jesuit cartographers, the eighteenth century works of James Rennell was perceived by the European scientific community as arriving at different and more reliable conclusions about the Brahmaputra and its source, produced by employing scientific means and deduced from his direct observation of the river along the borders of Assam and Bengal. He surveyed the river in its course in Bengal, and in 1765, extended it to a few miles into the Assom territory, where he was stopped by frontier guards of the native king.\textsuperscript{28} Observing the river at Goalpara, an important trading centre of that time on the river at the border of Bengal and Assom, Rennell concluded that the Brahmaputra must be "very different from the description given of it in the Maps."\textsuperscript{29} Observing the size and speed of the flow of it which he inscribed in his \textit{Memoir of a Map of Hindoostan}, Rennell was convinced that the Brahmaputra was identical with the

\textsuperscript{27} ibid., p.169, emphasis added.
\textsuperscript{28} Rennell notes in his journal about the difficulties of moving into Assom for a British subject, "The Assam country begins from the Bonaash River on the north side of the Barampury & one of their Chokeys [boundary post] is placed directly opposite Gwalpara; but on the south side the Bengall the Provinces continue for upwards of 21 miles... we were not permitted to land on the Northern or Assam side, all the way, there being several chokeys placed; however we found means to lay down about 10 miles beyond the Bengall Frontiers, & in returning we coasted the Assam side near enough to inform ourselves of all the particulars which we wanted," in La Touche, T. H. D., ed. \textit{The Journals of Major James Rennell}, 1910, pp.57-58, cited in Phillimore, \textit{Historical Records}, p.20.
\textsuperscript{29} ibid., p.79.
Tsangpo. This was contrary to the conclusions of D'Anville, who supposed this river to be the same with the 'River of Ava' or the Irrawaddy. This was so, since according to Rennell, "The Burrampooter was represented to him as one of the inferior streams that contributed its waters to the Ganges, and not as equal or superior." This way, Rennell sought to resolve the 'mystery' shrouding the origin and course of a river which was to engage the attention and efforts of many future cartographic expeditions of the subsequent period. Moreover, he claimed to reveal to the world (or Europe) a secret: "Till the year 1765, the Burrampooter, as a capital river, was unknown in Europe."

This statement, of course, was not entirely correct. Many European travellers had already 'discovered' this fact and registered it in their accounts. Father Desideri noted in his journal of 1715-16 that a river, after traversing Tibet from West to East, turned to South-East, entered 'Lhoba', and descending through Rangamati to the Mughal territory, joined the Ganges. John Stewart, "a great traveller," writer, and future secretary to the British colonial government at Fort William, also wrote about the true course of the Brahmaputra in 1763. Tieffenthaler, on the other hand, had already declared Brahmaputra's origin from around the Manasarovar Lake in the second half of eighteenth century. The discovery of 'conclusive proofs' of the origin and true course of the Brahmaputra, however, had to wait more than a century since Rennell studied the river in late eighteenth century.

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30 Rennell, Memoir, 1788-93, p.79.
31 ibid., p.79. Emphasis added.
32 ibid., p.79-80. Father Joseph Tieffenthaler (1710-85), born in Austria, and worked for the "Jesuit Order" in Central India. Described by Phillimore as a "Good linguist, mathematician, and astronomer, and devoted to geography." He sent from India "a large collection of maps and geographical papers" to the Jesuit headquarters in Paris and Copenhagen. Apart from his major work, Descriptio Indiae, he wrote a number of articles on the rivers of Hindustan, including 'Course of the Ganges, together with a Description of the Villages and Cities lying on both Banks,' 'Course of the Junna, which is numbered among the Great Rivers,' etc. Rennell used his maps in drawing his own, and had subsequently modified many of the conclusions of the latter. "[Rennell] had subsequently to reject Tieffenthaler's version of the upper course of the Ganges." See, the 'Biographical Notes' to Phillimore, Historical Records, pp.388-389.
James Rennell and the Scientific Study of the Brahmaputra

Although the development of the sciences in Europe during its transition from feudalism to capitalism was influenced by the colonial experience, it was a part of the emergence of Industrial Revolution and a world capitalist system. It will, however, be incorrect to over-emphasise, as has been done by some, the role of colonies in moulding the nature and course of scientific development in Europe. In early nineteenth century, by the time the British East India Company conquered the Brahmaputra Valley and made it the part of the growing colonial empire, the science of geography in general and that of hydrology as a special branch of studying water and water-bodies had already undergone considerable development in Europe.

The cartographer James Rennell, who most elaborately had applied geography as a science to the study of rivers in the subcontinent in the latter half of the eighteenth century, was commissioned by the Company to facilitate the smooth sailing of ships along the large rivers of Hindustan. Rennell conducted his surveys on the basis of direct observation and personal inspection in general, but in the case of mapping the Brahmaputra, he was forced to move away from employing the accepted and tested rules of geography, i.e., precisely the very means which were later dismissed as conjectural, fabulous, or simply non-scientific. Though the surveyor was convinced that Tsangpo of Tibet and Brahmaputra of Asom were names of the same river, a "positive proof can never be obtained" without actually tracing them, and Rennell was confident that such "a circumstance [was] unlikely ever to happen to any Europeans, or their dependants." In absence of a "positive proof", or any prospect of acquiring it in foreseeable future, he sought to present the "strongest presumptive proof possible" in favour of his conclusion. This Rennell did by corroborating his observations of the Brahmaputra in Goalpara with the information derived from Du Halde's map of Tibet, and also on reports as were "described by the

33 "In compiling their maps of India, both D'Anville and Rennell made use of every record they could find of the distance of one place from another, and give special weight to any distance that had been actually measured rather than estimated." ibid., p.10, original emphasis.
Referring to his native informants, Rennell noted that "They [also] informed me, that the Burrampooter has a very long course previous to its entering Assam; and that it comes from the NW through the Thibet mountains."35

Rennell's knowledge of Assam and of the Brahmaputra was thus produced through a blending of the scientific and the non-scientific, of the factual and the fabulous. In his practice of science, this line of demarcation often got blurred. Rennell himself was conscious of this demarcation, though he would not always be able to adhere to the conventions of collecting scientific information, conventions that were still in the process of making. In the assessment of the nineteenth or the twentieth century geographers, however, his work signified a clear break with the past. As such, his career was later divided into two distinct periods, "that of his earlier years of adventure as a sailor, an explorer or a surveyor, and that which covered more than fifty years of labourious and far-reaching study extending over every field of geographical activity."36 This way, the earlier period was read as one of the geographer-in-the-making, the pre-history of a man-of-science when Rennell veered uncomfortably close to the non-scientific as an adventurer. Only the latter period of his career was then recognised as befitting that of a scientist and a geographer.

Rennell was a self-taught man in his trade, an adventurer in the high seas from Plymouth and a midshipman with "the sword, the saucepan and the book."37 He landed in Madras as an eighteen-year-old teenager in 1760, and for the next eighteen years did not see his native land again. Drawing for him was initially a passion, and less a science. Before reaching India, during his voyages he made amateur plans of harbours and anchorages. Once in India, he was recruited on board the British royal ship Norfolk to take part in the war against the French in the blockade of Pondicherry, and there Rennell made a survey of the harbour of

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34 Jean-Baptiste du Halde (1674-1743), Parisian Jesuit Missionary to China. Rennell depended on his works in absence of other sources, but was apprehensive of its accuracy: "We have the history of the Lama's map in Du Halde, which is not altogether favourable to its character, especially in the parts towards the source of the Sanpoo and Ganges." Rennell, Memoir, p.300.
37 ibid., p.290.
Trincomali. Likewise, being part of another British naval fleet he made plans of the harbour of Port Mathurin in the East Indies. In 1763 Rennell decided to resign his post in the Royal Navy and entered the services of the East India Company. As the Company was eager to have its province of Bengal carefully surveyed by the middle of 1760s, "through the recommendation of [his] friends Rennell found himself at the age of twenty-one appointed to carry out this important work."38 As a surveyor in the service of the Company, "[H]is first attention was paid to the course of the Ganges."39

Within two years' of his survey work, he was also attracted to the vast range of mountains to the east of Hindustan, which he named the "Tartarian Mountains" and later came to be known as the Himalayas. The actual fieldwork covering almost the whole of Bengal took seven years, with more time having been spent in surveying what were thought to be the wild and less hospitable terrains. As such, it was noted that Rennell's field surveys, "in the country east of the Brahmaputra, where both men and beast were savage, might almost be said to be carried out at the point of the bayonet."40 In 1791, after completing a successful transition from being a sailor to a surveyor to a scientist when Rennell was conferred a royal medal, his Bengal Atlas was hailed as "executed with a degree of exactness that has not been paralleled by the most applauded geographers of this or any preceding age."41

The presumed break in Rennell's career or in the practice of science nevertheless was vague and ambiguous, as could be observed in J. D. Herbert's appraisal of Rennell published in a paper in 1830. Taking note of the recent geographical discoveries which seemed to confirm Rennell's calculations about the identity of the Brahmaputra and Tsangpo, the Deputy Surveyor General of India asserted that these new evidences "will add another to the many proofs we have of the sagacity of the father of our Indian Geography, Major Rennell, whose very guesses

38 Rodd Rennell, 'Major James Rennell', p.292.
40 ibid., p.294.
41 Joseph Banks, the President of the Royal Society, while awarding Rennell with the Copley Medal of the Society; cited in Ross, 'Major James Rennell', p.297.
appear better founded than the laboured erudition of other men." Thus, Rennell was held by later-day geographers to be sagacious in the practice of his science as long as he gathered his information as a direct observer, maintaining a high standard of objectivity. In case of the Brahmaputra, however, he was found to be merely guessing or speculating, being unable to enter Asom in pursuit of the true course of the river to objectively determine its true course and contours.

**Colonial Encounter with Asom: The Military Expeditions**

> For more than 30 years past, geographical research and surveying operations have accompanied our armies in the North West of India ... but within a late period the Burmese war has recalled our attention to the very imperfectly known countries to the north-east.

