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MAPPING AN *Empire*

THE GEOGRAPHICAL CONSTRUCTION OF BRITISH INDIA, 1765–1843

The University of Chicago Press

Chicago and London

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The University of Chicago Press, Chicago 60637
The University of Chicago Press, Ltd., London

Printed in the United States of America

06 05 04 03 02 01 00 99 98 97 1 2 3 4 5

ISBN 0-226-18487-0 (cloth)

Library of Congress Cataloging-in-Publication Data

Edney, Matthew H.
Mapping an empire : the geographical construction of British India, 1765–1843 / Matthew H. Edney.
p. cm.
Includes bibliographical references (p. 409) and index.
ISBN 0-226-18487-0 (cloth : alk. paper).
1. Cartography—India—History. 2. East India Company—History.
I. Title.
GA1131.E36 1997 96-39703
912'.54—dc21 CIP

♾ The paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

In memory of
John, Brian, and now Josh.

Who knows what other
wonders they would
have given us?

CHAPTER ONE

The Ideologies and Practices of Mapping and Imperialism

The activities of the East India Company in sponsoring science are an obvious point of approach to the whole ideology of British rule. The Great Trigonometrical Survey of India shows the workings of British policy better than still another study of Macaulay's education minute.

Susan Faye Cannon, 1978

Imperialism and mapmaking intersect in the most basic manner. Both are fundamentally concerned with territory and knowledge. Their relationship was the subject of Jorge Luis Borges' famous fantasy of an empire so addicted to cartography that its geographers constructed an "unconscionable" map at the same size as the empire itself, coinciding with it point by point.[1] This satire is rooted in an important realization: knowledge of the territory is determined by geographic representations and most especially by the map. Geography and empire are thus intimately and thoroughly interwoven. "In order to set boundaries to their empire and to claim to have reached those that were marked out," Claude Nicolet writes of the Romans, they "needed a certain perception of geographical space, of its dimensions and of the area they occupied." More generally, Nicolet argues, "the ineluctable necessities of conquest and government are to understand (or to believe that one understands) the physical space that one occupies or that one hopes to dominate, to overcome the obstacle of distance and to establish regular contact with the peoples and their territories (by enumerating the former and by measuring the dimensions, the surfaces and the capacities of the latter)."[2] To govern territories, one must know them.

In the case of the British conquest of South Asia in the hundred years after 1750, military and civilian officials of the East India Company undertook a massive intellectual campaign to transform a land of incomprehensible spectacle into an empire of knowledge. At the forefront of this campaign were the geographers who mapped the landscapes and studied the inhabitants, who collected geological and botanical specimens, and who recorded details of economy, society, and culture. More fundamentally than even Susan Cannon recognized, the geographers created and defined the spatial image of the Company's empire. The maps came to define the empire itself, to give it territorial integrity and its basic existence. The empire exists because it can be mapped; the meaning of empire is inscribed into each map.[3]

Imperial British India was far more dependent on maps than early imperial Rome had ever been. The steady expansion of map literacy in Europe since 1450—driven by new print technologies, protocapitalist consumption, and humanist culture—meant that by the eighteenth century the map had become, and has since remained, the dominant vehicle for conveying geographical conceptions. The intellectual process of creating, communicating, and accepting geographical conceptions, whether at an individual or sociocultural level, is thus often referred to as "mapping." It is a process which in the modern world depends heavily on the actual production of maps, which is to say mapmaking *per se*. Just as, in Samuel Johnson's phrase of 1750, "when a book is once in the hands of the public, it is considered as permanent and unalterable; and the reader . . . accommodates his mind to the author's design," so maps shape and manipulate mental geographical images.[4] The mapmaking process and the resulting maps are in turn dependent on aculturated conceptions of space. As with any other form of representation—graphic or textual, artifactual or ephemeral—meaning is invested in all aspects of cartography: in the instrumentation and technologies wielded by the geographer; in the social relations within which maps are made and used; and, in the cultural expectations which define, and which are defined by, the map image.[5]

This study of the surveys and maps which the British made in and of South Asia during the first hundred years of their ascendancy is accordingly a study of how the British represented their India. I say "their India" because they did not map the "real" India. They mapped the India that they perceived and that they governed. To the extent that many aspects of India's societies and cultures remained beyond British experience and to the extent that Indians resisted and negotiated with the British, India could never be entirely and perfectly known. The British deluded themselves that their science enabled them to know the "real" India. But what they did map, what they did create, was a *British* India. Wrapped in a scientistic ideology, each survey and geographical investigation was thoroughly implicated in the ideology of the British empire in South Asia.

A Spatial History of "India" to 1780

The creation of British India required the prior acceptance by the British of "India" as signifying a specific region of the earth's surface. Changes in the European involvement with Asia during the seventeenth and eighteenth centuries produced important changes in geographical conceptions, which were in turn more broadly accommodated and disseminated through cartographic representations. The issue here is that unless a region is first conceived of and named, it cannot become the specific subject of a map. Conversely, a mapped region gains prominence in the public eye. For example, there could be no maps of "Southeast Asia" until the Second World War, when the several colonial spheres of interest were replaced by a single theater of war; the distribution of maps of that theater subsequently led to the general acceptance of Southeast Asia as a region sufficiently coherent and meaningful to warrant its own academic discipline.[6] For South Asia, changing economic and political activities led to new geographical conceptions which, by the later eighteenth century, had developed into an image of India that coincided with the territory of the subcontinent and which was given meaning by the commercial and imperial ambitions of the British.

In the fifteenth and sixteenth centuries, Europeans conceived of Asia as an ill-defined series of exotic and fabulously wealthy countries. There was Cathay (China), Cipangu (Japan), and "the Indies." The conception of the Indies derived from Hellenistic Antiquity. It originally signified all the lands east of the Indus, the traditional eastward limit of the Hellenistic world. The Hellenistic image of the Indies was adapted by Renaissance Europe from the geographies of Ptolemy and Strabo and, although the Ptolemaic map was quickly supplanted by new maps constructed by Portuguese navigators, the Hellenistic nomenclature survived. *India intra gangem*—the Indies this side of (within) the Ganges—comprised all the lands lying between the Indus and the mouth of the Ganges and included the peninsula, which Ptolemy seems to have transformed into Taprobana, the oversized Sri Lanka. *India extra gangem*—the Indies beyond (outside of) the Ganges—comprised all the lands further west, specifically Indochina and modern Indonesia. Some

Renaissance geographers carried the name to its logical extension and called China "India superior." Christopher Columbus's conviction that he had indeed reached the Indies in 1492 resulted in the name being transplanted to the New World. The Indies henceforth became the East Indies, or East India. Thus, the London merchants who sought to compete with the Portuguese in the spice trade, and for which they received a monopoly charter from Elizabeth I in 1600, soon acquired the popular name of the "East India Company."

The initial plan of the English merchants was to establish trading centers in what is now Indonesia in order to control the supply of spices. They did so, but were evicted by their Dutch coreligionists in 1623. The English resorted to trading across the whole width of the Indian Ocean, from Arabia and East Africa to the Malay peninsula and further east to southern China. They established several trading centers, known as "factories," of which three on the coast of the subcontinent were dominant by 1700: Madras (Fort St. George), Bombay, and Calcutta (Fort William). The East India Company appointed a council of traders at each of these factories to manage the Company's affairs in each portion of the subcontinent. Each small bureaucracy was known as a "presidency" because its governing council was headed by a president; this name continued to be used even when the three small administrations were transformed into major territorial governments.

The three presidencies were functionally distinct during the initial period of English involvement in South Asia, that is, before the mid-eighteenth century. Administratively, none were responsible for the others. More often than not, they competed rather than cooperated with each other. The principal presidency was Madras. Bombay and Calcutta gave access to the markets and produce of the great Mughal empire, which dominated the north of the subcontinent, but the empire also regulated the English traders. Madras, on the other hand, lay on the southern fringes of Mughal power so that the English there enjoyed much greater economic flexibility. Located at the center of the Indian Ocean trade routes, and set up as an early version of a free-trade zone, Madras flourished. The French Compagnie des Indes sought to emulate the English success when it established its own factory at Pondicherry, just to the south of Madras.

European maps accordingly framed the subcontinent in three distinct ways in this early period. Beginning in the early 1500s, general maps showed the traditional region of the Indies, from the Indus to Indochina. The subcontinent was, of course, a prominent feature of these maps, but it was not their focus. Later in the sixteenth century, Europeans began to produce maps that framed only the peninsula south of the river Krishna, the area of their principal involvement. The third framing developed in the early seventeenth century and focussed on the polity of the Mughal empire. These maps emphasized the seat of Mughal power in the northern plains. They also included the Mughal territories west of the Indus: the Punjab, the Hindu Kush, and on occasion Afghanistan. They omitted the peninsula.[7]

The three framings began to merge in the eighteenth century. In part, this was a manifestation of the Enlightenment's encyclopedic mentality, which produced massive tomes intended to present all available knowledge to their bourgeois readership in a systematic manner. Geographical encyclopedias took the form of huge multivolume texts, which contained many small maps, as well as huge multisheet cartographic extravaganzas. These maps were constructed at such large scales, and were physically so big, that the cartographer could simply copy data directly from survey maps into the expansive graticule of latitude and longitude; he would not have to omit any data to ensure the new map's legibility.[8]

The prominent French cartographer J. B. B. d'Anville published the first such map of the Indies in 1752. He constructed his *Carte de l'Inde* in four sheets at a scale of about 1:3,000,000 (figure 1.1). It comprised almost one square meter of paper, too large to be reproduced here in its entirety. It was framed like all other maps of the Indies, extending from the Indus to the China Sea, with the subcontinent on the left and Indochina on the right. It was not much smaller in scale than maps of the two regional framings, and d'Anville copied data from them directly into the larger frame. The quality of d'Anville's sources was variable. As the region of most European activity, the peninsula was shown in greatest detail; d'Anville used the same sources to construct a somewhat larger-scale map just of the Carnatic, which was published in 1753. For the rest of the Indies, d'Anville's data was so sparse that the map was dominated by substantial areas of white space. D'Anville himself acknowledged that he would never have made this map with such sparse data had not the Compagnie des Indes specifically commissioned him to do so; nor was he reluctant to express his dissatisfaction with the map once it had been published.[9]

