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# Making Territory Visible: The Revenue Surveys of Colonial South Asia

BERNARDO A. MICHAEL

**ABSTRACT:** Once the British became a colonial power in south Asia in the eighteenth century, they had to struggle to determine the internal divisions and boundaries of the territories under their control. In north India, these units had been organized around various pre-colonial administrative divisions, such as *parganas*, which had never been mapped. With the introduction of detailed revenue (cadastral) surveys in the early nineteenth century, the British were able to map the *parganas* and other administrative units, thereby creating a durable record of property holdings. In the nineteenth century, they also allowed the colonial administrators to reorganize the old divisions into a well-defined and more coherent pattern that endured to form the geographical template of the modern state.

**KEYWORDS:** South Asia, north India, North West Provinces, Bengal Presidency, Bhagalpur District, Jaunpur District, Pumea District, East India Company, colonial state, Revenue Surveys, boundary surveys, cadastral mapping, territorial intermixture, territorial reorganization, *thana* divisions, *pargana* maps.

In 1768, the English East India Company acquired its first territorial possessions in India. Throughout the late eighteenth and early nineteenth centuries, the Company's territorial possessions in south Asia grew dramatically. These territories were organized into three Presidencies centered around the present-day cities of Calcutta (Kolkata), Bombay (Mumbai) and Madras (Chennai) (Fig. 1). However, from the inception of its rule, the Company state was confronted with a number of dilemmas. Company officials possessed scant information about the social, political, economic and cultural aspects of the lives of the people in these territories. Even more enigmatic was the extent and delineation of the territories, and colonial officials were hard pressed to discover the boundaries, internal divisions and organization of their dominions.

The British, therefore, immediately took steps to discover and clearly demarcate the territories now under their control. While some political boundaries were adjusted through wars with neighbouring states, most territorial reorganizations were the product of the surveys and mapmaking activities of the Company State. What eventually emerged was a new geographical template for representing states as clear-cut, non-overlapping territorial entities with a hierarchy of internal divisions capable of representation on modern maps.

The aim of this article is to connect two lines of inquiry that have been treated as distinct and

unrelated-the territorial 'illegibility' that confronted the Company and the mapping of the sub-districts (*parganas*) that were used as the main basis for revenue collection in north India.<sup>2</sup> My focus is on the mapping of the *parganas*, the least known aspect of the Revenue Survey's activities in nineteenth-century India. I shall argue that the *pargana* maps produced by the Revenue Surveys of the nineteenth century provided colonial officials with invaluable information concerning the extent, boundaries and internal organization of each *pargana*. This information was then used to reorganize the administrative geography of the territories into a coherent pattern of compact and clearly bounded administrative districts. Matters such as the institutional basis, the technicalities of revenue surveying and their impact on property rights and taxation claims, however, are beyond the scope of this article.<sup>3</sup> Given the primary sources I have examined, my remarks are confined in the main to the Revenue Surveys of the Bengal Presidency and the North West Provinces in north India:<sup>4</sup>

### *Illegible Space: The Need for Maps*

Typically, although not always, the Mughal territories secured by the East India Company in the eighteenth century had been divided into provinces (*subah*), districts (*sarkar*) and sub-districts (*parganas*), along with a host of other divisions, including *chaklas*, *tappas*, *tarafs* and *mauzas* (villages). By the end of the century, Company officials came to possess increasingly detailed topographical maps of the sub-continent, but all too frequently these maps were on too small a scale to show administrative boundaries and hence were of little practical use. Local administrators, concerned with day-by-day governance, needed the kind of information that could be obtained only through a painstaking and expensive cadastral-type survey of all rural properties. Only then would they be able to discover the boundaries of the *parganas* and the precise location of each village within them.

It is not surprising that Company officials had so much difficulty in grasping the layout and organization of the divisions now under their charge. A typical *pargana* was a tenurial patchwork of inter-mixed properties, with scattered enclaves of land held by inhabitants of neighbouring sub-districts, while fragments of its land lay beyond its borders, as exclaves in other *parganas* (Fig. 2). To compound matters, the interlocked properties were only loosely connected by constantly shifting property, taxation and tribute relationships based on a range of rights usually sanctioned by custom. Therefore, the boundaries of *parganas*, and other subdivisions (such as the *tappas*), were not only ill-defined but also constantly shifting.

Company officials in England as well as in India were increasingly made aware of the problems faced by their agents on the ground. In 1818, the Military Secretary to the Court of Directors in London summarized the general situation:

The Court [of Directors] have formerly had occasion to point out to the Governments in India the expediency of ascertaining with precision the true boundaries of our dominions. It is almost unnecessary to observe, that this is a duty which ought never to be neglected by any government that values its own rights or has a due respect for those of its neighbours. It is therefore desirable in the first place to possess an accurate outline of the several cessions which have from time to time been made to the East India Company by the several Governments and Chiefs of India, and which will of course give the general boundary of our dominions.

Next in importance, I conceive, is the obligation of gaining the best possible information respecting the frontiers of those states whose dominions we are bound by treaty to protect against foreign aggression. I am aware, that from the lax habits of the native governments, the frequent intermixture of their respective territories, and indeed, the intentional indefiniteness which prevails among them in respect to boundaries, this is a branch of Indian Geography which cannot be acquired without considerable difficulty.<sup>5</sup>

Such spatial illegibility was not confined to the boundaries of the Company's territorial possessions;

Company officials also had little or no idea of the internal divisions of the territories under their control.<sup>6</sup> In 1820, Walter Hamilton commented on the problem of unclear boundaries and internal divisions:

The map [of India] prefixed exhibits the large geographical divisions, but being constructed on so small a scale, it was found impossible to distinguish either the petty native states, whose territories are much intermixed, or the different districts into which the British provinces have been partitioned. With respect to the first, no native state has yet been brought to understand the advantages we are accustomed to see in a compact territory and uninterrupted frontier; and with regard to the latter, the limits of none can be considered as finally adjusted, the judicial and police arrangements requiring frequent revisal of boundaries, and various surveys being still in progress, with the view of obtaining more accurate geographical and statistical information than the Indian governments at present possess. Owing to these imperfections a town may be frequently assigned to one jurisdiction which in reality belongs to another, but the mistake is of no essential importance, and many such corrections must hereafter be required, the limits of no district having yet attained such precision and arrangement as to preclude the necessity of future alteration.<sup>7</sup>

There is plenty of evidence to suggest that such cartographic anxiety and concerns about the lack of information on the Company's territorial divisions and boundaries was both widespread and experienced at every level of governance.<sup>8</sup> One of the earliest observations on the fuzzy spatial qualities of the old *pargana* divisions came from Charles Bentley, the British official (or Collector) in charge of Chittagong District (in present-day Bangladesh). When asked, in 1772, for his opinion on the Government's plans for the collection of revenue, Bentley noted that in the district under his charge not a single *chakla* (another division, usually larger than a *pargana*) or *pargana* 'stood entire', which made it difficult to determine the total resources of the district.<sup>9</sup>

Ten years later, in 1782, Robert Kelly, a surveyor in south India, observed that

The Natives of India never think of surveying large territories, or of settling their boundaries in anything like straight lines; ... in the centre of a district fifty or sixty miles (80-96 kilometres) broad it is common to meet with villages belonging to the neighbouring states.<sup>10</sup>