-Surveyor General of India, 1830

The northeastern frontier of British India was termed as unknown even fifty years after Rennell conducted his first surveys of the region. The Surveyor General Blacker observed in 1824 just before Asom was to be annexed to the Empire, "[Assam's] interesting situation between Hindoostan and China, two names with which the civilized world has been long familiar, whilst itself remaining unknown, is a striking fact and leaves nothing to be wished, but the means and opportunity for exploring it." One opportunity so eagerly anticipated already presented itself when the Asom's king invited British intervention in 1792 to suppress the popular *Moamoria* rebellion in eastern Asom, whereby the king was driven off from his capital and his kingdom. Deputing Captain Welsh to drive back the rebels and to restore the Raja, the Governor General observed,

> However extraordinary it may appear to people in Europe, ... owing to the unremitting jealousy which the Chiefs of those countries have hitherto shown of the English, we know little more of the interior parts of Nipal and Assam than

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the interior parts of China, and I therefore think that no pains should be spared
to avail ourselves of so favourable an opportunity to obtain good surveys and to
acquire every information that may be possible.44

This is said to be the second attempt made by the British East India Company to
collect information about Asom, with Thomas Wood, of the Bengal Engineers,
employed as the surveyor to the expedition.45 The first attempt was presumably
made by Hugh Baillie, a private trader in Goalpara, later appointed as the
“Superintendent of the Assam trade and Collector of Rangamati and Goalpara,”
when the government in Bengal asked him to “report on the resources of Assam,
and the customs of the inhabitants.” But Baillie failed to produce any “systematic
survey of Assam” as he had to close down his Goalpara factory and office in early
1790 due to “dissensions and strifes then raging in Assam.”46 The other
prominent British private trader of the time in Goalpara engaged in trade with
Asom, Daniel Rausch “never appear[ed] to have contributed any information of a
geographical character, though he probably knew more about the Assamese of
that time then anyone else.”47

Joining Welsh’s detachment at Guwahati in December 1792, Wood “commenced
survey from the point where Rennell left off near Goalpara in 1765.”48 The
Brahmaputra and its surroundings were the immediate subjects of his survey.
Hoping to send the Bengal government the survey upstream of the “thirty or
twenty miles of more of this wonderful river,” Wood reached Jorhat and took part
in the battles with the rebels there. Proceeding with the British force towards
Rangpur, the capital, the surveyor reported,

I am now going up that river [the Brahmaputra] with the fleet as near to
Rungpore as we will have water, but am disappointed in surveying it. The banks
are perpendicular on each side, and covered with an impenetrable jungle. So

44 J. J. Johnstone, *Captain Welsh’s Expedition to Assam in 1792, 1793 and 1794*, Calcutta, 1877, p.10.
in 1807-14, ed. S. K. Bhuyan, Guwahati: Department of Historical and Antiquarian Studies, 1987
(1940), p.xi.
46 ibid., p.xi.
48 ibid., pp. 398-399.
soon however as I get up to Rungpore I mean to survey down the road we first marched up, at the commencement of which I left a mark... I shall be able without any great trouble to lay down the situation of the Capital.

The expedition now was called off, having “advanced many hundred of miles into an unknown country,” and its objective of restoring the country to the Ahom king being completed, making thereby the latter a protectorate and tributary of the British.49 By the time the expedition was called off in April 1794, Wood finished his survey of the Brahmaputra as far as the mouth of the River Dikhow in eastern Asom. Wood brought his works in the Valley back to Calcutta and in the following months, engaged himself in drawing up his maps. Thus the second attempt by the East India Company to “collect information about Assam” came to a close.

The next attempt by the British of this kind in the Brahmaputra Valley was to come thirty years later, piggybacking yet another military campaign. This time the adversary was the Burmese, and the ensuing engagement known as the First Anglo-Burmese War. Meanwhile, attached to the British embassy to the court of Ava in 1895, Wood subsequently “made an excellent survey of the Irrawaddy River.”50 This map of the Irrawaddy was considered to be “a careful piece of professional work,” which was proven to be of “the utmost value to the [British] army in the Burmese War, 1824-6,” and also during the war of 1852-3 with the Burmese, when copies of Wood’s map was “specially lithographed and eagerly sought for.”51

A good inventory of geographical knowledge of the newly acquired territories of the colony, and with it the knowledge of the various rivers with a view to utilize them was evident in the early days of colonial rule. In 1765 the Company employed a surveyor to map the course of the ‘Cossimbazar’ as well as the ‘Mohanaddee’ Rivers in the newly acquired “provinces of Chittagong, Burdwan and Midnapore”. Lewis De Gloss, the surveyor, made “exact surveys” in parts of Burdwan and Midnapore, “[B]ut most of his time was spent on surveys of the

49 Johnstone, Captain Welsh’s Expedition, pp.39-45.
51 ibid., p.85.
rivers and embankments, and on schemes for controlling the floods," a work found to be so important as to bring in more surveyors to assist De Gloss in this purpose.\textsuperscript{52} Surveys and estimates were important tools and in demand for controlling the rivers through "continuous embankments". These "great rivers of Bengal" which bring down "immense floods" are described as sources of "perennial anxiety to this very day," often destroying valuable agricultural lands and its produce, an important component of colonial revenue. In 1816-17, the \textit{bunds} along the Ganges in Rajshahi district of Bengal were surveyed, while 1824-25 the embankments on the Jessore River in the same province was put to extensive survey and mapping.\textsuperscript{53}

George Everest, another British surveyor in the service of the Company who would later earn his fame for the Great Trigonometric Surveys of the Subcontinent, was appointed in 1817 to clear the Icchamati and the Matabhanga Rivers off "trees, sunken boats, and other obstructions to navigation." This measure was necessitated by a petition from "the merchants of Calcutta" who complained that this 'evil', i.e. "the obstructions had become so many and dangerous as to cause the wreck of innumerable boats, and to entail heavy losses."\textsuperscript{54} Though Everest's efforts failed to provide a "permanent cure," this work of "great improvement by clearing the channel of obstructions" was achieved two years later.

Proposals were made to the Bengal government to monitor the changes in the main channels of the rivers in the province so as to facilitate the easy and safe passage of boats through them, and for that purpose their periodic and regular surveys seemed essential to the government. The 'Superintendent and Collector' of the Matabhnaga River was deputed to produce such a series of periodic maps of the navigable channels of the river. In 1823 when the need to search for a permanent channel connecting the Hooghly with the Ganges through the \textit{Sunderbans} became crucial for maintaining a smooth commercial navigation between Calcutta and Upper India that would be least obstructive, the

\textsuperscript{52} Phillimore, \textit{Historical Records}, Vol. I, pp.21-22.  
\textsuperscript{53} Phillimore, \textit{Historical Records}, Vol. II, p.15.  
\textsuperscript{54} ibid., p.15.
government in Bengal found these maps very instructive of the character of the rivers, even demonstrating certain fixed laws. Thus it was observed,

The maps annually prepared by Mr. May furnish a highly interesting view of the working of the river and...may enable us to ascertain the limits to which they extend [during floods and high tides, and also over time]. For, great and apparently capricious as is the destruction and creation of land which occurs...each year, it seems that the progress of the river is regulated by fixed laws, and that...after certain periods it returns over the space it has already traversed, so that the bounds of it's encroachment on either bank may be traced.55

Likewise, when "the old question of an artificial cut between the Ganges and one of its outlets near Jalangi." was reopened in 1819 as a means of carrying out 'improvement' of the internal navigation of Bengal, it was held that "Nothing can be definitely settled without a careful survey of the various streams which intersect the delta of the Ganges."56

The perceived threat from the Burmese kingdom bordering their territorial possessions on its north-east frontier in the meantime compelled the British to collect reliable and more detailed information than hitherto achieved, so as to protect it from future incursions by the kingdom of Ava in early nineteenth century. The control of Asom and the river-route of the Brahmaputra appeared to be crucial for the defense against Burmese aggressions and their allies, the French.57 From the early years of the nineteenth century, the territory between the British and the Burmese empires emerged as strategically important to the growing inter-imperialist rivalry. The threat seemed to the British to be immediate and real, since by 1822, “the Burmese having obtained complete mastery of Assam and a person of that nation having been appointed the

56 ibid., p.15.
57 "To the Company the strategic north-east frontier of Bengal meant the whole of the hill ranges surrounding the Assam valley, for the security of its Bengal territories rested not only on the peaceable demeanour of the peoples of the immediate frontier hills, but also of the independent regions such as Cachar, Assam, Manipur and Burma beyond them. Any power which might advance along the Brahmaputra into central and eastern Bengal was a potential threat." Borooah, David Scott in North-East India, p.63.
supreme authority, the country may now be considered as a province of the Burman empire.58 David Scott, in charge of the North East Frontier and based at Goalpara wrote to the British government in Fort William, and stressed on

[T]he gravity of the Burmese menace by pointing out that the whole of Dacca, Mymensing, Rangpur, and Natore districts now lay at the mercy of the Burmese. They now commanded the river routes into eastern Bengal and it would be as difficult to fight with them on water as was to fight with the Pindaris on land in South India. Their occupation of the Brahmaputra valley had changed the whole complexion of the Burmese problem. It would be a great miscalculation to judge the capacities of the Burmese in control of the Brahmaputra simply by the slow movements of their troops in the mountainous tract bordering on Chittagong and Tipperah. From the Brahmaputra valley they could easily sail down and sack Dacca and the adjoining districts, and against such a naval attack the superior discipline of the British troops would not be of much use.59

This perceived Burmese threat – particularly through the Brahmaputra – resulted in the British government of Bengal in taking military measures in its eastern frontier. “The whole frontier was placed under the special command of a Lieutenant-Colonel assisted by a Brigadier-Major. The particular threat from the Burmese war boats, was also tackled by the despatch of oared boats of the longest size, armed with a twelve-pounder caronade in the bows and a party of five gollandazes (matchlockmen) per boat.”60 Lt. Davidson, for example, who commanded at Goalpara, “found ample cause to fear [the Burmese] forces”, and “from his own experience knew the effectiveness of their swift war-boats each carrying anything up to 150 armed men.”61

Scott anticipated three possible routes for a future Burmese invasion of Bengal: the first from Manipur through Tripura and Cachar; the second through Cachar and Jaintia, and the third through Asom by the Brahmaputra. From the first route he expected little danger, since it ran through forests considered to be almost impenetrable at any season of the year, and he was confident that it could be

58 David Scott to Prinsep, cited in Borooah, David Scott in North-East India, p.72.
59 ibid., emphasis added.
60 ibid., p.74.
61 ibid., p.73.
defended by the British allies in Tripura with the minimum of British military support. The second and the third routes, he said, needed immediate attention. To the military commander Lt. Col. MacMorine, he wrote of the third route down the Brahmaputra, "I must confess that after mature reflection on this subject during the course of several years I am unable to device any effectual and readily practicable means of meeting it other than that of expelling the Burmese from the upper part of the river." That was because the Burmese war canoes with a speed of 8 to 10 miles an hour, once they had broken through the Company's flotilla at Goalpara, could not possibly be stopped by British gunboats with a speed of only 4 to 5 miles an hour. When in February the Government ordered an advance from Goalpara up the Brahmaputra Valley, they were only putting into practice the measures so often urged by Scott to meet the greatest Burmese threat: the control of the Brahmaputra river-route was the most effective guarantee against an imminent Burmese assault on Bengal. The subsequent military operations, as Scott had foreseen, was to stall any possible Burmese thrust down the Brahmaputra.