More significantly for the idea of India, the southward expansion of Mughal power under Aurungzeb (reigned 1658–1707) in the later seventeenth century led to the merging of the two regional framings in the early eighteenth century. As the empire now encompassed all but the southernmost tip of the subcontinent, in name at least, European cartographers extended their maps of the empire to incorporate the peninsula. Hermann Moll's "The West Part of India, or the Empire of the Great Mogul" (1717) is just one of several maps which equated the subcontinent (the west part of the Indies) with the empire (figure 1.2). The

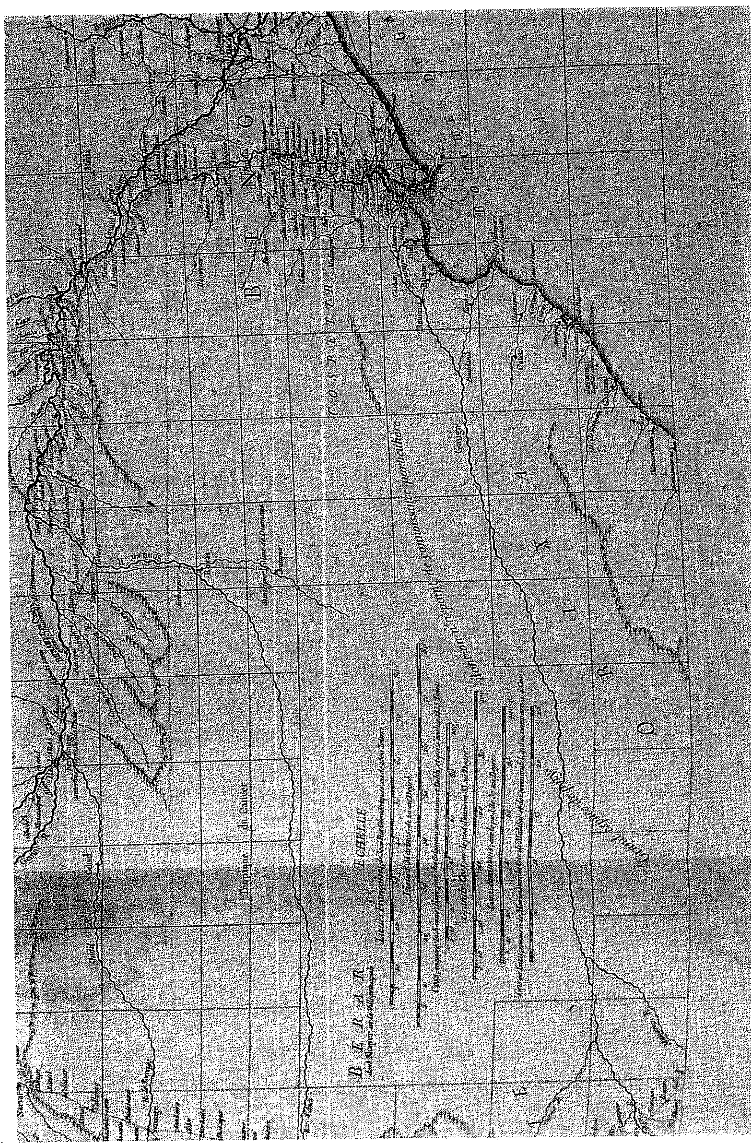

Figure 1.1 Jean Baptiste Bourguinon d'Anville, *Carte de l'Inde dressée pour la Compagnie des Indes* (Paris, 1752). Detail of Berar and Orissa. Copper-engraving.

D'Anville used only information derived from reputable sources, so his data for northern India were sparse; he did, however, borrow from other maps the fictitious Ganga river, shown here passing through the "great extent of country of which there is no particular knowledge." (The Smith Collection, Osher Map Library, University of Southern Maine.)

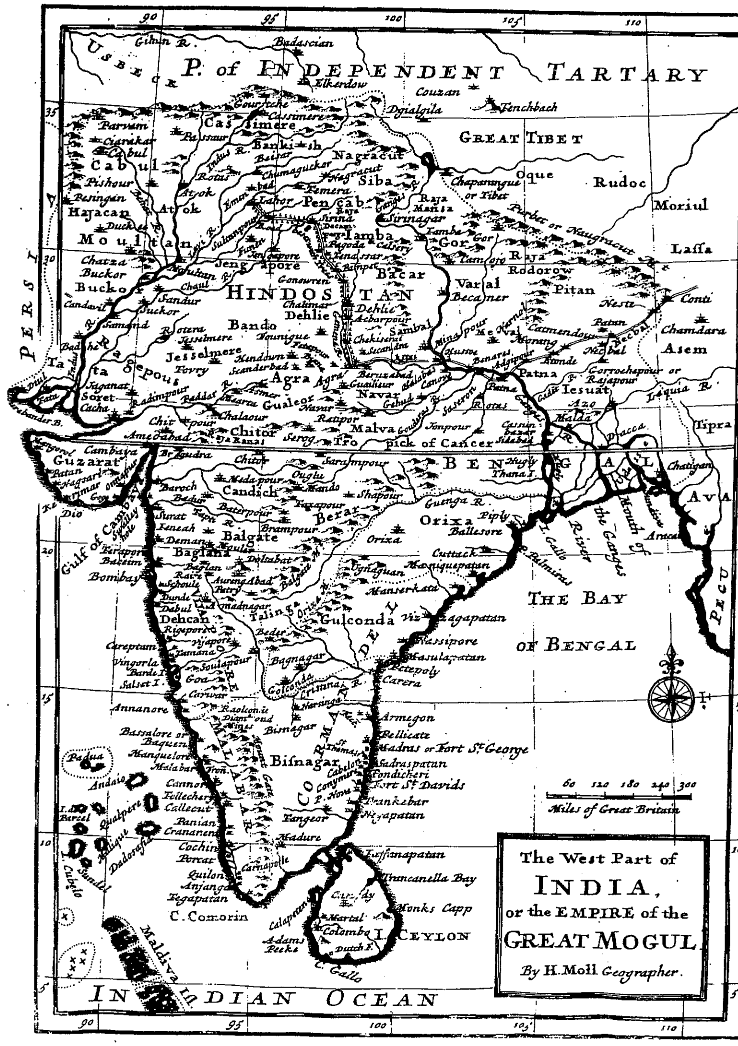

Figure 1.2 Hermann Moll, "The West Part of India, or the Empire of the Great Mogul," *Atlas Geographicus* (London, 1717). Copper-engraving; original size 18 × 25.5 cm.

One of the first maps to show all of South Asia in its modern conception. Previously, in his *A System of Geography* (1701), Moll had followed the existing convention and had shown only the Mughal empire. (The Newberry Library.)

map's frame now encompassed the entire region usually considered to be India *per se*, specifically the lands south of the entire circuit of northern mountains and including the lands west of the Indus. Nonetheless, there is still an ambiguity in such maps between the old regional concept of the Indies and the Mughal empire.

It is no coincidence that the early eighteenth century was also the period when the English and the French began to meddle seriously in South Asian politics. The prize was the immense revenue derived from land taxation, revenue which promised to far surpass the profits which could be realized even by monopoly trade. Initially, both European trading companies rented out their regiments to Indian princes; soon they sought to control the princes' finances directly. During the Seven Years' War (1756–1763), the global rivalry between the English and the French spilled over into a struggle for control of the Carnatic. A paradoxical consequence of this conflict was a major shift in English interests away from the south to the north, to Bengal, and to the heart of the Mughal empire. In what might have remained a comparatively minor aspect of the war, a small British army under Robert Clive defeated the Nawab of Bengal at Plassey in 1757, by intrigue as much as by force of arms. The English merchants found themselves in control of one of the richest provinces of the Mughal empire. Clive subsequently negotiated, in 1765, a formal position for the Company as the province's *diwan*, or chief financial and administrative officer. Thereafter the Company steadily eroded the position of the Nawab until they pensioned him off altogether in 1772.

The Company's dramatic territorial growth subsequent to Plassey did not take place in a vacuum. At home, the Company's territorial gains did not please many in Parliament. A series of political arguments over the very existence of the Company culminated in William Pitt's India Act of 1784. The Company's mercantile and territorial functions were separated in order to curb the excesses of the 1760s. As Calcutta was now the most important presidency, its governor was promoted to be governor general of Bengal and given authority in political and military affairs over both the Bombay and Madras presidencies. The governors and the commanders-in-chief of all three presidencies were henceforth to be appointed by the British Crown. And, perhaps most importantly, a parliamentary "Board of Control" was established to oversee, and if necessary to veto, the decisions made by the Company's directors; the board's president became a member of the cabinet. The 1784 act accordingly serves as a useful date for marking the conversion of the Company from a mercantile corporation to a major territorial power. I should also note that the conscious efforts at this time by the

English to incorporate the Scots into the home and colonial governments meant that the English East India Company is henceforth more properly referred to as being British in character.

In South Asia, the British territorial acquisitions were part of the larger process of the Mughal empire's slow disintegration. The forms and rituals of the empire remained, and the mughal himself remained the wellspring of authority. Even so, actual control of Mughal territories increasingly devolved onto the provincial governors and to new territorial powers. The Marathas had long been in conflict with the Mughals in western India and they now established new dynastic states. They also entered into a three-way contest for control of the empire, competing with the Afghans and the Mughals themselves; by the 1780s, the East India Company had replaced the Afghans in the struggle.

It was therefore during the 1760s and 1770s that the two regional framings completely merged to create a conception of India as a region characterized by multiple ambitions to take control of the Mughal empire. That empire had already expanded to cover the entire subcontinent; now British interests followed suit, expanding to encompass the north as well as the south. The new region was mapped as the domain of conflict between the Mughal empire, its successor states, and British interests. It looked as much to Afghanistan and the west as it did to Malaya and the east. Its autonomy was graphically manifested by the repositioning of the center line of the map frame to be coincident with the subcontinent's north-south axis (figure 1.3). Modern India was born.