In 1818, the high-ranking official George Dowdeswell lamented that, since Company officials had a very incomplete knowledge of the layout of their territories, they were unable to conduct the day-to-day affairs of administration.<sup>11</sup> A few years later, John Crawford wrote that 'the British possessions ... classed by governments and revenue or judicial divisions, must be considered only approximations to truth' and that the divisions had 'hitherto not received from the Indian authorities the degree of attention which [their] practical value and importance is entitled to'.<sup>12</sup>

The lamentable state of affairs persisted, however, and in 1830 the Company's Court of Directors was alarmed to find that their district officers still did not possess maps of the districts for which they were responsible. The Surveyor General in Calcutta was directed to provide the necessary maps.<sup>13</sup> By this time colonial officials were beginning to grasp some of the spatial dynamics at work in the old *pargana* divisions, but progress was slow. The Revenue Department of the North West Provinces, in its Resolution of 30 October 1837, was still able to observe:

It does not appear that under preceding governments the limits of these [*pargana*] divisions were always kept unchanged. Private interests or temporary purposes frequently occasioned the severance of a mouzah [village] from one Pergunnah [sic] to which it naturally belonged, and its annexation to another more distant one.<sup>14</sup>

One of the most vexing issues faced by Company administrators was the lack of accurate data on which to base the collection of revenue. Overall, the Company possessed uneven information on the internal resources, population, property rights, layout, extent and boundaries of the territories under its control. Officials had to sift through a profusion of tenures before authenticating and confirming their legal status. They had to inquire into the productive potentials of their districts before making revenue assessments (although, in reality, they often were forced to do the very opposite). When dispensing justice in civil and criminal matters, they had to determine the populations that fell under their jurisdiction and assign them to well-defined judicial districts.

Despite the desperate need for information on the administrative geography of the Company's territories, officials were able to do little in the first fifty years of colonial rule because of manpower and financial shortages. They continued to rely on indigenous records of taxation and property rights for information on the administrative districts they controlled. At the same time, they attempted to introduce measures calculated to rationalize and render coherent and permanent new administrative divisions. In 1786, for instance, the Company reconstituted all its districts. In 1791 the Amended Code of Regulations for the Decennial Settlement instructed the Collector of every district in the provinces of Bengal and Bihar to establish a fixed arrangement of internal divisions, such as *parganas*, *taraf*, *taluks* and *kismets*. The same Regulation also stipulated that the revenue accounts were to be based on the *parganas*. The financial records of units within a *pargana* were to be inserted into the account register of that particular *pargana*, and no other.<sup>15</sup>

Under John Macpherson's Governor Generalship (1785-1786), some of the *parganas* and *zamindaris* (estates) were organized into thirty-eight new districts or Collectorships.<sup>16</sup> Further territorial rearrangements, instituted in December 1792 under the direction of Governor General Lord Cornwallis, encouraged the division of every district into police jurisdictions (*thanas*) of about twenty to thirty square miles (53 to 78 square kilometres), with a principal town or market situated in the centre of the new administrative unit.<sup>17</sup> A year later, in 1793, a large number of territorial transfers took place between various Collectorships in the Bengal Presidency. Villages and *mahals* (revenue-paying lands) that were detached from their parent *parganas* were transferred to the nearest *pargana* in an effort to create districts with compact internal divisions.<sup>18</sup> In another instance, in 1835 some attempts were also made to align the boundaries of the *thana* (police) and *pargana* divisions in some districts belonging to the Banaras Division. Here, the irregular *pargana* boundaries were 'adjusted' and 'rounded off' to correspond to the *thana* boundaries.<sup>19</sup>

Along with this rationalization of territory through the creation of coherent and well-defined administrative units, efforts were also made to systematize existing practices of record keeping. To get the records to match the territorial divisions, Regulation 42 of 1803 decreed that cadastral information was to be recorded in two kinds of registers: one listing the tax-paying lands (*mal-guzari*), and the other organized around the *pargana* divisions. The latter was to provide details about the *parganas*, their internal divisions such as *tappas* and *taraf* and their constituent villages (*mauzas*). Detailed rules were also laid down regarding the physical maintenance of cadastral records, but little was said about maps and surveying (the other half of a complete cadastral record).<sup>20</sup>

Since the *parganas* inherited from the Mughals were not compact and had no clearly defined boundaries, compact *thana* divisions could not be constructed out of them. In 1809, Francis Buchanan-Hamilton (1762-1829) observed in the course of his topographical survey of Gorakhpur District that a number

of *thanas* had detached segments. He commented that the 'most un- exampled carelessness and confusion has arisen' and that the divisions, already of different shapes and sizes, were 'subdivided by intervening portions' of land belonging to adjacent units, so that 'many have the residence of their officers in situations that are exceedingly inconvenient'.<sup>21</sup> He also noted that the *thana* of Maghar was an 'irregular straggling jurisdiction, exceedingly ill arranged having nearly in its middle, or intermixed\_ with it, the division of Bakhira, and containing two detached portions of Bangsi'.<sup>22</sup> In order to correct this situation, he suggested that 'If these portions were joined to the two divisions and Bakhira made the residence of the officers of police, the jurisdictions would be tolerably compact, of a reasonable size, and its capital tolerably near the centre'.<sup>23</sup>

It is doubtful whether such measures to consolidate the *thanas* would have remedied the situation; tinkering with new or rearranged administrative divisions was not going to resolve the problems of 'territorial illegibility' and administrators' ignorance about demographic and economic resources. The problems Buchanan-Hamilton described were widespread in the Bengal Presidency and the North West Provinces. The *thanas* had been carved out of the old *parganas*, and inevitably they had inherited the 'deficiencies' of intermixed land. Only when surveys could be conducted at village level would it be possible to comprehend the exact composition of each *pargana* and to make the territorial adjustments needed to remove the problem of fragmented territory and irregular boundaries.

In north India, at least, colonial officials gradually reconciled themselves to the fact that they had to understand the structure of pre-colonial divisions such as the *parganas*. However, the existing revenue and property records were not particularly helpful in this regard. All too often, these records had been subjected to innumerable mutations as lands were transferred from one administrative division to another without any attempt to preserve coherent and unified blocks of territory.

In the early nineteenth century, little was said about the maps that, together with the registers, constituted a complete cadastral record, but pressure to produce detailed local maps was building up. In north India, it was realized that the delineation of all pre-colonial administrative divisions-such as the *parganas* and their subdivisions, the *tappas-through* detailed field surveys was necessary before index maps for the *parganas* could be produced. From such maps colonial officials would finally be able to see the discontinuities, intermixing and serpentine boundaries that characterized the *parganas* before they embarked on any project of territorial rearrangement that would create compact administrative districts.

Initiating a professional survey was not easy. In places like the Bengal Presidency where the Permanent Settlement was in force, there was no incentive to conduct a detailed survey, since the land-revenue settlements had been concluded in perpetuity.<sup>24</sup> Eventually Company officials realized that the Permanent Settlement constituted a huge loss to their treasury, and that future settlements had to be based on accurate information about the value of the resources which were being taxed. The combined cost of carrying out such local surveys and their unpopularity among indigenous land-holders, however, dissuaded the Company from undertaking large-scale cadastral surveys of its territories until 1822.

Finally the East India Company decided to break this impasse, and on 7 August 1822 it issued Regulation 7 instructing its officials in the Bengal Presidency and North West Provinces to commence detailed cadastral surveys, on which all future land settlements were to be concluded.<sup>25</sup> Regulation 9, passed in 1833, reconfirmed this measure and laid down the principles on which the surveys were to be conducted, including the stipulation that professional surveyors should be responsible for the fieldwork.<sup>26</sup> The stage was finally set for the compilation of the first district-level maps in the subcontinent based on detailed surveys; these also uncovered the ancient *pargana* divisions.