A British confrontation with the Burmese seemed inevitable, and indeed it materialised as the First Anglo-Burmese War in 1824. It was also an opportunity, after the British military campaign of 1792, that presented itself to the East India Company for gathering knowledge of their territories east of Bengal. Revenue Surveyors from different parts of the British Empire were entrusted with the duty of surveying this *terra incognita*. They were placed under the superintendence of the military command, and were to follow the several divisions of the army, so as to "derive advantage to the utmost practicable extent of the opportunities so suddenly and unexpectedly opened of pushing [our] investigations beyond those barriers which the well or ill-founded jealousy of [our] Eastern neighbours had hitherto opposed to us, and which we had till then no immediate hope of surmounting." Wilcox himself was placed under Captain Bedford as an assistant in October 1824 and was given the task of surveying 'Asam'.

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62 Scott to MacMorine, 6 February, 1824, Cited in Borooah, *David Scott in North-East India*, p.72.
63 ibid., p.82.
64 ibid., p.315.
The surveyors that accompanied or followed the military columns into different fronts of the war had most of the time to work from their boats in rivers and creeks, often bound by high banks and thick forests that made it difficult for them to take accurate measurements. However, the country being so inadequately known by the British, or for that matter – any European power till then, that any information whatsoever “was of utmost interest, even though not of great accuracy.” But the objectiveness of the geographical information and sketches, i.e., those that were collected through the direct observation of the surveyor, were asked to be separated from the ones that were received through a native informant.

It was expected by the survey authorities that the surveyors thus attached to the British troops would accomplish more than mere road or route-surveys, as it insisted on “laying down” the features of the country, hills and plains, rivers and forests as they were visible from the “line of march” of the survey. Of the course of the rivers in Asom, instructions were issued by the Survey of India that the surveyors would have to “be careful in ascertaining by actual survey to the greatest practical distance, & you will endeavour to supply from information the general direction of the streams beyond the limits of your survey, the names of the towns and villages near which they flow, the situation of their sources, and their junction with other streams...The section of rivers of any magnitude should be taken, showing the depth of water in the dry season & during the floods.” Captains Wilcox and Bedford carried out such surveys between 1824 and 1828 in the Brahmaputtra Valley, while the war also opened up the possibility of cartographic works in the north-eastern frontier along Burma as well as towards Tibet to the north.

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66 “Be very particular...in your maps, sketches and notes, in distinguishing between what you have actually observed yourself, and what you have inserted from information only, and always state the name and condition of the persons from whom you gained information...,” instructed the Surveyor General to Surveyor Wroughton in Arracan during the Anglo-Burmese War of 1824-26. ibid., p.199, original emphasis.
The major task for Wilcox was to collect “Geographical information properly so called” of the northeastern frontier of British Bengal. The Surveyor General briefed him, "You will take measures for the attainment of as much geographical knowledge on or beyond... the eastern frontier as the present or expected movements may admit." Wilcox noted that the earlier works – both the published narratives of journeys to that region by individuals, and scattered information in various journals – were hardly adequate to provide the precise and focused information that was sought to be necessary. Wilcox considered himself competent enough to undertake such a task. As he noted,

Having been on the spot from the beginning, at first an interested observer, and latterly employed in exploring myself much of the Terra incognita of that quarter, I consider that I ought to be able to give a connected view of the progressive steps made, as well as to supply many particulars necessary to the full comprehension of the subject, not yet generally adverted to.70

Arriving at the frontier town of Goalpara in early January of 1825 while the Burmese forces were retreating further eastwards, the survey party made "anxious enquiries respecting the source of the Brahmaputra" from the natives. The commonly held view among them was that the river emanated from the east beyond the boundaries of the kingdom of Asom. "We are told of a cataract, which imagination perhaps, rather than report, founded on respectable information, long continued to magnify into a splendid fall of the whole river from the bordering ridge of mountains." In addition to the information about its source, the native informants were asked about the distance and course of the navigable part of the Brahmaputra, "who knew well that the boats of Bengal could not pass more than one day's journey beyond Sadiya". Wilcox also procured an indigenous map in Goalpara “drawn in [the native's] own incorrect style” which showed the sites of the tributaries of the Brahmaputra, important villages and

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70 ibid., p.315, emphasis added.
administrative divisions, etc. They were informed by the natives of the Brahmakund that the source of the Brahmaputra was situated in the east.

Shortly afterwards, the survey of the Brahmaputra up to Sadiya and a short distance beyond it was completed by Lieutenant Burlton with the help of nothing more than a simple surveying compass. Facing rapid currents, shallow waters rocks on the surface of the river, he had to abandon the expedition not much distance upstream from the station of Sadiya. “From the narrowness of the water he imagined that the source of the Brahmaputra must be there, as it seemed very improbable such a small body of water could run the distance it is represented or supposed to do.”72 The perceived “narrowness of the water” upstream from Sadiya was due to the fact that the Lohit was not identical with the Brahmaputra, but the former was only a tributary of the latter, the surveyors concluded. The Tsangpo of Tibet was held to be the “Buri Dihong” in Asom. Wilcox thus notes,

Had Lieutenant Burlton added an account of the discharge of the river, according to the sections he took below the Buri Dihong mouth, and near Sadiya, this idea of the character of the river [narrow and shallow, and thus the impossibility of the Brahmaputra being identical with the Sanpo] could never have been formed. For the quantity of water discharged per second in the former place, was found to be 86,727 cubic feet per second, and of the sacred Brahmaputra, or eastern branch passing Sadiya, 32,413 feet in the same time.73

Since there was hardly any impression in Lt. Burlton’s mind that the Dihong could in fact be the continuation of the Tsangpo, and not the Lohit (which was thought to be synonymous to the Brahmaputra), “attention was not yet directed to the navigation of the Dihong.”74 Capt. Bedford and Lt. Wilcox, who by then reached the station of Bishwanath, were directed to survey the Buri Lohit (or the Old Lohit), the older branch of the river, and to resurvey the Brahmaputra, respectively. “Captain Bedford afterwards continued his route towards Sadiya, making a more accurate survey than Lieutenant Burlton had the means of doing;

72 ibid., p.318.
73 ibid., pp.318-319.
74 ibid., pp.319.
and before the expiration of the month of June, he had surveyed not only the whole distance on the great river from *Bishanath* to *Tengapani*, but having accompanied Captain *NEUFVILLE* on the expedition against the *Singpho* chiefs, he also added a hasty survey of the *Noa Dihing*."75

Wilcox himself meanwhile joined the British advances against the “*Singphos*”, who were reported to be making “daring and successful incursion” into the neighbouring areas of Rangpur in eastern Asom. For Wilcox, the process of scientific observation was a part of military marches into the less-known territories, even though not without improvisations to, and compromises in the rigorous standards of the professional surveyor. Proceeding up the *Disang*76 River, he found the banks to be “clothed with an impenetrable tree forest”, and hence “the distances I was compelled to estimate in time, guided by the experience I had of the progress of my boat at those places where it was practicable to use my perambulator.”77 Meeting with the “rapids” in the river which their Bengal-made boats could not surmount, and still five miles further from their destination Borhath, the party of the 46th Regiment had to be led by “one of the Asaro guides”, and “after a most laborious march through jungle, where no trace of a path was to be found”, Wilcox and his party reached their destination.78 Similar kinds of hurdles were faced by Wilcox as he was engaged in his next mission, the survey of the *Dikhow* River. Though “made under more favourable circumstances for arriving at accuracy, as the distance by the bund road both to Kowarpara and to Ghergong was surveyed, and hills determined in position from this base served to correct the remaining portion, but here as in the *Disang*, after arriving within a certain distance of the hills, I found it impossible to proceed: it is similar in character to the before named rivers.”79 Difficulties of the terrain were encountered by the other survey parties too, which were simultaneously engaged in the survey of the region. Lieutenant

75 Ibid., p.321.
76 *Disang*, one of the main tributaries of the Brahmaputra originating in the Patkai Range of the present Nagaland.
77 Ibid., p.321.
78 Ibid., pp.321-22.
79 Ibid., p.324.
Jone's Journal illustrates his detachment's march from Rangpur to Borhath, which

chiefly describe the embarrassments of a party moving on bad roads through a jungly [sic] and swampy tract intersected by swollen rivers. For the first fourteen miles, they encountered swamps, jheels, and tree jungle; then, after coming on a good broad road, and proceeding one mile along it, they found a fine stone bridge, of three arches, in good repair, over the Tezakhana nullah. The broad road continued (occasionally broken) through a more open country with the Naga hills on the right at no great distance. The Chipera river was crossed by the help of a party of Nagas, who are very expert in felling timber, and a raft was constructed for passing the baggage over the Tsokak, which could not be forded by elephants.80

When Wilcox finished his survey works in the upper reaches of the Brahmaputra in eastern Asom by the end of 1828, he was asked to make a survey of the river on his way back of its course through the plains of Bengal till where it flowed along the city of Dacca. It was felt by the government's survey establishment that the earlier surveys of the channel had become so outdated that they were hardly of any practical use due to the subsequent changes in the river, making the earlier cartographic studies redundant.81 James Scott too asked Lieutenant Wilcox to prepare a chart of the Brahmaputra from Goalpara to Jamalpur after receiving a request to this effect from the 'Burhampooter steam vessel' in 1828. This could be "highly useful", even though "no great degree of accuracy is required, and that I conceive that all that is necessary might be done as you proceed down the river in a boat - a general idea of the principal existing channels as compared with the state of the river exhibited in Major Rennell's map being all that is wanted", directed Scott.82 While returning from Asom by the Brahmaputra between February and June 1828, Wilcox took up a hasty survey of

80 ibid., p.324.
81 The Surveyor General noted, "such great changes have taken place since the compilation of Major Rennell's map, that...it affords little or no accurate information of this part of Bengal." Survey of India Records, Dehra Dun, No. 265, 13 October 1830, cited in Phillimore, Historical Records, Vol. II, p.16.
82 David Scott, Commissioner of Assam, to Lieutenant Wilcox, Revenue Surveyor, No.35, 11 April 1828, Series I: Letters Received from Government, Vol.6, 1828, pp.219-227, ASA.
this lower part of the river from Goalpara to Jamalpur in Bengal, and reported, "I found it advisable to adhere to one bank [of the river]...and I soon perceived that, instead of merely correcting Rennell's map for the alterations that have taken place, I must construct one anew; so little resemblance is now to be recognised with the former state of things."83 The surveyor observed that many places and landmarks such as village sites that were recognised in earlier cartographic representations had vanished, or had been moved to other places. Moreover, perceptible and striking changes in the landscape had been caused by the shifting of the river channels.84 A more comprehensive survey of this part of the river was authorised in 1830 under the guidance of Wilcox, and with the help of assistant surveyors.