Rennell and the Framing of India, 1782–88

The new conception of the subcontinent as an actual region in and of itself was most apparent in, and most effectively disseminated by, James Rennell's maps of India and their accompanying geographical memoirs.[10] As surveyor general of Bengal, Rennell had collected together the geographical data acquired by British army columns on campaign. There was now sufficient information that he could compile general maps of the entire subcontinent with much less white space than had plagued d'Anville's maps thirty years before. Admittedly, the detail of some areas remained rather sparse, especially to the northwest. Nonetheless, Rennell's maps provided the definitive image of India for the British and European public. It is in his highly influential maps that we find the establishment of India as a meaningful, if still ambiguous, geographical entity.[11]

The ambiguity of the region is most obvious in the various names

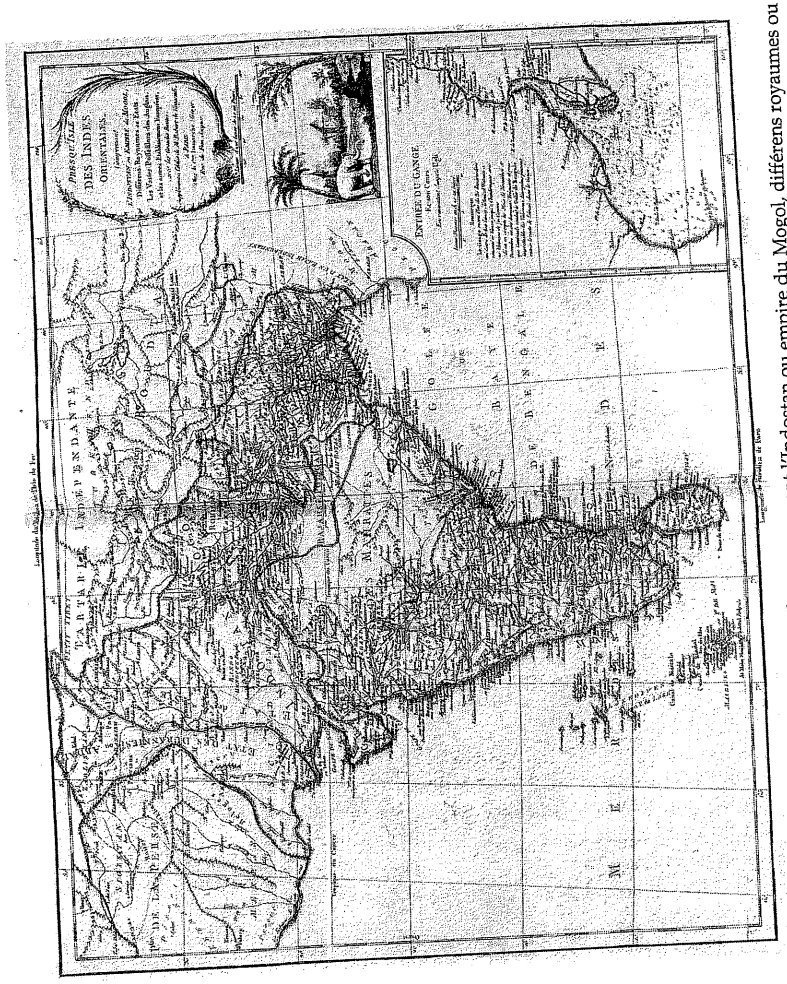

Figure 1.3 "Presqu'isle des Indes orientales, comprenant l'Indostan ou empire du Mogol, différens royaumes ou états, les vastes possessions des Anglais, et les autres établissemens européens," *Atlas universel* (Paris, ca. 1790). Copper-engraving; original size, 62.5 × 47.5 cm.
The original editions of the *Atlas universel* of Gilles and Didier Robert de Vaugondy (first published 1752) contained maps of all the Indies. C. F. Delamarche took over production of the atlas on Didier's death in 1786 and

that Rennell used to refer to the region that his maps framed. The titles of the maps and the memoirs all used "Hindustan." But this was not a self-evident region, so Rennell began both of his memoirs with an explanation of its extent. "Hindustan"—land of the Hindus—was originally coined by the early Islamic marauders to refer to the northern plains they conquered. Many Europeans adopted this usage. But the plains were also the historic core of Mughal power, so that "Hindustan" was used by some Europeans as a synonym for the empire. Because Hindus dominate South Asia and, furthermore, because the Mughal empire had by 1700 been extended almost to Cape Comorin, many Europeans took the entire subcontinent to constitute "Hindustan." Rennell did not select one of these three conceptions as being the proper one; instead, he conflated them. The titles of his memoirs explicitly equated Hindustan with the Mughal empire—*Memoir of a Map of Hindoostan; or the Mogul['s] Empire*—whereas the maps themselves were of the entire subcontinent. But within the memoirs themselves, Rennell usually referred to the whole subcontinent as "India." He thus established a conceptual equivalency between the subcontinent, India, and the Mughal empire: they all referred to the same fundamental region which he mapped.

The equivalency was borne out in Rennell's cartographic portrayal of political entities. He decided to subdivide India according to the Mughal subas (provinces) as defined under the emperor Akbar (reigned 1555–1605). Although these divisions did not extend very far south of the Krishna river, Rennell nonetheless thought that the system was "the most permanent one." His knowledge of the old divisions came from the recent translation of an Islamic geography of the empire, the *Ā'īn-i Akbarī* (1598).[12] Rennell showed the names of the subas in regular type on his maps, to distinguish them from contemporary political divisions in a cursive script. The new polities were named after their rulers, such as Nizam Shah or Moodajee Bhonsle (figure 1.4). Rennell explained his decision:

> It must be observed, that since the empire has been dismembered, a new division of its provinces has also taken place . . . These modern divisions are not only distinguished in the map by the names of the present possessors; but the colouring also is entirely employed in facilitating the distinctions between them. So that the modern divisions appear, as it were, in the *fore ground;* and the ancient ones in the *back ground;* one illustrating and explaining the other.[13]

Rennell's failure to identify the East India Company as the contemporary ruler of Bengal implied that Bengal was still a Mughal suba and

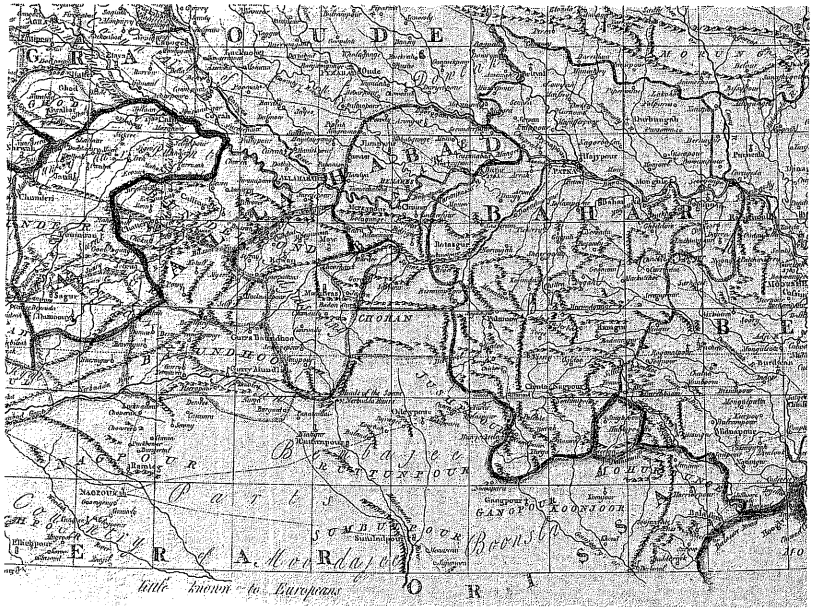

Figure 1.4 James Rennell, *Hindoostan* (London, 1782). Detail of Berar, Orissa, and Gangetic Plains. Copper-engraving.

Note the variations in type used for the Mughal divisions and the contemporary rulers (in a cursive script; for example, "Country of Moodajee Bhonsle"); also compare the density of Rennell's information with that of d'Anville in figure 1.1. (By permission of the Harvard Map Collection.)

that there had been a legitimate delegation of Mughal authority to the British. Conversely, the mughal himself, Shah Alam (reigned 1759–1807), is identified as actually ruling only the district around Delhi. Rennell thus justified British authority over Bengal as stemming from the sovereign authority of the Mughal empire, even as that empire had itself collapsed into a political anarchy signified through the names of rulers rather than regions. Rennell left the British as the sole representatives of the empire's legitimate and suprapersonal authority.

Rennell was himself an avid supporter of the East India Company's "splendid territorial aggrandizement." He devoted several paragraphs of his geographical memoirs to the defense of his old patron, Robert Clive, and of others who supported the Company's territorial conquests against critics in London. He was particularly motivated in his 1792 map of southern India to help "explain the present state of the political

geography of the Peninsula, together with the advantages that may be derived from our territorial acquisitions."[14] But this is not to say that Rennell possessed any greater idea of a future British empire which would one day cover the whole subcontinent. Instead, the maps of India-as-subcontinent produced by Rennell and copied by other European geographers reflected the continuing potency of the Mughal empire as the sole source of authority in the subcontinent. Contemporary politicians thought that the legitimacy of British power ultimately rested on the Company's adherence to forms of Mughal power and on its claim to rule Bengal as the imperial diwan. That is, the new regional maps embodied the recognition by all political factions that the Company's fortunes had become embroiled with the Mughal empire and its heirs, both *de facto* and *de jure*, almost to the exclusion of its other interests in Asia.

This message also constituted the essence of the remarkable title cartouche for Rennell's first map (figure 1.5). Most eighteenth-century maps were given intricate title cartouches, but very few were as elaborate as this. Rennell gave the following explanation in the memoir:

> *Explanation of the Emblematical Frontispiece to the Map*
>
> *Brittannia* [*sic*] receiving into her Protection, the sacred Books of the *Hindoos*, presented by the *Pundits*, or *Learned Bramins:* in Allusion to the humane Interposition of the British Legislature in Favor of the Natives of Bengal, in the Year 1781. *Brittannia* is supported by a Pedestal, on which are engraven the Victories, by means of which the British Nation obtained, and has hitherto upheld, its Influence in India: amongst which, the two recent ones of *Porto Novo* and *Sholingur*, gained by *General [Eyre] Coote*, are particularly pointed out by a Sepoy to his Comrade.[15]

In the background of the image, an East Indiaman is being loaded (the Indian on the beach, beyond the pandit proffering Britannia the sacred texts, can only be dragging his load toward the ship). Britannia's spear rests possessively on a bolt of cotton cloth (then the main Indian export to Europe), next to an artist's palette, mathematical dividers, and the stonemason's mallet and chisels (perhaps alluding to the freemasonry then resurgent in Europe). The iconography develops on that established in the 1730s, as with funerary statuary, in which India was personified according to "notions of place as a function of commerce or as a reference to the Orientalists' enthusiasms."[16] The textual components of British orientalism are emphasized, with the Brahmins handing over their legal texts (*sastras*), but its artistic (the palette), cartographic (the dividers), and architectural (the ziggurat at rear) elements are all included.

