

**Surveys of Control:  
Collaboration and Complication in the 18<sup>th</sup> and 19<sup>th</sup> Century Surveys of  
India**

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## Introduction

Soon after the British East India Company gained revenue collecting rights in Bengal a project began that would have profound influence on the whole of India. The project occurred alongside the military and economic conquest of India, supporting and utilizing British victories to increase its prominence. While this project was seldom secret, its currently limited presence in the histories of British India does not provide a full realization of its importance. The project was the geographical survey of India. Surveys are not the most obvious manifestations of the process of colonial power but they remain valuable for investigation. An analysis of the manner in which the surveys occurred and the ideas that motivated them can produce extremely revealing results. The practical and psychological motivations of colonialism can be seen in the personalities and history of the survey. Sometimes cartographers created maps and charts using survey data, but maps were only one of the many ways in which surveys influenced the colonial system. Survey data was also useful on its own as a centralized collection of information about an unfamiliar, and often hostile, place.

Early survey projects used simple mapping techniques and could only support limited amount of participants, usually pulled from military units with spare personnel. With time the number of survey projects grew enough to warrant specific governmental departments in all of the territories of British administration which oversaw the surveys for that region. Eventually the surveys grew to a point that centralization was required for their continued effectiveness. This led to the official creation of the Survey of India, and established the leadership of the surveys under a specific administrative hierarchy. The survey project continued to expand and advance, eventually the Survey of India was

using the most sophisticated technology and mathematics of the time, setting an example for surveys around the world. For more than one hundred years teams of men moved through British Indian territory, and often far beyond, performing surveys. With the completion of each survey mission the British came to know more about India. While the surveys had very important implications for the day to day ruling of India the ultimate goal of the project was the creation and possession of knowledge.

For the British, and Europeans, of the late 18<sup>th</sup> and 19<sup>th</sup> centuries, the world was knowable through rational means. Enlightenment ideas instructed Europeans that through scientific investigation and organization mankind had the potential to know each and every object and process in the world. A complete understanding of the world was available through the careful application of the systems of knowledge created by European thought. This mode of thought was highly influential in intellectual and ruling classes of Europe and informed, and continues to inform, Western thought and action. In the colonial context understanding this sentiment is particularly important. Knowledge was simultaneously a goal and a means to an end. The interconnection of knowledge and power in the colonial setting is a vital concept for investigating the history of colonial rule and thought. Knowledge could further the administrative and political domination of the Indian people by the British, but the act of gaining knowledge could also be a justification in and of itself.

Matthew Edney, a historian of the Survey of India, in describing practice of geography of the late 18<sup>th</sup> century describes the sentiment of an “encyclopedic mentality.” The bases for this idea were “rooted in two convictions, first that ‘every point on view, whatever its source, could be brought into rational debate with any other,’

and second that ‘such rational debate could always, if adequately conducted, have a conclusive outcome.’<sup>1</sup> The surveys provided an encyclopedic view of India for the British colonial rulers. A view that was both all-inclusive and quickly accessible and understandable. A view of one image that could easily be investigated and have knowledge extracted from it. India could be comprehensible as one whole and continuous concept. This idea of one complete and undivided India appears in the production of the surveys and maps. Both present a single image that expanded as British control grew and strengthened. This image was thought to be fully within the control of the British colonial rulers. The ability to ensure that British colonial endeavors were successful and continued into the future depended on the British control of both the practical output of the surveys as well as the abstract, psychological and ideological, benefits of the project.

The colonial environment that the surveys occurred within complicated the process of creating this knowledge. In Edney’s writing he critiques the whole of European Enlightenment geography as not meeting the standards it set for itself: “the conceptual unity of that archive was undermined by unavoidable messiness of the archive’s actual implementation.”<sup>2</sup> The messiness of this project is especially apparent in the examination of the Surveys of India. The presence of Indians in the surveys, as direct participants in the creation of knowledge, complicated and altered the survey project and the knowledge created. The surveys, and any subsequent production using the survey data, should not be seen as seamless and uncomplicated collections and representations of knowledge. The actions of surveys in the field are highly informed by their colonial

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<sup>1</sup> Edney “Reconsidering Enlightenment Geography” 170

<sup>2</sup> Edney “Reconsidering Enlightenment Geography” 190

environment. While a distanced point of view, in both a spatial and ideological sense, was supposed to guide the surveys towards a singular scientific collection of knowledge, it was an ideal that was never actually reached. Also, survey logs and reports are not the objective archives of information that they appear. They were thought of as insulated from the environment in which they were created, but are texts that still contain evidence of the influence of those that created them. Their production, and the accounts of field work, represent and reveal the contradictions and difficulties inherent in colonial rule.

The British considered surveys as an effective method of knowledge creation and extraction. Their wide ranging nature and the necessity of observing large areas from elevated positions made surveys particularly effective in producing broad collections of overall knowledge. These collections could then be leveraged in a variety of different manners to increase the power of the possessor of the knowledge. Indeed, European colonies were often subjected to surveys before metropolitan territory, with an eye to the increase both knowledge and power in difficult and volatile areas. In India the British sought to possess knowledge as a wide ranging and macro-image that simplified and increased the effectiveness of colonial rule. Surveys provided the practical information that was necessary for the administration of the colonial state. Distances and heights, landforms and roads, cities and villages, were discovered, measured, and represented. Surveys created a set of practical information that the British could use for everyday administration, taxation, and military action. Surveys could be consulted to settle disputes and to plan initiatives. From the information created through the surveys, maps were drawn, regions set, and borders determined. Surveys showed the British what they ruled and gave them the knowledge to rule it more effectively. Time and colonial

development brought advancements in surveying technology and cartography, increasing the accuracy and detail of the British representation of India. Greater detail, the British thought, brought them closer to the complete knowledge and control of that which they were surveying. Through an accumulation of knowledge methods of power and controlling authority could be created and refined. Accurate and comprehensive knowledge of India would allow the British to pursue any agenda in their colony.

But, the practical is only the most obvious of the motivations that controlled the surveys. Knowledge itself motivated them. The acts of creating and collecting knowledge demonstrated a power and mastery that was essential for the colonial project. This idea is presented most firmly in Bernard Cohn's Colonialism and Its Forms of Knowledge. Cohn presents examples of the involvement of knowledge creation and collection in nearly all aspects of the colonial process. Cohn also presents several modalities of the British knowledge project in India. These modalities are "shaped" by the British desire to "classify, categorize, and bound the vast social world that was India so that it could be controlled."<sup>3</sup> The modalities that are the most important for this paper are the "Observational/Travel Modality" and the "Survey Modality."<sup>4</sup> The Observational Modality involves the views and expectations of the British travelers through India. Movement through the land was simultaneous with the collection of a variety of observations that came to define what India was supposed to appear as. The Survey Modality concerns most directly "the exploration of the natural and social landscape."<sup>5</sup>

Cohn's ideas are present in this work, but they are heavily modified. It is true that knowledge was at the center of the British project in India but the manner in which Cohn

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<sup>3</sup> Cohn 5

<sup>4</sup> Cohn 6-7

<sup>5</sup> Cohn 7

describes the knowledge collection and creation does not take into account the processes of the Survey of India. As presented about Cohn is most concerned about the social investigations that collected knowledge, but the surveys were more often apart from society but still working to creation knowledge of the land for the British. Cohn mentions the survey of India briefly, but even in his description of the survey modality does not fully recognize the importance of the process of the survey and its difference from the other forms of knowledge collection performed by the British. Cohn mostly focuses on the presence of knowledge projects in relation to the British interpretation of texts and objects. The British collected language books, law codes, clothing, and works of art and analyzed, and re-presented them to further their knowledge and power in India. Even in his discussion of the famous surveyor Colin Mackenzie, Cohn focuses on Mackenzie as a collector of artifacts and antiquities.<sup>6</sup> Though this was an extremely important part of Mackenzie's work, Cohn does not consider that Mackenzie was obtaining knowledge from the land at the same time as a geographical surveyor. The focus in Colonialism and Its Forms of Knowledge is too great on objects and texts of India and does not consider that the land itself was a text to be collected and interpreted to gain knowledge. This work will consider how the British used the land itself as something that knowledge could be drawn from and used. Surveys, while simultaneously performing many important collections of non-geographical knowledge, were primarily concerned with the accurate representation and control of the land.

Even if no direct action resulted from the knowledge presented through the surveys, the fact of its creation and possession was important. The British had to prove that their systems of knowledge were superior to those present in India as they took

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<sup>6</sup> Cohn 81



control. The surveys were an attempt to apply formalized system of knowledge to the land of India. Science, and the practical and organized ideas embodied in the surveys, would cover India, replacing ancient systems of knowledge that could not withstand the force of British knowledge. The detail of the surveys and their inexorable progress across India proved that the ideas of the British were effective and resilient. India would be organized and rational, not necessarily in a political sense, though that to was an important goal, but in the minds of the British rulers in India, the imperial government in London, and the rest of the world. This formalized system appears in the massive logbooks of the Survey of India, in the regulated accounts of each survey season, and in the maps and charts produced using survey information. The existence of all of these objects and texts demonstrates an effort to create an India, born fully formed in the minds of the British, totally understood and controlled.

This desire for total control of knowledge also influenced the peripheral, but still important, production of the survey. Geographic information was the largest, but not the only, set of knowledge collected by the surveys. The surveyors included in their reports any observations that could be considered useful. Botanical, cultural, archeological, and any other observed or collected information appears in the accounts and reports of the surveys. This information, though not directly applicable to geographic purposes was still collected under the authority of the Survey of India. The breadth of knowledge that the surveys dealt with demonstrates their desire to possess and control as much of the knowledge of India as possible. This part of the surveys also further reveals the encyclopedic nature of the survey project. An ever increasing desire for both depth and breadth of knowledge drove the surveys to expand their creation and collection of

knowledge into increasingly disparate areas. The geographic knowledge of surveys provided a coherent outline and the remaining information collected during the surveys was useful in filling the outlines in. The non-geographical knowledge of the surveys strengthened the image of India created by the British, making it more and more detailed and closer and closer to fully conceived reality.

But, the creation of such a comprehensive and overarching representation is a varied and nuanced project, and it is made especially complex in a colonial setting. Working in India, with a limited number of Europeans, the British had to rely on Indian subjects to support the colonial system. The survey department was no different from any other colonial department, Indians worked throughout the survey hierarchy in a variety of capacities, from the lowest levels of hired labor to prestigious and respected mathematicians. The expansive scope of the surveys required a large surveying force. The British could not have hoped to accomplish such a project without cooperation and assistance. Both British and Indian members of the survey organization worked in the production and collection of knowledge in India. British and Indian interests and ideas influenced the commissioning of the individual survey missions and the people working on them.

While accuracy and disinterestedness were the watchwords of the leaders and workers, the surveys in India were anything but objective. Surveys and maps are not supposed to contain anything but the observation and representation of a place. The British, and nearly all Europeans of the time, understood them as a text that miniaturized and simplified the world for quick comprehension. Problems with surveys or maps were problems with mathematical representations or lack of useful information but did not

question the foundational concepts of geography. Only recent scholarship and analysis has sought to uncover the ways in which cartographic works exist in the same set of influences and interests as other texts like books, letters, speeches or paintings. This dismissal of the totally objective nature of maps can also be applied to the surveys that collected the data that eventually appeared, in a different form, on a map. Earlier surveys, occurring in a unstable setting were more clearly an element of colonial control, but as the surveys continued and scientific ideals gained further hold over Europeans minds, the explicit mission of colonial rule was obscured behind ideals of scientific discovery and understanding. Later surveys were attempting to create an image of India that would approach closer and closer to scientific perfection. But this ideal could not be reached. Too many interests informed the surveys. The colonial setting ensured that the project of creating an image of India was never fully controlled or understood. Even during the most rigorously scientific and heavily monitored projects of the survey the values and ideas of the British and Indians influenced the process, undermining the ideal of totally objective process of simple measurement and of a survey product that contained only the reality of the territory.

In order to investigate the progression of the idea of one, fully controlled knowledge of India, I will explore the combination and cooperation of the British and Indians within three eras of the surveys of India. While each era of the survey is different in its ideas, technology, and production, they are also similar in that both British and Indians are heavily involved in the project. At no point in the history of the surveys were the two groups separated, nor were their values ever absent. The process of knowledge creation and collection continually required the participation of Indian and British men.

While most histories of the surveys, if they attempt to confront these issues of knowledge and power at all, only focus on the work of the major British surveyors. I seek to present the less obvious influences on the survey project. Instead of relating the work of the leaders of the survey as emblematic of each era of the surveys of India I will examine the eras with a particular emphasis on elements of Indian participation in the surveys. By focusing on those less obviously involved with the surveys perhaps a more balanced conception of the surveys will result. Instead of the glorification of the survey as triumph over difficult terrain and barbarous natives that currently predominates in the limited amount of historical writing, I wish to show the surveys as more complicated endeavors, more closely connected to the colonial system than stories of adventure and science will comfortably allow. What I hope will emerge is a conception of the surveys, not as an inevitable project of practical necessity, but as a concerted effort to produce a controlled image, and as an effort that was fraught with contradiction and compromise.

The first era of the surveys of India begins in the late 18<sup>th</sup> century with the earliest British colonial expansion in Bengal. James Rennell, working within the initial days of British colonial development in India, performed a series of surveys in Bengal and the surrounding territory. For several years Rennell moved through the territory surveying as he went, eventually returning with the first collection of “scientific” geographic knowledge about India. From these surveys Rennell drew up maps of the newly British territory. These were the first British conceptions of India, and the first that represented India as a British possession. The complicated nature of this possession also appears in Rennell’s work. Through his reports it becomes clear the extensive reliance on Indian power structures and people to ensure the work of the surveys. Also, it becomes clear in

Rennell's writing that he was heavily dependant on Indian information for the creation of his maps. One of Rennell's most famous achievements, his *Map of Hindustan*, was created with an extensive use of Indian sources. From the earliest days of the survey then, the presence of British and Indian knowledge is visible. Rennell's work is also very valuable in that it formed the basis for the rest of the history of the survey of India. His work remained in circulation even after his retirement, and still held considerable influence over the direction of the survey project in India.

One of the men challenged by the continued dominance of Rennell's work was George Everest, the example of the second era of the surveys. Everest worked in the first half of the 19<sup>th</sup> century as the disparate survey departments of the Indian presidencies became centralized as the Survey of India. More importantly Everest presided over, and championed, a new form of surveying. Rather than relying on corruptible visual observations like Rennell, Everest advocated trigonometrical surveying. This technique, created by one of his predecessors, would produce consistently accurate and testable results. The knowledge produced through this process would be entirely objective, as much human involvement as possible was removed from the process of surveying. Highly sensitive instruments and mathematics replaced the previous reliance on direct human observation. Everest's surveys would be models of European scientific advancement and demonstrate the triumph of rationality over incoherent Indian territory. The project Everest lead was the Great Trigonometrical Survey of India, a project that would fully measure India with the greatest accuracy possible and create a collection of knowledge that could withstand both time and technological advancement.

Mathematically precise and obsessively controlled, these new surveys would create a new base for all subsequent surveys in their precision and translatability.

Everest was not as obvious in his colonial ideas as Rennell. He worked in a different period with a different environment. Nevertheless his conceptions of the British presence in India, and the values that grew from it were important influences on his work. The benefits of his surveys for the colonial state were never far from Everest's mind nor was the necessity of justifying the continued expense of his undertaking. Everest, though not as directly involved in colonial domination as Rennell, continued the process of control and containment in his surveys. While Everest considered his surveys to be the pinnacle of science and organization he was required to admit the extensive participation of Indians in his surveys. Like Rennell, Everest used Indian knowledge in the creation of his surveys, but Everest's use slightly differed. Instead of filling in blanks in British knowledge with Indian knowledge, Indians were an essential part of the knowledge creation of Everest's surveys. Everest's chief instrument maker and his most important mathematician were both Indian. The presence of these men, as well as many others, influenced the process of knowledge creation and collection of the survey, complicating the ideals of intellectual superiority that provided the foundation for European knowledge creation.

The final era of surveying discussed is the late 19<sup>th</sup> century period of Indian exploration outside of British India. During this time the Survey of India sent a number of Indians on secret missions into Tibet and Central Asia to bring back survey information. Ostensibly this project was about defending India from the encroaching imperial designs of Russia, but the desire for knowledge was just as strong in this period

as it was earlier in the surveys. This part of the survey's history is different in that the Indians operated largely independent of the survey administration. Their exploration was on foot through territory that a white British surveyor could not enter. What makes this era important for the exploration of the process of knowledge creation and collection is the manner in which the explorer/surveyors operated. While they were independent of direct British oversight they were also, perhaps, the most highly controlled Indians in the survey administration. Their names were disregarded. Instead they received codenames, to fool Russian agents eager to discover British plans. British officers regulated the very movement of their bodies. Their training and instruments all worked to mold them into reliable and accurate surveying machines. They worked through tremendously adverse circumstances to bring back knowledge to their superiors, knowledge which was then translated, checked, critiqued, and published. In this era the difficulties of colonial rule, made obvious by the still recent uprising, required extensive displays of control and proof of the British power and knowledge in India. But even in this highly controlled environment the project of surveying was not entirely one sided. Both the explorers and their officers participated in the production of knowledge. It was not the simultaneous work of knowledge creation as it was during Everest's surveys, but the inherent necessity of collaboration and the presence of competing interests and ideals remained.

Through all three eras of the survey it is possible to trace the competing themes of collaboration and control. The British continually sought to demonstrate their control of India through the perfection of the survey project. With each era new advancements were added to the process to increase the accuracy, detail, or range of the surveys. Each advancement was thought to contain the possibility of the complete control of India

through the creation of one wholly, British-created, image of India. This image was not necessarily a map or chart, though it could appear on them. Instead the image was contained in the minds of British and Indians alike. It was coherent and complete, and had both large and small scale details placed and named appropriately. Each part of the image was completely known, there were no parts missing or left out. British knowledge extended to completely enclose the image and determine its proper presentation.