By 1814 the "established procedure" of dispatching copies of surveys and other cartographic materials to London were in place. Unlike the eighteenth century administrators, adherence to "strict accuracy" was now demanded in early nineteenth century by the Court of Directors from their surveyors in India wherever possible, as in 1827 when the Atlas of India was in the process of preparation.85 Invention of new 'arts' or techniques such as lithography and projections made more accurate and detailed inscription and engraving possible, also making the circulation of these works more convenient and common. In case of the Brahmaputra Valley, the survey works started by Wood were perfected and filled-in with details by later-day surveyors and with specialised surveys in the second half of the nineteenth century. These works built upon the already accumulated cartographic knowledge, but now with a much greater emphasis on the experience and the presence of the professional surveyor. Local sources in such endeavours were still in use as was in the times of Rennell –whether in the form of the written accounts or the testimonies of indigenous informants – but  

83 Survey of India Records, Dehra Dun, No.231, Calcutta, 23 June 1828, cited in ibid., p.16.
84 Wilcox noted, describing such changes in the land, "The names even of some of the former villages have been forgotten, and the sites of many removed. Bugawa is supposed to have been where the bed of the river now is ...Below Burgowa scarce any resemblance can be traced to the banks of the Brahmapootra in the upper part of its course; instead of he long dreary tracts of impenetrable jungle, a fine open and well cultivated country extends". Phillimore, Historical Records, Vol. II, p.16.
85 The Court of Directors noted that many of the sketches, maps, field-books and other geographical outputs that were sent out to London were lacking in accuracy, and some were very "incorrectly copied". Phillimore, ed. Historical Records, Vol. III, p.292.
such sources were now increasingly found to be unreliable and unsuitable for the new demands that were made of the cartographic representations. The use of cadastral and revenue survey techniques produced from direct observations and standardized measurements by professional government surveyors became the norm in the nineteenth century Assam, as opposed to the earlier "road surveys" of Woods and Wilcox. For regions such as Tibet which still remained to be subjected to such detailed and evolved methods of cartography, however, older methods were continued to be employed even till the late nineteenth century. The endeavours to "lift the veil" from Tibet that kept it relatively unknown to Europe through itinerant native surveyors is a case in point, which was also connected to the efforts of the colonial government to determine the true source and course of the River Brahmaputra, termed among the very few geographical "mysteries" yet to be unraveled.

The Mysteries of the Brahmaputra

Endeavours to collect new and accurate information of the region beyond the northern frontiers of British India through the "Trans-Himalayan Explorations" in the second half of the nineteenth century was justified by the probability of future commercial expansion, geographical knowledge, and of Civilization in general. For the role of the Royal Geographical Society of London in encouraging such explorations to Tibet, Central Asia and Central Africa, there was a tangible purpose, it was observed by a member of the Society, Henry Rawlinson. Explorations resulting in "geographical discovery", it was thought, "led to the spread of civilization and general intelligence, and even to material advantage in the advancement of commerce and trade." At the same time, Rawlinson observed, "the Pundit's travels in Tibet had paved the way for the extension of our trade in that direction, and might hereafter prove of very great importance."86 The 'Pundits' who spied Tibet were to become an important medium for the expansion of imperial knowledge. It was expected by the

Geographical Society that "Under the auspices of British geographers both trades [of tea and wool] might be improved." This instance only demonstrated, the argument went, the "practical advantages attending geographical exploration, and that it was not pursued in a mere dilettante spirit or for a mere visionary object. It [the Pundits' journey] would in reality prove of very great value in improving the social state of the East."87

Mysteries shrouding the Brahmaputra puzzled and intrigued geographers, cartographers and surveyors, mysteries which they considered to be amongst the last of all the geographical riddles of the yet unknown world, the terra incognita of geography. The tracing of the source and the true course of the Brahmaputra, its 'identity' with the Tsangpo, the mythical great falls in the river as it comes down from the Tibetan plateau to Asom's plains, and the search for the 'cannibals' who were speculated in Europe to be living by the river in the most inaccessible and still scientifically untraced parts of its course, were regarded as some of the last puzzles in frontiers of the unknown, the last of the unsolved geographic mysteries.

These were the "great geographical puzzles", to solve which the colonial officials and men of science in particular engaged themselves for one and a half century. This process started in 1760s with James Rennell's river-surgeries, and was thought to be satisfactorily resolved during the so-called Abor Expedition of 1911-14 in the northeastern frontier of the British Indian Empire. This was also the period during which the Brahmaputra itself was being constituted in the way it is known today, both in scientific representations as well as in popular imagination, inscribed as one single river and with a well-defined course, and an "official" source.88

As early as in 1792, Thomas Wood, the surveyor who accompanied Captain Welsh's campaign to Asom was aware of this "great puzzle", and expressed his desire of "tracing the Berrampooter." He carried forward the survey work

87 ibid., p.170.
towards the eastern reaches of the river from Goalpara, where Rennell left off his surveys in 1765. James Rennell was aware of and engaged with this puzzle while he was surveying the province of Bengal. However, as he noted afterwards, "I find it totally impossible to obtain any information from the natives to be depended upon." Wood, expecting to unravel the mystery, noted, "I had flattered myself next season to have had it in my power to clear up Major Rennell's doubts relative to the source of the Burrampooter." But once the military campaign was called off in 1794, the region now could not be approached from the Asom side. It was only after its annexation in the second decade of the nineteenth century, that fresh attempts were made by the British towards uncovering the mystery of the Brahmaputra.

Phillimore notes that both the Surveyor General of India and the Political Agent in charge of Asom were anxious to "solve the riddle of the Brahmlutra [sic]," and in September 1825 asked the services of Wilcox to be deputed to the "special duty" to trace the "sources of the great body of water which the Brahmpootur pours through Bengal." Wilcox was instructed by Scott to commence his work by first tracing the Subansiri River, a major north bank tributary of the Brahmaputra coming down through the foothills of the eastern Himalayan mountains, and joining the latter on the middle reaches of its course in Assam plains. The surveyor responded by saying that "my first attempt shall be made on the Sooburnu Shree, falling into the Boree Lohit in longitude 94°13... a successful trip up it must tend to throw light on the connexion of the great Thibet river with the waters of the plains of Assam." This work, and those of the other surveyors and travellers over the first decade of colonial occupation of its North Eastern

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91 Survey of India Records, Dehra Dun, No 204, 27 September 1825, cited in Phillimore, *Historical Records*, Vol. II, pp.55-56. Wilcox too states their purpose thus, "The interest too excited by the question of the identity of the Sanpo and Brahmaputra, evidenced by the notice taken of the subject in Europe, seems to call for the execution of such a task... Captain Bedford was instructed to consider the Brahmaputra as the chief object of attention. ...He was to endeavour to unravel the mystery in which was enveloped each notice or tradition respecting its fountain head by proceeding up its streams as far as the influence of the neighbouring force, or the safeguard of a detached escort might permit." Lieutenant R. Wilcox, 'Memoir of a Survey of Assam and the Neighbouring Countries, Executed in 1825-6-7-8', *Asiatic Researches*, Vol. XVII, pp.315-316.
Frontier, it was now thought, "had shown conclusively that the Luhit branch of the Brahmaputra that came from the Brahmakund was not the main river, but that the great volume of water came down from the Dihang. This was, of course, no proof that the Dihang was the outlet of the Tsangpo, [so] Wilcox's next task was to test the widely held theory that the river of Thibet discharged its waters through the Irrawaddy." Hodson, the then Surveyor General of India, gave his own opinion on the matter which generated a considerable interest back home in Britain,

A great interest is taken about the Burrampooter and much nonsense issues from the press... Mr. Klaproth, a continental coxcomb, has written that the Sampoo is the Irrawuddi, which can hardly be. Sampoo means a river, but the Guroo Sampoo of Du Halde issues, it is supposed, from the high land near the Mansarovur Lake; I say 'suppose', for I have no evidence to that purpose, but think it likely to be the case. If so, its length...to the north east of Ava would make it a very large river. Rennell thought it was the Burrampooter, but, supposing it to come from so far west as the Munsarvar Lake, it would even then be almost too large a stream to be one of the main feeders of the river... Turner, in the Embassy to Teshoo Sumboo[in Tibet] saw a river he calls the Burrampooter or Erechoomboo ... which he says goes into Assam.

The Irrawadi flowing through Burma was also proposed as the most probable outlet for the Tsangpo. But Turner, attached to the British embassy to Lhasa at the end of eighteenth century, claimed to know "that the two rivers [The Tsanpo of Tibet and the Brahmaputra of Assam] were the same". He wrote, "[T]he Berhampooter...penetrates the frontier mountains that divide Tibet from Assam.