Figure 1.5 Title cartouche, E. Edwards *del.* and J. Hall *sc.*, to James Rennell, *Hindoostan* (London, 1 December 1782, 2 sheets). Copper-engraving; original size, 26.7 × 18.4 cm.

The packet being given to Britannia is labeled "shaster," that is, *sastra*, a Hindu religious code or law book. (By permission of The British Library, IOR X/223.)

To these conceptions Rennell added the celebration of empire and of British arms, very much in the Roman mold, complete with mercenary soldiers (the sepoys) and an imperial wreath. The wreath is not made from hallucinogenic laurel, used by oracles for divinely inspired visions, but rather from the opium poppy, the primary cash crop for the China trade. The Roman influence extended to the map itself, as Rennell used Roman sources for fixing places in the northern plains and gave a scale bar for Roman miles in addition to those for geographical [nautical] miles, statute miles, and the coss, a common Indian unit of distance. Rennell thus established India as the site of glorious conquest and territorial aggrandizement.

The continued expansion after 1790 of the Company's territories and of its political power produced an increasing congruence between the old Mughal and the new British empires. The Company's interests, which had grown in 1757 to encompass the eastern seaboard of the subcontinent, expanded still further. By 1818, British military strategy took the entire subcontinent into account even if the British had yet to conquer it all.[17] And with that expansion came new geographical information to be fitted into new editions of old maps or to serve as the basis of entirely new maps of India. The new information was collected and organized according to the new polities shaped and created by British hegemony. The maps of India produced both by the Company's officers in India and by its client cartographers in London increasingly reflected that organization, replacing the Mughal provinces with British districts and creating a geographical entity defined by the extent of British-dominated states and provinces.

Over the course of the nineteenth century, the British mapping of India further consolidated "India" in its modern image. Rennell had to take great care in defining what he understood to be the regions which constituted Hindustan/India. A century or more later, such care was no longer necessary. The geographical rhetoric of British India was so effective that India had become a real entity for both British imperialists and Indian nationalists alike. Both groups held "India" to be a single, coherent, self-referential geographical entity coincident with the bounds of the South Asian subcontinent and the extent of British power but which nonetheless predated British hegemony. Thus, one historian could state in 1902 that the purpose of his account of the empire was "to set before the ordinary reader the story of the steps by which India came gradually to be painted red on the map."[18] The triumph of the British empire, from the imperialist perspective, was its replacement of the multitude of political and cultural components of India with a single all-India state coincident with a cartographically defined geographical whole.

This geographical conception of India was adopted without question in the second half of the nineteenth century by Indian nationalists. They argued that there had historically been a region of cultural unity which coincided with the entire subcontinent. This position is enshrined in the present-day state of India, which has asserted that its northern frontier has run "approximately where it runs now [1959] for nearly three thousand years."[19] India is not unique in this respect. Benedict Anderson has noted that both Thailand and Indonesia have inherited the "colonial imaginings" of coherent geographical entities which supposedly predate the colonial era.[20]

The nineteenth-century consolidation of the idea of India was not a direct outgrowth of the initial framing of the region in the late 1700s. The consolidation depended on the comprehensive mapping of British India. In constructing a uniform and comprehensive archive of India, the British fixed the scope and character of the region's territories. They located and mapped the human landscape of villages, forts, roads, irrigation schemes, and boundaries within the physical landscape of hills, rivers, and forests. They also undertook cadastral surveys, delimiting field boundaries, buildings, and even individual trees, when agriculturally important, at scales sometimes as large as forty feet to an inch (1:480). The British made themselves the intellectual masters of the Indian landscape. And they did so with all the certainty and correctness granted by the Enlightenment's epistemology.

That epistemology, however, was flawed. The archive was certain and truthful only within the rhetoric of the Enlightenment philosophes. "India" does not comprise a pre-existent stage, framed by mountains and oceans, on which the events of history play out. It is not a "theater of its own design," to use Paul Carter's phrase. It is instead a creation of historical events and processes. It is, like all other regions to which we ascribe some meaning, the product of spatial history.[21] To believe otherwise requires intellectual convolutions. B. B. Misra has stated, for example, that although it is "a unified geographical category equipped with national frontiers, the Indian subcontinent has hardly ever been a single, integrated political entity."[22] The geographical unity of India is, in short, a creation of the British mapping of their empire.

The Cartographic Ideal and the Great Trigonometrical Survey of India

The conceptual potency of James Rennell's framing of India and the subsequent consolidation of that image depended on European culture's unquestioning acceptance of maps as unproblematic and truthful

statements of geographical reality. The formation of this cartographic ideal had two stages. First, the Enlightenment philosophes developed an epistemological ideal: correct and certain archives of knowledge could be constructed, they believed, by following rational processes epitomized by mapmaking. In the case of mapmaking, however, the epistemological ideal was undermined by recognized flaws in cartographic technologies. The second stage in the formulation of the cartographic ideal accordingly came with the widespread promulgation of a technological solution—"triangulation"—which promised to perfect geographical knowledge.

In British India, triangulation was represented by the Great Trigonometrical Survey of India (GTS). Because of the GTS, the British could believe that they were indeed constructing a single, complete, truthful, and ordered archive of geographical knowledge for their empire, even though a single, systematic, and coherent survey organization for all of their empire—the Survey of India—was not established until 1878. The literature of the early British surveys in India reflects this belief: the simple presence of the GTS was sufficient to bring all the British mapmaking activities into a single, coherent whole. At the core of this study, however, lies the argument that, in practice, the British could never implement the technological ideal offered by triangulation and were forced to rely on the older epistemological ideal of the eighteenth century. That is, the British could only make their general maps of South Asia by combining multiple surveys within a framework of latitude and longitude. The epistemological ideal is itself open to an extensive critique. More generally, some recent writers on the culture of imperialism have accepted the claims for constructing complete archives of knowledge at face value. As I will further argue, such perfection and total comprehensiveness is impossible *in practice*. The European knowledge of each empire is accordingly far more incomplete and nuanced than has often been recognized.

Rennell provides the starting point for the eighteenth-century style of topographic mapmaking in India. He made the first regional survey in the subcontinent—of Bengal between 1765 and 1771—and he did so with a methodology derived in principle from the techniques of map compilation. Rennell and his assistants measured distances and directions along the roads through Bengal. He also measured the latitude and longitude of key locations—control points—so that he could progressively fit the road surveys into a graticule* of meridians and paral-

*"Graticule" is a neologism, ca. 1875 (Helen Wallis and Arthur H. Robinson, eds., *Cartographical Innovations: An International Handbook of Mapping Terms to 1900* [London: Map Collector Publications for the International Cartographic Association, 1987], 172–74), but

lels and so construct the actual maps (see figure 1.4). This style of survey was fast and relatively easy and it was popular with military surveyors throughout the eighteenth century.[23]

For the eighteenth-century philosophes, mapmaking was the epitome of the ordered and structured creation of a coherent archive of knowledge. All geographical information could be sited and any conflicts reconciled within the map's graticule. The need to evaluate different data sources meant that map compilation was a highly complex and erudite process. Much of the complexity would be removed if the data came from a single source, specifically a regional survey undertaken in a *systematic* manner. Each route would be measured with the same methods and with the same instruments, so that the surveys would be consistent in quality and content, regardless of the skills of the particular surveyors. The survey's organizer would further ensure that all parts of the region were mapped together, without any inefficient duplication or unrealized omissions.

Michel Foucault considered natural history to be the Enlightenment's paradigmatic "Order of Things," but the natural historians themselves consistently employed maps and mapping as the trope for their taxonomic systems. Military reformers of the later 1700s positioned mapping at the core of "military science." Because their basic character lay in the use of instruments to extract meaning from the world, surveying and mapping were major contributors to the visualism and empiricism of later Enlightenment science. Most significantly, the combination of terrestrial and celestial measurements, in a system of knowledge which has recently been termed *mathematical cosmography*, was a fundamental component of the Enlightenment's world order.[24]

The epistemological certainty enjoyed by Enlightenment mapping, however, was substantially undermined by a widely recognized flaw. Both map compilation and the associated regional survey depended upon the astronomical observation of the latitude and longitude of a few important places, and such observations were famously uncertain. Each method of measuring either latitude or longitude was known to contain errors, but those errors could not be quantified. The best that could be done was to make as many observations as possible on the assumption that the errors would cancel themselves out. The field surveyor, however, rarely had time to make more than just one or two observations at any location. Moreover, each determination of latitude and longitude was independent of all others so that it could not be corrected easily. The result was that the tie between detailed survey and the general map was problematic. The map's theoretical perfection was denied by the imperfections of contemporary technology.

I prefer it to "grid," which has gained currency in the cultural studies' literature regarding maps. Grid implies a regular arrangement of two orthogonal series of equally spaced lines, as in a Cartesian plane, which in turn implies an infinite conception of space. In contrast, graticule embodies the variability of arrangement of parallels and meridians within and between map projections and also suggests the finite space of the earth's surface. Furthermore, twentieth-century topographic maps possess *both* a graticule symbolic of the map projection and a superimposed grid for referencing locations. Contemporary terms such as *réseau, net,* or *mesh* are also too vague.

What triangulation offered was a systematic technology whereby geographic information could be made truly certain and comprehensive. Its principles are relatively simple. The surveyor first imagines a series of straight lines joining the tops of hills or tall buildings. The hilltops are selected so that the lines form either a long chain of triangles or a network of interlocking triangles spread out across the landscape (figure 1.6). The surveyor determines the geometry of the triangles by measuring their interior angles. The actual size of the triangles is determined by the very careful measurement on the ground of the length of one side of a triangle; the lengths of all other triangle sides are calculated from this one "baseline" by means of trigonometry. The later Enlightenment term for a triangulation was therefore a *trigonometrical survey*. The result is a rigorous mathematical framework in which all points are defined with respect to each other.

Triangulation's promise of perfection rests on four factors. First, each control point is mathematically bound to its neighbors so that its position is automatically corrected. The triangulation is constructed without reference to any astronomical positions. Some latitudes and longitudes do need to be determined in order to fix the position and orientation of the survey on the earth's surface; the latitude and longitude of each triangle vertex can then be calculated, but these are only secondary calculations and do not affect the survey's structure. Second, the locations of the triangles' vertices are also defined by the configuration of the landscape itself so that the survey's structure is closely congruent with the physical structure of the territory being mapped. Third, the density of triangulated control points—the triangle vertices—is much greater than can be achieved by simple astronomical observations. An extensive triangulation can accordingly support far more detailed and comprehensive district surveys than would otherwise be feasible.