But these ideas were simply the ideals of the survey project and could not represent the reality of the survey process. The British ideal of the survey occurred in a vacuum, on unpopulated land, with only British personnel. Instead the surveys were complicated products created through the work and influence of many different people, British and Indian. The surveys could not show just one view of India because of the multiplicity of views that existed during the survey operation. It is unrealistic to say that all of the participants directly influenced the output of the survey. But, it can be shown that there were many people deeply involved in the project. The official leaders of the survey were not the only people to have their interests integrated into the process of knowledge creation and collection. The leaders do provide a useful entry into the history of the survey though. Using the leaders to divide and describe certain areas of the survey's history allows for a deeper analysis. While the evidence of the participation of Indians in the surveys is strong it is not extensive enough to draw larger thematic conclusions about the survey and the colonial process. Using the leaders of the survey as examples to investigate the participation of Indians at different points in the survey's history allows for the presentation of large thematic ideas. By describing in the interaction of Indians and British in the surveys the adaptations and alterations of the



project of knowledge creation appear in greater detail. The addition of both groups into the history of the survey serves to deepen and complicate the description of the project, but also make it more useful. Ultimately by exploring this process it will become clear that the surveys were a distinctively colonial undertaking, with all of the problems and contradictions that entails, rather than a cartographic or scientific project.

## James Rennell and the Early Surveys of India.

James Rennell published *The Geographical System of Herodotus, Examined; and Explained by a Comparison with those of Other Ancient Authors, and with Modern Geography* in 1800. Rennell wrote the book after a life of surveying and map making in India. His work in India and the maps and information produced during his tenure as the Surveyor General of Bengal set Rennell at the forefront of the British cartographic establishment. The esteem of his accomplishments was so great that even after his retirement from the British East India Company Rennell was still called upon to settle disputes that arose during the production of maps and charts concerning India.<sup>7</sup> It was during this time as a respected figure at the intersection of the British scientific, cartographic, and colonial communities that Rennell wrote *The Geographical System of Herodotus*. Rennell compares the modern geographical knowledge that he possesses to that which was presented by Herodotus. Rennell describes both the shortfalls and the successes of the ancient work while adding his own asides, some of historical analysis and others concerning modern events.

In his introduction Rennell presents a quote by the notable British Sanskritist, Sir William Jones. Jones laments the fact that there are very few sources available to construct a reliable “geography of Asia.” He continues: “‘until some geographer, equally skilled in the eastern languages, and in the science which he professes,’ will correct the geography of Asia, the reader of its history, must be content with the present imperfect system.” Rennell takes somewhat of a contrary view on the subject. He himself had

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<sup>7</sup> Edney 202

composed a *Map of Hindoostan* in 1782 after a career of surveying in India, making extensive use of Indian sources for information and assistance. Rennell reminds Jones, while generously acknowledging that Jones probably lacked the leisure time to fully explore the available evidence, that:

“very much might be done by faithful translation of the works of the Oriental geographers, for the use of European ones. It may also be said that we must be content to receive things in such a way as they may be conveniently, or indeed at all executed: and finally that the most perfect work is nothing more than the nearest approximation to the truth.”<sup>8</sup>

Rennell spent a large part of his life trying to find the nearest approximation to the truth in his maps of India, producing what were considered at the time to be the most accurate charts to date, works that were used for many years after their production, and even after new methods and information revealed the inaccuracies and limitations of the work.

In his rebuttal to Jones’s indictment of the cartographic knowledge of India Rennell reveals the strong foundation of native knowledge that colonial map makers and surveyors appropriated and reinterpreted. Rennell advocates using any knowledge available to advance the European project of creating an accurate view of the world. The purpose of his reinterpretation of Herodotus, who he characterizes as a “heathen,” is to explore “the earliest known system of geography as far as it goes. It may therefore be worth while to examine this system in order to compare it with the actual geography.”<sup>9</sup> It is clear that in Rennell’s estimation the only actual geography is that of the modern,

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<sup>8</sup> Rennell Herodotus X-XI

<sup>9</sup> Rennell Herodotus 1

European, geographers like himself. However, his extensive use of knowledge sources that did not match up with the prejudices of colonial rule complicates Rennell's professed desire to create an "actual" geography. While Rennell created the first large scale, British-made images of India that conformed to contemporary geographic values, his work was not a display of the total mastery of geographic knowledge by the British. The image of India Rennell created was originally conceived as completely within the control of British knowledge and power, but the history of his surveys shows that the process was far from the monolithic and stable process that it was expected to be. Evidence of the paradoxical colonial necessity of collaboration and domination appears in the historical evidence of Rennell's work. Exploring accounts of Rennell's work and his writings reveals this contradictory stance, both disregarding and requiring native participation and knowledge in the process of controlling India.

In 1757 the British military forces in India defeated the army of the Nawab of Bengal, Siraj-ud-Din, at Plassey and soon established a system of provincial rule in Bengal to control the territory that they had gained. The East India Company continued to solidify its hold over Bengal and eastern India through military and diplomatic means in the following years. In 1765 the signing of the Treaty of Allahabad ensured British administration and revenue collection rights in Bengal and surrounding areas. The British quickly became a substantial territorial authority with interests in many of the power struggles occurring in India. The Company worked to establish itself as a regional power and as it gained this status, aspirations for financial gain and a need for territorial security increased.

James Rennell played an important role in this early phase of the British colonial endeavor in India. Rennell rose through the ranks of the Bengal military engineers to reach the notice of many in the Company's administration. With his experience as a military surveyor and engineer, as well as judicious introductions made by friends on his behalf, Rennell was commissioned to produce a working map of Bengal. Rennell had worked in other engineering positions before, and had performed some marine surveys, but there was little in his background that would indicate that he should be considered as the man to undertake a project of such a large size and importance. But the necessity of possessing useful maps required that the project move as quickly as possible.

Rennell writes in 1764 that "I am correcting the geography of the Kingdom of Bengal, a work never attempted before the present Governor<sup>10</sup> came here."<sup>11</sup> With limited funding and assistance, Rennell began his surveys. Initially staying on the navigable rivers of Bengal to acquire his data, he soon moved further from the rivers to gain more accurate views of the land. Between 1765 and 1771 Rennell led a regional survey of Bengal, creating maps of the roads and distances between key points in the British territory.

At the outset of the Bengal survey, Rennell wrote to a friend in England of the "number of barbarous nations to pass through," adding that, "some of them are extremely jealous of Europeans."<sup>12</sup> In the available correspondence Rennell does not elaborate further on his view of the project much beyond relating the hardships that he and his team had to face and his consideration the fact that, as the leader of the survey the project, he

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<sup>10</sup> Henry Vansittart, President of Bengal: 27 Jul 1760 - 3 Dec 1764  
([http://www.worldstatesmen.org/India\\_BrProvinces.htm](http://www.worldstatesmen.org/India_BrProvinces.htm) accessed Jan 25 2005)

<sup>11</sup> Rennell MS Entry 26 1/9/1764

<sup>12</sup> Rennell MS Entry 29 31/8/1765

would likely earn five or six thousand pounds when it is completed.<sup>13</sup> The surveys did not require completely accurate distances but were to be performed quickly and “in a cursory Manner only, correcting them by latitudes or other eligible means.”<sup>14</sup> While working on the surveys Rennell was appointed by a returning Robert Clive to the newly created office of the Surveyor General of Bengal in 1767. Rennell then served from 1767 to 1777 as the first Surveyor General and solidified the position of the Survey of India in the colonial government.<sup>15</sup> The official historian of the surveys of India, R.H. Phillimore describes Rennell’s production as the leader of the Indian surveys as: “far from complete or accurate in detail, but showed the general geography of the whole country and the more important features with sufficient accuracy for the needs of the time.”<sup>16</sup>

After serving with some distinction as the Surveyor General, Rennell petitioned the government of India to grant him a pension and allow him to retire back to England to begin a project of examining, organizing, and evaluating the collections of “Maps, Charts, Views of Lands, Sea Journals, and other Geographical and Hydrographical Information of various kinds: all (or most) of which, according to the present System, appear to be laid by to perish.”<sup>17</sup> Rennell returned to London in 1778 and began to publish commercial works of geography based on his work in India. He first published a collection of his Bengal surveys in 1780 and 1781 as *A Bengal Atlas*. After this project was completed Rennell set to work on the disorganized and chaotic archives of the Company. Rennell began to compile and synthesize information and after extensive work produced a map entitled *Hindoostan*, in 1782. In a letter, Rennell briefly mentions

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<sup>13</sup> Rennell MS Entry 26

<sup>14</sup> Phillimore I 22

<sup>15</sup> Edney 12, 134

<sup>16</sup> Phillimore I 2

<sup>17</sup> Edney 98

the project saying that he: “has in hand a map of Hindustan,” which he describes as “a work much wanted at this time.”<sup>18</sup> Matthew Edney describes Rennell’s process of creating the map of Hindustan as not only a work of intellectual accomplishment but also as a demonstration of Rennell’s mastery of the geographical information of India “he brought all of those disparate sources together and welded them into a single, correct image. He was the map’s author; he was the creator of the knowledge.”<sup>19</sup> While Edney is correct to point out the authority that Rennell gained from the process of creating his maps and survey it is not true that he was the sole author or creator of the knowledge. The characterization of Rennell as a single author of the one correct image of India overemphasizes his ability to collect information from so many sources without being influenced by them at all. Even if Rennell did not explicitly adopt the views of Indian geographical information that were present in his sources, the act of authorship in an colonial setting cannot be considered as taking place in a vacuum. The influence of Indian sources as well as Rennell’s reaction to the influence appears in his actions as a surveyor and later in his map production.

Rennell was the initial figure in the British project of claiming and creation cartographic knowledge in India. Rennell’s work occupies an important location in the political and administrative structures of the early British Indian Empire. Through his work, the East India Company expanded both its physical power over the territory of India and its symbolic or psychological power in the minds of the Indian subjects and British citizens. His brief position as the Surveyor General of Bengal gave to him

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<sup>18</sup> Rennell MS Entry 95 30/11/1782

<sup>19</sup> Edney 100

extensive abilities to influence and create images of the Company's colonial activities and possessions. But, the images in Rennell's work were not the result of strict scientific examination and synthesis. Rennell's colonial environment and the influences of Rennell, his workers, and sources heavily informed the production of work in the surveys. While he tried to rely primarily on his own surveys or other British data it was impossible to create a useful map with such a limited pool of knowledge. Rennell used British surveys and travel accounts and similar information, from reliable European sources, in the creation of his maps, but they were not enough to create a complete or even satisfactory image of the territory. Forced to recognize the limitations of European geographical knowledge Rennell combined these sources with information from many sources not produced to European geographic standards. Rennell's knowledge and expertise, supposedly encoded into images of the map, was actually the product of a variety sources filtered through Rennell's experience and ideas. It's work was the result of his acquiring many different sources of knowledge about India, digesting them, and producing a map that was supposed to appear seamless and complete. His production combines his own knowledge with information from Indian and other sources to create an image that appears to be organized and coherent. While the maps produced by Rennell appear to be complete and scientific documents, their creation was more convoluted and influenced than can be seen in the maps. The final product disguises the negotiation and reinterpretation that was necessary for Rennell's work to create a comprehensible image of India that was not lacking an appropriate amount of detail.

Map making and surveying each necessitate a different perspective. Both require the creation and representation of knowledge in an organized and scientific fashion, and



each, in its way, presents the land as a text to be observed and conceptualized. Though there are similarities between the production and purposes of a map and a survey the two activities proceed in different manners and with different final results. At the time Rennell worked in India there was a distinct split between the process of map making and that of surveying. Each process had its own characteristics and those that participated in one did not necessarily also participate in the other. Maps could be created from collections of travel accounts and geographical guesswork and the data contained in survey reports could be read on its own as a substitute for drawn maps. The consequence of this separation was apparent when Rennell came to India. His superiors in the East India Company possessed maps of India but they were old and of a scale too large to be practical and often were more creations of assumption and art than of accurate information. What was lacking was a rigorous framework for the geographical knowledge that a modern series of surveys would provide. The surveys that would provide the organization and fine detail needed for useful maps were not available. Rennell was able to exert a higher level of control on both the process of surveying and map making, ensuring that the final production was according to his interests.

Surveying, for Rennell and his contemporaries, was not directly related to the creation of a map. Surveying required active physical interaction with the land. The description is created continuously, on the ground, while moving through the landscape. A survey project was an arduous undertaking that required physically demanding travel and the ability to deal with adverse circumstances, often with little material support. Surveys were performed most often by military detachments, forced to follow their commanding officers through the tedious and difficult process of surveying territory.

The information produced by surveys was most often in the form of tables of distances and rough sketches of the landscape. Speed was valued over extreme accuracy and there was little standardization.

While surveying was a rough and practical undertaking map making was a process more closely associated with desk bound clerks, engravers, and printers. Map making was still in a relatively early stage of development and modern forms of maps were gradually gaining wide acceptance. The recognized utility of organized and accurate maps was growing in governmental administration as well as in the large public. Contrary to surveying, map making was an endeavor largely confined to the indoors. Large amounts of information from route surveys and other sources were compiled in a central location and then examined and synthesized into one coherent product.

As a geographer and surveyor Rennell fit in with the contemporary thoughts of his day concerning the process of colonialism and dominance of the British. Historian Robert Mayhew characterizes Rennell's opinion of the native population as "obstacles to the progress of geography."<sup>20</sup> Mayhew also situates Rennell's attitudes in the "broader system of national and ethnic stereotypes, which builds from an assumption of European superiority."<sup>21</sup> However, Rennell's "imperial assumptions," are described as being somewhat backward looking and "modeled in the era of the control of India by the East India Company in the 1760s." Rennell's work was "related to a conception of empire that would be overtaken before his death."<sup>22</sup> Rennell advocated that the British limit the amount of territory that they sought to acquire, though this opinion was quickly becoming unfashionable even as he presented his ideas in his work. While Rennell may not have

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<sup>20</sup> Mayhew 197

<sup>21</sup> Mayhew 197

<sup>22</sup> Mayhew 201

been desirous of dominating the entire Indian subcontinent through military or political power he was extremely keen to display the entire continent through his maps and surveys. Despite his partially outmoded imperial values Rennell, and his work, was centrally located in the project to extend British power across the Indian subcontinent through the collection and creation of geographical knowledge. Rennell created the first images of India that allowed for effective large scale investigation. Through his surveys and maps British power was shown to extend through their legally recognized territory to include all of India, even those territories that were not yet under the official sovereignty of the British. If the British never fully subjugated the entirety of the subcontinent through their political or military power, their systems of knowledge extended in all directions and crossed all barriers.

James Rennell was intensely connected to the colonial system, and his characterizations of Indians demonstrate the ambiguous and contradictory nature of the relationship between the colonizers and colonized. While Rennell does not hide the stereotypes that inform his colonial mindset, his vision of Indians was not limited to just defining them as obstacles to the advancement of his surveying work. His interaction with Indians and Indian knowledge occurred over a wide range of situations and cannot be said to reflect any one explicit colonial ideology. Rennell's opinion of India altered as the condition around him changed. Each survey placed Rennell into new situations of contact with the people and knowledge structures of India. Sometimes Rennell experienced India in confrontation but more often it was in a mode of collaboration and mutual assistance. The following sections will demonstrate the different circumstances

and approaches used by Rennell and Indians during the early surveys. Because of this somewhat flexible environment Rennell was open to the influences of India knowledge in his work. While this did not transform him into an advocate for leaving the colonies of India, perhaps it did allow him to be more open to the use of Indian information while constructing the maps that he later presented to the British public. Interaction and cooperation also influenced the overall image, or idea of India created through Rennell's work. Instead of one image, wholly conceived and controlled by the British, many images existed and were combined to create a knowledge of colonial India.

The wide ranging surveys Rennell supervised brought him into contact with a diverse cross section of the population of Bengal. The nature of the survey was such that Rennell had to cover as much of the land of Bengal as physically possible to create an accurate survey to be later integrated into useful maps. Different encounters during the survey illustrate the manner in which Rennell's attitude toward Indians changed with the situation. Rennell was concerned with the continuance of the survey above all else and was willing to use any means to ensure that his work was not impeded. This included calling on Indians and their power structures to solve problems encountered by his surveying parties. But, Rennell did not see himself as working in an innocent environment, his mission was to collect the information about Bengal so that it could be used to better subjugate the territory. Rennell fully subscribed to the notion that much of India was barbarous and violent and that British surveyors would not be given freedom to move where ever they wished without impediment. While Indian participation was an important element in the work Rennell did not seek for any sort of direct cooperation or

understanding. Rennell's conception of the survey was lacking ideas of colonial improvement or stability that be attached to the survey with later leaders. His mission was one purely of knowledge extraction. There was little room for compromise with those that he encountered if they prevented him from his surveys. Often coercion and violence were used to ensure that surveying continued, despite objections.

Rennell began his career in India in Engineers of the Bengal army and his survey work reflects the militaristic and conquering aspects of early colonial rule. In 1765 Rennell set out with four European assistants, one of whom, an Armenian, was soon killed in a hostile encounter.<sup>23</sup> These men were responsible for leading a party of 61 Indians to survey Bengal the territory ordered to Rennell.<sup>24</sup> The group was organized by military rank although not every member of group was an officer in the Bengal army.

When Rennell began, the surveys were still very much a part of the Company's military establishment. Survey missions were supposed to use military resources to complete their projects. But, because the surveying parties were considered only to be of peripheral importance to the military they did not receive the extensive funding they required. Resources were often not available in the quantities or qualities necessary for the survey and the leaders were forced to look elsewhere. Phillimore sets the scene of Rennell's early surveys:

“When Rennell started his surveys Bengal had not yet come under the regular administration of the Company's servants, who were still but strangers in the land, occupied with commerce and money making, with but a few troops for the protection of

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<sup>23</sup> Phillimore I 283

<sup>24</sup> Phillimore I 289

their factories or to support the collection of revenues; the bulk of the small army was fighting beyond the western frontiers.”<sup>25</sup>

Because of a lack of wide spread military and governmental infrastructure, resources had to be obtained outside of the Government of India’s jurisdiction. Often the leaders of surveys had to take men and material from the areas they surveyed, sometimes without prior arrangement or immediate repayment. These practices were an important cause of friction between the surveyors and the people whose land they passed through.