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93 ibid., p.57.
95 Michell in his report on the north-eastern frontier of Bengal, wrote about the probable connection between the Tsango and Irrawadi rivers, "If we believe the native surveyor, we have hitherto been wrong about the supposed course of the Sanpo, as it lies more than a degree further to the north than has been supposed, thus leaving 10,000 square miles of watershed to the Dihong or Subansiri river. If this drainage is assigned to the Subansiri river, then the Dihong and Sanpo must be the same river. But there seem very strong reasons to dispute such an assignment, for then we have the fact that if this watershed is added to the watershed of the Subansiri the result is 18000 cubic feet per second coming from each square mile, which is an extraordinary state of affairs, whereas, if the watershed is assigned to the Dihong, we have the very natural result that the Dihong does not break through the Himalayan chain from the north and the Sanpo and Irrawady are the same river." Michell, Report, pp.17-18.
In this latter region it receives a copious supply...before it rushes to the notice of Europeans below Rangamatti, on the borders of Bengal.\textsuperscript{96} Wilcox and Bedford's surveys were compiled in the form of maps in 1828, where the sources of the "eastern branches of the Brahmaputra" were shown, and "the Tsangpo was shewn in dotted lines as falling into the Dihang," but as Phillimore observes, "its big loop to the north-west round Namcha Barwa\textsuperscript{97} was unknown before 1912." Wilcox, like Rennell and many others anticipated the connection between the Tsangpo and the Brahmaputra, but it was not considered to be scientifically proved till the military campaign against the 'Abors' in 1911, i.e., through direct and objective observation by surveyors attached to the campaign.

\textbf{In Search of the Origin of the Brahmaputra: Trans-Himalayan Expeditions}

\begin{quote}
A European, even if disguised, attracts attention when travelling among Asiatics, and his presence, if detected, is now-a-days often apt to lead to outrage. The difficulty of redressing such outrages, and various other causes, have, for the present, all but put a stop to exploration by Europeans. On the other hand, Asiatics, the subjects of the British Government, are known to travel freely without molestation in countries far beyond the British frontier.\textsuperscript{98}
\end{quote}

On the 23 March 1868, a paper was read before the Royal Geographical Society of London by Captain T G Montgomerie, where he proposed to talk about the just concluded Trans-Himalayan Explorations from Nepal to Lhasa, and "thence through the upper valley of the Brahmaputra to its source." The river in Tibet is identified here as the Brahmaputra, and the plateau through which it flows as the "upper valley", the lower one being the plains of Asom. This exploration which the paper proceeded to present then was about searching and locating of the source of the Brahmaputra in Tibet, already identified as one river. The information thus collected by the native surveyors was found by the president of the Society to be "of great importance to geographers."\textsuperscript{99} Though there had been

\begin{flushright}
\textsuperscript{96} Samuel Turner, \textit{An Account of an Embassy to the Court of the Teshoo Lama in Tibet}, London: Samuel Turner, 1800, p.298.
\textsuperscript{97} A high peak at the extreme east of the eastern Himalayan range.
\textsuperscript{99} ibid., p.164.
\end{flushright}
numerous visits by Europeans to Tibet during the two or three previous centuries, missionaries included, "no account of its real geographical features...had ever been brought before the Society prior to the present journey of the Pundit," he noted. Of the "course of the great Brahmaputra River which flowed through the central portion of the country [of Tibet]," the president further noted, "[A]lthough that river was at so short a distance from the north of our Indian possessions, its course in passing through the Himalayan chain into Assam was not yet defined," and "this" he considered "was one of the great geographical problems which remained to be solved."\textsuperscript{100}

The efforts towards resolving this mystery by sending spies and informants, however, started much earlier. A mendicant, Paramanand Acharya was a traveler who got favourable assistance from the British government in Assom in his mission of 1847. Regarding his journey, Francis Jenkins, the Commissioner of Assam wrote to Captain Vetch, the political agent for Upper Assam,

Should Permanund be able to penetrate to Lhasa, I have begged him to endeavour to return by the valley of the Sanpoo, which may be the stream in continuation of that River, and in his opinion it is not Dihing but another branch of the Burhampootur from which also flows the Dibong separating within the hills to be united again below Sudiya. I would beg you to give advice to the abors on the Debong in case Permanund should be able to return by either of those rivers, and to tell them they will be rewarded for any assistance they may afford him."\textsuperscript{101}

One of the objectives thus was to make "Permanund to follow down that River to this province [Assam] that this great geographical desideratum may be set at."\textsuperscript{102} Not much, however, is known about the outcome of this expedition. But in early 1860s, a proposal to send natives to Tibet in disguise for carrying out survey works was placed before the colonial government. The proposal having

\textsuperscript{100} ibid., p.165
\textsuperscript{101} F. Jenkins, Commissioner of Assam, to Captain H. Vetch, Political Agent of Upper Assam, Dibrooghur, No.292, 21 August 1847, Series XI, Vol.8, April-November 1847, ASA.
\textsuperscript{102} F. Jenkins, Commissioner of Assam, to Captain Cunningham, Proceeding on a Special Mission to Thibet, No. 294, 21 August 1847, Series XI, Vol.8, April-November 1847, ASA.
been accepted, the Superintendent of the Great Trigonometrical Survey of India engaged two persons for the purpose.\textsuperscript{103} Of them, Nain Singh was a government schoolmaster (or \textit{pundit}) in the village of Milum, in the Johar district of Kumaon, and the other, his cousin Manee Singh was a “Putwarie, or chief native official of Johar.” Their affinity to and acquaintance of Tibetan ways of life and culture, along with physical proximity were important factors determining their selection, as the two ‘Pundits’ were thought to belong to “a peculiar set of people, generally called Bhootiahs (quite different from the Bhootiahs, or Bhootanese, of Bhootan), who inhabit the highest accessible parts of the different valleys in Kumaon and Garhwal.”\textsuperscript{104}

It was reasoned that the aforesaid Bhootiahs could make the best of explorers in Tibet because of their knowledge of the Tibetan language, and also because their easy entry into Tibet. Manee Singh was found to be “far superior to Nain Singh in position, wealth, and intellect, and might have done well”, but his ‘superior talent’ could not be fully materialised by the British as “unfortunately he was too well off in his own country to take to the rough life of exploration.” Once the “promising recruits” were secured, Nain Sing and Manee Singh were sent to the headquarters of the Trigonometrical Survey for training. When Capt. Montgomerie took over the charge of training them for the forthcoming ‘Trans-Himalayan Exploration’ of the two natives, he found the trainees to be “very intelligent,” who “rapidly learnt the use of the sextant, compass, \& c., and before

\textsuperscript{103} To the question “What is a Pundit”, the following was offered as an answer, “A Pundit was not a very mysterious personage. The word simply meant one who had \textit{read} the ‘shasters’ or the sacred books of the Hindoos. A Pundit was simply then an educated Hindoo. He would be very valuable for Buddhist countries, but he would be utterly useless in Mohammedan countries.” T. G. Montgomerie, ‘Report on the Trans-Himalayan Explorations, in Connexion with the Great Trigonometrical Survey of India, during 1865-7: Route-Survey made by Pundit -, from Nepal to Lhasa, and thence through the Upper Valley of the Brahmaputra to Its Source’, \textit{Proceedings of the Royal Geographical Society of London}, Vol.12, No.3 (1867-1868), p.169. But Edmund Smyth, who was responsible for selecting the two recruits, gave a different reason for them being called Pundits. Though “Pundit is a title generally given to learned Hindus, but schoolmasters are always called Pundit whether learned or not.” Nain Singh was a government schoolmaster, and probably the first man to be sent to the Survey of India “to be instructed in the use of surveying instruments, and his title of Pundit (which means schoolmaster) seems to have stuck to him during the remainder of his life. The same name was also given to the other explorers who followed him, who were no Pundits alone.” Edmund Smyth, ‘Obituary: The Pundit Nain Singh’, Edmund Smyth, ‘Obituary: The Pundit Nain Singh’, \textit{Proceedings of the Royal Geographical Society and Monthly Record of Geography, New Monthly Series}, Vol.4, No.5 (May 1882), p.315, emphasis added.

\textsuperscript{104} Smyth, ‘Obituary: Nain Singh’, p.315.
long recognised all the stars without any difficulty."¹⁰⁵ After being trained, Montgomerie sent both off together to make a route-survey, with directions to follow the 'Brahmaputra' from its source in the mountains east of the Lake Mansarovar to Lhasa.¹⁰⁶ The route they were to traverse, however, was perceived to be a difficult one, no survey of which was known to be made till then.

The two pundits started their journey on 20 March 1865, and hired four men as their servants to accompany them. On the way, they put on Tibetan attire as a camouflage. They called themselves to be the Bisahiris or tradesmen, and the reason they gave for their journey was buying of horses, and to pay homage at the Lhasa shrine. The party reached Lhasa on 10 January, 1866. Nain Singh in the process traversed about eight hundred miles of the 'Brahmaputra' and the Great Road that lay along the river.¹⁰⁷ The results of this exploration by Pundit Nain Singh were received at the headquarters of the Survey of India, which included, among other results, "[A]n elaborate route-survey, extending over 1200 miles, defining the road from Kathmandu to Tadum, and the whole of the Great Tibetan road from Lhasa to Gartokh, fixing generally the whole course of the great Brahmaputra River, from its source near Mansarovar to the point where it is joined by the stream on which Lhasa stands."¹⁰⁸

Through this exploration, the source of the river Brahmaputra was located.¹⁰⁹ Also, the main branch of the river was determined through inquiries made to the Tibetans of the place. Though Nain Singh travelled along the road that lay along the Great River, at the junction of the tributary Charta Sangpo, the road separated from the river, and therefore was not observable for a course of hundred miles further east, where the road again met the river. "Of this [sic] 100 miles of the rivers' course nothing positive is known," Montgomerie informed, as

¹⁰⁹ "The river Brahmaputra was ascertained to rise in about north latitude 30.5°, and east longitude 82°", Memorandum, in Montgomerie and Pundit, ‘Report on a Route-Survey’, p.211.
according to "natives of the country" there was no good road along it. The pundit however "conjectured that the river flows (somewhat as shown in the map by dotted lines) south of a great peak which he observed from the road."\textsuperscript{110} The Geographical Society, while discussing the \textit{Report} by Montgomerie and its results, noted that "[T]he course of the great Sampu River in the maps by D'Anville and the Jesuit missionaries, was well confirmed by the labours of the Pundit."\textsuperscript{111} For his "great journeys and surveys in Tibet, and along the Upper Brahmaputra, during which he has determined the position of Lhassa, and added largely" to the "positive knowledge of the map of Asia," Nain Singh was awarded the "honour of a Royal medal" in May 1877.