### *The Revenue Surveys after 1814*

The cadastral surveys in India were varied in their objectives, mode of operation and achievements. In the eighteenth century, Revenue Surveys had been conducted in the Presidencies of Bengal, Bombay and Madras by their respective surveying departments under the general oversight of a government body called the Board of Revenue (originally set up in Bengal Presidency in 1772 to oversee the collection of revenue).<sup>27</sup> Then, in 1814, the offices of the Surveyor General in the three Presidencies were combined and a new office of the Surveyor General of India was created with its headquarters in Calcutta. Colin Mackenzie, the Surveyor General in Madras, was appointed the first Surveyor General of India (1815-1821).<sup>28</sup>

Despite the formal unity of a Surveyor Generalship, there was little coordination on the ground between the Revenue Surveys in the individual Presidencies, which, to all intents and purposes, continued to be driven by the regional interests of local authorities.<sup>29</sup> In the Bengal Presidency, for instance, the Board of Revenue was responsible for the surveys of the Lower Provinces (including Bengal, Orissa, Bihar and Assam) from its headquarters in Calcutta, and for those of the North West Provinces (previously called the Ceded and Conquered Districts) from a base in Allahabad. At first, Revenue Surveys in the Bengal Presidency were irregular, poorly coordinated and, in many respects, incomplete.<sup>30</sup> Gradually, though, as the surveys began to cover vast swathes of the Presidency and the North West Provinces, greater coordination ensued.

In north India, the Revenue Surveys were a composite of two operations, professional and native. The surveys were under the charge of a European surveyor (military or civilian) who worked closely with local European and Indian officials, landholders and other local notables as well as with the native staff, whom he recruited and trained himself, to gather relevant information.<sup>31</sup> The survey was essentially topographical, with administrative and village boundaries measured with precision by professional surveyors.<sup>32</sup> Other information concerning the layout of individual property holdings was sketched in by eye, and details about tenures, crops and soil types were entered into registers, usually by the district officials and their Indian staff.

How these surveys were to be conducted was set out in Regulation 9 of 1833, which called for a detailed village-by-village survey (*mauzawar*) from which maps would be constructed to show the villages and their lands, as well as to indicate the *pargana* to which they belonged.<sup>33</sup> Villages could be treated as permanent entities, unlike estates which varied in shape and could disappear entirely over time. Estate surveys continued to be conducted in those areas of north India where the Permanent Settlement was still in force, although there too village surveys eventually became the norm, especially after 1841, when the Revenue Board decided that surveys in Bihar should be conducted on a village basis.<sup>34</sup> Thereafter, the village became the basic unit of surveying and formed the building blocks out of which administrative divisions such as the *pargana* were to be reconstructed on maps.<sup>35</sup>

The professional part of the revenue survey commenced with district officials marking the boundary of the village to be surveyed. The European surveyor then demarcated this boundary scientifically using a theodolite and chain. The objective of such a survey (*thakbast*) was to demarcate the external boundaries of tax-paying villages (*mauzas*) and to identify revenue-paying estates (*mahals*), resumed tenures, rent-free tenures (*akhiraj*) and lands concealed from taxation (Fig. 3). In addition to the map, a file (*mis*) was prepared which gave, among other details, a full description of the boundary and the names of adjoining villages. On the completion of the survey of every village in a *pargana*, a list of villages was made out, together with a rough sketch map (*mujmilii*) citing every village circuit in its proper relative position within the *pargana*.<sup>36</sup>

The *thakbast* was followed by the second phase of the Revenue Survey, a general survey of the village

under assessment showing the cultivated lands within it. This so-called 'Native Survey'<sup>37</sup> comprised a map (*shajra*), which was not drawn to scale but which had every field shown on it numbered, and a corresponding field book (*khasra*) (Fig. 4). An accountant (*patwari*) registered each field number in the *khasra* along with the name of the proprietor, its area, soil type and the crops grown.<sup>38</sup> After Regulation 9 of 1833 came into force, a professional surveyor was placed in charge of the *khasra* surveys. In 1837, one of the surveyors, Lieutenant Henry L. Thuillier, insisted on the addition of a compass and scale to the maps. He also devised a simple and basic surveying process that allowed him to employ native assistants instead of Europeans and Eurasians, thereby reducing the cost of the survey.<sup>39</sup> The native surveyor (*amin*) made his measurements by using a compass mounted on a graduated circle with chain. Since all 'native' measurements were based on the surveyors' circuits, this allowed the reconstruction of the territorial profile of a village in a neat progressive fashion.<sup>40</sup> The survey field books, called *khasra chittas*, continued to contain information about field size, proprietors, location and number of fields and estates (*tauzi*) in the Collectors rent roll. Thus the holdings of a village or *mahal* (an estate paying revenue to the government) were reconstructed without recourse to the more expensive and time-consuming scientific survey.

Every attempt was to be made to relate the Revenue Surveys to the ongoing work of the Great Trigonometrical Survey (GTS) of India, which had commenced operations in 1799 and was still in progress.<sup>41</sup> It was hoped that the Revenue Survey would be able to fill in the triangulated spaces fixed by the GTS, and 'put sinews and flesh on the colossal skeleton which that survey constructs'.<sup>42</sup> The idea was that the triangulation would provide a mathematically rigorous framework on which all future surveys (cadastral and topographical) would be based. This aim, however, worked only imperfectly, and on many occasions the Revenue Surveys were carried out before the GTS had begun in the region in question, as for example in the case of the 1838-1840 Revenue Surveys of the District of Jaunpur (see Fig. 2). In some areas the Revenue Surveyors were able to anchor their surveys to GTS-generated points as in the case of the Revenue Surveys of the District of Purnea, 1840-1847 (Fig. 5).<sup>43</sup>

The faulty sequencing of the two map-making projects characterized British surveying efforts throughout south Asia, and the GTS emerged as the structure of the imperial geographical archive only around the time of the retirement of George Everest (the Surveyor General) in 1843.<sup>44</sup> Meanwhile, the Revenue Surveyors tried to narrow the discrepancies between their data and that of the GTS. For example, the first surveying group to work in an area was supposed to leave a prominent marker at each 'triple boundary point'-that is, the place where the boundaries of three *parganas* met-and to erect there a small masonry platform for the benefit of any surveying

parties that might follow.<sup>45</sup> How all this actually worked out in the field is unclear, but surveyors reporting a decade or more later seem not to have experienced any particular difficulty in aligning the two surveying systems.<sup>46</sup>

### *The Pargana Maps*

In the early 1820s and 1830s, Company officials hoped that a general map of a district could be put together from a congregation of village circuits, thus recreating the *pargana* to which they belonged. This plan failed when surveyors discovered that the *parganas* possessed intermixed bodies. The maps constructed show that-like the



villages-the *parganas* rarely possessed compact and well-defined bodies. Bits and pieces of the land of one division would be found scattered within the jurisdiction of another, especially along their edges. Sometimes this phenomenon was pronounced throughout the interior of an entire district, as was the case with the *parganas* lying along the northern boundary of the District of Pumea (Plate 7; see also Fig. 5). Here the *parganas* of Powakhalee and Fattehpur Singheea lay scattered throughout the district in a most discontinuous manner, leaving it almost impossible to reconstruct what belonged to what and to understand their physical layout because of the way lands belonging to one village lay as exclaves within the boundaries of not only one but often two or more other *parganas*. The situation meant that it was almost impossible to reconstruct coherent district level maps by merely assembling village maps.