To Rennell and others the barbarity of the nations passed through was demonstrated by the natives’ unwillingness to fully cooperate with the survey parties as they tried to requisition goods and men to aid in their surveys. In 1766 Rennell requested “People and Provisions” from the Dewan of Olyapour. The Dewan was not prepared to give Rennell resources to bring what he saw as a military exploration party into his territory, so he forbade his subjects from hiring themselves to Rennell, though they could sell provisions if they chose. Rennell sent repeated messages to the Dewan but continued to meet with an uncooperative response. After ten days of requests Rennell ran out of patience and ,

“About 8 next morning I went with Mr. Richards & 16 Sepoys towards his Countrey House under cover of a thick fog but he had got intelligence of our March, & was gone before we entered the House. I informed the servants that if they did not produce their master I should set fire to the House, which was accordingly done, & we retired to our Baggage on the South side of the Teesta.”<sup>26</sup>

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<sup>25</sup> Phillimore I 291

<sup>26</sup> Phillimore I 291

After this Rennell and his men had to retreat from the hundreds of soldiers and villagers that pursued his party for nearly six miles. This instance demonstrates the confluence of the projects of colonial pacification and surveying. In order to gather information about an area Rennell required a certain level of social and political stability as well as being able to take the resources and supplies he need. If these conditions were not met Rennell considered himself justified in altering the conditions, even through violence. The process of acquiring knowledge is highly dependent on the circumstances on the ground. Rennell could not survey if he was facing the prospect of armed resistance in his chosen area.

A 20<sup>th</sup> century author, Showell Styles, narrates another adventure during Rennell's survey work in early 1766. Rennell and his men were working around the eastern border of Bihar, when Rennell met with an old military associate of his. This man, Lieut. Dennis Morrison, informed Rennell about an army of raiders that were threatening nearby villages. Rennell left behind his surveying work for a time and with his men, joined Morrison's force. Soon the British forces found the raiders and met them in a "short but bloody fight." Styles revels in the description and turns Rennell from a surveyor into an Imperial hero:

"Rennell was in the thick of it, sword in hand. The Sanyasi broke and fled, leaving half their number lying dead or wounded. But Rennell was down, with terrible saber-cuts in head, arm, and shoulder. Morrison brought him safely back to Calcutta, but it was nine months before he was able to rise from his bed. Almost at once he was back at his work for the general survey."<sup>27</sup>

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<sup>27</sup> Styles 34

Rennell is less illustrative in his own account stating that when they came upon the enemy “they made a desperate effort to defend themselves,” and “In this Skirmish I had the misfortune to be surrounded by the Enemy, & received several cuts from their broad Swords, one of which threatned [sic] my Death.”<sup>28</sup>

In a later instance of Rennell’s encounter with Indian opposition to his work occurred during work “on the North side of ye Ganges.” The surveying party had “halted near Pulash the 5<sup>th</sup> Instant at Noon. A few minutes after our Arrival the Villages came arm’d, & threatened to fall upon Us. I asked them if they had any Complaints to make. They abused me, told me no, & insisted that I should go away.”<sup>29</sup> Rennell could not leave, for he had work to do in the area and would not give it up because he had upset the village and its leaders. After informing the head of the village, Cadder Beg (Kadir Beg)<sup>30</sup>, of the group’s intentions, Rennell had a few days of relative quiet before Cadder Beg confronted him with a group of armed villagers. Cadder Beg “appear’d on Horseback, & with him a very great rabble, some of them armed with Matchlocks, & the rest with Pykes & Swords ext.”<sup>31</sup> Cadder Beg informed Rennell that he wished to fight and force the British party to leave his territory. Rennell, realizing the gravity of the situation and not wishing to use his sepoy in a dangerous battle, fired a shot at Cadder Beg, attempting to end the battle by killing him outright. Rennell missed Cadder Beg but, apparently, hit another man. After this exchange the village army retreated but continued to send parties to harass Rennell and his men. Rennell continued to receive messages from Cadder Beg: “one of them so full of Abuses & Menaces, that I thought

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<sup>28</sup> Phillimore I 292

<sup>29</sup> Phillimore I 292

<sup>30</sup> Phillimore I 293

<sup>31</sup> Phillimore I 292



Myself fully authorized to chastise the Messenger, which I did; the rest contained his hints of Independence, together with Orders for me to depart.”<sup>32</sup>

Rennell continued to work in the area despite the mounting displeasure of Cadder Beg. Eventually, according to Rennell, Cadder Beg gave in and instead of belligerence “he fell into the opposite Extreme, & began to apologize for his behavior, which he imputes to Ignorance and my Station & Employment.”<sup>33</sup> It is unclear why Cadder Beg had such an apparently abrupt change of heart, though it might have something to do with Rennell’s appeal to the Council at Murshidabad to classify Cadder Beg as a criminal and the council’s request to the Naib Duan<sup>34</sup> to bring Cadder Beg to Murshidabad as a prisoner. According to Phillimore the request was carried out, Cadder Beg was brought in and found guilty of “insolent and outrageous behavior,” also, Rennell was found not to have killed the man he was reported to have shot.<sup>35</sup> In an effort to make an example of those who interfered with the Company’s business Cadder Beg was “drummed” through the city of Murshidabad, then through the village where the offenses had been committed, and then ordered travel to meet Rennell and ask for pardon.<sup>36</sup>

These instances in the surveying projects of James Rennell demonstrate the level of India involvement in the surveys. While carried out under the authority of the British, the surveys depended heavily on Indian resources, which the Indians were in a position to provide or deny. The above incidents display the lengths Indians would go to assist and resist the surveys and the actions the British would take to ensure the survey’s success.

The most important, though least mentioned, form of native participation in the surveys is

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<sup>32</sup> Phillimore I 292

<sup>33</sup> Phillimore I 293

<sup>35</sup> Phillimore I 293

<sup>36</sup> Phillimore I 293

the use of native labor within surveys. The process of surveying that Rennell used was not as resource intensive or mathematically complicated as later projects but it still required large amounts of labor from the surveyor and those that supported him. Survey groups under Rennell would travel along the roads or paths in their survey areas and record the important characteristics of the land like changes in elevations, rivers and other water sources. Many of the characteristics noted were of military usefulness. This was due to the historical connection of surveyors to military engineers and to the necessities of colonial mapmaking, which at this point in the British domination of India were mostly concerned with troop movement and fortification and not with establishing or measuring territory. Rennell could not have traveled the lengths that he did alone, a large contingent of support workers was necessary to ensure that his supplies and instruments followed him from place to place. Rennell makes little mention of the men he hired to carry out this work for him, but it is obvious that the work of the surveys depended just as much on the men that carried food and tents as it did on the men making the measurements of the land.

Another important aspect of Rennell's work is the continual use of Sepoys and other Indian subordinates as protection during the surveying project. Rennell had over sixty Indians under his command during one survey expedition, but that was just for the work of measuring and support of the survey. More men were needed to ensure the security of the surveying party. At the beginning of his career Rennell traveled with a small detachment of native soldier. In 1764 Rennell began his work with a detachment of 21 soldiers to follow his party. After the attack in 1766 that left Rennell wounded and bedridden, "the Governor ordered that the Surveyor General should always travel with an

escort of a full company, with one or more British officers.”<sup>37</sup> The soldiers were attached to the surveying parties to combat the often violent resistance that the surveyors faced in their work. Fearing loss of territory, increased taxes, or further subjugation to the British, many Indians actively resisted the approach of surveying parties, making the use of military force necessary. Sepoys receive more mentions than the laborers and servants of the surveying parties, perhaps due to their more visible role fighting on behalf of the British.

The surveying teams did not just require that the Indians employed by the British participate for their work to be successful, it was also necessary for Indians not connected to the Company to cooperate in the survey. Phillimore makes the necessity of this participation clear in the first volume of his history: “It would not be correct to give the impression that Rennell and his surveyors were in constant conflict with the people of the country, as this narration of a few incidents might imply; the work indeed could not have proceeded had this been so; on the contrary the Council were glad to commend ‘his just and inoffensive conduct to the People of the Country.’”<sup>38</sup> Phillimore does relate any direct mention from Indian sources of Rennell’s good conduct but only has the commendations of Rennell’s peers to substantiate Rennell’s positive position with the natives of India.

A further example of the British dependence on Indian power and information in the surveys is displayed in Rennell’s final recourse in his conflict with Cadder Beg. Rennell could not, or did not want to, defeat the man militarily and his attempts at diplomatic communication were also unsuccessful, in this situation he turned to a higher

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<sup>37</sup> Phillimore I 300

<sup>38</sup> Phillimore I 295

authority, the Council in Murshidabad. The Council, which did not have any direct power over Cadder Beg, turns to Naib Duan. This man finally dispenses what is deemed an appropriate punishment upon Cadder Beg. It is clear in this situation that the British domination of India is not complete, even in the territory that they officially possess. Cadder Beg feels as though he has enough power to resist the work of the British surveyors, and even to speak of his “Independence.”<sup>39</sup> Paradoxically the British cannot respond to this intense denial of their power, they require another power, one recognized by Cadder Beg and those around him, to stop him and bring him to punishment. Beyond the need for the Indian political system to bring to justice those outside of the reach of the British authorities, the survey teams required the agreement of Indian governments to travel through restricted areas. Phillimore explains: “before a surveyor could enter any foreign territory, he had always to be provided with a *parwana* or passport; once provided with this he was seldom molested, and then only if he strayed unwittingly beyond the limits specified.”<sup>40</sup> The project of surveying was not a project controlled by the British colonial state. While colonial necessity may have initiated the surveys they could not exist without extensive Indian participation. Surveying the land necessarily involved the presence of Indian, both those accepted the surveys and those that resisted them. The project then was not under Rennell’s complete control, nor can the results be considered as a disinterested and objective report of Indian territory. With each encounter of Indians resisting the surveys or each instance of Indian participation in the work of surveying Rennell’s work was informed and changed. The final product of the survey, though considered as a complete and useful representation of British territory, is

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<sup>39</sup> Phillimore I 292

<sup>40</sup> Phillimore I 296

actually much more fragmentary and subjective, this characterization continues through Rennell's work, and the rest of the history of the survey of India.

The presence of Indians in Rennell's project of surveying continued through the physical process of surveying on the ground and into the office. Rennell was somewhat atypical from his contemporaries in that he worked in both the field and the office. Rennell's dependence in the field on Indian, labor, protection, and government was explored above, but he also used Indian knowledge and sources in his creation of maps and other cartographic documents, especially in his Map of Hindoostan. The form of map making used by Rennell, common at that point in the 18<sup>th</sup> century required a distillation of large amounts of information from many different sources into one coherent and seamless whole. Rather than being the product of a single set of surveys, or even the product of a single national project, the data used to create the maps were pulled from sources that spanned large spaces of time, technique, languages, and accuracy. The creator of the map had large amounts of influence in deciding what information was present and how it appeared on the final version of the map. Rennell used information from a wide variety of sources to create his map. The lack of any one comprehensive and reliable source of knowledge necessitated that Rennell absorb as wide a range of information as possible to present a complete image of India. Those mentioned most often in the Memoir are the maps of Jean Baptist Bourguignon D'Anville, a French geographer who had created the earlier *Carte de l'Inde*, and the *Ayeneh Acbareer*<sup>41</sup> a description of the geography of the Mughal Empire under Akbar written by Abul Fazl. Less central sources range from the many descriptions of marches of British troops and

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<sup>41</sup> Ain-i-Akbari

geographic explorations<sup>42</sup>, to classical accounts of Pliny and Alexander the Great,<sup>43</sup> Jesuit maps of China<sup>44</sup>, and information from the kingdom of Timur.<sup>45</sup> Susan Gole, a historian of Indian maps, lists four maps, each one created by an Indian that was used by Rennell to construct the Map of Hindoostan.<sup>46</sup> Rennell saw one of these maps, a map by a “native of Guzerat,” as giving “the form of Guzerat with more accuracy, than most of the European maps can boast.”<sup>47</sup> Each source was interpreted and weighed by Rennell, their accuracy ascertained as well as possible before their knowledge was integrated into the map. The usefulness of each knowledge source was determined by comparing it to the accepted, British, astrological measurements of latitude and, less often, longitude. Through this comparison Rennell could determine how closely a source approached his necessary level of accuracy. Though it was important to demonstrate the provenance of the information presented by each source, at times, Rennell also used less rigorous means to continue his work. In his discussion of the mapping of South India Rennell laments that there are certain areas he cannot present due to lack of good information about them. While this is not overly surprising as there are many other areas that he admits to not having the most accurate sources for, in this particular case Rennell also lacks any informal knowledge. He writes: “My local information, fails me entirely in this place; and this kind of knowledge is so requisite to a geographer, that no degree of study of investigation can compensate for the want of it. It not only enables him to reconcile names and situations; but oftentimes furnishes him with a criterion by which he may

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<sup>42</sup> Including an important series of exploratory surveys performed in 1774 by Sepoy Golam Mohamed between Bengal and the Deccan (Rennell Memoir vi)

<sup>43</sup> Rennell Memoir 39

<sup>44</sup> Rennell Memoir 87

<sup>45</sup> Rennell Memoir 54

<sup>46</sup> Gole India Within the Ganges 21

<sup>47</sup> Gole India Within the Ganges 21

distinguish the value of his materials.”<sup>48</sup> It is not entirely clear what local information entails, if it is his own personal knowledge of a place, or if it is information from a locality somehow relayed to him. Either way with this statement Rennell reveals the subjectivity of his project. Rather than relying on his archive or surveys of other controlled information he gives highest authority to the local knowledge of a place. This destabilizes the coherent structure of this map project, and creates questions as to the ideal of Rennell’s map as a presentation of India as one image.

By providing a memoir with the map Rennell attempts to demonstrate his mastery of the information necessary to produce a work of such magnitude. But, Rennell’s memoir makes clear the fragmentary and tenuous nature of the evidence that was used and eventually glossed over by the production of the map. Rennell tried to set himself as the sole author but the very methods he use in creating his map weaken his position as the only possessor the correct knowledge of India. Throughout the text of the memoir Rennell writes as the sole author of the map, displaying his knowledge by choosing and correcting those that came before him. But, Rennell’s knowledge does not reach all parts of India nor does it completely understand even the parts that it does not reach. His *Map of Hindoostan* is a product of many sources of colonial and non-colonial knowledge that Rennell attempted to reconcile by hiding it in plain sight. His memoirs make it very clear that he could not create one whole map of India with accurate and acceptable knowledge throughout, but the map was presented as totally authoritative and reliable. This may have to do with the standards of map reading of the time. Less attention was paid to the sources of a map and plagiarism and copying maps was frequent. The seams and gaps in Rennell ability to control knowledge appear in his maps. Like the control and use of

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<sup>48</sup> Rennell Memoir 83

native labor and authority during his surveys Rennell's authority over geographical knowledge is not complete and often the result is contradiction and confusion.

While describing the overall structures of his Map of Hindoostan in the preface of his memoir Rennell displays an important contradiction in his approach the information of British and Indian sources. He first mentions that he has decided to follow the system of Emperor Akbar and use the "soubahs" (subas) or regions of his empire to divide his own map. This is done because "the ideas of the boundaries are not only impressed on the minds of the natives by tradition, but are also ascertained in the AYENEH ACBAREE; a register of the highest authority."<sup>49</sup> The authority of the Ain-i-Akbari is not considered on the next page where Rennell writes:

"Considering the vast extent of India, and how little its interior parts have been visited by Europeans, till the latter part of the last century, it ought rather to surprize us that so much Geographical matter should be collected during so short a period; especially where so little has been contributed towards it by the natives themselves, as in the present case."<sup>50</sup>

Rennell then is working to insert European geographical information into an overall conception of India developed by the administration of a Mogul emperor. The subtitle of his map is also indicative of the presence of an India framework of knowledge in which Rennell worked. *A Map of Hindustan; or the Mogul's Empire* still indicates that there is an imperial presence in India, not the British, that still holds significant influence in determining the shape and character of the image India. When attempting to create an overall system for organizing and subdividing the entire mass of India Rennell relied on a

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<sup>49</sup> Rennell Memoir iii

<sup>50</sup> Rennell Memoir iv



system of ideas developed well before he began his work and without the benefit of European methods or standards. But during this process he must hold the difficult position of making use of a valuable document and demonstrating appropriate disdain and detachment from native knowledge. Later Rennell disparages the lack of accuracy in the measurements of latitude and longitude in the *Ain-i-Akbari* and assures the readers that he does not use it “but in a few cases, where every other species of information has failed.”<sup>51</sup> At many other points in the memoir the *Ain-i-Akbari* is mentioned as an important source of information. While Rennell is quick to dismiss the knowledge contained in the *Ain-i-Akbari* in situations where he possesses British or European information at other points it is his sole reliable resource. Rennell’s opinion of his sources changes depending on their utility. For certain sections of India all he had to use were the accounts of native Indians or ancient geographies far removed from what he considered to be the standards of the day. When necessary these are given increased weight, but when they can be replaced they are considered as little more than misguided writings. From its very beginning the *Map of Hindoostan* contained both Rennell’s European knowledge as well as a collection of the knowledge of India. Though Rennell may have wished to privilege European knowledge in the construction of his maps he was not able to fully do so due to the extreme deficiencies in British knowledge of India’s geography.

The confusion that is created by the simultaneous dismissal and necessity of native knowledge also continues to appear with Rennell’s attempted reconciliation of the different distance measurements in some of his sources. Some of his Indian sources use a length measurement called a *coss*. Pliny and other classical writers use different

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<sup>51</sup> Rennell Memoir 47

lengths of miles than Rennell. Rennell had to determine a conversion between the alternative measurements and his own in order to use the information of non-British sources in his map. An accepted conversion for the Roman mile is used to determine Pliny's accuracy with little difficulty.<sup>52</sup> The coss however is more difficult, requiring more information to create a conversion. Also, the coss is not standard across India. Depending on the locality different conventions apply to the length of a coss, preventing a truly accurate and portable conversion.<sup>53</sup> Even after Rennell determined a satisfactory ratio between a coss, a British mile, and a degree he still does not always use the European measurements. Rennell often uses the coss in his memoir when relating information from Indian sources. Similar to his use of Akbar's provincial titles to create an initial framework for his map Rennell could not avoid using the distances contained in the India sources in his work. Though he does not acknowledge the measurements with the same language as those found in European sources their presence is still necessary for the creation of his map. This knowledge, appropriated by Rennell, of the regional subdivisions of India and a large amount of distance measurements, forms a large part of the basic foundation of his project. While Rennell's encyclopedic approach to map making made it acceptable to use a wide variety of sources his use of Indian knowledge is still problematic. In the same manner that Rennell could see some Indians as savages worthy of military coercion and reprisal and at other times turn to other Indians for essential mediation and resources, he could also both disparage Indian geographic knowledge and use in his most important projects.