The mysterious puzzle of the river, however, "whether this river [of Tibet] is or is not the upper course of the Brahmaputra", still remained unresolved in absence of a "positive proof". Montgomerie noted that the discharge measured by Nain Singh of the great river at Chushul where it received the 'Lhasa River' was 35,000 cubic feet per second in the dry season of December and January. On the other hand Captain Wilcox, in the dry season of March 1825, measured the discharge of the 'Dihong' River, supposed then to be a tributary of the Brahmaputra and at the highest point yet reached in that river, at 50,000 cubic feet per second. The length that the river traversed between these two points was estimated by Montgomerie to be about 350 miles. It was quite probable, he argued, that the river received still more waters from tributaries along this stretch, and that a discharge of 35,000 cubic feet of water at the upper end might increase to 50,000 cubic feet at the lower end. Moreover, no tributary was large enough to the west of the Dihong to account for the discharge measured near Lhasa, he contended. The Subanshiri River, the largest of the tributaries of the Brahmaputra except the Dihong, had a discharge only of 15,000 cubic feet, as noted by Captain Wilcox during his river-surveys of the Valley. Montgomerie therefore agreed with Wilcox's conclusion, expressed almost forty years earlier, that "if the great river that flows to the south of Lhasa is not the same as the Dihong, it is impossible to

\textsuperscript{110} ibid., p.212.
\textsuperscript{111} Montgomerie, 'Report on the Trans-Himalayan Explorations', p.146.
see how a sufficient area can be left to provide the water of the latter.”112 Thus, in concluding his Report, Montgomerie noted,

I consequently conclude that the great river south of Lhasa forms the upper part of the Brahmaputra, and is identical with, and forms the Dihong, or main branch of the said river... Positive proof, as to whether this river is or is not the upper course of the Brahmaputra, can of course only be afforded by tracing the river from Lhasa downwards. Every endeavour will be made to supply this missing link, meantime this last exploration tends to show that Turner [in 1783] and Wilcox [in 1825-8] were right in concluding that the great river which flows through the Lhasa territory is the upper course of the main stream of the Brahmaputra, the largest river in India.113

Almost five years after Nain Singh's journey, another party of Pundits was sent to explore some “portion of the unknown regions north of the Tibetan watershed of the Upper Brahmaputra.” This was part of the Survey of India's attempts to “get more information as to this terra incognita”, that is, “the vast regions which lie to the north of the Himalayan Range.”114 By the time the report of the explorations in the region were published in mid 1870s, the geography of an area of about 12,000 square miles was said to be elucidated, and “one northern tributary of the Upper Brahmaputra has been thoroughly explored, thus giving us some idea as to how far back the northern watershed of this great river lies.”115 Also, one explorer managed to trace the ‘actual course’ of the ‘great Brahmaputra river’ below Shigatze, thereby “adding to our knowledge” of the same.116

Nain Singh in the meantime led a group of “native explorers” to the sources of the Sutlej and Indus Rivers in 1870. In July 1873, the ‘Pundit’ “volunteered to make a fresh exploration” from Leh to Lhasa. He was given two objectives, and was to fulfill the more convenient of the two. The first was to join a caravan party to

113 ibid., pp.218-219.
115 ibid., p.329.
116 ibid., p.330.
Peking, failing which he was to "endeavour to return to India by an easterly route from Lhasa, down the course of the Brahmaputra if possible." On 15 July 1873 Nain Singh and "his party" left Leh, and passed en route Noh and Thok Daurakpa, to Lhasa. On his way he reported the existence of 'gold-fields' which were worked, and surmised that "there are enormous tracts of land where gold is to be obtained by digging." The party reached Lhasa on the 18 November, and from there he left purportedly for pilgrimage to a monastery ten days' journey north of Lhasa. Accompanied by two assistants, Nain Singh moved northward, but soon "he wheeled round and commenced his return journey to Hindustan," in a southerly direction. The explorers reached a place Sama-ye, from where they travelled downstream of the 'Brahmaputra'. The Report noted, "[I]n this portion of its course it is known either as "Tsanpo" or "the river", or by the name of Tamjun Kha." The Pundit observed that the flow of the river was very sluggish, and this he found out by throwing a piece of wood into the waters, "which was carried along a distance of 50 yards in two minutes and forty seconds." This place was called Chetang, and was noted by the Report to be "the lowest known part of the course of the Brahmaputra in Great Tibet".

At this point Nain Singh left the river, but not before "defin[ing] the course of the river approximately for a very considerable distance from where he left it." From this place the "general course" of the river was visible for about thirty miles downstream, and there it encountered a mountain range that diverted it to a south-easterly direction. This information of the Pundit was noted to be in accord with that in Du Halde's seventeenth-century map. Enquiring about the further course of the river from Chetang, it was found by the explorers, that

After leaving Gya-la, the approximate position of which is about 130 miles below from Chetang, the river is said to flow for fifteen days journey through the rice-

118 Ibid., p.101-103.
119 ibid., p.113.
120 Ibid., p.116.
121 ibid., p.115.
122 Ibid., p.116.
producing country of Lhokhalo...Its inhabitants are said to carry on trade with the people of Kombo district, which lies between it and Lhasa, but they have no communication with the people on their south, the Shiar Lhoba, a wild race (probably the people who are known to us as Mishmis) who inhabit the country through which the great river flows to Gya (in Asom).\textsuperscript{123}

With this new information, it was observed that "a little more light" had been thrown on the course of "the Tsangpo or the Great River of Tibet." Based on this new evidence, Trotter, who drew up the \textit{Report} of this exploration, asserted that it would be safe to identify the Tsangpo with "the large river which, under the name of Dihong, enters Assam near Sudiya, where it is joined by the Brahmakund."\textsuperscript{124}

On his way back, Nain Singh was detained in Tawang [in the present-day province of Arunachal Pradesh of India] for a couple of months, as it was difficult to procure permission to traverse that region from the 'Tawangpas', or the 'Lamas' of the Tawang monastery. It was believed that to keep the trade between Tibet and Asom solely in their own hands, the Tawang officials "systematically prevent[ed] all strangers from passing through their country."\textsuperscript{125} On 17 February 1875 Nain Singh left Tawang, and reached the British territory in the Darrang district on 1 March. He was then 'forwarded' from there to Guwahati, and then to Calcutta by steamer, where his journey ended on 11 March 1875. The \textit{Report} on Nain Singh's journey observed that as a result of this endeavour,

\begin{quote}
The Brahmaputra has been followed for a distance of 30 miles in a portion of its course, 50 miles lower down than the lowest point previously determined; and as its approximate direction for another 100 miles has been laid down, the absolutely unknown portion of that mighty river's course now remaining has been very materially reduced. The route Lhasa and Assam \textit{via} Tawang, of which next to nothing had hitherto being known, has been carefully surveyed, and the daily marches described.\textsuperscript{126}
\end{quote}

\textsuperscript{123} Trotter, 'Account of the Pundit's Journey in Great Tibet', p.116.
\textsuperscript{124} ibid., p.116.
\textsuperscript{125} ibid., p.121.
\textsuperscript{126} ibid., pp.121-122.
Many native surveyors were subsequently engaged to follow Nain Singh's footsteps in order to record geographical information of the still-unknown regions beyond the Himalayas. In 1878 J. T. Walker of the Survey of India dispatched A.K., or Kishen Singh to “make his way as far as practicable through Tibet, which was comparatively a terra incognita."127 The route he started on was not visited by any European after 1811. After being detained for about a year in Lhasa and a long route-survey of Northern Tibet and Mongolia, in March 1882, Kishen Singh in Eastern Tibet "struck across the remarkable region of contiguous parallel rivers which forms such a prominent feature on all maps of Tibet, but which as yet has not been explored by any European, though several have attempted to penetrate it both from the east and the west."128

Thus, between Nain Singh's initial journeys in 1860s and '70s and the Abor Expedition of 1910s, there were continued attempts to solve the 'mystery' of the river. In 1880, Kinthup, another 'Pundit' from Darjeeling, was deputed to trace the great river of Tibet on its way downstream where it entered the "mysterious veil" of the "unaccounted for" territory between the Tibetan plateau and the Brahmaputra Valley. His subsequent exploits in 'exploration' has been much celebrated variedly as a story of high-adventure and 'romance', of courage and perseverance, of faithfulness and loyalty, and so forth. Drawing eloquence in praise of the past Indian explorers surveying across the Himalayas, a reviewer in the Geographical Journal commented in 1923, "Only once perhaps in the history of the Indian explorers has such perseverance [a la Kishen Singh] been equalled, [i.e.] Kinthup's romantic journey down the Brahmaputra."129

By the time Nain Singh retired from active service as an explorer for the Survey of India in late 1870s, it was presumed by colonial geographers that "the veil had been lifted from Tibet and the surrounding countries. A glimpse had been

128 ibid., p.75.
obtained of the mysterious lands beneath... The recent history, geography, and political conditions of the semi-independent states of Asia were revealed. The carefully compiled reports of both Montgomerie and Trotter were of surpassing interest."130 It was felt, however, by the colonial government that though much has been now known of the territory, much more was still left and needed to be known. "Problems, however, remained still to be solved, and no break in the continuity of the work occurred in the retirement of the master."131 Southeastern Tibet (viewed from the British side, that is) and its surrounding regions were continued to be 'explored' by 'native surveyors' in disguise, continuing till the late years of nineteenth century. Hari Ram (M-H), 'Lala' (L), Nem Singh (G-M-N), Sukh Darshan Singh (G-S-S), Sarat Chandra Das (D-C-S) and many others, now more referred to in the colonial records by their abbreviated pseudonyms than the earlier designation of the Pundit, were sent across the borders for gathering more geographical observations and information.