In about 1838, under the influence of Deputy Revenue Surveyor General James Bedford, some improvements were introduced to procedures followed by the professional surveyors working in the North West Provinces. Henceforth, the Revenue Surveys of individual villages and their boundaries were to be preceded by a scientific survey of a larger or 'main circuit', using a compass and chain. These large main circuits (*halkas*), which encompassed areas that varied in size from 30 to 50 square miles (78 to 129 square kilometres) in the North West Provinces to 150 to 200 acres (about 61 to 81 hectares) in the Province of Bihar, were adopted to free the general maps from the accumulation of small errors and to tie the interior surveys to well-established points.<sup>47</sup> Once the boundaries of the main circuit had been determined, the smaller village circuits could be marked off and surveyed by the field parties. The idea was that 'all survey operations work should always be carried on from whole to part, and never from part to whole'.<sup>48</sup> This principle was consistently upheld, and the demarcation of main-circuit boundaries henceforth invariably preceded detailed field operations.<sup>49</sup>

Initially, each main circuit followed the boundary of a *pargana*, with the starting and closing point of each circuit the point of contact of three *parganas*. By 1855, however, it became clear that aligning the main circuit with the boundaries of a *pargana* was problematic, because one *pargana* often contained land from another as a consequence of the frequent transfers of a village from one sub-district to another in the revenue records.<sup>50</sup> The intermixed land and the discontinuous *pargana* boundaries confounded the surveyors and rendered the whole surveying exercise tedious and inconvenient.

In November 1855 the Survey Department passed orders decoupling the boundaries of the main circuits and *parganas*. One order stated that the

shape of the circuit may be as compact and symmetrical as possible without any reference whatever to the sinuosities of the boundaries of either Purgunnahs [sic], the only conditions being compact block-longlines and minimum number of stations whereby the angular observations and linear measurements will be reduced and the traverse proof rendered more certain. The maps will likewise be far more convenient for lithography than many of the Purgunnah maps are at present.

The order went on to say,

No detached portions of any Purgunnahs whether surveyed or remaining for survey, lying without the main circuit are to be brought into the area statement on the main circuit map, or referred to in any way; only the traverse village circuits embraced within the main circuit are to be accounted for.<sup>51</sup>

The principle of keeping the *parganas* separate from the Revenue Survey was reiterated in December 1855. Instead of the *pargana* serving as the basis for organizing survey data, from now on each main circuit and the village circuits within it were to be assembled together to reconstruct the map of a district. Circular

102 further stated that

The conduct of the operations according to the main circuits as surveyed, instead of by Purgunnahs as provided in Circular no. 101, dated the 26th November last, will also greatly tend to get a season's work out of hand and obviate the delay and occasional loss now experienced by the detention of the village plan volumes by some surveyors year after year for the insertion of detached villages.<sup>52</sup>

The village circuits within a main circuit were to be marked off and shown as belonging to their respective *parganas* by a distinguishing colour and number. <sup>53</sup> In the case of villages with severely intermixed lands, surveyors were instructed to combine them into a single unit which would be placed in the records under their joint names.<sup>54</sup>

The maps that were produced from the village circuits were plotted to a scale of four inches to a mile. The scale then had to be reduced to either one-inch or two-inches to a mile to fit the *pargana* maps, and to four miles to the inch to match the district maps.<sup>55</sup> The district maps also showed the various *thana* divisions, rivers, roads and other topographical features. In this manner, it became possible to reconstruct and represent through maps, 'the whole face of a district'.<sup>56</sup> At last, the colonial state could view the ancient administrative units they had inherited and edit them for its own convenience.

### *Later Progress*

The Revenue Surveys were conducted throughout the colonial state's dominions, albeit in a phased manner, with varying degrees of success, during the rest of the nineteenth century and into the twentieth. One contemporary noted that the Revenue Surveys were probably most accurate in the Madras Presidency and least accurate in the North West Provinces. Although the Bombay Revenue Surveys were good for fiscal purposes, their maps were less reliable.<sup>57</sup>

The Revenue Surveys faced numerous problems throughout the period. High costs coupled with the persistent threat of financial cutbacks, distractions of war, inaccurate surveys and local resistance meant that progress was uneven.<sup>58</sup> One issue that had always undermined the authority of the surveyor and the system of governance he represented was the corruption and bribery that were rife among the lower ranks of the surveying parties. To one contemporary, it was as if 'A set of hungry ameens [native surveyors] were set loose upon the district'.<sup>59</sup> Bribes were taken from local landholders and cultivators; records were tampered with under all sorts of pretexts.

The questionable accuracy of many of the earliest surveys meant that resurveys were sometimes needed or that the results were contested. Not a few hapless surveyors found themselves in court trying to defend their actions. In the 1830s, both Robert Terranneau (1790-1841) in Azamgarh and Horatio Nelson (?-1839) in Rohtak had to face challenges over discrepancies between the

professional and the *khasra* surveys.<sup>60</sup> In 1888, another surveyor, H.B. Talbot, trying to explain his actions to a court, was unable to vouch for the accuracy of his surveys.<sup>61</sup> Cases such as Talbot's suggest that the success of a technical exercise such as surveying can be measured only after it had negotiated a social and cultural terrain.

Despite all the limitations and problems, the importance of the Revenue Surveys for the colonial state cannot be overstressed.<sup>62</sup> Their maps and registers stood for the state's claim to sovereignty insofar as it had delegated to itself the right to investigate (in a manner no previous regime had done) the indigenous population's property, to assess and levy tax on its land and, finally, to represent that land on maps. For the officials of the colonial state, the introduction of the Revenue Surveys was confirmation of their own intelligence and superiority. In 1821, Holt Mackenzie, Secretary to Government in the Territorial Department, was already sure that the operation [of Revenue Surveys] would be so manifestly advantageous to the community that, rude as they are, they would soon probably discover and appreciate the benefit of a measure which brought the safeguard of European intelligence and honesty home to their villages.<sup>63</sup>

To judge from the reports sent to the Surveyor General, the confidence expressed by Mackenzie in the usefulness, accuracy, effectiveness and superiority of the Revenue Surveys only grew throughout the rest of the century.

### *Putting the Pargana Maps to Use*

There can be little doubt that the British colonial officials used the Revenue Surveys to generate new, detailed and valuable information about rural property rights and resources in the territories they were administering in south Asia. Gradually, as the surveys covered more territory, the registers and accompanying maps provided officials with the first panoptic images of the traditional *pargana* divisions in their original layout—discontinuous and inter-mixed.

The process by which the Revenue Surveys were linked to the larger project of reconstructing the layout of the *parganas*, and the districts to which they belonged, took time to materialize. The sporadic surveys carried out before 1822 tended to be ill-coordinated, varied in planning and execution and were not geared to the creation of a map of an entire *pargana*, let alone a district. The

maps that were initially produced were of villages or, at best, individual *parganas* or other administrative divisions such as the *thanas*.

Perhaps the first attempt to connect the Revenue Surveys with the general survey of a district in a systematic fashion was enunciated in Regulation 7 of 1822, which stated that

The advantages of a survey fixing the limits and extent of individual villages are most important, whether for revenue or judicial purposes; but it is also highly important that such measurements should be connected to the general survey of the district.