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<sup>52</sup> Rennell Memoir 38

<sup>53</sup> Rennell Memoir 18

Rennell's opinion of non-British geographical information remains apparent in his later writings. These were mainly texts exploring questions of history and historical geography. He maintains his colonial characterizations of foreign lands and colonies under British rule. In these works Rennell is not as constrained by the necessity of producing a practical and efficient work for governmental use and often inserts large digressions and personal asides into the text. Even in the historical studies Rennell published after his official retirement there remains language heavily invested with colonial rhetoric. Rennell uses his new writings to continue his work of creating a British collection of geographical knowledge that is fully controlled as well as at the same time, being useful for enacting control over people and or other systems of knowledge. Rennell's reinterpretation of classical geographies allows him to both critique the limitations of ancient geographical information, and also to insert his own contemporary values into an ancient and authoritative text. In *Herodotus* Rennell finds issue with the writings of the ancient Greek, particularly about his ungenerous and ignorant view of the population of India. Rennell informs the reader that he should look with skepticism on "Herodotus's very confined knowledge of India," and,

"the extraordinary reports which he has detailed concerning its inhabitants; some of which are highly injurious to the character of that industrious, inoffensive, and highly civilized people. For, with many particulars that are true, respecting their customs, and manners, he has mixed a greater number that are false; and of such a nature as to brand their characters with a charge of odious and obscene practices; from which they are perfectly free, at this time; and were so, no doubt, then."<sup>54</sup>

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<sup>54</sup> Rennell *Herodotus* 306

The complementary attitude that Rennell takes in this passage is undermined a few pages later in his discussion of Alexander the Great's travels in India. While relating a story about Alexander's meeting and travels with a "Bramin" named Calanus the charitable tone Rennell presented previously, slips. Rennell writes:

"In this Indian philosopher, we trace, at a distance of more than 21 centuries, the same frame of mind, and the like superstitions, as in the same tribe, in our own times; a contempt of death, founded on an unshaken belief of the IMMORTALITY of the SOUL, (a cordial drop which the most *atrocious* of the *enlightened* moderns would rob us of); and an unconquerable adherence to ancient customs."<sup>55</sup>

Rennell fully subscribes to the view that the Indian, and many other native populations are stuck in their past, imprisoned by traditions and beliefs that prevent them from reaching the levels of civilization and scientific advancement of Europeans. In these sections Rennell is demonstrating his authority over the ability to define Indians and India. His experience gives him authority over the knowledge of India. Looking back on Herodotus Rennell can use this knowledge for his own ends. Herodotus is available for reinterpretation by Rennell because of the lack of accuracy and "actual" geographic information in the ancient work.

The title cartouche of Rennell's Map of Hindoostan contains a large and striking image.<sup>56</sup> Britannia, in the middle of the image, holding a spear and shield, stands on the foot of a pedestal engraved with the names of famous British victories in India.

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<sup>55</sup> Rennell *Herodotus* 310

<sup>56</sup> examples of the image can be seen in Edney *Mapping and Empire* and Raj "Colonial encounters"

From her right Britannia accepts a packet labeled “shaster,”<sup>57</sup> from a group of three Indian Brahmins. On her right two armed gentlemen watch over the scene. At Britannia’s feet lay various tools, like brushes, dividers, and a roll of paper. In the distant background a temple stands on one side of the image while a merchant ship is unloaded on the other. Palm trees and other vegetation fills in the gaps, and a small figure in the center of the image works in a field. This image, included as a glorification of the British possession of India, is much more complicated than initially appears, and serves as a useful symbol to describe Rennell’s situation.

Rennell may not have designed the image himself but its inclusion on his map is an apt symbol of his complicated relationship with the inhabitants and information of India. While the cartouche may be read as a straightforward celebration of the British project to create the maps that would allow for the subjugation of India, this reading does not take into account the complicated production of the map. The presence of the Brahmins can be read as a proof of the complete subjugation of India and a willing transfer of knowledge authority to the British from the Indians. But more compellingly, in light of the information contained in Rennell’s memoirs and in the history of his survey work, the action of the cartouche can be seen as collaboration. The British are receiving knowledge that they could not obtain on their own from those willing to give it to them. The weaponry in the drawing shows that the process was not always peaceful or without difficulty, but does not deny that the process occurred. Britannia is not picking the information off the ground, but is directly involved with Indians in the gaining of her

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<sup>57</sup> “The packet being given to Britannia is labeled “shaster,” that is *sastra*, a Hindu religious code or law book.” Edney 14

knowledge. That the knowledge gained is in the form of Indian laws goes further to demonstrating the dual nature of the British project in surveying India.

Rennell officially began the project of surveying India and the process by which the British attempted to gain control of Indian knowledge. But as this image shows this was not a project of one man. Despite the geographic ideals of the time there were many involved in the production of geographic knowledge who were not immediately apparent in the final product. While Rennell's name is the most prominent on the map he is only one of many whose knowledge has been integrated into the map, and into the image of India created through it. In this early stage in the colonial domination of India by the British the desire for one, comprehensible image was intense. The ability to grasp one image as that which was possessed was highly desirable. But in the production of one image, many different images were used. The final image was not the result of the control and possession of India by the British but the result of negotiation and discourse between the newly powerful British and older systems of power. At the outset of the survey the British wished to create one stable image of their own and this desire would continue through the history of the Survey of India. But, along with this desire would continue the necessity of Indian involvement in the production of the image, an involvement that would strengthen and deepen as the survey spread and advanced. The British knowledge of India through the surveys would never be solely British, just as the domination of India as a colony would never be complete.

## George Everest and the Great Trigonometrical Survey of India

In his account of the measure of one of the meridians of the Trigonometrical Survey of India George Everest laments the difficulty of his project saying:

“It was unquestionably the most harassing duty I ever had to perform, and I had to bear nearly the whole burden of the arduous task myself, for there was at that time a no person at my disposal to whom I could depute any portion of the work except under my own immediate supervision and control.”<sup>58</sup>

This quote is indicative of the attitude that Everest took towards his entire project of trigonometrically measuring the Indian subcontinent. The most important element of the project was control; control of knowledge, of the survey process, and of people. Everest was unwavering in his desire to see the entirety of India mapped with the highest accuracy that was available with the trigonometric techniques of modern cartography. The Great Trigonometrical Survey of India (GTS) was an attempt to control the British image of India down to the smallest detail. The power of the trigonometrical process was its extreme accuracy and mathematical precision. With these surveys Everest and others sought to revise the earlier, incomplete, image of India with a single image that was entirely consistent and backed up by testable scientific ideas. The goal of the survey was not to directly produce maps but to measure as much of India as possible. Accurate scientific measurements could be transferred into any medium necessary, maps, charts, tax reports, train schedules, or military marching orders. Measurement ensured control. Like Rennell and his patrons Everest was involved in a project to expand the ideas of

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<sup>58</sup> Everest Account *xxiii*

British control across India, both in the literal sense on the ground, through the creation of accurate geographic knowledge, and in the abstract metaphorical sense in the minds of British and Indian people.

Everest's survey project strengthened the British ideal of measurable and controllable India, through the application of British knowledge and technology. The British depended on the application of superior military technology from the beginning of their colonial project in India. However, at Everest's time the British science and technology used to control India did not just encompass the weapons used to subdue India, but also the improved surveying equipment like the theodolite<sup>59</sup> or the measuring bars. These new instruments were used to observe, define, and control the creation of geographical knowledge rather than to kill. While the violence and death were mostly removed from the process, control was still the most important element of any colonial project, the surveys included. New survey equipment greatly changed the British project of knowledge creation and collection in India. Technological superiority combined with preexisting ideals of knowledge superiority to strengthen British power to control and define. Precision and exactitude pervaded the survey process as the new instruments gained widespread use, with important repercussions for the entire survey project and the large system of colonial ideas. Knowledge, for Everest's surveys, was determined by the amount of land covered by exact trigonometrical measurements. With each region covered by the triangles of the trigonometrical survey the British gained knowledge over India. With each triangle completed the British came closer to developing a complete picture of India, measured and defined, that they could claim to have created. The project was ambitious and complicated, but as Clements Markham in his 1871, *Memoir of the*

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<sup>59</sup> Survey instrument used to measure horizontal and vertical angles.



*Indian Surveys* writes of the GTS, “when completed, [the survey] will be among the most glorious monuments of British rule in the east.”<sup>60</sup>

Indians were not absent from this undertaking. Just as Rennell had relied on Indian information and labor to fill in his maps, Everest and the Great Trigonometrical Survey continued to rely on Indian labor and knowledge to advance their work. Everest required teams of Indians to transport and maintain his surveys like Rennell, but he also employed Indians in roles far more specific. Radanath Sirkdar and Syed Mohsin, were two vital members of Everest’s establishment. Sirkdar was Everest’s chief computer and Mohsin was responsible for repairing, maintaining, and constructing the survey instruments during Everest’s later work on the trigonometrical surveys. In the recognition and utilization of Indians in survey work Everest went far beyond Rennell. While Rennell certainly worked with Indians in his surveying parties it was never on the same level as Everest. Everest’s colonial context made it more acceptable for him to allow Indians advanced positions in his survey, but it did not remove the difficulties reconciling long standing colonial prejudices with the new situation of Indians in elevated positions. The British colonial state in the mid-19<sup>th</sup> century was secure enough in its power that Indians were allowed into some positions beyond that of hired labor or servants. While not all British were fully comfortable with the growing presence of Indians in new positions, the sheer size and complexity of colonial rule in India necessitated the addition of Indians to take some of the responsibility of running the state from the British. This position would be heavily revised after Everest’s retirement as the events of the Mutiny of 1857 would cause the British to heavily curtail the use of Indians in elevated positions.

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<sup>60</sup> Markham 45

Everest's single minded focus on the science of his project, mostly ignoring the colonial and imperial implications of his work, may be a result of his attempt to gloss over the personal and political contradictions inherent in his work. The increasing emphasis on science and technology informed Everest's work far more than Rennell's. Everest used scientific language to characterize his survey project. The addition of technological and scientific language changed the explicit and implicit motivations of the survey project. Instead of Rennell's barely disguised use of his survey as a tool of colonial control, Everest's motivation was less obvious. The survey project under Everest and the GTS was less obviously concerned with India than it was with scientific measurement of the globe. But underneath the scientific veneer the GTS was as much about control as any earlier survey. The work of Everest and the GTS sought to augment colonial control with the transformation of India into a numerically catalogued ideal. Where Rennell was most concerned with practicalities and the large scale in his work Everest was detail obsessed. Rennell tried to capture and produce an image of the entirety of India that would produce the overall impression of the place and its situation. Everest sought to place the entirety of India, every last piece of knowledge, into a rigorous scientific grid that European examiners could check and explore.

From 1818 to 1843 George Everest worked on a project to map the Indian subcontinent with an accuracy that was far beyond what Rennell had been capable of when he started his surveys. Like Rennell, Everest also was a member of the Bengal Army, but Everest was an officer in an artillery unit.<sup>61</sup> He worked in a variety of roles for the military, gaining the notice of his superiors, most notably for leading surveys in Java

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<sup>61</sup> Phillimore IV 433

and supervising the dredging of some previously unusable rivers in Bengal.<sup>62</sup> Based on these successes Everest was chosen as the chief assistant to William Lambton in 1818. Lambton at that time was the head of the newly recognized Great Trigonometrical Survey of India. Lambton and Everest considered the purpose of the Great Trigonometrical Survey, to be twofold. One purpose was to provide an accurate set of base line measurements that would be necessary for the making of a unified collection of maps of India, later to be compiled into an atlas. The other, less immediate, purpose was to use the measurements made in India to determine the true shape and size of the Earth, a science known as geodesy and Everest's real passion.

After Lambton's death in 1823, Everest assumed the position of Superintendent of the GTS.<sup>63</sup> Everest led many survey teams through India measuring an extensive series of baselines and angle measurements. As can be seen in the opening quotation Everest was extremely reluctant to relinquish control over his surveys to anyone, he worked incessantly, often in difficult conditions to ensure that his team produced accurate results. A rigorous survey schedule and unhealthy working conditions forced Everest to take a hiatus from India after only two years of survey work during which he returned to England.<sup>64</sup> Even during these breaks Everest worked on his project, computing distances and angles from the and lobbying in person and in writing on behalf of the Survey of India. Everest had to work constantly to insure that his surveys had sufficient funding to continue to operate at an acceptable level. During his time away from India Everest also visited surveying operations in Ireland and spent a large amount of time seeking out

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<sup>62</sup> Phillimore IV 433, Edney 211

<sup>63</sup> Phillimore IV 433

<sup>64</sup> Phillimore IV 2

repairs and replacements for his rapidly aging survey equipment.<sup>65</sup> The amount of rhetorical and political energy that Everest put into advocating for the GTS and the Survey of India in front of the board of the East India Company gained him recognition with the directors of the East India Company. He was appointed the Survey General of India in 1830. This was in combination with his current position as head of the GTS, which brought two branches of the Survey of India under one leader.<sup>66</sup> After obtaining this appointment Everest returned to India.

With the authority of his new position Everest began to lead the measurement of new base lines and angles for the trigonometrical survey. Most of his work was done on what was called The Arc of the Meridian, a line of longitude that passed through the middle of the Indian subcontinent. By completing a series of trigonometrical sections up the Arc, Everest could both advance the mapping of India as well as creating a set of data to continue his geodetic calculations. For the next eleven years Everest lead surveys through India to complete the Great Arc and begin a series of secondary trigonometrical lines in other parts of India. Everest worked until 1841 on field surveys and spent 2 more years completing computations and charts.<sup>67</sup> With the work on the Great Arc completed Everest retired from India in 1843 and returned to England, where he remained a notable figure in the scientific community until his death in 1866.<sup>68</sup>

Unlike Rennell, whose surveying in earlier days of the East India Company allowed him to directly participate in the violent expansion and consolidation of British

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<sup>65</sup> Phillimore IV 433

<sup>66</sup> Phillimore IV 433

<sup>67</sup> Phillimore IV 439

<sup>68</sup> Phillimore IV 441

rule, Everest relates few military adventures of his survey parties. Everest's accounts are much more concerned with scientific and engineering questions than issues of political or military confrontation. While instances of armed conflict are mentioned Everest did not join in the fighting in the same way as Rennell. Everest worked in a different colonial environment than Rennell. The consolidation of colonial power that had occurred during the intervening years changed the situation of the British in India. The necessity of military conquest was diminishing. The idea of British rule, direct or indirect, had spread across the Indian subcontinent and had subdued most of the incidents of outright resistance. The new manifestations of British power were backed up by the ever present military force of the colonial army, but did not automatically or explicitly depend on military action to spread or display British authority.

Even though Everest did not participate with the same energy in direct colonial domination that Rennell displayed, the ideas of colonialism still compelled him. The Great Trigonometrical Survey was the most important thing in his life, the entity to which he devoted all of his time and his health. Even though he did not originate the idea of the trigonometrical survey in India he became synonymous with it. The GTS was an also important aspect of the display of British power in India. Through the surveys the British were able to create collection of measurements of India that they could refer to and rely on as the truth. What was sought was permanent, accurate knowledge of India. The measurements of the GTS were one of the first, essential steps in insure that all of the geographical knowledge of India was based on a stable and scientific base. The survey was not a hasty military survey done in a moment of necessity nor was it begun with the desire for immediate financial return. Everest's project required large amounts of

resources and time to complete, and as C. A. Bayly points out it was “probably not of immediate practical value to the British revenue or political authorities.”<sup>69</sup> The primary motivation for beginning an undertaking of such scale and expense was the possession of accurate and consistent measurement, even if the process was long and expensive. Using the GTS the British would create their own true geography of India, a geography that would be entirely consistent, accurate, and complete. While the professed scientific goals of the survey often take prominence in the accounts of its participants, the motivation of knowledge possession and control informs all members of the survey. Despite the theme of science for the sake of science that appears in Everest’s work he was aware that he was working in a colonial system and that his actions had ramifications for the authority of the British in India. The practical scientific goals of the survey and the less concrete motivation of knowledge power controlled the surveys and ensured their relevance in a colonial setting.

The early uses of trigonometrical surveys occurred in colonial areas ruled by the British. A British general first recognized of the usefulness of trigonometrical surveys after the 1745 Scottish uprising.<sup>70</sup> Also, the Ordinance Surveys of Ireland, begun in 1824, used trigonometrical surveying and were a constant reference for those working in India.<sup>71</sup> Everest himself visited Ordinance Survey teams and though the environments and requirements were very different attempted to adapt their methods for working in India.<sup>72</sup> These earlier instances of trigonometrical surveying in colonial settings proved

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<sup>69</sup> Bayly 161

<sup>70</sup> Markham 44

<sup>71</sup> Doherty 13,41

<sup>72</sup> Everest’s letters to Lord Sussex contain numerous discussions of his experiences with the Irish surveys. Especially letter VIII where Everest defends his innovations in the GTS by comparing his situation in India to that of the surveyors in Ireland.

the usefulness of the surveys in their ability to measure and define territory to aid in the maintenance of peace and control. Non-trigonometrical surveys also occurred in other colonies in the early and mid-19<sup>th</sup> century. Of particular note are the British surveys to determine border lines in British Guyana. Though not trigonometrical they served a similar purpose as all colonial surveys, defining a territory that was confusing and amorphous and increasing the British hold over the knowledge of their colonies.<sup>73</sup> The GTS was to be the largest trigonometrical surveying performed in a colonial setting and also the most technologically and mathematically advanced. The language used to describe the survey in India also exposes the colonial desires for domination that influences the surveyors and leaders. Beginning with Lambton's early description of the GTS and extending throughout the literature is the use of words like "net" or "network" to describe the appearance and actions of the survey. The GTS is often likened to throwing a net over India, as in this quote from Markham: "Lambton's system had been to throw a network of triangles over the whole face of the country."<sup>74</sup> This language of containment and possession often occurs during the descriptions of the survey. Also there is frequent use of the term "gridiron," an idea proposed by Everest as a refinement and simplification of Lambton's original survey plans. The idea was to limit the amount surveys needed to create an accurate measurement of India. The term continues the language of surrounding and containing India and the "iron" adds to it ideas of permanence and rigidity. Another instance of colonial ideas in the language in the writings of the GTS describes the surveys as the work of creation. Surveys worked to create an India within the control of British knowledge systems of superior science and

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<sup>73</sup> See Burnett, Masters of All They Surveyed

<sup>74</sup> Markham 87

technology. Again it is in the laudatory memoirs of Clements Markham where it is especially apparent. The concept he presents of the GTS as a skeleton, both “colossal”<sup>75</sup> and “mighty,”<sup>76</sup> which subsequent detailed surveys will “fill in” or “put sinews and flesh on,” is especially evocative and, indicate the conception of the surveys as projects of nearly divine creation.