Kinthup's exploits in search of the 'Brahmaputra' had been called "one of the last romances of the Survey of India."132 The results of his explorations went a long way for the colonial surveyors, geographers and other men of science, as well as the British government in bringing the unknown into the fold of the familiar. Yet it also stimulated the construction among them of modern myths or mysteries: the most imaginative and speculated one being the story of the falls on the Tsangpo. Though the oneness of the Tsangpo in Tibet and the Brahmaputra in Asom was widely-accepted by the end of the nineteenth century, European geographers and colonial administrators in India were equally intrigued by the drastic fall in the level of the river. The Tibetan plateau had an elevation of over 4000 meters, while that of the eastern parts of the Brahmaputra Valley was no more than 300 meters. Speculations were rife among the contemporary geographers and explorers about the existence of "the highest waterfall in the world" as the Tsangpo descended from Tibet to the British territory. It was supposed to be somewhere in the unknown "100 miles", of which Kinthup's narrative contained but a passing reference. Kinthup testified in his memorial

130 ibid., p.438.
131 ibid., p.438.
132 ibid., p.191.
which was later translated into English for the Survey of India, mentioning for
the first and also the last time in his narrative, the ‘falls’ on the Tsangpo, those
that was to occupy the imaginations of a generation of geographers. He noted,

The Tsangpo is two chains distant from the [Pemakoi-chung] monastery, and
about two miles off it falls over a cliff called Sinji Chogyal, from a height of about
150 feet. There is a lake at the foot of the falls where rainbows are always
observable.\(^{133}\)

The absence of any reference to the falls other than the one in Kinthup’s
narrative, and that too in a very scanty manner, is noted as late as 1895, more
than ten years after explorer’s journey. Waddell wrote, “[N]one of the trained
Indian surveyors, so far as I remember, have yet penetrated to the falls of the
great Tsang-po river, in the lower part of its course through Tibet; but by hearsay
reports these falls have been placed about 29°36'/N. lat. and 94°17'/E. long.,
between the districts of Kong-bu and Pema-koi.”\(^{134}\) Tibetans were claimed to be
aware of the existence of the falls. He also obtained a drawing of it, sketched by a
“lama artist” who was claimed to be a native of the Pema-koi district and knew
the place well. This sketch, Waddell informed, was shown to some Tibetans, and
“all those Tibetans who have visited the fall, to whom I showed the sketch,
recognized the general correctness of its leading features.”\(^{135}\) The figure of the
“king-devil” remained enveloped by the rushing waters, and cliffs of the fall by
thick forests abound with tigers, it was noted. The fall itself was said to be
approachable only from the below its gorge where there is a ‘rude’ monastery,
attracting pilgrims and visitors.\(^{136}\)

In April 1906, The Royal Scottish Geographical Society adopted a resolution to be
presented to the British government, where it proposed that an expedition be

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\(^{133}\) Cited in Dunbar, *Frontiers*, p.189.

\(^{134}\) Surgeon-Major L. A. Waddell, ‘The Falls of Tsang-po (San-pu), and Identity of that River with the

\(^{135}\) Waddell, ‘The Falls of the Tsang-po,’ p.258. He goes on, “This devil is placed there under a spell by
the Lamas, and when the river is low, the faithful can see his figure looming dimly through the
falling waters, as indicated in the picture.”

No.5 (1906), p.301.
arranged and carried out to explore the still-unknown and uncharted territory in
and around which the Tsangpo, to the site of the ‘puzzle’ or the “missing link”. Its
necessity was now made more acute "[I]n view of the great regret felt in
geographical circles throughout the world that the proposed expedition down
the Brahmaputra to Assam did not take place at the close of the Tibet Mission,
1903-04," led by Francis Younghusband.137 Such an exploration was argued to be
of "extreme interest or importance", as it was expected that it would "finally
settle" the question of the river's identity once and for all, and would put an end
to all the speculations surrounding it. Moreover, with the discovery of the falls on
the river, the Society pointed out, “much light would be thrown on the geology of
the region.”138 Apart from these, there were many other "grounds" too for
prompting the early preparation of an expedition to this region: “nothing is
known at present of the tribes who inhabit the tract through which this part of
the river passes. Valuable collections of the fauna and flora would probably be
obtained. It is possible that a good route might be discovered leading from Assam
into Tibet by the great river; such a route would have much importance in
promoting British trade with Tibet.”139

Solving the Last Riddle: The ‘Abor Expedition’

No such expedition, however, was taken up immediately. ‘Explorations’ by
individual or small parties in the region though, initiated by Nain Singh’s
journeys in 1860s, continued from the Tibetan as well as the British territories

137 ibid., p.301. Captain Ryder, a surveyor attached to the “Tibet Mission” led by Frank Younghusband, however, mapped the “whole course of the Brahmaputra from Shigatse to its source” in 1904 along with the “Mansarowar and adjoining lakes, and the sources of the Indus and the Sutlej, and has proved beyond doubt that no higher mountain than Mount Everest lies at the back of the Himalayas.” See Thomas Holdích, Thomas Gordon, Douglas Freshfield, Henry Howorth and Frank Younghusband, ‘The Geographical Results of the Tibet Mission’, The Geographical Journal, Vol.25, No.5 (May 1905), p.493, Emphasis added. More European travellers followed the footsteps of the native spies in the decades to follow, and the ‘iron curtain’ of Tibet to Europe was finally lifted in 1920s, when Europeans, most prominently the British, and later the U.S.A. got increasingly involved in the politics of the region. For a secret travel to Lhasa by William Montgomery McGovern, see his To Lhasa in Disguise: A Secret Expedition through Mysterious Tibet, Delhi: Asian Educational Services, 2000 (1924).

138 ibid., p.301. “In particular,” the resolution of the Royal Scottish Geographical Society observed, “we might expect information as to the structure of the country traversed, and the relation borne by the vast Himalaya ranges to the elevated plateau against which they abut.”

139 ibid., p.304.
without having much success in "penetrating" those elusive "100 miles". Even as
Kinhtup was engaged in his observations in Tibet, Captain John Michell, "of the
Intelligence Department, Simla" carried out in 1882 a reconnaissance survey
approaching from Asom, of "the rugged mountain region of the upper waters of
the Brahmaputra, in the hitherto inaccessible valleys of which lies the secret of
the true course of the Sanpo river of Tibet." Michell found that only two rivers
of Asom had the possibility of being the continuation of the Tsangpo: the Dibong
or the Dihong. The first river was "excluded from the question" since its course
had been traced and its source almost ascertained by recent survey works.

But this by no means made the job easier for the men of science grappling with
the question, and "by no means solved by this fact". Michell was informed by the
so-called Abors that the Dihong came down from the northwest and not from the
north, and that it was not a continuation of any great river. "A view from the
northern side of the gorge of the Dihong would probably settle the vexed
question," asserted members of the Royal Geographical Society who discussed
Michell's "reconnaissance sketch" of the mountain range. But this was
improbable, it was felt, given the fact that "[T]hey [the Abors] will not allow
strangers to enter their country... [N]o European has crossed [this] mountain
barrier".

In January 1909, Colonel D. M. Lumsden, Noel Williamson, and Rev. W. L. B.
Jackman visited the "Abor country" in an attempt to overcome this "Nature's
barrier" – the region between Tibet and Asom unexplored by any European so
far, and through which the Tsangpo-Brahmaputra was supposed to flow. They all

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140 'The Abor Country, on the Upper Waters of the Brahmaputra', *Proceedings of the Royal
1882), p.676.
141 It was noted in a discussion in the Royal Geographical Society, referring to the expeditions
of Colonel Woodthorpe in 1880s, that he "ascended [the Dibong] to the highest point yet reached by
any European- considered himself to have derived, from extensive views, and native information in
connection with them, a fairly accurate knowledge of the sources of Dibong, and the course of its
main stream in the hills". This led Colonel Yule, a member of the Society to declare that "Dibong,
in spite of its large discharge, does not come from Tibet." J. T. Walker, 'The Hydrography of
South-Eastern Tibet', *Proceedings of the Royal Geographical Society and Monthly Record of
142 'The Abor Country', p.676.
143 ibid., p.676.
had varied purposes for the journey, that of Lumsden being to "unveil" the 'mystery' of the falls.144 But they were "dissuaded" on the way by the gams, the headmen or elders of different 'Abor' villages, asking them to abandon their wish to advance further northward. Williamson offered Rs.100 to the gams, but the latter demanded a similar amount for each village the colonial officers were to pass. The matter was settled with an offer of Rs.150 for all the villages collectively. But they were again asked to stop their journey just after a week's march by the eight gams who accompanied them as 'guides'. The gams decided that to "proceed onwards in the present unsettled state of the country would be very dangerous" for the explorers, as different villages ahead were on a "war-path". They were however asked to "come back next year, when all will be well. "Yes," the priest quaintly remarked, "next year if there is no war, sickness will probably be the excuse."145 The exploration party could not make much progress, Williamson fell seriously ill and they had to abandon the "tour" just after a month of its commencement, returning from the village of Kebang in February 1909. Lumsden noted the other causes of their failure,

We were blocked at Ke-bang, but by passive resistance only. On this occasion they had a valid excuse for their conduct, namely, their war. Leading us too by the most difficult parts they could, throughout our journey, showed us they were none too keen to facilitate our movements. For instance (as we afterwards discovered), the old gam of Ke-bang, when he faced us with a rock and the precipice en route to his village, slipped quietly away by another path, the entrance to which he had hidden by cutting down branches of trees.146

144 Lumsden states, "The object of my visit was to unveil, if possible, the mystery still surrounding the falls of the Tsangpo; but Mr. Williamson's main object, as political officer, was to establish friendly relations with the Bor Abors, while the padre undoubtedly had his mission work at heart." D. M. Lumsden and Noel Williamson, 'A Journey into the Abor Country, 1909', *The Geographical Journal*, Vol.37, No.6 (June 1911), p.621.
145 ibid., pp.625-626. "Sickness", or the fear of it, did play a role in the objections that were raised by the village headmen against the journeys made by 'strangers' passing through the country. Lumsden notes that "when we entered the village [called Reu], there was a dead young pig suspended over the gate- this to protect them against any sickness we might bring with us- an offering to the spirits of evil. On leaving, we were again treated to another phase of demon-worship. The young men of the village followed us for nearly two miles, throwing tiny shreds of bamboo at and over us. This [was] to ensure us taking the evil spirits with us."
146 ibid., p.627. Such strategies of what is called the "passive resistance" of the villagers were often described as "treachery" in writings by the colonial officials. Emphasis added.
In such a situation, he thought that there were only two ways for exploring the Dihong River in the future. First, a small party of "two sahibs and a native surveyor" supported by a group of twenty 'coolies' who would "stick by the river and follow its course the entire way". They would offer presents to the villages on the way whenever it was necessary, such as coloured-thread and needle which Lumsden found were in great demand among the tribal communities residing these hills. If this way were to be found unsuccessful, as was shown by their own experience, the second way could be the last and only plausible option. This was "[B]y taking, say, 200 coolies and a force of native troops sufficient to guard them in their marches... With such a force of carriers and sticking to the native paths and villages as we did, would necessitate most of the supplies for coolies as well as the rest of the party from the plains, as it would be practically impossible to procure the needful amount of rice in the country." This was an argument which implied the carrying out of survey and 'exploration' works through a full-scale military 'expedition', a euphemism for invasion. Force, or the fear of its violent application, would be used against the 'Abors' and other "wild tribes" if they continued their resistance to the progress of the expedition. It was a "conclusion" which anticipated the coming expedition against the 'Abors' two years still in the future. As was noted, "if little has been achieved" through the present effort by Williamson, Lumsden and Jackman, "a good deal has been done to pave the way for the next attempt."