The same Regulation went on to state that

The main object ... is ... a general map of the district, and ... separate maps of the villages contained in it ... In the general survey, the position of each village should be fixed as accurately as possible, some remarkable object (a temple or the like) being taken as the point of observation, and specified as such ... The limits of pergunnahs

should be particularly attended to.<sup>64</sup>

Some years elapsed, however, before such distribution maps were produced. In 1830 the Court of Directors in London observed with dismay that no maps had been provided for Company administrators in Bengal which clearly demarcated districts (administrative, revenue, judicial and police) and their boundaries.<sup>65</sup>

Only in the second half of the nineteenth century was a consistent effort made to render the Revenue Surveys geographically coherent and thus useful for purposes of general administration. It is these general maps of a district that finally gave the first visual glimpse of the *pargana* divisions and clearly revealed their irregular boundaries and intermixed bodies. Sometimes this phenomenon had already been shown to be pronounced throughout an entire district, as was the case with the *parganas* of the District of Jaunpur, where the *parganas* of Muree and Raree were particularly fragmented and where the district included part of the adjacent territory of Oudh [Awadh] (Fig. 2 and Plate 8).<sup>66</sup> Later, it was found that the *pargana* of Purbutpara (belonging to Bhagalpur District) included the two detached subdivisions (or *tappas*) of Lodweh and Simrown which were separated by the intervening *pargana* of Kurruckpoor (Plate 9).<sup>67</sup> The same phenomena occurred in other parts of north India.<sup>68</sup>

Colonial officials were initially reluctant to tamper with the *pargana* divisions, although an occasional attempt was made, even in the eighteenth century. It became clear, though, that the detached parts and discontinuous boundaries of

the *parganas* were not only administratively inconvenient, but also somehow 'unnatural'. The colonial official's vision of a district's territorial structure was that it should be 'natural'-stable, geographically compact and distinguished by well-defined, continuous boundaries. That vision was embodied in the government's Resolution of 30 October 1837, in which it was recommended that care should be taken to preserve uniformity in tenures, compactness of territory and well-defined boundaries.<sup>69</sup>

Every effort was made to minimize the problem of the intermixed layout and sinuous boundaries of the *parganas* on the *pargana* maps. This certainly appears to have been the case with the map of the District of Tirhut (in the Province of Bihar), which had been prepared by a civilian surveyor, Alexander Wyatt. Wyatt vividly described the broken geographies of the *parganas* of Tirhut, yet scarcely a hint of these discontinuities is seen on his map.<sup>70</sup> Instead, the *parganas* appear neatly whole and compact, and only detached portions of land too large to gloss over are shown.

In fact, the trend seems to have been for the later district maps to show increasingly compact administrative divisions until all elements of intermixed territory and irregular boundaries were eliminated. On the ground this meant the transfer of villages between *parganas* went hand in hand with the transfer of records and the redirection of tax flows, a re-arrangement that was made with increasing frequency in the **nineteenth** and early twentieth centuries.<sup>71</sup> In the end, every attempt seems to have been made to 'mend' the scarred, bent, mutilated, entangled and patchy bodies of the traditional *parganas*. In due course, these efforts assumed the shape of a massive colonial project of (re)territorialization that silently reorganized the colonial state's territories on new lines. The words of Major James Lind Sherwill, the Revenue Surveyor of Dinajpur (Bengal), capture to some extent this project of spatial reordering. In 1865, he observed:

The area of the entire tract included in the Dinajpore survey and under consideration in this report, is, ... 4,586 miles square [more than 11,800 square kilometres] and is divided into 84 pergunnahs, the lands of which are so cut up and intermixed as to baffle all attempts of a revenue surveyor to define their limits, or even assign them a locality on the maps, except a few of the Northern ones. In addition to these

84 pergunnahs, there are portions of 14 more, belonging to other Districts. For the convenience of surveying, the whole has been lumped into 38 convenient sized blocks. These have been defined on the professional maps by distinguishing colours, and named after the pergunnah of which each one is chiefly composed. Some of these blocks contain portions of as many as 25 pergunnahs. <sup>72</sup>

In time the *pargana* boundaries were further adjusted to create districts that possessed continuous boundaries and compact bodies with internal divisions and sub-divisions that did not overlap. It was not just the *thana* divisions that were rearranged. Efforts were also made to align the *thanas* with revenue (*tahsil*) and judicial (*munsifi*) jurisdictions. Villages with criminal, civil or fiscal jurisdictions lying in different districts were realigned, so that all jurisdictional boundaries neatly coincided with the boundaries of a district. For example in 1874, fifteen villages belonging to the Collector's rent-roll of Gaya District (in the Province of Bihar) but under the criminal jurisdiction of the neighbouring Hazaribagh District (Chota Nagpur region) were transferred from Gaya to Hazaribagh. <sup>73</sup>

In another case, the executive, fiscal and police jurisdictions of the *thana* of Mirserai had been located within several different districts: its criminal jurisdiction was vested in the sub-divisional officer of Fenny and came under the judge of Noakholly [Noakhali] District, but its civil jurisdiction lay with the *munsif* of Dewangunj (all in the Province of Bengal). In due course, all jurisdictions were made to coincide, and the *thana* of Mirserai was included within the Fenny sub-division of Noakholly District. <sup>74</sup>

The Revenue Surveys were conducted with varying degrees of success in the three Presidencies. Even within a single Presidency there were variations. The surveys conducted in the North West Provinces in the first half of the nineteenth century were considered inaccurate and of limited administrative value. There was considerable debate among government officials, surveyors and the general population concerning their scientific value, accuracy, use of 'native' surveyors and their 'intrusive' character. By the 1880s, the Revenue Surveys were being employed all across India, extending to Peshawar District (today in Pakistan) in the west and Assam in the east. In the south the Surveys covered the Madras Presidency and in the north the Province of Punjab. The Revenue Surveys were carried out on agricultural land, mostly in the plains, but in some instances extended to the hills as well. <sup>75</sup> Vast tracts of the Indian subcontinent were covered by these detailed surveys. In 1876, there were seventeen Revenue Survey parties employed by the Government of India to survey 11,175 square miles [27,720 square kilometres] of country. <sup>76</sup>

It is now widely accepted that colonial cartography played an important role in the establishment of British rule in south Asia. Recent works on colonial surveys have examined in considerable detail various genres of surveys, surveying institutions and map making in the area. Hitherto, however, the Revenue Surveys have escaped such scholarly treatment despite the critical role they played in state formation. The Revenue Surveys produced valuable information on the structure of property rights and the productive potential of land in south Asia; they also represented the first attempt to map systematically the ancient *pargana* divisions, thus revealing their disconnected and fragmented nature. The territorial reorganizations that followed greatly facilitated the creation of a new geographical template for representing the modern state as a well-defined territorial entity with a hierarchy of non-overlapping internal divisions capable of representation on maps. The establishment of new police, revenue and judicial divisions through the reconstitution of the older *pargana* divisions was one of the great silent projects of territorial adjustment conducted by the colonial state in south Asia.<sup>77</sup>

I have been able to offer here only a preview of the as yet unwritten story of how the British colonial state wrestled with the complex structure of the territorial and jurisdictional arrangements it found in south Asia.<sup>78</sup> From what my own researches have uncovered to date in the Bengal and North West Provinces, however, it is clear that further research into this little-studied aspect of colonial history will be amply repaid.

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## NOTES AND REFERENCES

I. The terms Company and colonial state, as used here, refer to the structures of government installed by the English East India Company in south **Asia** between 1765 and 1857, after which the British Crown took direct charge of the Company's territories.