Everest and those who worked with him in the Survey department were working to control India and its people through both their scientific work and example. The survey was creating a framework of knowledge into which everything in India would one day be placed. Survey teams were not working to spread the power of the British through demonstrations of superior military and economic mobilization but through the collection and creation of knowledge. A territory could not be conquered or economically managed with just the trigonometrical information produced by the GTS. Creating maps useful to soldiers and administrators on the ground occurred well after the GTS had been through an area by a separate branch of the survey administration. The processes used and the information gathered by Everest and the GTS were of a much more abstract quality. Crossing the territory with surveying equipment and measuring it was only the first part of trigonometrical surveying. With each part of each triangle completed by the GTS teams more data entered an expanding pool of numbers and charts all of which had to be computed, compared, and reconciled by mathematicians and geographers. While in Rennell’s project the information gathered during a survey was closely followed by the production of new, or at least revised, map, during Everest’s work the information gathered was only useful for map making after a long period of calculation and continued

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<sup>75</sup> Markham 103

<sup>76</sup> Markham 116



detailed surveys. Compared to Rennell's work the product of the GTS was almost pure information, pure knowledge. There was little immediate practical application for the data produced by the surveys. While the actual output of the surveys wasn't of immediately obvious use the act of creation and control of knowledge represented in the surveys was fundamental. The GTS can be considered a sort of long term investment in the colonial power of the British in India. The stated purpose was to provide base line measurements for the topographical and revenue surveys that would later inform the useful maps of India. The other purpose was to demonstrate that India was a territory that the British could quantify, limit, and understand through the application of their colonial and scientific power. Through the GTS the British attempted to subdue the expansive and heterogeneous land of India, not with military might but with knowledge and calculation. Through the surveys a variety of information about India was collected and created, and through the GTS the information was molded to a scientific and mathematical framework. Everest makes a certain note of the British possession of this framework in his account of one survey trip. In his introduction he claims:

“From what preceded it will doubtless have been thoroughly understood that the work now described depends entirely for its unit of measure on the iron standard A of 10 feet, and brass standard scale A of 6 inches belonging to the Honourable East-India Company, which are susceptible of reference at will to the standards of Europe.”<sup>77</sup>

Everest is writing about the bars used to correct the measuring tools of the British surveys, these were instruments that measured the base lines of the trigonometrical units of the survey. In his estimation the East Company is the final arbiter of the lengths that

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<sup>77</sup> Everest Account lxxv

are used to measure India. While seeking to appear universal through the application of scientific method, ultimately Everest's and the British surveys depended on a British determination of space. With the GTS the conception of space created by the British was extended across India.

In C.A. Bayly's *Information and Empire* he describes the GTS as a "conduit for colonial knowledge."<sup>78</sup> While this is an accurate characterization of the actions of the GTS it may miss that much of the information that passed through the GTS establishment was actually created by the GTS itself. The gathering of trigonometrical data and the mathematical interpretation of it was an act performed by the British surveyors on the land. From each surveying point the British created new knowledge about the land around them. Also, the knowledge created and transmitted by the GTS was not strictly of the mathematical variety. Surveyors were not only responsible for creating a trigonometrical outline for measuring India, but also continued a long established practice for surveyors to describe other aspects of the land they passed through. Descriptions of encounters with natives and reports local customs appear intermixed with mathematical observation. Even in accounts that are specifically concerning the geographical survey operations of a party there are often asides mentioning the local flora and fauna as well as descriptions of the people encountered during the survey. In the 1891 handbook of the Trigonometrical Survey there is specific instruction that the officers "engaged upon Triangulation may with propriety describe the country over which his work extends; and if it is a more or less unknown district, he should make the best use he can of his opportunities collecting notes about inhabitants, their manners, customs, language, &c.,

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<sup>78</sup> Bayly 161

for insertion in his report.”<sup>79</sup> All of this information was collected and transmitted through the colonial administration where diverse groups assimilated the new knowledge. Rennell had also compiled information about the people found during his surveys, but it was Everest and his surveys that combined this collection of cultural and societal knowledge with scientific and mathematical exploration. The practice of surveying territory required extensive management of people and resources, and the British gained as much knowledge of their colonial subject through the performance of the surveys as through the geographical data that the surveys created.

But the process was never fully controlled by the British, while it may have been a conduit for knowledge the knowledge that was moving through the GTS was of extremely complicated origins. Elsewhere in Bayly’s description of the information collection and transmission it is apparent that the British did not entirely control every aspect of the transmission of information. While the surveying teams could interpret their trigonometrical data through their own mathematical constructions, other information could not be collected in the same way. The new instruments and techniques of the GTS could not control non-mathematical information. The extensive observations of the surveys had to be recorded and analyzed but it did not necessarily fit into the framework of rigorous colonial knowledge collection action. Few, if any, of the names of villages or landmarks were in English, necessitating the use of an Indian alphabet to put the names into their records. There are multiple colonial implications of this decision. The first is that the use of the Devanagari dialect and alphabet by the GTS was important in the standardization of Indian languages in the East India Company.<sup>80</sup> The

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<sup>79</sup> Strahan Report on the Explorations 311

<sup>80</sup> Bayly 158

use of the alphabet is also a necessary use of Indian forms of knowledge. This situation further demonstrates the extent to which the survey process was never fully controlled and that its output was not as consistent as it was thought to be. That the knowledge of the survey could not even always be encoded and presented in English should prove that control of the final output of the survey project was shared between British and Indian forms of knowledge and participation.

Surveyors saw their work as a sort of scientific missionary project. Through British influence and control India would be transformed into a fully rational and organized colony. By creating accurate cartographic information about a place the British paved the way for the benefits of other civilizing influences. The experience of the technology and knowledge needed to perform the surveys was thought to influence the native population. Seeing the surveys performed and the applications of knowledge and technology that went along with the surveys, would demonstrate to the Indians the uncontested benefits of the power of the British state. Everest himself, while often distancing himself from the day to day aspects of colonial rule, preferring to stay within his realm of measurements and mathematics, still could not resist relating the positive changes created by the Survey and the colonial government in his memoir:

“The condition of the country appears to have greatly improved since the period of 1824 of which I speak, which is a never failing result where any tract of India had for a reasonable period been subject to the steady and systematic controul of British rule; not that I mean to say that the government of the East-India Company is precisely Utopian or unsusceptible of amelioration; but what I do mean to assert is that in all portions of the tract passed over by the Great Arc series, of which it

will be conceded that I am authorized to speak with confidence, the contrast exhibited by the present over the former amount of prosperity is most striking where the British power had been paramount, and is more and more marked in proportion to the influence which that power exerts”

In a footnote attached to the above remark Everest continues by citing a specific example.

“The plain of Seronj,” was empty during the first survey pass in 1824. But by 1837 it was so built up that “free ground on which my camp could be pitched was not to be found.” Everest contends that British influence in the region had stabilized and opened the area to development and that “Other instances without number might be adduced if necessary.”<sup>81</sup> Despite his desire to appear concerned only with the abstract and objective practice of surveying in India, Everest could not work outside of the colonial structure of ideas. His work was a significant part of the colonial project, demonstrating the power and advancement of the British. But like the projects of his predecessors it was also necessary for Everest to make use of Indian resources. He could not have done the work that he wished without the assistance and participation of Indians.

SEID MOHSIN (SYED MIR MOHSIN HUSAIN)

For Everest and the other men working on the GTS the instruments with which they measured distances and calculated angles were matters of the greatest importance. Without advanced instruments surveys could not be conducted with detail much greater than those of Rennell or other earlier surveyors. The most important instruments, measuring bars and theodolites, were designed and built in England and shipped to India.

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<sup>81</sup> Everest Account k

In his writings about the GTS, Everest spends large passages going into minute detail about the instruments and equipment used during the survey. In his account of surveying part of the Arc of the meridian Everest often describes the problems with his instruments as “evils” and spends large sections of the work describing his surveying tools. Everest covers the diverse array of equipment needed by the survey with extreme detail. His investigation of the instruments extends down to the smallest part and the most minute detail. Due to the highly sensitive nature of the equipment even small flaws could lead to large errors in the survey data. The surveys could not operate if there was a question as to the accuracy of the measurements produced by their instruments. The machines needed constant supervision to ensure that they operated correctly, and Everest and others were continually looking to improve their instruments or obtain new instruments to replace those that were approaching obsolescence.

The equipment Everest began his surveys with was inherited from his mentor Lambton. Unfortunately most of the equipment was aging and in dire need of repair. Of particular importance was the 36 inch (Great) Theodolite which was rapidly falling into extreme disrepair as it had been in use since 1808.<sup>82</sup> Everest dealt with this problem during his convalescence in England, purchasing and testing new surveying equipment for the GTS. After calibrating and testing the tools in London, Everest transported them back to India to commence a new round of surveys. But the environments of London and India treat survey equipment very differently and stresses appeared during actual survey work that Everest could not simulate in London parks. Consequently the equipment was often in need of minor repairs and maintenance, and sometimes in need of overhaul and reconstruction.

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<sup>82</sup> Edney 241-2

Early in the survey these tasks were neglected or done in the field because repairing the equipment meant shipping it back to London to the manufacturer. Everest desired to change the policies of the survey and find someone who could repair the equipment in India to the same degree that it could be repaired in London. After negotiation with his superiors Everest was allowed funds to hire a craftsman that could perform the intricate work needed on the survey equipment. The first man to enter this position was Mr. Barrow, who traveled to India with Everest in 1830.<sup>83</sup> Everest and Barrow did not get along and often exchanged angry letters concerning the progress and manner of the work on the instruments.<sup>84</sup> Barrow could not contend with Everest's constant demands for progress and after particularly difficult time working to repair the large theodolite in 1837 Everest requested that Barrow be sent away from the survey camp and back to Calcutta.<sup>85</sup> After this incident Barrow retired and the responsibility of maintaining the equipment of the survey was given to Seid Moshin, an assistant of Barrow that Everest had developed a respect for.

Moshin began as an instrument repairer in 1824 and was appointed as a Sub-Assistant to the GTS in 1836. Everest recommended Moshin for the promotion as "peculiarly remarkable for his inventive talent, the facility with which he comprehends all mechanical arrangements, and the readiness with which he enters into all the new ideas of others."<sup>86</sup> Everest made it very clear in his writings that he would not be able to operate if Moshin were not a part of the survey at least at the rank of a sub-assistant. This was a high rank for a native Indian to reach and allowed Moshin privileges beyond many

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<sup>83</sup> Phillimore IV 418

<sup>84</sup> Phillimore IV 418

<sup>85</sup> Phillimore IV 419

<sup>86</sup> Phillimore IV 458

other workers on the GTS, of any race. In one particular instance mentioned by Everest, Moshin and Everest's chief computer Radanath Sickdar were meeting in the survey's observatory, Barrow entered and had to wait two hours for Everest to finish with his sub-assistants before he could approach him.<sup>87</sup>

In his capacity as a sub-assistant Moshin performed a great deal of repair and maintenance on the GTS's instruments. Moshin also traveled with the survey as it moved in order to repair equipment that broke in the field. In 1839 Moshin was with Everest and succeeded in performing a delicate procedure on one of the theodolites, a task that Barrow had refused to perform, thinking it was too difficult. This was a particularly important accomplishment as it required a Moshin to design new equipment of his own to complete the job. This was not a complicated repair but was the division of the measuring circles of the theodolite into equally spaced units. The division must be perfectly consistent around the entire circumference of the circle or all of the measurements would have been incorrect. Moshin completed the procedure to the satisfaction of Everest, a demanding overseer, and the theodolite was soon returned to use. Because of this, in 1842, Everest recommended Moshin for a further promotion and salary increase, to that of Mathematical Instrument Maker, the spot formerly held by Barrow.<sup>88</sup> Also Moshin was rewarded 200£, also at Everest's suggestion, as it was the fee that any skilled London craftsman would have charged for a similar operation.<sup>89</sup> The directors of the company promoted Moshin but created a new title for his position, "Head Artificer to the Department of Scientific Instruments."<sup>90</sup> Everest was disappointed with

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<sup>87</sup> Phillimore IV 419

<sup>88</sup> Phillimore IV 458

<sup>89</sup> Phillimore IV 458

<sup>90</sup> Phillimore IV 458



the title saying that it was “a source of deep personal mortification,” and in 1843 successfully petitioned for it to be changed to the original one that Barrow had held.<sup>91</sup> In Everest’s 1847 account of a survey of part of line of the meridian he mentions Moshin as his indispensable “native artist.” and in one footnote writes a small biography of him describing how he “found him on my arrival in 1830 and perceiving that he was a person of great original talent I took him by the hand, and did all in my power to develop his natural genius.”<sup>92</sup> Moshin continued to work for the survey and was granted a personal allowance of Rs. 150 per month.<sup>93</sup> He died on February 11<sup>th</sup> 1864.

#### RADHANATH SICKDHAR

The instruments of the GTS produced masses of geographical data. But, the data was useless without the extensive analysis that occurred after a field season. The mathematics necessary for the GTS were extremely complex and at the time were at the very forefront of European mathematical practice. Geodetic measurements especially were especially complicated but all parts of the survey required intense mathematical work. In order to ensure that the surveys were as error free as possible the mathematical determinations of the triangles were compared against the measurements taken with compensation bars on the ground. This two-fold process was the central part of the GTS and the reason that the surveyors could claim to possess such accurate measurements. Constant checking and rechecking greatly increased the persuasiveness of the presentation of the knowledge of the GTS. Everest did not do all of the mathematics

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<sup>91</sup> Phillimore IV 458

<sup>92</sup> Everest Account xxix

<sup>93</sup> Phillimore IV 458

himself, though he was an accomplished mathematician he was better recognized for his innovations in field work and leadership of the surveys. Instead, teams of computers worked to interpret the data brought back by the survey teams. Everest was in charge of the computers in the same manner that he was in charge of field operations, but beneath him perhaps his most important sub-assistant and the chief computer of the GTS was Radhanath Sickdhar.

Sickdhar began working with the GTS as a computer in 1831 after his graduation from Hindu College. Everest soon noticed him for the work he was doing and was appointed as a sub-assistant after only six months in the department. As a sub-assistant Sickdhar traveled with the surveying groups in the field and was required to perform a variety of tasks. While working in the field he was commended for his abilities with the survey's equipment. Soon Sickdhar was serving directly beneath Everest in the field and the office and Everest's esteem for him continued to grow. His participation became more and more important for Everest as the years and survey seasons continued. The appreciation for Sickdhar's work constantly appears in the accounts of the surveys with extremely expressive language. In 1838 Sickdhar requested to a release from the survey department so that he could pursue a better paying job as a teacher. The prospect of loosing Sickdhar was greatly upsetting for Everest and he strongly petitioned the government to give Sickdhar a special increase in his salary in order to keep him working for the GTS.<sup>94</sup> Sickdhar accepted the raise and remained with the GTS even after Everest's retirement, becoming Chief Computer in 1843, until his own retirement in 1862.

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<sup>94</sup> Everest wrote: "he was become, as it were, my right arm in all manners connected with computation and registry of data, and the loss of his services at this critical moment would be one of the most severe privations that could be inflicted on me." Phillimore IV 375 and 461

Aside from his mathematical skills and usefulness in field work Sickdhar was also notable for the extent to which he adopted European manners and ideas while working on the survey of India. Everest took particular notice of Sickdhar's English, stating:

“His knowledge of English is fundamental, and his pronunciation free from vicious accent, to the extent that it would require a delicate ear to detect the solid worth of the English character from the weeds and lichens which disfigure it, and, carefully avoiding our vices and absurdities, has confined himself to closely imitating out regard for truth, integrity, and manly virtues.”<sup>95</sup>

Also, Sickdhar dressed in a European style and ate European food. He writes of his own transformation while in the field with the survey, “when I started for the Himalayas I took with me a Brahmin cook who died 3 years after. Up to this time I was a rigid Hindu, but after 15 days being my own cook, I began to take English food. Col. Everest was at first dissatisfied but afterwards admitted me to is own table.”<sup>96</sup> It is not clear in this entry if Everest was upset because Sickdar was acting like a European when he should not have been or if it was because he was obviously modifying or abandoning his India identity. In a diary entry quoted by R.H. Phillimore, Sickdhar also writes “although by birth of the sacerdotal order, he is by persuasion a Unitarian.”<sup>97</sup> Although Phillimore does not make it clear if he is talking about himself or Everest, it would not be surprising if Sickdar adopted Western religious attitudes along with his other adaptations during his time in the survey.

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<sup>95</sup> Phillimore IV 461

<sup>96</sup> Phillimore IV 461-2

<sup>97</sup> Phillimore IV 462

Moshin and Sickdar share a unique position in Everest's administration. Everest's effusive praise for the men and a lack of any mention of a situation where they did not meet his expectations show their position in the Survey was both secure and well deserved. The biographies of the two men make it clear their special circumstances in the survey and also what was necessary for Moshin and Sickdar to reach their positions of heightened esteem. Each man was responsible for an important part of the knowledge creation and collection by the survey. Moshin and Sickdar also present the most Europeanized of the Indian workers in the Survey. This perhaps is due to both their own decisions and Everest's influence. As mentioned in the complaint of Mr. Barrow above, he once had to wait for Everest while Everest met with Moshin and Sickdar. While this situation is telling as the power dynamic in the survey administration, what is more interesting than the meeting is that while Barrow was reprimanded for not removing his hat while he waited, the sub-assistants both continued to wear their hats and smoked cigars with Everest while they were meeting.<sup>98</sup> It is clear from this anecdote that Moshin and Sickdar had developed some European habits while working for the survey. This was probably encouraged by Everest, who often seems uncomfortable with overt or excessive displays of native sentiment or identity in his office.