The final factor is triangulation's role in geodesy, the science of determining the size and shape of the earth itself. Triangulation was first used in the sixteenth century for just this task. If a chain of triangles is constructed running north-south along a meridian, then the surveyor

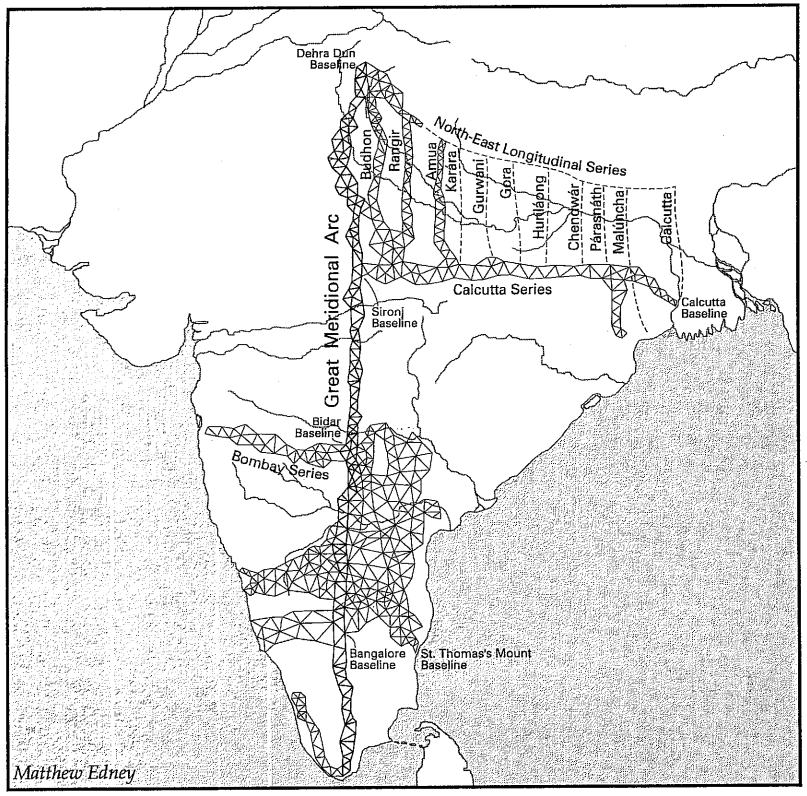

Figure 1.6 The extent of William Lambton's initial triangulation in southern India (1799–1817) and the arcs of the Great Trigonometrical Survey of India completed by 1843. Some of Lambton's earlier work, which was not subsequently used by the Great Trigonometrical Survey, is not shown. Note that much of the triangulation shown here was resurveyed or rejected later in the nineteenth century. Based on J. T. Walker, "Index to Great Trigonometrical Survey of India, 1 May 1862," CUL RGO 6/423/10, fol. 152.

can calculate the ground length of that portion—or the arc—of the meridian. The surveyor also measures the difference in latitude between the extremities of the arc. Because these values are measured independently of each other, they can be directly compared, yielding the length of one degree of arc along the earth's circumference. (Similar results can be obtained by measuring an arc of a parallel, but the uncertainty of measuring longitude meant that this was very rare before 1850.) If the

earth is assumed to be a sphere, this can be readily converted into the length of the entire circumference, thereby giving the size of the earth's radius. In his *Principia Mathematica* (1687), Isaac Newton demonstrated as a corollary to his theory of gravitation that the earth is in fact flattened at the poles. This realization prompted numerous geodetic arc measurements to prove, or disprove, Newton's theories and to determine the earth's precise shape.[25] The mathematics involved in geodesy are complex and do not concern us here, except to note that they made geodetic triangulations into acts of high science comprehensible by only the select few.

The net result of the greater accuracy of triangulation, of its greater congruence with the land, of its greater degree of control, and of its use in measuring the figure of the earth is that triangulation is held to offer the potential perfection of the map's relationship with the territory mapped. Triangulation defines an exact equivalence between the geographic archive and the world. Triangulation makes it possible to conceive of a map constructed at a scale of 1:1. Not only would this be the same size as the territory it represents, it would *be* the territory. The "technological fix" offered by triangulation has served to intensify the Enlightenment's "cartographic illusion" of the "mimetic map."[26]

Initially, geodetic triangulations in the late eighteenth century did suffer from uncertainties. The increasingly fine discrimination—precision or "exactness" in contemporary usage—of surveying and astronomical instruments through the century meant that repeated measurements of a single angle or length were as varied as observations for latitude and longitude. Unfortunately, both geodetic triangulations and astronomical research entailed extensive repetition of measurements which somehow had to be reduced to single values. Astronomers and geodesists accordingly drove the development of statistical methods, notably "least squares" analysis, for modeling observational uncertainties. Once the intellectually interesting issues of measurement had been solved, geographers and geodesists turned to new questions and left cartography behind as mere technique. In the popular mind, however, mapmaking continued to be imbued with all of the scientism and empiricism of the Enlightenment understanding of science: the world can be mapped exactly, the world can be *known*. In this context, the map's graticule of meridians and parallels signifies the map's scientific, rational, ordered, and systematic foundations. It signifies the map's naturalness: the map *is* the world.[27]

The principal British triangulation of South Asia, and therefore the key to the conceptual consolidation of a pre-existent "India," was the Great Trigonometrical Survey. The GTS had its origins in 1799–1800

when William Lambton, a Crown infantry officer, persuaded the Madras government to fund a triangulation across the peninsula south of the river Krishna. Lambton had two purposes in mind for such a survey. He wanted to contribute to the advances recently made in geodesy by measuring several chains of triangles. In addition to some short chains running along meridians, he also wanted to undertake the highly unusual measurement of an arc of a parallel across the south Indian peninsula. Eventually, Lambton's geodetic efforts focused on a chain of triangles running north from Cape Comorin, an arc which later became known as the Great (or Grand) Meridional Arc of India. The geodetic aspect of the work so dominated Lambton's reports that it precluded almost all reference to the survey's second function, which was to create a rigid framework for controlling detailed topographical and cadastral surveys. Lambton's assistants accordingly covered southern India with a network of triangles; based as it was on the highly accurate Great Arc, this secondary triangulation did not have to be undertaken with the same degree of nicety.

Lambton's survey at first lacked any formal name and was variously referred to as his general, geographical, geodetic, or astronomical survey. (The last name is obviously a misnomer!) The work was also limited to the peninsula south of the Krishna river. All of this changed in 1817 when responsibility for the triangulation was transferred to the Calcutta government and the survey itself was officially entitled the Great Trigonometrical Survey. George Everest, a young artillery officer, was at that time appointed to be Lambton's assistant. Everest became superintendent of the GTS on Lambton's death in 1823 and in 1830 he also became surveyor general of India. Everest completed the Great Arc, carrying it through 21°22′ of latitude, or about 1,400 miles (2,250 km) to Dehra Dun in the foothills of the Himalayas. A truly immense undertaking, as early as 1830 it was recognized in its "length and accuracy, . . . as exceeding . . . all [geodetic] arcs yet measured."[28] Everest's second achievement was to establish a system of triangulation that would eventually be extended across the whole of the subcontinent. Whereas Lambton had opted for a mesh of triangles, Everest advocated the formation of a "gridiron" of chains of triangles which would be easier and therefore cheaper to construct. When he retired in 1843, work on the first cell, covering Bengal, was progressing nicely (see figure 1.6).

The summary histories of the early British surveys in India present the technological fix of the cartographic ideal in all its glory. Their simple, linear sequence begins with Rennell, who began to map all of India in 1765 and who is therefore often called the "Father of Indian

Geography." Lambton put the surveys on a properly scientific footing with his triangulation, once he had overcome the petty objections of some accountants; his measurement in April 1802 of a baseline at St. Thomas's Mount, near Madras, is supposed to have placed *all* of the surveys in India on a "scientific basis." Subsequently, Everest's geodetic work perfected the fit of the triangulation to the actual surface of India. Set against these technological achievements are the conditions in which the surveyors worked and which the surveyors overcame. The result has been to present the history of the surveys in India in the simplest, most stirring, and most romanticized terms. It is all brave and courageous men braving the terrors and prejudices of a harsh environment, narrow-minded bureaucrats, and often hostile natives in order to create useful and essential knowledge of the world itself. It is a history that has been propounded in recent histories of cartography and popularized through a television series.[29]

The longer, more detailed official histories of the British surveys are not as simplistic as the summary accounts, yet they too do not question the underlying assumption that the Great Trigonometrical Survey was instrumental in unifying the surveys of India. Despite all the odd and exceptional surveys, the overall thrust of the British surveys was, they argue, to create a single archive of knowledge. This is the central theme of Andrew Scott Waugh's 1851 report in justification of the GTS's large expenditures in the face of parliamentary questions.[30] Clements Markham's 1871 *Memoir on the Indian Surveys* was imbued with the ideals of the systematic and comprehensive survey even as he united in one archive all of the India Office's geographical materials: geodetic, topographic, geologic, cadastral, marine; graphic and textual.[31] Reginald Phillimore's monumental, four-volume *Historical Records of the Survey of India* (1945–58), covering the period before 1843, was written with the benefit of hindsight—"for professional surveyors now working in India . . . that they might know . . . how the modern system came to be built up"—so that he too was fundamentally committed to the idea that the surveys constituted a coherent intellectual endeavor.[32]

In scope, these accounts fit into the modern perspective on the development of systematic statewide topographic surveys. The cartographic ideal requires that we assume that maps necessarily refer to the physical landscape and that their history is the history of their ever-increasing accuracy and comprehensiveness. From this perspective, triangulation-based surveys are seen as an inevitable and necessary development. The surveys consolidated the "science" of cartography and represent the final rupture from the older, "artistic" forms of mapmaking. In the paradigmatic historical sequence, there were a few precocious triangu-

lation surveys in the sixteenth and seventeenth centuries, but it was not until the eighteenth century and the geodetic and topographic surveys of France that the feasibility of an extensive systematic survey was proven; the other European states soon emulated the French experience with their own triangulation-and-topography territorial surveys. When historians have noticed the institutional circumstances of the new surveys, it has been to cast the surveyors in the role of heroes-of-science who overcame the stupidity of decision-makers who were too narrow-minded to appreciate the need for new and better technologies; the surveyors therefore contributed significantly to human progress.[33]

The epistemological ideal of cartographic perfection has also given rise to the recent critique of maps as paradigmatic tools of modernity's totalizing and all-engulfing culture.[34] It has also carried over into Edward Said's critique of western imperialism's investigations of Oriental cultures and societies. At first, Said employed geographical conquest and hegemony simply as a metaphor for cultural conquest and reconstruction. Subsequently, he has tightened the tie between geographical and cultural domination. He has, for example, argued that Europe's comprehensive observation and codification of the non-European world was done "in so thorough and detailed a manner as to leave no item untouched, no culture unstudied, no people or land unclaimed." Imperialism is "an act of geographical violence through which virtually every space in the world is explored, charted, and finally brought under control. For the native, the history of his or her colonial servitude is inaugurated by the loss to an outsider of the local place . . . "[35] The imperial power thus recreates the empire in its maps, subsuming all individuals and places within the map's totalizing image. Military conquest, geographical conquest, and cultural conquest are functionally equivalent.