2. Qeyamuddin Ahmad has pointed out the existence of the Revenue Survey's *pargana* maps and their usefulness for research. See Qeyamuddin Ahmad, 'Pargana-maps and village survey records: a note on an unnoticed source-material for the history of Bihar', Appendix IV, in *Comprehensive History of Bihar*, ed. Bindeshwar P. Sinha; vol. 2, part 2 (Patna, K. P. Jayaswal Institute, 1988), 588-

94. See also Miriam Dossal, 'Knowledge for power: the significance of the Bombay Revenue Survey, 1811-1827', in *Ports and Their Hinterlands in India (1700-1950)*, ed. Indu Banga (Delhi, Manohar Publishers, 1992), 227-43. A representative sample of studies on the cartographic history of south Asia can be found in J. B. Harley and David Woodward, eds., *The History of Cartography*, vol. 2, part 2, *Cartography in the Traditional Islamic and South Asian Societies* (Chicago, University of Chicago Press, 1987); Matthew H. Edney, *Mapping an Empire: The Geographical Construction of British India, 1765-1843* (Chicago, University of Chicago Press, 1998); and Ian J. Barrow, *Making History, Drawing Territory: British Mapping in India, c.1756-1905* (New Delhi, Oxford University Press, 2003). On the notion of 'territorial illegibility', see Bernardo A. Michael, 'Separating the Yam from the Boulder: Statemaking, Space, and the Causes of the Anglo-Gorkha War of 1814-1816' (unpublished doctoral dissertation, University of Hawaii-Manoa, 2001). On the connections between space, cultural geography and state formation in general, see, among others, Henri Lefebvre, *The Production of Space* (London, Blackwell, 1991); Doreen Massey, *For Space* (London, Sage Publications, 2005); John Pickles, *A History of Spaces: Cartographic Reason, Mapping and the Geo-Coded World* (London, Routledge, 2004); James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, Yale University Press, 1998); and Edward Soja, *Postmodern Geographies: The Reassertion of Space in Critical Social Theory* (London, Verso, 1989).

3. For the history of the Survey of India in general, see Reginald H. Phillimore's magisterial *work-Historical Records of the Survey of India*, 4 vols. (Dehra Dun, Survey of India, 1945-1958)-arguably still unmatched in its ambition and chronological spread. For a general history of cadastral mapping see Roger J. P. Kain and Elizabeth Baigent, *The Cadastral Map in the Service of the State: A History of Property Mapping* (Chicago, The University of Chicago Press, 1992).

4. Information on the Revenue Surveys is obtainable from a number of sources. The Historical Records of the Survey of India, which are stored in the National Archives of India (New Delhi), contain both maps and correspondence pertaining to the activities of the Survey of India from the 18th century onwards. Maps from the Revenue Surveys can also be found in the map collections of the British Library (London) and the National Library (Calcutta). It is also likely that an assortment of Revenue Survey maps of historical value can still be found in various surveying offices spread across the country. A better grasp of the local contexts within which these Surveys unfolded can be gained through a close reading of district records and maps available in various archives in India.

5. Military Secretary [Lt. Col. James Salmond (?)] to Chairman, Council of Directors, 7 April 1818, in *Political and Secret Department Records (Miscellaneous)*, British Library (hereafter BL), Asia, Pacific, Africa Collection, India Office Records (hereafter APAC, **IOR**), L/P&S/19/8, Collection of Miscellaneous Letters, letter no. 8.

6. Instances of this abound from across south Asia. To cite one example, when the British acquired the territories of Mysore in 1799, they received a list of the *parganas* allotted to them. It did not take long for the British to realize, to their embarrassment, that they had little knowledge of the location and boundaries of these *parganas*. See Edney, *Mapping an Empire* (note 2), 27.

7. Walter Hamilton, *A Geographical, Statistical, and Historical Description of Hindostan and the Adjacent Countries*, 2 vols. (1820; reprinted, Delhi, Oriental Publishers, 1971), vii.

8. For the use of the term 'cartographic anxiety', see Derek Gregory, *Geographical Imaginations* (London, Blackwell, 1993), 70-205; Sankaran Krishna, 'Cartographic anxiety: mapping the body politic in India', in *Challenging Boundaries: Global Flows, Territorial Identities*, ed. Michael Shapiro (Minneapolis, University of Minnesota Press, 1996), 193-214.

9. Cited in Alamgir Muhammad Serajuddin, *The Revenue Administration of the East India Company in Chittagong, 1761-1785* (Chittagong, University of Chittagong Press, 1971), 58-76, ref. on 60. Bentley divided Chittagong into nine new,

compact revenue zones, which he continued to call *chaklas* (*ibid.*, 61).

10. Phillimore, *Historical Records* (see note 3), I: 242. I I. Edney, *Mapping an Empire* (see note 2), 119.
12. John Crawford, 'Description of India, 1822-23' (BL, APAC, IOR (see note 5), Eur Mss D457a and D457b, quote from D457a, pp. 177-78).
13. Extract of Letter from Court of Directors, 22 December 1830, in Copies of Letters from the Court of Directors (Old no. 1/5), in National Archives of India, New Delhi (hereafter NAI), Historical Records of the Survey of India (hereafter HRSOI), S. no. 90, p. 92. I do not have any evidence to show if these orders were carried out.
14. See Resolution of the Revenue Board, North West Provinces, 30 October 1837, Uttar Pradesh State Archives, Lucknow, Board of Revenue, Map Shelf Series, serial no. 86, mis! no. 86, box 14, para 3, Vernacular Maps, General Questions.
15. Amended Code of Regulations for the Decennial Settlement for Bengal and Bihar, September 1791, in *Proceedings of the Board of Revenue*, 23 September 1791, no. 17, West Bengal State Archives, Calcutta.
16. See Bankey B. Misra, *The Central Administration of the East India Company, 1773-1834* (Manchester, Manchester University Press, 1959), 156.
17. Misra, *The Central Administration* (see note 16), 332. Later still, Regulation 22 of 1816 directed magistrates to establish *thanas* or police jurisdictions in the areas under their charge. A *thana* was named after the place where it was located, and gradually the term came to denote the whole area constituting the jurisdiction of the *thana*. By 1835, just prior to the commencement of survey operations, there were 638 *thanas* in Bengal, each having an area of some 231 square miles (598 square kilometres) and a population of more than a million inhabitants. See Ahmed, 'Pargana-maps and village survey records' (note 2), 589.
18. In Bengal, such exchanges took place, for example, between the districts of Dacca, Mymensingh, Tipperah, Murshidabad, Dinajpur and Bhagalpur (*Proceedings of the Board of Revenue*, 15 May 1793, and 16 August 1793; *Printed Index to the Proceedings of the Board of Revenue*, 1793 (all in West Bengal State Archives, Calcutta)).
19. See Letter from Magistrate of Azamgarh to the Commissioner, Ghazipur, 8 November 1835 (Regional State Archives, Allahabad, Gorakhpur Divisional Records, basta 27, vol. 57).
20. More details about this and other regulations can be found in *Return to an Order of the Honorable House of Commons, dated 22 July 1853, for A Selection of Papers illustrative of the character and results of the Revenue Survey and Assessment which has been introduced into the North West Provinces of the Bengal Presidency since the Year 1833, House of Commons, 20 August 1853* (London, House of Commons, 1853).
21. Francis Buchanan-Hamilton, 'The Gorakhpur Report' (1809), I: 297-98, in BL, APAC, IOR (see note 5), Eur Mss. D 91.
22. *Ibid.*, I: 297.
23. *Ibid.*, I: 297-98. Similar descriptions can be found in Buchanan-Hamilton's accounts of the districts of Bihar: Francis Buchanan-Hamilton, *An Account of the District of Purnea in 1809-10* (Patna, Bihar and Orissa Research Society, 1928); *An Account of the Districts of Bihar and Patna in 1811 & 1812* (Patna, Bihar and Orissa Research Society, 1928). Elsewhere, in his survey of the districts of Patna and Gaya, he observed that the *thana* divisions were 'miserably intermixed and discordant'. See *An Account of the Districts of Bihar and Patna in 1811 & 1812*, 3-4.
24. In 1793, the English East India Company introduced the Permanent Settlement in the Provinces of Bengal, Bihar and Orissa. The settlement fixed in perpetuity the tax due from landholders in addition to recognizing the latter's proprietary rights. For more details on the revenue settlements concluded in the Company's territories, see Burton Stein, *Thomas Munro: The Origins of the Colonial State and His Vision of Empire* (Oxford, Oxford University Press, 1989); and Ranajit Guha, *A Rule of Property for Bengal: An Essay on the Idea of Permanent Settlement*, 3rd ed. (Durham, NC, Duke University Press, 1996).
25. Regulation 7 flowed out of the recommendations made by Holt Mackenzie, Secretary to Government in the Territorial Department. In his famous minute of 1 July 1819, Mackenzie suggested that a systematic survey was the only way by which the Company could acquire accurate knowledge of its territories, their resources and potential for development and taxation. See an extract of this Regulation in 'Miscellaneous Revenue Letters Received by Collector of Gorakhpur' (Regional State Archives, Allahabad, Gorakhpur Collectorate Records, basta 12, vol. 92, pp. 139-68). See