From available evidence, both men knew English. Moshin signed his name with his title printed in English underneath,<sup>99</sup> and Sickdar was proficient enough to compose an autobiography in English that has since disappeared.<sup>100</sup> While Moshin did not have any officially recognized schooling Sickdar was a graduate of the Hindu College which provided many other recruits to the GTS. While addressing a group of later graduates

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<sup>98</sup> Phillimore IV 419

<sup>99</sup> Phillimore IV 419

<sup>100</sup> Phillimore IV 461

Everest exhorted them to improve themselves using Sickdar as an example. By working to be like Sickdar, who was “universally loved,” they could also advance the image of their race. Everest explains that Sickdar will eventually “furnish a convincing proof that the aptitude of your countrymen for the practical, as well as the theoretical, parts of mathematics is in no wise inferior to that of Europeans.”<sup>101</sup> Sickdar is presented as an example not just because of his skill but also because of the status he holds with the British. Ian Barrow cites a mention of Sickdar by Andrew Waugh, a later Surveyor General, in which Waugh praise Sickdar as a “‘brilliant success’ because he had become ‘thoroughly Europeanised’ and had ‘surrendered his caste and prejudices.’”<sup>102</sup> Sickdar integrated as well as possible into the GTS hierarchy and was consistently noted as a complementary addition to the survey. This is not to say that Sickdar’s place in the GTS was without complications. As stated above, Sickdar’s adoption of a European diet and location at the dining table initially confused and upset Everest.

Because of his exceptional position and the singular nature of the skills required Moshin was not presented as often as an example to others. His participation in the GTS was more complicated than that of Sickdar. Moshin’s career in the GTS more fully demonstrates the tensions between the recognition of his useful abilities and the difficult process of establishing an Indian in a highly visible role in the survey. The complicated presentation of Moshin’s title demonstrates the uncomfortable nature of Moshin’s rise through the survey establishment. From his position as a sub-assistant Everest recommended his promotion. But Moshin did not move directly into the position held by his predecessor. A new title was created for him, though he would be doing the same

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<sup>101</sup> Phillimore IV 340

<sup>102</sup> Barrow 137

work. Moshin began his new work as the Head Artificer to the Department of Scientific Instruments. This title was not acceptable to Everest who lobbied the government to reinstate Barrow's former title of Mathematical Instrument Maker. Moshin's race is very closely related to the changes in title involved in his advancement. The new title labels him as an "Artificer" rather than an, "Instrument Maker," as well as removing the person in the position from a direct relationship to mathematical or scientific authority. Even through the word "scientific" is present in Moshin's first title it is only the title of the department which has authority over him. There is no connection between the person doing the work and his possession of mathematical or scientific knowledge. The organization possesses the knowledge required for working with the GTS instruments not the individual. Only the skill of artifice, a characteristic with extremely complicated connotations, applies to his position. For the government administration an Indian working with such complicated scientific tools must be proceeding without any actual working scientific knowledge of the instruments. The work then is a result of art and instinct, not science or knowledge. Everest's desire to change the title of the position back may indicate his personal unease with the addition of an Indian at such a high level. Especially in his operation to divide the circles of the GTS's main theodolite, Moshin proved that he was adept at both the physical or mechanical parts of the job and the theoretical or engineering aspects. While the government was reluctant to recognize the possession of scientific knowledge in an Indian subject, Everest may have been wary of a man working in his office recognized solely for his "artifice." The insulation provided by the more scientific vocabulary of the original title was sufficient to make up for the presence of a non-European in the position. Everest's ultimate allegiance was to his

work. He made his decisions with an eye to how they would improve or hurt the GTS. Everest was not acting on Moshin's behalf out of his enlightened view of Indians but because of Everest's own overriding desire to totally control his surveys to ensure their success.

Though he was ultimately concerned with the scientific progress of his survey Everest should not be seen as an unprejudiced meritocrat, only concerned with the practical and scientific abilities of his subordinates. As the multiple sides of the above biographies make clear, he was working in a colonial environment and his requirements for his subalterns bear the mark of his colonial values and ideas. Sickdar and Moshin allowed Everest to survey more effectively and produce more accurate data from the surveys. But they also increased the ability of the survey to demonstrate British power over India. Sickdar and Moshin further increased the strength with which the colonial state could control knowledge with the skills they brought to the survey and the example of their presence. Their presence served as a physical indication and reminder of British control of the Indian people. Their acquiescence to British colonial policies within the GTS was a powerful example to show other Indians the manner that they should approach the British state. But, continuing the theme that appears throughout the surveys, the British could not fully recognize the contributions of the two men without making apparent their lack of knowledge and expertise. Moshin and Sickdar worked within dual characterizations. They were both important and valued members of the survey project while at the same time being strangely inappropriate presences in the British power structure. Despite their accolades they are written about in a different manner from the other, British or European, workers in the survey. In the selections

mentioning Sickdar or Moshin words like “peculiar” appear frequently as do other specific notations of their race. Their presence is discussed very often in the manner that it reflects on the relative lack of skill or intelligence in the rest of the Indian population. Despite their skill they cannot escape the colonial prejudices about Indians. Even in Everest’s supposedly scientific organization, the ideals of colony have full weight.

The conflict and confusion of the knowledge creation project carries on through the primary personalities of the GTS and into the entire organization. Indications of the tension and confusion of the project appear throughout its hierarchy. These tensions reveal the incomplete control of the survey and knowledge creation project and also serve as an example for the difficulties with the entire colonial system. Power was never fully within British control, every aspect of the project was a sequence of compromises and collaborations. While the British could conceive of their survey project as thoroughly monitored and controlled, and therefore producing fully acceptable results, the fact was that the presence of Indians within the survey establishment altered the project. The British could characterize their information as inviolable and unproblematic, but the characterization would only rest on the surface of a complicated arrangement of interactions and negotiations.

Rennell could not fully control the processes through which he attempted to create knowledge about India and Everest’s control over his own processes was similarly incomplete. While the biographies of Sickdar and Moshin seem to show the two men fully conforming to British rule there are instances in which the two men demonstrate acts of resistance. The acts are far from explicit but certain actions of the two men do



appear to be calculated to act against the large structures of British power. Resistance also appears in other areas of the survey. While the privileged position of Sickdar and Moshin may have mitigated their desire to directly oppose British power, other Indians in the survey, and in the larger population, were far more demonstrative in their resistance. The lower level of intensity of the acts of many of these people somewhat obscures their characterization as resistance but does not erase it. There is little or no mention of Indian resistance, at least from within the survey administration, in any history of the survey. Revising this position, and realizing the presence of resistance where it was previously ignored further complicates the survey project, situating it more in the real world of colonial rule, than the detached, idealized environment of much of its current historical interpretation.

Moshin and Sickdar were extremely atypical, and their experiences did not extend to other Indians under Everest's command. Everest did not direct the same amounts of commendation or recognition towards the rank and file Indians who worked in a variety of subaltern roles in his surveys. Very few Indians are ever recognized by name or for anything but their mistakes. Everest's prejudices did not manifest in cruelty or mistreatment. But within his work and his writing he continually reveals his superior attitude toward the Indian members of the survey department. Control was the ultimate intention of Everest's projects for the Survey of India. India was to be brought fully under British control through the knowledge produced by Everest and his workers. In order to do this Everest required control over the men who assisted him in producing the knowledge.

The primary manner in which Everest imposed his control on his Indian workers was through his sentiments of paternal superiority. This attitude allowed him to continue to see himself as leading the process of bettering both his men and the land around him. Everest was an extremely driven worker, often continuing his work in the field when he knew of the detrimental effects it would have on his health and pushing his surveying parities to ever greater goals of distance and accuracy. He expected the same amount of zeal for his goals from his workers as he himself possessed. His paternal authority allowed him the power to teach and to monitor those beneath him. Phillimore makes a special note of Everest “paternal pride,” when it came to his sub-assistants.<sup>103</sup> Also, in one description of Radhanath Sickdar Everest makes certain to remark that Sickdar has been trained “from boyhood under my own eye.”<sup>104</sup> As the head of the survey organization he also possessed ultimate control of the knowledge produced by the surveys. The level of control desired by Everest also necessitated the complete control of the people working to create the knowledge. While discussing the selections of his sub-assistants Everest explains the level of commitment he wishes to be able to demand from his assistants, they should be technically proficient in surveying and mathematical techniques but:

“These are the things which anybody can learn who is not incompetent of mind, but what are of more consequence that these are the habits of obedience and assiduity – the ability to bear toil and exposure to fatigue and climate – the disposition to regard their profession as their particular world and delight –

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<sup>103</sup> Phillimore IV 379

<sup>104</sup> Phillimore IV 342

without reluctance to devote themselves to a forest life – without a lingering wish to return to the society which they have forsaken.”

Everest believed that anyone could be taught to an appropriate level of technical proficiency. What outweighed the technical considerations was the ability of the man to conform to the ideals of the survey establishment. Everest sought strong and intelligent men who were also willing to submit to the orders and control of colonial leaders. While he was able to find some willing to work for him Everest's control of them was not complete, even his closest assistants Sickdar and Moshin, did not always demonstrate proper levels of submission and deference while working on the GTS. His paternal authority was supposed to create workers totally submissive to the large mission of knowledge creation and collection. But Everest's shortsightedness, comparable to that of the colonial system in general, did not explore the possibilities of dissent and resistance beneath a supposed appearance of control. It was in the reactions to this paternal superiority that the resistance of the Indian workers in the survey is most apparent. Many Indians working on the GTS challenged Everest's attitude of control and set out their own examples of leadership and authority in the survey establishment.

Everest is most vociferous and complicated when discussing the more advanced members of survey, those that were not as prominent of Moshin or Sickdar, but far more highly trained and regarded than the average laborer or camp attendant. Most prominently in the accounts of the survey are the computers and clerks of the Calcutta office of the Trigonometrical Survey. The men working in this office were often under Everest's direction, when he was not in the field, and their work was of particular importance to him because it dealt directly with his geodetical measurements. Everest

realized the importance of the men in this office, and also the necessity of keeping them for their important work. But he did not see them as the equals of European survey workers, despite their skill. Everest was particularly critical of the Bengali computers, seeking to conform them to his own ideal of what their appropriate position and demeanor should be. In one confrontation Everest writes about the clothing of the office workers, saying:

“It is not considered amongst the English consistent with decorum to enter and apartment destined either to business or domestic affairs without such dress as is simply sufficient to cover the nakedness of the person. In points essential to their religion or the ... habits of their country I shall carefully abstain from interfering but in such as are not at variance with these, I have a right to expect that they will in their turn comply with my wishes.”<sup>105</sup>

In Everest’s expectations his continues to reveal his own paternal desires. He expects proper dress from his workers, but what is more important is that he speaks from a position of knowledge about what the workers should do. Everest understands the “essential points of their religion” and avoids countering them, demonstrating his possession of knowledge of Indian religions that is superior to his Indian workers. His paternal position is strengthened by his knowledge. In dealing with his computers Everest seeks consistency and control, just as he does in his survey work.

In a later incident the computers of the Calcutta office further challenge Everest’s control. Running the office in the manner he did, with long seasons of difficult field work followed by off seasons of demanding calculations and repairs in the office, Everest did not always meet the expectations of his subordinates. Everest’s demands combined

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<sup>105</sup> Phillimore IV 339

with the penury of the GTS office often made the work environment difficult, especially for those that knew they could find easier work for more pay in other branches of the survey or other areas of employment. Employees, of all races, were lured away from the GTS, often leaving in large groups, at such a rate that Everest was forced to petition the government to disallow recruiting of workers between government agencies. Everest believed that prestige of the work of the GTS and his own personal leadership of his men would keep them, but he was mistaken. While Everest expressed sympathy with the demands of his employees for better wages, he maintained that he could not increase their pay. The power to determine salaries was vested in higher levels of the Government of India, Everest could advocate for his computers, but there was little else he could do. Everest writes about the situation: “It has ever been my attempt to apply my own darling profession, the Great Trigonometrical Survey of India, perfect fairness and impartiality.” Though his tone of conciliation and concern is mitigate by his later remark concerning the complaint of the computers that they cannot support their families on their current salaries, “As to ... the wives and families it is a question which must be arranged with Dr. Malthus.”<sup>106</sup> It is not clear whether this comment is meant to be in jest, although there is little humor elsewhere in Everest’s writing, but it is a particularly callous response to men requesting a pay raise to care for their families. Many of the computers left the office despite Everest’s protests and attempts to convince them otherwise. After many of the computers left the GTS office, Everest was greatly disturbed. The lack of employees was a problem but the manner in which they left seems to be an even greater concern. Everest writes:

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<sup>106</sup> Phillimore IV 340

“It has been my study to have them treated with kindness and consideration, and not one of them, save Gurucharn, has had so much civility as to thank me at his departure. This is a sorry mode of quitting my patriarchal influence and shews me that they are yet to learn how to praise the good offices of their superiors.”<sup>107</sup>

While part of Everest’s indignation may be that he was frustrated at losing so many valuable computers, he must also have been indignant that his influence had not had the desired effect on his employees. The actions are some of the more important expressions of resistance from the Indian workers. The workers looked for and found better jobs despite their current positions in the GTS and Everest’s imaging paternal hold over them. By leaving they challenge the strength of the GTS to control their lives and present new ideas of self determination. It is also important to note that a group of men left the survey at one time. Dissatisfaction with the job was strong and pervasive enough to induce many to disregard the power of Everest and GTS and start new jobs.

While the lack of authority is presented above in a somewhat specific instance, the records of the Survey of India also contain less organized but still important elements of resistance. In a letter Everest received from a white subordinate officer about one of the India subordinates at the Calcutta office he receives more news about uncooperative India workers:

“He absents himself whenever he things proper generally on the plea of sickness, and in the case of holidays should there be a couple of days in the week, he is sure to take the week to himself...No remonstrance or admonition on my part has any effect on him; added to which he is of a very insubordinate disposition and sets a bad example to the rest of the computers...I have frequently threatened this

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<sup>107</sup> Phillimore IV 341

contumacious Baboo with your displeasure, and at one time I had hopes of a reformation as he apologized for his error and promised to behave better, but, I have been sadly disappointed. Even now he is absent.”<sup>108</sup>

The incomplete British control is epitomized in this man, who continually disregards his work when it suits him, and even though he expresses his apologies does not change his ways in any noticeable manner. The letter does not suggest that the man be punished, or even released from his position, there does not appear to be any recourse other than reprimand from a higher officer in the office. This ineffectual control appears to extend through the Calcutta office, the oldest and most important of the survey offices. It was also the seat of the GTS, the most technically advanced and ambitious project of the Survey of India. If in this place, where the British power should have been the strongest and most pervasive, the ability of the British to fully control their subordinates is in great question.

Aside from the skilled computers most of the other Indians involved in surveying were little more than purchased labor, to be noticed most often in their lack of performance or difficulty in hiring. Everest seldom writes more than a few words about the laborers and lower subordinates involved in the surveys. He shows his lack of regard for the less skilled Indians working for the survey teams in one of his letters where he states “all inferior parts of the drama must be enacted by genuine natives, or, as the Americans significantly call them, Niggers.”<sup>109</sup> Terms like this are never applied to those Indians higher in the surveys organization, but it is still important that Everest considers these terms in his work. These workers also had the ability to resist the surveys though

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<sup>108</sup> Phillimore IV 342

<sup>109</sup> Everest Letters 99

they did not receive the same amount of individual notice that the computers experienced. Instances of slow work or equipment failure may all have elements of resistance within them, and each one erodes the ideal of one survey force, entirely focused on the creation of a scientifically measured image of India.

Many different forces were acting within the survey administration, Europeans and Indians, high and low skill level workers, and those who willingly collaborated with the British and those that resisted. None of these groups was monolithic or self contained. Each group interacted with the others. It is through these interactions that the GTS produced its knowledge. No amount of scientific control or technological advancement could prevent the influence of those that worked on the survey from informing the results. The GTS may have produced logs that appear to be little more than tables of numbers representing angles and distances. But, these products still contain the evidence of the participation of a multitude of actors, each with a different set of ideals and interests. While sterile numbers may disguise of such interests their presence remains. It is in the production of the numbers, and not their final presentation, that valuable historical exploration occurs. This era of the survey of India continues the ideas that began with Rennell's surveys years before. The desire for control is still as strong, but the actual possession of the control is even more tenuous. The addition of more and more Indian workers into the survey project further weakens the British idea of the surveys as an application of a British system of knowledge to the land of India. Even with the extensive and complicated technological advances beyond Rennell's time the project of the survey is still undeniably connected with the Indians that it is attempting to



survey. Control of knowledge, the cornerstone of the survey project, is continually revealed as fiction. As the British possession of India increased and became the largest power on the subcontinent their control became ever more tenuous and complicated. Participation, and even dependence on Indian knowledge, resources, and people, continued from Rennell to Everest and continues on past Everest into the next era of the surveys.

## The Indian Explorers of Tibet and Central Asia

In February 1885 the Royal Geographic Society met to listen to one of their members read his latest work. The featured speaker was J.T. Walker, former Surveyor General of India and he presented a paper entitled “Four Years Journeyings through Great Tibet by One of the Trans-Himalayan Explorers of the Survey of India.” Walker had written up the account of one of his subordinates, codenamed A-K, who had been sent on a surveying mission into Tibet. The reason that the explorer himself was not presenting the paper nor even present at the meeting was that A-K was an Indian. A-K had been ordered by Walker and other officers of the GTS to perform a survey in Tibet. When returned his data was translated, analyzed, and rewritten. Eventually the work of A-K in Tibet became the work presented by Walker to the Royal Geographic Society.

After Walker’s extensive presentation of A-K’s observations the meeting turns to open discussion. The assembled members praise for the work of Walker and the diligence, resourcefulness, and courage of A-K from the assembled members but there are also some critical statements. While there is no question about the results or the validity of the results there are some dissatisfied with the manner in which they were gathered. Mr. Delmar Morgan voices his complaint about one deficiency in the work of A-K:

“Looking to the value of the work done by these pundits, it was very much to be regretted that Europeans did not push forward into these countries, bringing back the results of the observations which could not fail to be of great interest. The Natives employed in this work through very intelligent, had no special

qualifications for observing those facts of natural science which would be observed by Englishmen.”<sup>110</sup>

Disregarding the fact that Englishmen could not enter Tibet at the time without severe risk to their lives Mr. Morgan calls into question the ability of Indians to notice elements of the natural world that would be more obvious to an Englishman. In other words, the knowledge collected by A-K may have been missing valuable details. This was not because A-K's work was lacking or insufficient, but because he was not capable of noticing certain elements of the natural world. Morgan does not question the intelligence of A-K, as it was well proved by the preceding presentation by Walker, but that A-K's intelligence could not match the intelligence of an Englishman employed on the same survey route. This concern is somewhat answered by a statement by the president of the Royal Society, Sir Henry Rawlinson. The answer is not that A-K possesses observational skills equal to an Englishman but that Walker's work makes up for the gap between A-K's and a British observer. Through Walker's influence and actions the knowledge produced by A-K is ensured as accurate and useful. Rawlinson says that he “must remind the meeting that A-K was really General Walker's own creation; for they were indebted to the General, not only for the scientific preparation of the individual and for the organization of the expedition, but also for the utilization of the results.” He continues “Without an experienced and commanding head to have reduced the rough notes and books to order all this exploration and this expenditure of skill, of industry, and of courage, would have been in vain.” Rawlinson's remark sets Walker as the most important element of the mission. Without Walker and his survey organization, A-K would have been uncontrolled and unable to relay any new knowledge to the British.