This "next attempt" by the British was to be in the form of the so-called Abor Expedition in 1911-12, its immediate cause being the murder of Noel Williamson, the Political Officer, and a whole party led by him in 1910 near the village of Reu. The colonial government accused the Abors of killing Williamson by treachery, luring into a trap when he unsuspectingly accepted the invitation of the headmen. His sole objective in embarking on a second "mission", it was

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147 ibid., p.628.
148 ibid., p.629.
149 "Had Mr. Williamson on his second visit followed the route we then took," Lumsden observed, "no doubt he would have been met once more at Kebang by Maddu gam of Reu and had some excuse made, as was done to us, for preventing him crossing the river [Dihong]. To avoid this, and placing faith in the invitation the Gam of Reu then gave him to return next year and all would be well, he crossed the Dihong lower down and marched for his village, encamping for the night within a few hours of the place. That evening a number of Abors came from the Reu village and offered him"
claimed, was to maintain the friendly relations which were "seemingly established" with the tribal residents of the hills during their first visit in 1909. Dr. Gregorson, whose objective was the same with Lumsden himself, i.e., the discovery of the Brahmaputra's falls, "was killed by the same treacherous gang, as well as those with him." Williamson and others were killed through intrigue, and their death needed to be avenged - this was the thinly veiled suggestion that Lumsden put across to the colonial government as he wrote, "When the time arrives, no doubt the Assam Government (who are the best judges) will take the needful steps to deal with the situation."

The time arrived soon enough, when the oppositions of the Abors and others to proceed through their country could no longer be "admitted by default." The expedition had many other objectives besides exploration of the unknown parts of the Dihong, noted Bentinck, the political officer attached to the Abor Expeditionary Force:

I am not at liberty to detail all these, but may mention the exaction of reparation from a most elusive enemy, the construction of a mule-road over heart-breaking country, the opening up of friendly relations with tribes and villages whose very names were either unknown or matters of vague and generally incorrect conjecture, and the necessity of appearing always in sufficient force to ensure against accidents.

The surveys of Captains F. M. Bailey and Morsehead attached to the Abor Expedition having been completed during the campaign, the course of the river was said to "leave little doubt as to the general character" of the river. The 'myth' of the falls was dispelled, and so was the hope of finding the cannibals beyond the known territory, though some portions of that region still remained to be presents. This no doubt strengthened his belief that he would be welcomed on arrival, and on getting there next morning and being met by Maddu gam he unhesitatingly followed him to his doom." ibid., p.621.

ibid., p.621.

ibid., p.621.


Hamilton, An Account of Assam, p.97.
observed ‘directly’. The stories of Kinthup and other native explorers of the past who visited the area were checked, authenticated, and refuted or corroborated. Kinthup’s account was found to be the most authentic of them all, and his ‘honour’ restored when as a result of the recent findings and authentication of his story, he was sought out from oblivion in Darjeeling, and given a royal medal.

Thus, by the second decade of the twentieth century, the river itself was almost completely mapped, with the disappearance of the dotted lines of the previous maps which showed the Tsangpo/Brahmaputra in this *terra incognita*. The river now was fully known and mapped out, with the scope for mysteries, conjectures and speculation about its course being put to rest forever.

**Studying the Brahmaputra in the Twentieth Century**

The Brahmaputra as a route of strategic importance for the British Indian Empire once again came to the fore at the beginning of the First World War I. The *Military Report on the Brahmaputra River System*, prepared and printed in 1914 from Simla by the British Indian Army is a manual to the British forces for ready reference, presented visual details and maps of the river-system. Descriptions of the Brahmaputra and its tributaries connecting the various towns and administrative centres in the valley are shown with various topographical indicators. A military report on the ‘Dihang’ Valley, one of the major northern tributaries of the Brahmaputra in Eastern Assam, was to follow a few years later, with similar characteristics and a similar purpose.

While the use of the Brahmaputra as the main conduit of troops sent to various parts of the Valley as well as the adjoining hills continued through the nineteenth century well into the twentieth – at times with renewed importance as was during the War in 1914 – in absence of a reliable road transport system, it was also the main route of commerce in the North Eastern Frontier. Both these

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aspects led the colonial government to take up minor measures of studying and ‘improving’ the rivers in the Valley. As has been pointed out above, measurements of volume of water carried by various rivers were collected from mid-nineteenth century, the navigable channels of the Brahmaputra, which kept frequently changing and shifting, was monitored to keep up the steamer communication, snags and bends were cleared from many smaller rivers that were impediments to smooth sailing of carriers, and so on.

Wilcox as well as Pemberton who was to continue the survey works in the region in mid 1830s, scrupulously noted not only the observations required exclusively for the immediate purpose they had in hand, but also had a keen eye for mapping out the terrain for future commercial enterprise. Pemberton crisscrossed the frontier during his surveys over the plains of the Brahmaputra as well as the hilly terrain of the “Eastern Frontier” during mid 1830s, regions that were “never before visited by Europeans”. He not only carried out his professional part of the job, but also reported the existence of “valuable timber” and mineral and other resources that he observed during his journeys. Pemberton’s observation on Assam here is instructive:

Looking to the extraordinary fertility of the soil, the noble river which flows through the valley from one extremity to the other, the innumerable streams falling into or branching off from it, both on the north and south, and the proofs derived from history of its former affluence, abundant population, and varied products, there can be no doubt that in the course of a very few years...this province will prove a highly valuable acquisition to the British Government- its revenue already shows progressive improvement...The opening lines of communication, and facilitating thereby the transit of merchants with their goods, is, next to a settled form of government, which Assam now enjoys, the object of primary importance for the effectual development of the resources of that country.156

Thus, for instance, if Wilcox was the one to discover pools of petroleum in the wilderness of eastern Asom, a discovery not very far in time and space from what was considered as valuable discoveries of tea and coal in the same region, Pemberton informed his employers of the discovery of iron-ore in Manipur. Such concerns though were not coincidental. It reflected one of the major imperatives of the colonial regime to expand the frontiers of its possessions eastward. Along with it was to expand the frontier of knowledge about the colonial possessions to take stock of the natural resources and commercial enterprises offered by the region.

From the early twentieth century, the colonial government was forced to draw its attention to another aspect of the river-system, the floods. Particularly after the earthquakes of 1897 the terrain in the valley underwent changes that, along with other social factors, started to make the floods more devastating to the poorer sections of the peasantry, thereby also affecting the collection of land revenue. The demand for the construction and maintenance of embankments to protect farmlands, along with demands for flood relief and waiver of land revenue was forcefully made by peasants to the government, which the latter had so far conveniently made the responsibility of local bodies and village associations, with very little assistance from the government funds.

The construction of elevated railway lines cutting across the natural path of the floodplains also had an adverse impact on abating the devastation of floods. There followed enquiries into the causes of the floods in the Valley taken up by various branches of the government, including the study of the effects of deforestation and soil erosion, and of man-made structures such as embankments and blockades to the natural course of rivers and flood-waters, etc. Though these studies identified some of the major factors contributing to destructive floods, it was admitted that the scientific knowledge of the river system in particular and of the region's ecology in general was partial and highly inadequate. The considerations of imperial finance and revenue, whereby the colonial government held that expenditure on the study of the causes of floods and on flood-protection works was wasteful and without adequate returns,
played a decisive role in the apathy towards reducing the adverse affects of devastating floods on its subject population.157

After 1947, and particularly after the great earthquake of 1950, a series of scientific studies were commissioned by Indian government and were conducted by its experts to produce better knowledge about the Brahmaputra river system. While the provincial government took a pragmatic approach by taking up the construction of earthen embankments all over the Valley as the most readily employed and inexpensive flood protection measure, the central government aimed at undertaking long term projects that were aimed at "harnessing" the "water resources" of the region. It can be argued that while the river embankments were undertaken by the provincial government with a short-term perspective, i.e., without thoroughly studying the taking into consideration their possible future affects, considering only the local needs and the perceived immediate benefits of embankments, the studies engaged by the central government took the whole region which comes under the 'watershed' of the Brahmaputra river under its purview, and keeping in mind long-term objectives. These studies went into collecting scientific and technical data about the river system from 1950s and analysed long-term data generated by government agencies. However, as will be argued subsequently, the production of scientific knowledge about the Brahmaputra in this latter phase too was informed by interests of the State and commerce, as was the emphasis and deployment of one form of knowledge by the state-scientists over others.

While embankments were continued to be constructed at a frantic pace in the Valley, big dams were presented as the only permanent and long-term answer to the recurring floods in the Brahmaputra. In addition, they could also generate electric power, expand areas under irrigation, and thereby usher in development of the region, was an oft-repeated argument of the State. The studies that were carried out about the river system after 1950s were aimed at looking into these possibilities. The U.S. agencies along with Indian government's experts recommended the 'taming' and 'stabilization' of the river through such

157 For a further discussion on this subject, see Chapter VI: 'Floods and the Fields'.
multipurpose reservoirs on the major tributaries of the Brahmaputra, after thorough scientific studies were undertaken. In the last decades of the twentieth century the construction of these big dams commenced, while the work of collecting scientific data of every major river in the Seven-Sisters region continued simultaneously, with the 'Master Plan' for many of the major rivers in the region completed by government organisations during this period.158 The 'scientific' nature of the plans and projects of the State on the Brahmaputra, however, has come under trenchant critique in the last few decades, reminding once again that knowledge production—whether under colonialism or imperialism, whether scientific or otherwise—is even today equally integrated with the exploitation of the people and Nature.

158 See Chapter VIII: 'River Control' for more details.