also Holt Mackenzie, 'Orders and Observations on Execution of Revenue Surveys', 25 August 1821 (ibid., Gorakhpur Divisional Records, basta 2, vol. 15, pp. 27-54).

26. For details, see Misra, *The Central Administration* (note 16), 214-18. Regulation 9 resulted from a conference of surveyors convened at Allahabad (in north India) by Governor General William Bentinck in January 1833.

27. The functions, jurisdiction and structure of the Boards of Revenue varied over time (Misra, *The Central Administration* (see note 16), 115-16). Revenue Surveys had been carried out under local initiative on a small scale and with varying accuracy and results in the Presidencies of Bengal, Bombay and Madras. In the Madras Presidency, Revenue Surveys were conducted as early as 1802-1806 by Alexander Read in Salem district and by Thomas Munro in the Ceded Districts (in south India) on a *ryotwari* basis (assessment based on detailed field surveys).

28. See Phillimore, *Historical Records* (note 3), 2: 306-7; 3: 300.

29. The connections, if any, between the Revenue Surveys conducted in the three Presidencies await further examination. For instance, Robert Wroughton's meticulous surveys of Sohagput and Ramgarh in the Narbada Territories (central India) in 1841-1842 caught the eye of Surveyor General Andrew Waugh who then recommended them as a model for the Revenue Surveys of the Nilgiri hills in south India in 1844 (Phillimore, *Historical Records* (see note 3), 4: 228; Edney, *Mapping an Empire* (see note 2), 217-19).

30. Phillimore, *Historical Records* (see note 3), 2: 6. In the 1830s, special surveys were conducted under the direction of civil commissioners in Bihar, Sundarbans, Noakhali, Chittagong, Sylhet and Assam (ibid., 4: 178). 31. Phillimore, *Historical Records* (see note 3), 4: 402.

32. While most surveyors were drawn from the Company's military units, civilian surveyors were increasingly appointed in the Bengal Presidency from the 1830s, possibly due to the encouragement given by Deputy Surveyor General James Bedford (1832-1843). See Phillimore, *Historical Records* (note 3), 4: 388.

33. The *pargana* divisions were not the only divisions recorded by the Revenue Surveys. For instance, in Assam in the northeast, police (*thana*) and revenue divisions (*tahsil*) were also recorded (Phillimore, *Historical Records* (note 3), 4: 205).

34. Phillimore, *Historical Records* (note 3), 4: 180.

35. It might be useful to bear in mind the distinction between the boundaries of a village as the unit for Revenue Surveying and the boundaries of a village as perceived by the inhabitants. While one set of boundaries was formed by the imperatives of the colonial state and its driving concern for revenue, the other set might be determined by quite different imperatives, those defined by centuries of habitation, local history and religious observances.

36. Frederick C. Hirst, *Notes on the Revenue Surveys of Bengal, Bihar and Orissa, & Assam* (Calcutta, Thacker, Spink & Co., 1912), 33.

37. The custom of maintaining a *khasra* register was an established practice, and this is probably why it was referred to as the 'Native survey'. Traditionally, the older-style *khasra* had been a statement of measurement of land that was entered in a field book, but the location of fields in relation to each other was never systematically recorded, making it difficult to prepare a coherent map from these details. See J. H. Young, *Revenue Handbook* (n.p., n.d.). A copy of this book can be found in that Bihar State Archives, Patna. See also N. T. Davey, 'Memorandum on the Khasra Survey in Bengal.' in Frederick C. Hirst, *A Digest of the Original Correspondence upon the Revenue Survey of Jaintia Pargana, District Sylhet, Assam, 1837-40* (Shillong, Assam Secretariat Printing Office, 1912), 18-24. The *khasra* surveys were first introduced in the Revenue Surveys by H. L. Thuillier in 1837 during his survey of the Jaintia *pargana* in the Bengal Presidency (Hirst, ibid., 2).

38. Misra, *The Central Administration* (see note 16), 218. See also *Directions for Revenue Officers of the North West Provinces of the Bengal Presidency* (Calcutta, Baptist Mission Press, 1850).

39. Commenting on the economy that Thuillier's survey offered, N. T. Davey noted that Thuillier's improvised *khasra* survey was employed 'in preference to the more perfect system of field surveys on professional principles to meet the demand for a cheap and expeditious survey, to be executed by unskilled workmen and as an auxiliary to the professional operations by which the Khasra was checked' (Davey, 'Memorandum' (see note 37), 20). Thuillier later became Surveyor General of India (1861-1877).

40. Hirst, *Notes on the Revenue Surveys* (see note 36), 52. See also Henry Landor Thuillier and Ralph Smyth, *A Manual of Surveying for India detailing the mode of operations on the trigonometrical, topographical and Revenue Surveys of India*,

3rd ed. (Calcutta, W. Thacker, Spink and Co; London W. Thacker, 1875), 389.

41. The GTS was initiated in India under the charge of William Lambton in 1799 with the intention of mapping the subcontinent systematically through the process of triangulation. For more on the GTS surveys, see Edney, *Mapping an Empire* (note 2).

42. *The Calcutta Review*, n.d., cited in Clements R. Markham, *A Memoir on the Indian Surveys*, 2nd ed. (1878; reprinted unchanged, Amsterdam, Meridian, 1968), 118.

43. In 1838 Lieutenant John Fordyce (1806-1877) obtained triangulation points from the Great Arc in the conduct of his Revenue Survey of the District of Agra. It is not known if Fordyce's example was embraced by other surveyors (Phillimore, *Historical Records* (see note 3), 4: 233).

44. Edney, *Mapping an Empire* (see note 2), 29.

45. See letter of 15 April 1844 from Captain Andrew Waugh, Surveyor General of India, to Captain Robert Wroughton, Deputy Surveyor General, in Letters from Surveyor General to Surveyors, 1844-1845 (NAI, HRSOI (note 13), serial no. 491, old no. 12/5).