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<sup>110</sup> Walker Four Years 25

What is presented then is a vision of A-K as a machine. Like Everest's theodolites, A-K does not produce automatically coherent knowledge during his surveys. He was a tool used to survey difficult or inaccessible terrain but like any tool had his own limitations that had to be considered. An appropriate agent must supervise him, order him on his missions, and collect and interpret his results. The types of knowledge sought by Mr. Morgan may be within in the accounts of A-K but only Walker or another Englishman could extract what is relevant and useful from the works. This process occurred for all of the native explorers, or "Pundits", as the British often termed them. Each was ordered to keep detailed records of his journey and when/if he returned home his records were turned over to his superiors to be translated, discussed, and eventually integrated into the overall collection of knowledge about India and its surroundings.

This project continues the process of British knowledge creation through surveying. In this instance the process of gaining the knowledge is even more complicated and dependent on the dual themes of collaboration and control than previous survey eras. Rennell had moved through the land and observed, for the most part, with his own eyes and produced final maps on his own. Though he used Indian knowledge extensively in his project his use for it was to incorporate it into his own work. Rennell was producing what he considered as his own image of India. While it was informed by Rennell's survey work in India as well as Indian sources the final product was from seen as coming directly from Rennell. With Everest's work and the Great Trigonometrical Survey new complications appeared with the increasing prominence of Indians in the survey establishment. Everest believed himself to be producing knowledge that was

purely scientific with all aspects of human influence controlled as closely as possible. The nature of the knowledge of Everest and GTS was supposed to be wholly scientific and therefore British. But Everest did not explicitly recognize that his knowledge was being filtered through several different Indian workers in his office. Everest's knowledge came through multiple layers of British and native knowledge and experience. Everest did not specifically react to the large presence of Indians in a process that he wished to be entirely scientific and European. However, his discomfort and conflict is noticeable in his desire to see his Indian employees, especially the most important ones, as nearly European.

The project of knowledge creation and control through the Survey of India was even more complicated for the participants in the late 19<sup>th</sup> century than it had been during the time of Rennell or Everest. The presence of Indians had expanded as the size of the survey department grew, but there is no evidence of Indians remaining in positions as important as Sickdar or Moshin. But, there were still opportunities for Indian participation in the survey beyond the level of laborer or servant. During this time Indians were sent on missions, on their own, into areas that the British could not enter to perform surveys. These were not areas under British administration. Controlling and administering the people in Tibet and other regions was not the immediate issue. Nor were the regions surveyed of immediate obvious economic importance, for while there was trade between Tibet and India it was not at the scale the British could profit from. A 20<sup>th</sup> century author, Indra Singh Rawat, has described the motivations of this period of intensive use of Indian explorers as being: "inspired by the professional spirit to fill in the blanks in the map of the continent, to discover remarkable places, to put every town and

village in its right place on the great globe, to trace the course of every river, lake, mountain and road and also to discover the customs and manners of the people they came across, with no ill-will for any one.”<sup>111</sup> While this statement incorrectly characterizes the surveys during this period as benign, it does accurately describe the breadth of knowledge sought by the surveyors and their superior officers.

The British very visibly wished to possess accurate knowledge of the regions around India in order to plan for and repel any attempts made by colonial rival. Only though accurate geographical knowledge could the British know how to counteract the encroaching threat of the Russian empire. Tibet and other territories around India were buffers against Russian encroachment and it was important to know the character of the land, to monitor Russian developments, and to plan against future invasion plans. The remote and difficult nature of the terrain had prevented any imperial power from mounting accurate surveys, what little was known of the land was based on speculation and the limited information available in the accounts of a few travelers. By surveying the land before their Russian opponents the British could attempt to control the knowledge of the territory to their advantage.

Knowledge was the most important aspect of this conflict between the British and Russian Empires. Spies and explorers played the largest role in the action. Outright military violence was rare. The government in India sought to gain as much intelligence about the Russian plans concerning India. The British government in London and in India attempted to predict and preempt Russian aggression to protect the Indian empire. Actions during this period of intrigue and tension have been called part of “The Great Game,” and the native explorers of the Survey of India played a prominent role in the

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<sup>111</sup> Singh i

British plans. The regions surrounding India, through which any over-land aggressors would have to pass through, needed to be known with as much detail as the rest of the British territories. In his history of the Great Game, Peter Hopkirk characterizes the geographic knowledge as one of most important elements in the conflict: “Despite dangers...there was no shortage of intrepid young officers eager to risk their lives beyond the frontier, filling in the blanks on the map.”<sup>112</sup> Native explorers were an “ingenious solution” to the problem of mapping areas “too perilous, or politically sensitive, for Europeans to venture into even in disguise. And yet these parts had to be explored and mapped if India was to be defended.”<sup>113</sup> The native explorers were defending the Indian Empire by observing and defining the territory around it. They were operating in territory where Russian, British, Chinese, and native influence all worked with and against each other. Exploration was a military and political act. As historian Kapil Raj writes “Geography being a continuation of politics by other means, the political situation in turn demanded the continuation of geography by other means.”<sup>114</sup>

While the British were explicit in their desire to use the native explorers against Russian aggression, other motivations continued to influence the survey project. Like earlier eras of the survey, the explicit motivations for the survey, while important, only served in the immediate term to legitimize a longer term project of knowledge creation and control. What the British did not discuss was the use of the explorer’s surveys as a continuation of the British project to create a single controllable image of India. Surveys of different forms had been occurring for more that one hundred years by the time A-K was sent out on his mission, but the British still did not possess complete geographical

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<sup>112</sup> Hopkirk 5

<sup>113</sup> Hopkirk 5

<sup>114</sup> Raj 159

knowledge of India and its surroundings. British control of the territory of the colonies was threatened by Russian encroachment, or the idea of Russian encroachment, but was more closely threatened by discontent and disorder within India. Control was sought through the surveys of Central Asia and Tibet, not just in the sense of preventing the loss of unhindered administrative and economic access to these areas, but also control of the manner in which the territory was perceived by those in it and by those examining it from a distance. Russian geographic knowledge of Central Asia and Tibet was a threat to the coherent image of India that the British had been attempting to create since the time of Rennell, but it was not the most important. While it was feared that Russian geographic knowledge could eventually create a competing image of India and its surroundings that could not be monitored, edited, and ultimately controlled by the British the larger threat was the loss of control within India itself. Control had been nearly completely lost during the Mutiny. These surveys were an attempt to regain an appearance of control. Like Rennell's surveys and maps, used to create the first images of India as known to the British, or Everest's surveys to consolidate and quantify a vast Empire, the mission of the Indian explorers was to continue the advance of British monopoly of knowledge creation and collection. The Indian exploration of Tibet and Central Asia used the project of the surveys to shore up a weakened colonial state through the application and demonstration of colonial knowledge and power. But like the previous forms of the project this too was fraught with compromise and complications. Just as it had been impossible to control the knowledge created during the earlier eras, so too would the knowledge of this era escape the total control by the British.



The use of Indians as explorers for remote or inaccessible territories began early in the history of British surveying in India. In 1774 a sepoy officer was sent into southern India to collect information for the Bengal Army.<sup>115</sup> Also, various map makers hired their own Indian explorers to collect information about areas that they could not use their own surveys to describe. Later, Indians considered to be more learned were recruited by the Company, trained in the use of compasses and perambulators, and ordered to survey areas that the British could not enter. By 1813 native explorers were conducting unofficial survey missions in central Asian territories at the orders of British officials, though they were doing so without the financial backing or expressed permission of the East India Company.<sup>116</sup> The government of India was slow to officially recognize the possibilities offered by the native explorers until the later half of the nineteenth century, when conflicts began to develop between the British Empire and Russia and Chinese interests in Asia.

In 1861 Thomas George Montgomerie, an East India Company Officer, proposed a new set of surveys of Tibet and Central Asia. His plan was radical, in that it was common knowledge that almost all of the European expeditions into those regions resulted in expulsion from the region at best, and at the worst, the grisly death in an unknown, savage land. Montgomerie was more familiar than most with the dangers of surveying in remote regions with harsh climates and difficult inhabitants. He had made a name for himself surveying in Kashmir and had produced very accurate results while remaining in the good graces of the local rulers and people.<sup>117</sup> Indeed, Montgomerie was still surveying in Kashmir while the Mutiny of 1857 paralyzed most of the British

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<sup>115</sup> Waller 22

<sup>116</sup> Waller 22

<sup>117</sup> Raj 157

administration in India. For his work he was made a member of the Royal Geographic Society and a near celebrity in the press. Montgomerie was also concerned about the future security of Central Asia and sought to use his experiences to advance British interests in the region. He knew that surveying would allow the British access to new information and territory both about the land and the presence or absence of Russian or Chinese forces. The difficulty was in getting British agents past the border and into the regions of inquiry. Montgomerie had seen Indians crossing borders that the British could not while working in Kashmir.<sup>118</sup> The ease with which native Indians moved in and out of these territories inspired him to begin drafting proposals for officially mandated surveys conducted by Indian explorers. Montgomerie first presented his idea to the Survey of India and its leader Gen. Walker. Walker saw the merit of the idea and added his support to Montgomerie's request to the government for official permission to perform native surveys. In 1862 Montgomerie made an official request to the Government of India and it was approved the next year. This approval would initiate more than two decades of intensive exploration conducted by Indian explorers. Between 1865 and 1885 the Survey of India initiated many survey missions to a variety of territories, with varying degrees of success. During the period of these surveys the explorers gained the collective title "the Pundits." It was by this name the explorers were referred to by the government, part of the veil of secrecy that the surveyors attempted to place over their work in Tibet and Central Asia. Montgomerie would leave India and die an early death in 1878, but his idea would continue to inspire more surveys by India explorers.<sup>119</sup> Walker continued to take personal interest in the surveys until his

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<sup>118</sup> Waller 26

<sup>119</sup> Waller 129

retirement in 1883, after which he left India.<sup>120</sup> With the two men gone, and overall fears about the Russian Empire decreasing, the project began to lose its force and eventually faded. But, the ultimate success for the British was knowledge of thousands of square miles of territory that they had never previously surveyed or described and that were now firmly within their knowledge.

While Walker and Montgomerie were the most prominent British names in the history of the Indian explorers it is also essential to examine the experiences of the numerous India explorers themselves. They are unique in the history of the Survey as of India as being both the most independent Indian workers, while at the same time being the most highly regulated and controlled. The Indian explorers of this era were able to decide their own course through the territory that they were ordered to survey. Certain routes were recommended the situation on the ground necessitated flexibility and more often than not the final route differed from the planned route. During the exploration the explorer himself was in charge of what, where, and when he performed his observations as their opportunity was largely dependent on the circumstance of his travel. While it may initially appear that the work of the explorers occurred independently, outside of the normal colonial framework of power and coercion, they were actually heavily involved in the British process of demonstrating and enhancing colonial power through knowledge. Their training controlled the very steps that they took as surveyors, and every detail that they observed while on their mission had to be recorded and presented later to their officers. While the explorers could largely determine their own conduct during the surveys they were still working in a highly constricted environment. Looking at the

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<sup>120</sup> Waller 129

histories of the Indian explorers it is apparent that many of the men toiled on through extreme hardships and over long periods of time to bring back their information to their superiors. Most men returned with their missions completed to the fullest extent possible and very few disregarded their orders or deserted. But, there is confusion as to why the explorers went to such great lengths, for limited reward, and why many participated in multiple missions, knowing the demands that would be placed upon them. While it is not suggested in most writing on the subject it is probably true the Indians explorers did not have a choice in their participation. Most were already members of the GTS in some form, and had to follow the orders that they were given. While this may seem to demonstrate a fully controlled administration, it is in the actions of the explorers while on their mission that gives the lie to the fiction of total British control of the process. Examining some of the histories of the explorers will reveal some of the complicated processes of this project of knowledge creation and control.

The first explorers recruited by the British were a pair of cousins from the Kumaon region. The region that these men came from was extremely close to Tibet and the people of the region, the Bhotias, traveled trade routes between India and Tibet during the summers.<sup>121</sup> Mani and Nain Singh were the first two men selected to begin training as explorers for the Survey of India. Mani had extensive experience with other European expeditions to remote parts of Central Asia and other attempts to enter Tibet, and came of the survey with several recommendations from earlier explorers.<sup>122</sup> Nain Singh had been a member of the Education Department, as the head master of a government vernacular

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<sup>121</sup> Raj 164

<sup>122</sup> Waller 40

school in his village from 1858 to 1863.<sup>123</sup> A British officer named Smyth, the Inspector of Education for the region, who was also an exploration enthusiast, found the Singhs.<sup>124</sup> After their recruitment the cousins traveled to Dehra Dun the headquarters of the Survey of India. It was in Dehra Dun that the Singhs were trained for the task ahead of them. The men learned a variety of surveying techniques and then were tested on their ability to perform the proper surveying tasks.

After a year of training, the explorers left Dehra Dun for Tibet. Their discovery at the border by Chinese officials required the cousins to develop a new plan for their mission. Due to a variety of complications it was impossible to travel along their originally intended route. The two men decided to try separate routes and split up in Kathmandu.<sup>125</sup> Mani Singh soon abandoned his efforts saying he could not overcome the bad roads and sickness encountered during his travels. Montgomerie was skeptical and “thought a more likely reason was ‘want of determination.’”<sup>126</sup> Nain continued on by attaching himself to different groups of merchants to disguise his travels. After nearly a year and half of travel Nain returned with his cousin to Dehra Dun to complete their mission. The final result of Nain’s travels was:

“thirty-one observations for latitude, allowing the calculation of positions, heights, and climates of Lhasa and other important towns; an elaborate route survey of over twelve hundred miles covering the whole of the great road from Lhasa to Gartok as well as the route from Kathmandu to Tradom; and the defining of most of the course of the Tsangpo/Brahmaputra from its source near Lake

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<sup>123</sup> Rawat 4

<sup>124</sup> Waller 39

<sup>125</sup> Waller 45

<sup>126</sup> Waller 46

Manasarowar to the point where it was joined by its tributary from Lhasa. In addition, valuable data were supplied on the Nepal valley.”<sup>127</sup>

Montgomerie received the information recorded by Nain Singh and checked it against other available sources to ensure its accuracy, coming to the conclusion that Nain’s work was “well done” and had produced “highly creditable” results.<sup>128</sup> Nain had proven himself as a valuable agent in the British exploration and survey projects and Montgomerie was vindicated in his plan for native explorers. News of the success of the mission spread in the survey department and the government. Montgomerie took advantage of the good sentiment and wrote a petition to the government for more funding to send more native explorers into Tibet for further surveying.<sup>129</sup> The government approved the funding and Montgomerie began to recruit new Indian explorers. Nain Singh would perform more surveys on subsequent trips into Tibet. After his health deteriorated to such a point that he was not longer able to meet the demands of extended surveying he stayed in Dehra Dun and was responsible for training new generations of native explorers. His career in the survey department was recognized with the reward of a gold watch from the Royal Geographic society. News of his accomplishments was also available outside of Britain, Nain Singh received a gold medal from the Paris Geographical Society for his accomplishments.<sup>130</sup> One survey official lauded Nain Singh by saying that he was “a man who has added a greater amount of positive knowledge to the map of Asia than any individual of our time.”<sup>131</sup> At his retirement from the survey department Nain Singh was compensated for the time and effort he had given to the

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<sup>127</sup> Waller 51

<sup>128</sup> Waller 51

<sup>129</sup> Waller 52

<sup>130</sup> Rawat xvii

<sup>131</sup> Rawat xvii

Survey of India with an appointment as a Companion of the Indian Empire and a grant of land, with the right to collect rents, from the British Government of India.<sup>132</sup>

After gaining official recognition and funding the Survey of India continued to recruit men from the Kumaon region for training as clandestine surveyors. Using the family connections of Mani and Nain Singh, Montgomerie and Smyth brought more men into their department. One man in particular would prove to be as valuable an explorer as Nain Singh. Kishen Singh, codenamed A-K, was recruited in 1867 and began his training with Montgomerie and Nain Singh. Kishen Singh undertook three survey explorations for the Survey of India.<sup>133</sup> The first, in 1872, explored new parts of Tibet and gathered information about the Tibetan capital, Lhasa.<sup>134</sup> His most impressive survey began in 1878 and would last for four years. It is this survey that Walker would present to the Royal Geographic Society. Kishen Singh was ordered to make a south to north traverse of Tibet to explore the area to the north of the Kunlun mountain range. Kishen Singh initially left Darjeeling and traveled to Lhasa, here was forced to spend a year in the city due to the sickness of traveling companion a lack of merchant parties available to attach himself to, for protection during his travels. During this time he compiled extensive accounts of the city, its people, and administration, which would form the basis for much of the British knowledge of Lhasa until European representatives could be safely sent there. After nearly two years of traveling, dissention arose within the small party of Kishen and his two attendants. One of the attendants, a man named Gangaram, did not wish to continue, and one night left the other two men to die after stealing their horses and most of their belongings. In his report on this expedition Walker inserts a

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<sup>132</sup> Rawat 61

<sup>133</sup> Waller 115

<sup>134</sup> Madan 115

note here that Kished did not harbor visible ill will towards Gangaram even after this event. Walker says:

“it is very remarkable for the absence of any expression of animosity of resentment towards this man. But I think it may be said with truth of Asiatics generally that they are not surprised when a man makes the most of his opportunities to better himself, even at the own expense; men with who we Englishmen are ever reader to sympathize as victims of oppression whether in Egypt, or Turkey, or India, take a much more charitable view of their oppressors – more particularly when they happen to be their own countrymen – than we do, feeling probably that they have only been done as they themselves would have done had they had the chance, though very angry at the moment, their anger is not infrequently succeeded by admiration of the skill which their oppressor has shown in doing well unto himself.”<sup>135</sup>

Kishen and his other attendant, Chumbel, had to hire themselves out to passing merchants as animal herders and guards as well as performing other odd jobs trying to regain the funds to carry on the survey and return to India. It was this massive setback that increased the length of the expedition far beyond that which was expected by the British. After a time the two began to travel again. They eventually completed their objective of crossing the Kunlun mountains and found a European missionary in Tibet who gave them some much needed money as well as relaying a letter announcing that they were still alive back to Darjeeling. Kishen and Chumble continued to survey and completed the route that had been planned for them from the beginning. They returned to Darjeeling after covering around 2800 miles over 4 and a half years. It was this journey that Walker

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<sup>135</sup> Walker 8



related to the Royal Geographic Society in 1885. He reports that on their return the men had to be “taken in hand and questioned and listened to, and their narrative has to be translated into English and written down.”<sup>136</sup> Like Nian Singh, Kishen Singh, was also heralded in and outside of India for his work. The tremendous achievement of Kishen Singh during his extended journey was recognized with multiple awards and honorary titles. The Italian Geographical Society awarded him a First Class Medal and the Government of India allowed him rent collection rights over a village in Sitapur district.<sup>137</sup>

While the achievements of the explorers are extremely impressive they should not be the end of the history of native exploration in India. Too often historians writing about the Indian explorers place their emphasis solely on the accomplishments of the explorers, disregarding any analysis of the motives or ideas that initiated and influenced their work. Historical studies are often accounts of the triumph of the explorers over a variety of dangerous and fantastic circumstances. Emphasis on the harsh environment, political intrigue, and the privations of long distance travel in unfriendly territory simplifies and trivializes the explorations as mere physical feats. In the glorification of the distances traveled and the obstacles overcome the history of the explorers ignores the ideas that surround the creation of the Indian explorers and their missions. Little attention is paid to the control necessary for the British to recruit and send out the explorers, nor do the authors explore the translation and interpretation by the British of the explorer’s observations. As demonstrated in the earlier quotes from the meeting of

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<sup>136</sup> Walker 16

<sup>137</sup> Rawat xviii

the Royal Society, the men recruited by Smyth and Montgomerie became machines. They were molded into intelligent surveying machines by the extensive training given to them through the Survey of India. It was thought that controlling the surveyors to such a degree would allow the British a higher level of control over the information that they produced. The training involved both physically and materially transforming the explorers into machine/agents that, like Everest's survey instruments, could produce raw information that the British could examine and evaluate for later inclusion into a large collection of geographic knowledge. But the control could not be complete. The explorers remained able to express their own idea about what they observed during their missions.