In the same vein, we can easily argue that each systematic survey constituted a geographic "panopticon." Jeremy Bentham's ideal prison was characterized by separating the convicts into individual cells for their better control; a system of backlighting would ensure that the convicts could be observed at any time—and they knew that they could be observed—by the invisible, anonymous, and all-seeing/panoptic guard. Foucault used the panopticon as the exemplar for those "instruments of permanent, exhaustive, [and] omnipresent surveillance" which permeate modern society and which fabricate the individual. As mechanisms of the state's discipline, the surveys improved "the exercise of power by making it lighter, more rapid, more effective," and more subtle.[36]

Thus, maps of India—particularly those hung on council-chamber

walls—presented to each British official a single and coherent view of South Asia. At one uniform scale, all portions of Indian space became directly comparable and normalized. Knowledge of India was homogenized; particular variations and contingencies were subsumed within a "house of certainty." Each town and district was identified and assigned its own particular location within the fixed and immobile mesh of meridians and parallels. The space of the map was not bounded and limited but was as extensible and as potentially all-encompassing as British power and knowledge could make it. Moreover, that spatial architecture was rooted in non-Indian mathematics and structures; it was a European panopticon. Of course, the analogy of the map with the panopticon is not perfect, if only because the land itself is not sentient and its inhabitants were not necessarily aware of their cartographic representation; the geographic panopticon is not *direct*. The maps of India nonetheless form a disciplinary mechanism, a technology of vision and control, which was integral to British authority in South Asia.

A Flawed Ideal: The Practices of Mapping

The problem with Edward Said's conception of European imperialism is that it is too monolithic; Michel Foucault's understanding of the modern state's surveillant powers is too pessimistic, especially in the context of the nineteenth century.[37] European states and their empires could never be so totalizing. They could never be so effective. Linguistic problems alone meant that the surveyors had to rely extensively upon indigenous assistants, guides, and local informants. Moreover, like all instruments of state power, the surveys were exercises in negotiation, mediation, and contestation between the surveyors and their native contacts, so that the knowledge which they generated was a representation more of the power relations between the conquerors and the conquered than of some topographical reality.[38]

Even if it were epistemologically possible to construct the perfect, totalizing knowledge archive, it would have been institutionally impossible actually to do so. The possibility of constructing a map at 1:1 ignores the reasons why specific institutions make maps in the first place: to stand in for, to represent, the territories they depict in a wide variety of personal, social, and cultural exchanges. Not only would a map at 1:1 be impractical ("the farmers objected: they said it would . . . shut out the sunlight"), it would be quite useless ("so now we use the country itself, as its own map, and I assure you it does nearly as well").[39] It is of course naive to suggest that technological developments were by themselves causal factors in the epistemological shifts of the later En-

lightenment. We must also pay attention to social conditions which allow the adoption of new technologies and which seek epistemological change. And because societies are not monolithic, their adoption of new technologies and epistemologies will be variable in character. Ultimately, geographic archives must be incomplete. They are constructed from knowledge circumscribed by the numerous contingencies of knowledge acquisition. The texts and maps did not present truth, nor do the maps constitute panopticons. The British simply believed that they did.

In the present day, such criticism mounts a potent challenge to the cartographic ideal; in the Enlightenment, however, it constituted only an empty threat. Eighteenth-century epistemology acknowledged that the actual measurement and observation of the world would be flawed and it had developed a series of mechanisms to cope. That is, each measurement or observation was construed as possessing a kernel of truth together with some erroneous or flawed aspect; the "rational" comparison and reconciliation of different sources of information would remove the errors and flaws and therefore reveal the truth. Or rather, that was the belief which defined the character of investigations by mapmakers, natural historians, and other scholars. As I will discuss in the following chapters, this epistemology is subject to an extensive critique. The immediate point, however, is that politicians, bureaucrats, and mapmakers in the eighteenth and early nineteenth centuries did not recognize such fundamental flaws.

The experts and decision-makers did, however, recognize the practical limitations of the cartographic ideal's technological fix. Of particular importance was the character of each government and its ability to implement a systematic survey. The colonies and their governing organizations were never coherent, efficient, and singular political entities but instead were characterized by numerous internal divisions. They also suffered from an endemic lack of skilled personnel and money which could only be detrimental for the surveys. A triangulation might be simple in concept, but its implementation has always been difficult. A triangulation is slow. Even the simplest triangulation requires a great deal of planning to identify the hills and buildings to be used as stations. On occasion, towers must be built. Flags and poles have to be erected on hills to provide unambiguous targets for the surveyor; even then, such targets can be obscured by clouds, rain, or heat haze so that the survey's progress is unpredictable. Once the numerous observations have been completed, there are even more complex calculations to be computed. A triangulation is costly. The instruments for measuring horizontal angles (theodolites) are expensive. The principal surveyors have to be skilled and well-educated and so command high salaries. They are, moreover, supported by a large cadre of subordinate surveyors, computers, and laborers whose total payroll can be substantial.

The relationship between a triangulation's extent and its cost is nonlinear. The larger the area to be covered, the greater the care which must be exercised and the greater the accuracy and precision of the instruments to be used. Expenses escalate dramatically. For very large areas, several levels of triangulation will have to be undertaken. A very high-quality, "primary" triangulation is undertaken between widely spaced hills, perhaps as much as sixty miles (96 km) apart, and is computed with respect to the variable curvature of the earth's surface. This serves as the basis for secondary and tertiary triangulations, which provide a sufficient density of points for detailed surveys.

Extensive triangulations could only be undertaken by governments. No single individual had the financial wherewithal to fund them; no commercial entity wielded the necessary authority. The adoption of each and every triangulation-based survey, which is to say each attempt to create a geographic panopticon, was accordingly dependent on the condition of each state. Those which lacked a large and entrenched military-fiscal infrastructure could not muster the long-term resources necessary to support extensive triangulations. When systematic surveys were actually begun, they depended upon the fickle support of individual ministers. The mapping of France by the Académie royale des sciences—the first successful, systematic, statewide survey—was repeatedly interrupted between 1668 and 1740, while the topographic mapping after 1744 featured extensive conflicts between the royal and provincial authorities and within the financial sectors of the French state.[40]

Perhaps the best indicator of the practical infeasibility of the cartographic ideal is the failure by almost every state before 1880 to incorporate a cadastre into their systematic topographic surveys. Conceptually, cadastral surveys were important contributors to the imagined ability to make a map at a scale of 1:1. The various reconsiderations of cadastral surveys in British India as well as in Europe all proceeded from the expectation that they ought to be based on territorywide triangulations and that they ought to be the primary surveys from which all smaller-scale maps should be derived. But in reality, the survey of each individual village remained unique and separate on its own geometric basis. Cadastral surveys were accordingly significant for the development of cartographic literacy among Europeans in the eighteenth and nineteenth centuries, both in terms of pointing toward the possibility of

fulfilling the ideal and in promoting map use. Nonetheless, the cadastral surveys were, in practice, too large-scale, too detailed, and too unwieldy for comprehensive mapping.[41] Their role in this study is accordingly ambiguous. Ideologically influential, they contributed little to the comprehensive mapping of India.

The one attempt to establish a systematic cadastre on a statewide triangulation which succeeded was the Ordnance Survey of Ireland (1824–46). The British mapped their colony at a scale of six inches to a mile (1:10,560), a very large scale for topographic mapping but still rather small for cadastral purposes. Had the British attempted a more suitable larger scale, say one inch to a hundred feet (1:1,200), they would most likely have failed too. On the other hand, the Irish survey's parent organization, the Ordnance Survey of Great Britain, was not so coherent. Dating back to 1791 and a topographical survey of southern England, made in preparation for a possible French invasion, the Ordnance Survey still competed in the 1860s with other state institutions over responsibility and resources for mapping tasks. The Ordnance Survey might today be held to be the epitome of the systematic, statewide survey, yet it is impossible to identify the precise moment when the modern Ordnance Survey was founded.[42] None of the great topographic surveys of the nineteenth and twentieth centuries came into existence fully fledged. Each grew and evolved in conjunction with the expansion of responsibilities and the extension of the power and authority of their respective states.

If we question the precepts of the cartographic ideal, we must question our assumptions about the nature of maps which derive from that ideal, and this in turn requires a reexamination of the history of the systematic surveys promulgated after about 1800. We might follow the lead of the Survey of India's cartographic expert in the early twentieth century, William Coldstream, who referred obliquely to the hollowness of cartographic rhetoric when he asserted that India had never been a "survey utopia where professional survey requirements are paramount."[43] In examining the Indian Survey Committee of 1904–5, whose deliberations were thoroughly imbued with the cartographic ideal, Andrew Cook has demonstrated that the implementation in India of an ideal systematic survey was hampered and constrained by the administrative priorities and bureaucratic structures of the different British governments. Most significantly, priority was always given to cadastral over topographic surveys. And, as already noted, the cadastral surveys were not incorporated into the general mapping program. The progress of the comprehensive mapping of India was therefore quite irregular, so much so that Cook characterized it as being more the

result of accident than of design. Deepak Kumar came independently to a similar conclusion in a study of the administration of the several "scientific surveys" established by the British after 1850 to study India's geology, languages, ethnology, and archaeological remains.[44]

The systematic survey of India quickly dissolves into anarchy once these complexities are acknowledged. The perfection offered by the triangulated control of topographic surveys requires that the technology be implemented *in the proper sequence.* If a detailed survey is to take advantage of a mathematically rigorous framework, then it must be founded on triangulated control points right from the start. This in turn implies that the triangulation has to be completely computed and corrected *before* any detailed surveys are begun. If a topographic survey is made first and only then adjusted to fit a triangulation, then its errors are as likely to be increased as to be decreased. That is, not following the proper sequence introduces uncertainties into the surveyed data which are unquantifiable and therefore unremovable.