46. See 'Annual Reports of Revenue Surveys, Upper Circle, 1858-1861' (NAI, HRSOI (note 13), Rev/IO).

47. For the North West Provinces, see Orders of James Bedford, Deputy Surveyor General to all Revenue Surveyors, 14 June 1838 (NAI, HRSOI (note 13), Revenue Survey Departmental Orders, Rev/9, 1833-1863). For Bihar see 'Appendix IO,' in Young, *Revenue Handbook* (note 37).

48. Ralph Smyth and Henry Landor Thuillier, *A Manual of Surveying for India detailing the mode of operations on the revenue surveys in Bengal and in the North-Western Provinces* (Calcutta, W. Thacker, 1851), 342.

49. See Circular of 23 July 1840 from Deputy Surveyor General James Bedford, Revenue Survey Departmental Orders, Rev/9, 1833-1863 (note 47). See also Circular of 20 May 1847 from Officiating Deputy Surveyor General H. L. Thuillier (*ibid.* p. 28).

50. The reasons for such transfers were many—sale of lands, loss of lands due to war, power struggles between diverse social agents and the shifting nature of agricultural cultivation.

51. See Circular no. IOI of 26 November 1855, from Deputy Surveyor General, H. L. Thuillier (Revenue Survey Departmental Orders, Rev/9, 1833-1863 (note 47), pp. 32-36).

52. See Circular 102 of 3 December 1855 from H. L. Thuillier, Deputy Surveyor General (*ibid.*, pp. 38-40, para II).

53. See Circular no. IOI (note 51), pp. 32-36.

54. Rule 38, Directions for Collection of Land Revenue, North West Provinces, 1849, cited in Hirst, *Notes on the Revenue Surveys* (see note 36), 36-37.

55. Phillimore, *Historical Records* (see note 3), 4: 7, 206.

56. See Circular 102 (note 52), pp. 38-40, para 8. For more on the imperial drive to create a single spatial framework displaying the connectedness of colonial territories, see Edney, *Mapping an Empire* (note 2), 96-104.

57. Markham, *A Memoir on the Indian Surveys* (see note 42), 180-1, 193.

58. For instance, shortages of finance, disagreements between officials both in India and England, and wars such as the Afghan war of 1842 were known to have impeded the progress and expansion of these surveys (Phillimore, *Historical Records* (see note 3), 4: 181; 3: 146).

59. Paunchkoree Khan, *The Revelations of an Orderly: Being an Attempt to Expose the Abuses of Administration by the Relation of Everyday Occurrences in the Mofussil Courts* (Benaras, Recorder Press, 1848).

60. Both Azamgarh and Rohtak lay in the North West Provinces. Phillimore, *Historical Records* (see note 3), 3: 146.

61. Deposition of Mr. H. B. Talbot, surveyor, on 4 July 1888, before sub-judge of Saran (*Bettiah Raj Majizkhana* [Record Room], North Champaran, Bihar, unmarked basta, case no. 71).

62. For examples of texts that explore the connections between states and cadastral projects see Kain and Baigent, *The Cadastral Map in the Service of the State* (note 3); Peter F. Dale, 'Cadastres and cadastral maps,' *The Cartographic Journal* 14 (1977): 44-48.

63. Mackenzie, 'Orders and Observations on Execution of Revenue Surveys', 25 August 1821 (see note 25).

64. Phillimore, *Historical Records* (see note 3). 3: 152, 158. 65. *Ibid.*, 3: 152, 276.
66. *Map of the District of Jounpoor* [Jaunpur]. Surveyed by Lieutenant S. A. Abbot, 1838-1840. Re-compiled in the Surveyor General's Office, Calcutta, 29 April. 1846 (BL, APAC, IOR (see note 5), X/1419/1).
67. *Map of the District of Bhaugulpoor* [Bhagalpur]. Surveyed by Capt. W. S. Sherwill and Mr. J. J. Pemberton, 1852 (BL, APAC, IOR (see note 5), X/1041/1).
68. Other maps showing the same discontinuities include the *Map of Pargana Erinch and Baina Bazar*, by R. Mathison, 1830 (National Library, Calcutta, *Historical Map Collection*, map no. 5); *Map of the District of Asra*, by Capt. J. Fordyce and Lt. Robert W. Wroughton, 1840 (BL, APAC, IOR (see note 5), X/1377); *Map of the District of Jessore*, 1855-56 (X/1177/1/1); *Map of the Rampoor Jagir*, 1867 (X/1503).
69. See *Return to an Order of the Honorable House of Commons dated 22 July 1853* (note 20), 17.
70. See Alexander Wyatt, *Geographical and Statistical Memoir of the District of Tirhoot* (Calcutta, Calcutta Gazette Office, 1854). Whether Wyatt chose to do this through his own initiative or under instructions from a superior officer is as yet unclear.
71. An examination of maps from a single district over a period of time clearly confirms this trend. Later maps show fewer detachments, less intermixture and more compact divisions, until finally, all traces of the former are eliminated.
72. Major James L. Sherwill, *A Geographical and Statistical Report of the Dinajpore District* (Calcutta, Bengal Central Press, 1865), 1-2.
73. Also in Gaya District (lying in the province of Bihar) in the same year, the *munsifi* of Aurangabad was made coterminous with that of the sub-division of Aurangabad. This was achieved by adding the *thana* of neighbouring Daudnagar to Aurangabad *munsifi*. In this manner the civil and executive jurisdictions were made to coincide (BL, APAC, IOR (see note 5), *Bengal Judicial Consultations* P/242, Proceedings of the Revenue Branch, Jurisdictions and Boundaries, pp. 1-131, esp. pp. 12-14, 45-46).
74. Proceedings of July 1877 (BL, APAC, IOR (see note 5), *Bengal Judicial Consultations* P/910, p. 77). Similar evidence of territorial redrawing is available from the North West Provinces. See E. B. Alexander, *Statistical, Descriptive and Historical Account of the Gorakhpur District*, ed. H. C. Conybeare and Edwin T. Atkinson (Allahabad, North West Provinces and Oudh Government Press, 1880), 276; Henry M. Elliott, *Memoirs on the History, Folklore and Distribution of Races of the North-West Provinces of India*, ed. John Beames, 2 vols. (1869; reprinted Delhi, Sumit Publications, 1985), 92, 96.
75. In south India, the hill areas that came under the Revenue Surveys included the Nilgiri and Kundah hills (1851-1852) and the coffee plantations of Wynaad District (1859).
76. See Clements R. Markham, *A Memoir on the Indian Surveys* (London, distributed by Allen & Co., 1871, 1878 etc.). The 2nd edition of 1878 (see note 42), with Markham's own preface, was also printed in London for the British government. It was reprinted unchanged in 1968 in Amsterdam by Meridian and in 2004 in Delhi by Manohar Publishers. The reference here is to p. 188 in the 2nd ed., Amsterdam reprint.
77. This drive to redraw territories would persist throughout the colonial and even postcolonial periods of India's history. The *Bengal Judicial Consultations* (BL, APAC, IOR (see note 5)), are full of such instances, which in some cases run to hundreds of pages. See the following series in the *Bengal Judicial Consultations*, Judicial, 1887-1905, P/5408-5410 (for 1898); Revenue (1874-1886 and 1906-1936), P/242, P/236, P/910, P/1319, P/1641. P/ 1836, P/2024, P/2238, P/2487 (all for 1874-1886). For evidence of persisting spatial illegibility in the 21st century, see Willem van Schendel. 'Stateless in south Asia: the making of the India-Bangladesh enclaves', *Journal of Asian Studies* 61:1 (2002): 115-17.
78. But see Animesh Chakrabarti, 'The ongm of subdivisions in Bengal', *Bengal Past and Present* 47 (1978): 36-64.