The most important part of the training was the control of the pacing of the explorer. The distance measurements of the explorers were based largely on the amount of steps taken during the course of the survey mission. Each step taken covered a consistent distance and was repeated over hundreds and hundreds of miles. A tremendous amount of discipline was required to ensure that each step was the same, for the final measurements to be accurate and reliable. Years of practice forced the men into a standard pace that they would use throughout their expeditions. British surveyors analyzed the explorers' gaits and translated them into units of measurement. The men were discouraged from other means of transportation because it would disrupt the calculation of distance when their mission was over and they turned in their observations. Like Rennell's process of translating the *coss* of his Indian sources into useful measurements for his maps; Walker, Montgomerie, and other British surveyors converted the steps of the Indian explorers into British miles and degrees. Initially the test of the

explorer's reliability as surveyors was to perform a walking survey of a previously examined route. Supervisors then compared the paces of the explorer to measurements already in hand. When the explorer proved his ability to accurately return appropriate measurements he was accepted for a mission. In this way the explorers became "calibrated" scientific instruments.<sup>138</sup> After the completion of the field missions of the explorers the British undertook a lengthy process of verification. The steps, formed through years of practice and totaled by the explorer, were checked against astrological or other measurements. This was different from the initial test routes in that the explorer performed the measurements necessary for checking the mission surveys. These measurements were made using a variety of instruments and techniques that the explorer received during training.

While the explorers were trained to be accurate surveying machines their abilities were augmented with a collection of equipment that allowed them to take observations beyond the normal range of human observation. This equipment was necessary for the level of accuracy required for the British surveys, by attaching it to the explorers the British invested some of their scientific knowledge into the explorers. Experience and equipment made them useful and accurate but did not raise them to the level of a European observer. The process of exploration and survey still required extensive European involvement and interpretation to be considered successful. While the British could order the explorers on specific missions, there was no insurance that the explorers would or could follow the routes specified. The final analysis of the information also occurred in a highly compromised environment. Explorers, translators, officers, and administrators, of both native and European all worked to create a final product.

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<sup>138</sup> Raj 178

Along with the celebration of the explorers' physical abilities, determination, and courage, every history also makes certain to note their equipment. The men received a collection of special instruments that they would use to measure their geographical progress and record these observations. Due to the sensitive nature of the explorers' missions, the instruments were disguised or hidden in a variety of ways. The listing of these clandestine survey instruments is a common theme in all histories of the Indian explorers. Details and explanations are always similar, and the tone of each description, authors take great pleasure in the ingenuity of the design of the instruments. Also the inherent danger of the survey is attached to these instruments as their description often contains the fact that if any of the instruments were found to be what they really were, the explorer would face immediate punishment and death.

Native explorers all received a similar set of equipment throughout the surveys history. The instrument most often discussed is a pace counter disguised as Buddhist rosary with 100 beads.<sup>139</sup> This instrument worked with the regulated pace of the explorer to ensure that an accurate distance count could be taken for the mission. Another instrument that is given particular notice is the false Buddhist prayer wheel with a secret compartment for holding slips of paper for the explorer to make his daily notations on. Idealized, fictional, accounts of an explorer appearing to pray while actually making geographic measurements and notations often appear during the discussion of these instruments. A variety of other geographical instruments concealed on the person and in the luggage of the explorer. All of these instruments were technologically behind those used by Everest for the trigonometric surveys and would only serve to make the most basic of geographical observations. Their simplicity was

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<sup>139</sup> nearly every account also makes sure to mention that a proper Buddhist rosary has 108 bead.

both a consequence of the rigors of the journey and a demonstration of the lack of sophistication expected in the explorers by their British officers.

While most of the literature on this subject is detailed in the description of the equipment there is little discussion about anything beyond the clever manner in which the explorers concealed their surveying instruments. Authors have not recognized the significance of the instruments as elements of control of knowledge. Indeed, the instruments are as important as the training in the creation of the explorers as reliable and accurate surveyors. By concealing British scientific instruments in traditional Tibetan objects the British reinforce the instrumental nature of the explorers. Leaders of the survey integrated survey instruments into the common objects of the native people making them both less conspicuous and more pervasive. The religious nature of the instruments also goes further to concealing and integrating the instruments. Prayer wheels and rosaries used as scientific surveying instruments reveal a British technical imagination that considered itself as controlling multiple knowledge sources in their colony. British knowledge was thought to cover both the scientific and religious elements of India. Combining religious instruments and scientific instruments brings the survey techniques and practices into closer proximity to the Indian population. The native surveyor/explorer is known to be unable to use fully advanced instruments, but can use those that are simple and closely related to the everyday objects of his life.

The explorers and their instruments were part of the knowledge project that utilized earlier colonial knowledge to further knowledge creation in a contemporary setting. The use of the instruments of a religion to gain knowledge for colonial ends serves as proof for the British of their knowledge and power. Survey operations take

advantage of the whole range of British knowledge to ensure their effectiveness. Knowledge of the religions of India is used to gain geographical knowledge and colonial and political rule. The title of “Pundit,” further emphasizes the connection that the British developed to further the survey project. Religion brought the survey project closer to the individual bodies and identities of the explorers. With a more fully integrate surveying instrument, the British could come to a greater understanding and control of India. While none of the explorers were necessarily Buddhist, the British combination of the religious objects and their survey instruments served to make the explorers appear more effective and further under the control of the British. Instruments and the survey project become a part of the nature of the explorer. The instruments are almost invisible when they are hidden on the body of the identity of the explorer, further blurring the line between where the instruments stop and the explorer himself begins. The religious appearance of the instruments further connects them to the explorer making their work more natural and ingrained. It is in this integration of the explorer and his tools that the British attempt to gain further control over the process of creating and collecting knowledge.

European geographers and colonial administrators understood the information recorded by the explorers as the highest authority for the unknown regions of Asia. The authority of the information resulted from the confidence placed on the training and instrumentation of the explorers. Kapil Raj describes this process of training and calibration as a process of standardization that allowed the measurements of the explorers to be accepted and compared. It was essential that:

“the results obtained through one set can be compared with those obtained through the other set – and thus that contemporary science can claim to be universal...Assured of the calibration of his human instrument, Montgomerie could now legitimately link two distinct surveying techniques on the same map – classical triangulation and geodetically and astronomically controlled route surveys of the Pundits.”<sup>140</sup>

In the same manner that Everest relied on the smallest details of his mathematics and instrumentation to produce accurate results, or Rennell concerned himself about the provenance of his collection of sources and informants, a similar idea of correctness and accuracy of knowledge applied to the native explorers. It was through the training of the explorers as standardized and disciplined observers that the British considered their knowledge as accurate and useable.

In this period of the British control of India, a demonstration of power and knowledge was vitally important. Coming so soon after the mutiny that revealed the failure of British knowledge and control of India, a measure of control had to be exerted over India and its population. The Survey of India, which had continued to operate, even in the turmoil of the mutiny, was an important vehicle to reassert the domination of the British in India. In his analysis of the surveys Ian Barrow states the effectiveness of the survey to make apparent the power of the British power in India. Barrow writes:

“Another principle reason for the general popularity of the romance of the anachronistic trans-Himalayan surveys may have been that they were often expressed as examples of the thoroughness of British control over Indian, or ‘native’, agency. The ability of British surveyors to direct and, especially, to train

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<sup>140</sup> Raj 179

Indians to survey in a 'modern' fashion was the first indication of both the entrenched and enlightened nature of British power in India."<sup>141</sup>

The explorer's missions were part of an attempt to reassert the authority of the British after a disastrous collapse of colonial power. A effective display of the power of the colonial system through the undertaking of a complicated and dangerous survey mission could work to further strengthen the British position in India.

While he is correct in noting the environment of power that the surveys occurred within, Barrow mischaracterizes the anachronism of the surveys. While the equipment and the training of the explorer was not as advanced or extensive as that of the workers of the GTS, the work of the explorers was still useful and relatively accurate. The surveys were not carried out using the highest technology of the day but that does not mean that the results of the survey were unusable. The physical measurements of the explorers were backed up with the astronomical measurements and calculations after the missions ended, proving their accuracy. Part of the reason for the accuracy of the explorers was the extreme discipline that was instilled in them during their training. It was because of the regulated pace and use of instruments that the explorers were able to return useful results to the British upon the completion of the surveys.

This discipline also demonstrates the exercise of power that was necessary for the surveys. Their commission and oversight both create and require numerous demonstrations of power on the part of the British. Power was necessary to create and mold the explorers into surveying agents. Also the internalization of the power of the British, by the explorers, was required to ensure that the explorers carried out the missions to the farthest extent possible. But power was not just used by this project, it

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<sup>141</sup> Barrow 130



was also created. As Barrow states, the British used the surveys to make apparent their control over Indian subjects. Through the training and influence placed in the explorers the colonial structure was proven capable and effective. The values of the colonial state were embodied in the explorers and their mission, as well as in the entirety of the survey project, the successes proved that the British could rule India in the administrative and organizational sense. But the surveys also sought to prove that the British could rule and control India in a knowledge and informational sense. Producing knowledge in the form of survey data and maps showed a continuity of surveying and the ability to create knowledge that the British had been attempting to demonstrate since the first survey performed by Rennell nearly one hundred years earlier.

The native surveys of Tibet were not a perfect indication of the British power. Similar to all of the previous surveying projects this one was incompletely controlled and misunderstood. It was thought that the surveys showed the ability of the British to create the explorers. In the making of such reliable and accurate surveyors the British proved their power over the people of India. But the control was more limited than the British ideal actually recognized. The explorers were not so easily recruited or trained. Their very limited number, and the fact that they had to be recruited from within other colonial establishments shows that the administrative reach of the British did not extend as far as they hoped. Also, the training for observation and measurement were not as complete or ingrained as the British believed. Independent work allowed the explorer freedom to observe without the guides of the British officers. They were also working in unknown areas that could not be checked or re-measured in the same way that their training areas had been. Thus, the explorers were able to record what they saw, though it was not

necessarily what the British wished them to observe and record. When the explorers returned and the British regained possession of their observations and information, their control of knowledge was still incomplete. The reports of the explorers were never in English, but in the native language of each explorer. Only after an extended process of translation and transmission could the knowledge of the exploration be understood by the British. Even after the translation of the records into English it remained the task of the British survey personnel to sift useful knowledge from the whole of the records of the explorer. This process could prove to be lengthy and tiresome. Many officers remark that the explorers often recorded many things that were completely useless for the British. As Lieutenant Colonel Strahan notes during one of his analyses of an explorer's mission, he had to leave aside large portions of the explorer's information about the stories explaining Tibetan traditions. Though they had been "faithfully related by UG in his diary," they were, "hardly worth transcribing."<sup>142</sup> The British could only use what the explorers brought back to them. Their knowledge was based on that which was given to them through the labor and observations of the explorers and surveyors that they had sent out. In this way the explorers could react against their repressive training and their characterization as surveying machines. The British could work to instill as strong a sense of control and responsibility to the mission as possible into the explorers but there was no guarantee that the explorers would perform exactly as expected.

In this late era of the survey the British designed a survey project that would reinforce the control of people and knowledge that had been lost after 1857. Using the threat of Russian aggression as a convenient reason the Survey of India created numerous men that they considered to be living, walking surveying machines. The rigorous

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<sup>142</sup> Strahan 25

training of these men and the manner in which they appeared to conform to the British ideals created the impression that the control was nearly perfect. But as earlier eras of the survey have also shown, the surface output of the project should not be considered as one complete and uncomplicated whole. Each report and map created from the surveys of the Indian explorers is the result of both the initial input of the explorer and the analysis and translation of the British officers. The knowledge of Tibet and Central Asia, supposedly the main weapon against the Russian menace, was as suspect as any of the older knowledge of the survey, in that many interests can be found in its production. The British wanted to possess knowledge of territory outside of India, and they wanted to be the sole possessors of the knowledge. But the project by which they gained their knowledge added many more layers of interpretation and influence that clouded the ideal of accuracy and control. Despite the amount of energy and planning put into the control of knowledge during this era the British were no more successful in eliminating any of the elements that should have complicated the acceptance of geographical knowledge as accurate and useful. Indians continued to be both the primary actors in the production of knowledge as well as the entities that created difficulties in the approval and provenance of the knowledge of the survey.

## Conclusion

“A laudable curiosity prompts to inquire the sources of knowledge and a review of its progress furnishes suggestions tending to promote the same or some kindred study. We would know the names at least of the individuals to whom we owe successive steps in the advancement of knowledge.”<sup>143</sup> This was written by Robert Hyde Colebrook, the surveyor general of Bengal from 1794-1808 and reprinted in a later history of the Indian Surveys, as a preamble to a dissertation on ancient Indian astronomers. What this work has attempted to demonstrate is that the British rarely held such sentiments about the sources of their geographic knowledge of India. The project of the survey of India was one of definition and control. British knowledge and power would extend across India to know each and every aspect of the territory.

Ideally, nothing would escape the observation of the British surveyors and their instruments and reports. Control was supposed to result from the knowledge gained through the surveys; control of the everyday administrative duties of the colony as well as control of the thoughts and perception of the India by those within and outside of India. Control was built on the continuous and pervasive observation of the survey, which was considered as producing consistently accurate details about the land of India. Accuracy was dependent on quality of the observation, developed through the skill of the surveyor and the sensitivity of his instruments and analysis. All of these qualities were thought to be present in the British surveyor. But there were never enough British surveyors, or colonial agents of any type, and the strong presence of Indians in the survey establishment undermines the ideals of control and knowledge constructed by the British.

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<sup>143</sup> Markham 232

While Colebrook's language in this passage shows an apparent recognition of the British indebtedness to Indian knowledge and information in astronomy, beneath the literal language it is also indicative of a widespread attitude found among colonial rulers. He demonstrates both recognition, albeit somewhat tepid, of the achievements of Indian astronomers while at the same time proclaiming the British as the current preeminent agents of knowledge possession and advancement. What is not recognized is that the project of knowledge creation, in astronomy, or in the surveys, was characterized by an inherent tension between cooperation and control. British surveyors and rulers could not work without of the participation of at least some Indians and in this participation the detached objectivity of the survey was threatened. Early surveyors, like Rennell, were faced with a near total lack of British knowledge and were forced to use the knowledge from Indian sources in their work. While its presence did not automatically disqualify the work as a useful geographic document, it did create difficulties in reconciling the sources of knowledge in a way that did not fully demonstrate the British lack of control and knowledge. Later surveys attempted to control knowledge not with individual application of skill and intelligence but through the use of science and mathematics. Though scientific thought had always been present in the surveys during Everest's era it was conceived as the ultimate goal of the survey. This also created complications as the British considered themselves as the sole possessors of scientific knowledge. Especially during Everest's surveys scientific knowledge and expertise existed in both British and Indian workers. Everest's personal experience demonstrates the confusion and tension that developed as he attempted to reconcile his ideal for the survey project with the necessity of compromise and the subsequent damage to the survey's objectivity and

accuracy of knowledge. During the era of the Indian explorers, control of Indians within the surveys was at its highest point, but paradoxically so was the agency of the individual Indians to create and collect their own knowledge. But even the extensive application of authority and coercion with regard to the Indian explorers could not prevent them from acting of their own will.

The continued presence of competing interests within each era of the survey project challenged the creation of one concrete and controlled image of India. At no point were the interests of the British and the Indians involved in the survey separated from the project. In the previous sections I have attempted to demonstrate some of the instances where the presence of the competing interests become apparent. At points even the existence of one, apparently seamless, final product of the survey cannot disguise the reality of the survey process. I have sought to connect the surveys with the overall themes of the colonialism. Rather than regard the surveys as special instances of British action within India, the surveys should be seen as a part of a continuation of ideas that inform all colonial projects. By examining the survey project not as one of scientific harmony and triumph but as one of colonial compromise and negotiation I have attempted to advance the greater history of the colonial project.

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