The British surveys did not follow the proper sequence. It took most of the century for George Everest's gridiron framework of triangles to be completed. On several occasions early in the nineteenth century, the triangulation surveys were awarded scarce resources in preference to the topographic and cadastral surveys. Even so, almost all topographic, and all cadastral, surveys in India were undertaken *before* the general triangulations could reach each respective region. Nor was there ever a single, coherent survey organization that could properly implement a systematic survey. The Great Trigonometrical Survey only emerged victorious in the late 1830s after a long bureaucratic competition over the most appropriate technology for mapping India. Only then did the last advocates of James Rennell's eighteenth-century style of surveying and mapping fall silent and all of the Company's administrators accept the GTS as the provider of structure for their geographic archive. But the acceptance of the GTS did not mean the end of the British dickering over their archive. All British survey activities were (supposedly) unified in 1878 to form the Survey of India, of which the GTS became the "geodetic branch." Subsequently, the Indian Survey Committee was convened in 1904–5 to effect substantial reforms in the various mapping activities. Nonetheless, by the time of Everest's retirement in 1843, the geographical archive's final structure was firmly established. I therefore use 1843 to mark the end of this study.

The role of the Great Trigonometrical Survey in unifying the cartographic image and archive of India rests on an act of cultural confusion. Enlightenment society invested maps with authority because of the manner in which truth was constructed within the space of their grati-

cule. The data which contributed to the maps were indeed the result of measurement and observation, but they could only achieve greater significance and meaning within a graticule of meridians and parallels. In contrast, triangulation provides its own framework whose authority derives entirely from its constitutive acts of measurement and observation. The basis of the map's cultural authority thus shifted from the cartographer in his office to the surveyor in the field. The rhetoric surrounding the GTS in the early nineteenth century, and the assumptions subsequently made by its historians, would have it that the cartographic ideal was indeed implemented. And this is the act of confusion: even with the GTS, the key technologies for constructing the map of India remained in the office. The British achieved a compromise which cloaked the continuing exercise of map compilation in the authority of systematic field observation.

The comprehensive mapping of India was accomplished not through the systematic observation and measurement of the land but through the construction of the cartographic image of the subcontinent. Initial projects to compile a comprehensive map of India were varied and were distributed between London and the three presidencies. The key development in this regard was the establishment, in the 1820s, of a project to compile an *Atlas of India,* at the medium scale of four miles to an inch (1:253,440). In the debates which continued through the 1830s concerning the best way to map India, the very existence of the Great Trigonometrical Survey was tied to the production of the *Atlas.* The *Atlas* would bring together all of the topographic surveys and warp them to fit the GTS in order to create the definitive cartographic representation of India.

It is here that the apparent perfection of the geographical panopticon promised by the Great Trigonometrical Survey is revealed as an empiricist delusion. The chaotic circumstances of British surveying in India are conveniently obscured by a veneer of order and system. The ordered hierarchy of dependence between the surveys did not in fact occur. Whatever order was imposed on the detailed surveys came *after* the fact, when they were incorporated into the general archive. The order did not derive directly from the surveys themselves. What the British implemented was not the ideal, but only the *image* of the ideal.

The Ideologies of Mapmaking and of British India

Modern culture's firmly established conception of cartography envisages the map as a concise statement of facts about geographic reality. Maps are so naturalized within modern culture that their construction

and use are rarely remarked upon. Thus, despite the time, labor, money, and general effort invested by the British in mapping India, the topic has rarely been addressed by general historians of South Asia. Only very recently has B. B. Misra recognized the surveys as being "instruments of territorial integration" and has added them to the list of the Company's infrastructural activities deemed worthy of extensive study (revenue administration, judiciary, army, police, schools, censuses).[45]

Increasing sensitivity to epistemological issues has led some historians of South Asia to pay attention to the role of surveyors who were involved in the British endeavor to define their empire intellectually. The surveyors and geographers, notably Francis Buchanan and Colin Mackenzie, have now entered the literature as active agents of imperialism rather than as passive data collectors.[46] Nonetheless, the geographers' specifically cartographic activities remain outside the scope of these studies. The ambiguity of this situation is reflected in David Ludden's recent essay on the changing political contexts of orientalist studies. To characterize the Company's initial gathering of information, Ludden highlights the contributions of three particular officials: James Rennell, the geographer who surveyed Bengal and mapped India; William Jones, the jurist who presided over the translation of Indian legal treatises; and Thomas Munro, the administrator who pioneered the settlement of land rights on individual cultivators. With the consolidation of British rule, Ludden writes, the "pathbreaking discoveries became authoritative wisdom; innovative methods became systems. Jones fathered a discipline [Indology] and Munro an administration."[47] But what did Rennell father? Rennell drops out of the analysis because for Ludden, as for most historians, only Jones and Munro created new intellectual constructs through which to comprehend and govern India. Jones created a systematic code of Hindu law when none had existed before; Munro's idealized conception of rural Indian society as an amalgam of enduring village republics subsequently colored all British policy. But Rennell is seen as having been uncreative, as having merely gathered data from a pre-existent and predefined landscape. Rennell's actions are construed as being necessary for British rule, but not as encompassing intellectual creativity, except perhaps for the overtly artistic title cartouche of his 1782 map (see figure 1.5).

In contrast, this study proceeds on the assumption that technology and knowledge are not neutral and unproblematic phenomena. Neither individuals nor institutions adopt new technologies as a matter of course. Surveyors and cartographers are not bound to make the "best" maps that they can; administrators and bureaucrats are rarely noted for their altruism. In short, the triangulation-based systematic surveys are

rooted, like all other modes of cartographic practice, in cultural conceptions of space and in the politics of manipulating spatial representations. Cartography is a human endeavor and is accordingly replete with all of the complexities, ambiguities, and contingencies which characterize any human activity.[48] From this perspective, the British mapping of India takes on an entirely new and vital significance for the character and ideology of the East India Company's curious, hybrid state in South Asia.

The history of the East India Company's mapping activities can be summarized as the history of British attempts to make detailed topographic and cadastral surveys adhere to a systematic standard within a coherent administrative structure, even as the forces of inertia, expediency, and financial strain worked to preserve the almost anarchic conditions of mapmaking in India. Debates within the Company's administrations in London and India over the proper mapping policy to be pursued ran almost continuously through the early nineteenth century. In particular, the bureaucrats and politicians sought a resolution to the three-way contest between the pragmatic need for geographical information, unforgiving fiscal reality, and aspirations to the cartographic ideal. The contest's most revealing aspect for the character of the East India Company is the persistence of the cartographic ideal. Why was it so popular? What is the arena of overlap between the ideology of mapmaking and the ideology of empire?

For the British in India, the measurement and observation inherent to each act of surveying represented *science*. By measuring the land, by imposing European science and rationality on the Indian landscape, the British distinguished themselves from the Indians: they did science, the Indians did not, unless in a limited way and then only at the express request of a British official. Whether or not Indians independently pursued activities which agreed with the European conception of science is beside the point.[49] In the arena of education and knowledge, the surveys were a principal means by which the British held themselves to be superior to the Indians and therefore worthy of the territorial sovereignty which they had acquired. The practicing of cartography—the making of surveys and the compilation of maps—was quintessentially at once a scientific and a British activity.

The precise hierarchy implied by a triangulation-based survey embodied the power-hierarchy of the empire itself. Detailed topographic and cadastral surveys each covered a single pargana or taluk administered by Indian officials; they depended on more extensive triangulations covering one or more of the districts administered by British "collectors" and magistrates; those comprehensive triangulations depended, in turn, upon the geodetic-level triangulation covering all of India, the realm of the provincial governors and the governor general. In both hierarchies, order, policy, and responsibility pass down from top to bottom, while detailed information or money pass upwards. The hierarchies ensured the comprehensive cartographic and political control of all regions. These two aspects of control and knowledge were combined in the hierarchy of labor promoted by the trigonometrical surveys and which became the standard system for all of the scientific, intellectual, or professional agencies within British India: a few expert Europeans engaged in mapping and science and directed several layers of half-caste and Indian laborers, with each subordinate layer being less intellectually autonomous.

The view of science held by the British in the early nineteenth century was a thoroughly bourgeois and genteel conception. The pursuit of science was used as one more means to distinguish members of the European social elites from the lesser classes, although this ideology was by 1800 being contested within British society. By defining themselves as rational and scientific creatures, the British administrators and officials and politicians in India set themselves in opposition not only to the Indians but also to the lower classes of British soldiers, merchants, planters, hangers-on, and all the others who found themselves in India. The British elite created a myth of a bourgeois colonial community comprised only of themselves, which subsequently engendered the greater, more potent, and more ambiguous myths of Raj, of the White Man's Burden, and of the never-setting Sun.

This study therefore extends the work of some South Asianists who critique the cultural and historical knowledge archives which the British constructed for India. Following Edward Said, Ronald Inden has demonstrated that the British constructed an essentialist opposition between the Indians and themselves. Indian thought is characterized as "dreamy imagination," European as "practical reason"; Indian society is characterized as an "imprisoning (but all-providing) caste system," European as being based on the "free (but selfish) individual." India is represented as "simple and unchanging" in contrast to the "relatively complex and shifting" conditions which can be seen to have actually prevailed once the old certainties and polarities are rejected.[50]

A more nuanced perspective, on which this study draws heavily, is offered by C. A. Bayly, who argues that the British representations were enshrined in myths of coherence, order, and rigor. Bayly has indicated that the British derived from their pandits the brahminical perspective of an Indian society hierarchically organized by degree of purity and pollution, which perspective they then mediated through their own

Christian/evangelical, deistic, and rationalist/utilitarian beliefs. The result was a complex construction of Indian society and Hindu religion which enabled the British to rule India and to interact with Indians, yet which effectively obscured from British view the significant changes occurring in South Asian society and culture after 1750.[51] Marika Vicziany accordingly warns modern historians that while Buchanan might indeed have "established a tradition of empirical enquiry into Indian society," it was nonetheless "an empiricism with limits and limitations" which cannot "reveal the underlying realities of life in India at the turn of the nineteenth century."[52]

Thomas Metcalf has argued that the essentialist difference between Indians and Britons was built up by the British to justify the central paradox of their rule: British government was directed by liberal and nationalist ideals at home yet their rule over millions of Indians was clearly despotic. The key to the British self-representation, and therefore of their representation of Indians, lay in their own claims to possess an innate rationality and scientific nature. Unfortunately, Metcalf restricts his discussion of British rationality *per se* to a few observations on the "scientific" manner in which the British studied questions of race, including caste, gender, and history in the period after 1850. That is, Metcalf is concerned with the social phenomena which the British "saw *in* the world."[53] This study effectively takes Metcalf's analysis to its logical conclusion, specifically that the British self-image rested on a perceived difference between how they and Indians saw, and so mapped, the world itself.

Perhaps the most important portion of Claude Nicolet's comments on imperial space quoted at the start of this chapter is the parenthetical phrase, "or to believe that one understands." The British constructed a cartographic archive which they *believed* properly described India. To the British, the cartographic archive and its constituent surveys was indeed a perfect geographic panopticon. But what it described and allowed access to was *British* India, a rational and ordered space that could be managed and governed in a rational and ordered manner, according to "a rigorous tradition of administrative accountancy and . . . an ideology of transcendent law and sovereignty." It was this rationality and certainty which, for Bayly, distinguishes the East India Company's state from other "oriental" states and which marks it most clearly as an *imperial* state.[54]

In seeking knowledge from Indians about features of the South Asian landscapes and societies which could not be directly observed, the British had to negotiate a linguistic and epistemological gap. Company officials relied on the presumed order and system of the archive to absorb and make meaningful the information derived from the numerous Indian informants. The archive thus obscured the basic conceptual gulf between the British and the Indians caused by language and which persisted throughout the period of British rule. But I do not wish to overstate the gulf. Seeing information as a commodity to be purchased from its traditional purveyors, the British adopted the existing intelligence systems of India and added their own systematic archival practices. The fact that the British were able to conquer and control India indicates that much of their political, economic, and strategic knowledge was valid. But that information was not necessarily complete: most obviously, the Mutiny of 1857 caught the British by complete surprise. Ultimately, all British knowledge of the Indian "Other" was "exiguous."[55]

Although the main impulse of this study is to explore the linkages between the ideologies of mapmaking and British India, its examination of the later Enlightenment's cartographic ideal is necessarily relevant for the history of the systematic, statewide surveys generally. The debates on the Great Trigonometrical Survey and the proper manner in which India should be mapped were all rooted in the general British understanding of maps and mapmaking. After 1824, the proponents of the GTS looked to the Ordnance Survey of Ireland as the epitome of what they hoped to achieve in India. Drawing on the concrete example of the Irish survey, they were in the late 1830s finally victorious over the advocates of general surveys made in the style of Rennell.

I cannot, of course, claim that the institutional history of the GTS, the *Atlas of India*, and other mapping activities in India replicates those of the surveys of European states. The general issues which I address—of survey technologies, the epistemology of mapmaking, indigenous resistance and negotiation, administrative structures and internal debates, and the mythic construction of complete territorial archives—do nonetheless apply as much to the European scene as to the Indian. Indeed, the British surveys in India are more European than colonial in their conception. With the exception of the Ordnance Survey in Ireland and the mapping associated with Napoleon's short-lived expedition to Egypt (1798–1801), there were no attempts to establish a systematic, triangulation-based topographic survey for any European colony until the height of economic imperialism after 1870. Before then, colonial cartography was undertaken with the older technologies of the eighteenth century and in an *ad hoc* manner.[56]

One benefit for applying the lessons of the British mapping of India to Europe is to highlight the role of the systematic surveys in the territorial definition of the modern state. Eric Hobsbawm has distinguished the "characteristic modern state" from its early modern precursors by, among other factors, its initial attempts during the later Enlightenment "to impose the same institutional and administrative arrangements and

laws all over its territory."[57] A necessary ingredient in this process was the establishment of a sense of territorial uniformity that allowed *all* of a state's territory to be treated in the same manner, regardless of obvious and compelling regional variations. A significant element in the formation of the modern state was, accordingly, the proliferation after 1750 of systematic territorial and statistical surveys. The application of the same techniques and scales of enquiry to each and every district meant that the resultant maps and statistical tables all contained the same sorts of information and were constructed and tabulated in the same manner. They therefore obscured, or denied, local nuances and particular circumstances. The systematic surveys provided the information required by increasingly centralized states and, more fundamentally, they constituted each state's representation of its territorial self.

Such an approach balances the attention usually paid to boundaries as the key elements in defining the state's territory. Borders obviously represent the physical limit of the state's legitimate authority. Modern states have accordingly equated their borders with their sovereignty, so that a breach in the one is a breach of the other. Consideration of the state-territory relationship has thus focused on the role of the border as the line of physical contact and conflict between states and as the delimiter of territory to be filled by the culture and economy of the state's dominant center. Drawing attention back to the rhetorical domination of territory as an active component of the internal negotiations of modern state formation provides an approach to the continuing problem of nationalism and its rhetoric of territorial rootedness.[58]

The present study is therefore more than the history of a particular cartographic institution or a particular manifestation of British imperialism. My concern is with the elite *British* construction of knowledge, with their assumptions and ideologies, as part of the broader goal of understanding the empire they created in India. (I must stress again that I am interested in the construction of knowledge by an *elite:* the scope of knowledge is determined not by some fiction of ethnicity but by society and economics.) I am interested in the cartographic culture transplanted from Europe to India by the British elites. "Cartographic culture" encompasses not material map-artifacts but the understanding of the practices of cartography which a society possesses, the forms of representation employed to experience and explore the world, and the means whereby the social order permeates those representations in order to recast and recreate itself.[59] That is, this is a study of the creation of a legitimating conception of empire, of political and territorial hegemony, mapped out in a scientistic and rational construction of space.

PART ONE

THE ENLIGHTENMENT CONSTRUCTION OF GEOGRAPHICAL KNOWLEDGE

[The Great Trigonometrical Survey] has given us the framework, or anatomy, of India, and on this framework an enormous series of maps, geographical, political, military, and cadastral, has been based. Whatever may be the destiny of India in the future, it must stand as an everlasting testimony to the scientific industry of the British nation. It can never be effaced so long as stone walls can contain the records.

Thomas H. Holdich, 1916

CHAPTER TWO

Observation and Representation

Thomas Holdich, a retired senior officer of the Survey of India, represented the structured assemblage of geographic knowledge as a concrete structure in and of itself. This was not an uncommon strategy. The built environment of the archive and museum has long served as a fundamental metaphor for modern European conceptions of knowledge creation. Data and artifacts can be collected within sturdy walls and there reassembled into meaningful arrangements. Indeed, the walls are overly protective. They physically divorce the collected data and artifacts from the actual contexts of their occurrence and existence. They keep their contents from being harmed and they actively shield them from the confusion and corruption of the world beyond. Within those walls, the archivist or curator constructs an artificial environment within which data and artifacts can be rearranged, manipulated, and controlled. Holdich's conceit, and that of the British more generally, was that the system by which geographical data were arranged within the archive was not artificial but was a true replication of South Asia's actual geography.[1]

Holdich's identification of the Great Trigonometrical Survey as the key contributor to the true representation of India is, historically speaking, a red herring. The survey's geodetic triangulation actually constituted a technological fix for the Enlightenment's older ideal of certainty and truth. That ideal was based on the structural equivalence of the imaginary lines of longitude and latitude on the earth's surface with the same lines as drawn out on a sheet of paper: the structure of the map—the archive—was the same as that of the earth itself. The geographer could mark each measured location at its correct position within the map's graticule of meridians and parallels. The only problem was that contemporary technology could not measure longitude very well. The map was therefore perfect only in principle, not in practice. Triangulation promised a better technology to fix up the Enlightenment ideal—to force practice and principle to coincide—so Holdich attributed the perfection of the geographical archive of India to the Great Trigono-

metrical Survey. But for a complete understanding of the epistemological basis for the British investigation of India, we must start with the Enlightenment's conceptions of observation and the archive.

The eighteenth-century conception of knowledge placed great significance on the empirical experience of the world. The appropriative character of that knowledge is most clearly demonstrated through the museum. In India, as elsewhere, the British assembled vast collections of mineralogical, botanical, and zoological specimens (some alive). In the human arena, the study of dress, society, tools, and architecture was complemented by the collection of as many artifacts as possible, including manuscripts. Captain James Blunt even attempted to "*collect* a small specimen" of the language of a hill tribe in Ellore, but because his "only method of *acquiring* this [specimen]" was to point to various objects, he was able only to define ten word pairs.[2] The specimen was the fetish of the traveler. The result was the bewildering profusion of animals and birds shot in the hunt, jewelry, insects, paintings, pressed plants, manuscripts, pieces of monuments, and a myriad of other curios which were donated to the Asiatic Society in Calcutta or which found their way to the India Museum in London.[3]

Whether fragmentary or whole, the specimen was taken as representative of the larger entity or population being sampled. Collection necessarily entailed the physical extraction of each specimen from the original, complex contexts of their occurrence, from an ecology or village. Each simplified specimen was then recontextualized within the museum by its arrangement in juxtaposition with other specimens. Within the museum, curators identified relationships between the samples themselves, rather than between each sample and its original environment, thus creating new complexes of knowledge in the form of artificial taxonomies.

Observation and the archive functioned in a manner directly analogous to collection and the museum. Observed facts were considered to be as concrete and as representative as physical specimens. Indeed, collection defined the fundamental stratum for all observational strategies. That is, the empiricism of the later Enlightenment posited a direct, visual link between an entity in the world, the individual's mental perception of that entity, and the individual's inscription of that perception on paper. The inscription could involve any combination of numbers, written statements, or graphic sketches but, regardless of its form, it was assumed to be an "essential" and literal copy of the original entity. The recorded fact would, of course, contain some degree of error—an individual might not draw well, for example—but it would always possess a kernel of truth. The inscribed record of a fact carried away by the geographer was thus directly equivalent to a physical sample or artifact carried away by the geologist or anthropologist. The recorded facts were collected in archives, such as the office of the surveyor general of India, and there related to each other to produce knowledge.[4]

Recent trends in social and cultural studies question the presumption that a representation can constitute an essential copy of reality. Representations of the world—whether numeric, written, or graphic—are bound up both with the acts and conditions of observation and inscription and with the subjective condition of the observer. Indeed, paintings, statistical tables, or written texts are as much representations of those conditions as they are of the reality they purportedly show. Nor can representations stand alone. They all melt together into a vast discursive web which defines *in toto* not what the world is but what it ought to be. From this poststructuralist position, the metaphorical archive constructs itself: there is no pre-existing structure within which to fit and to arrange facts. Instead, the archive stands for the discursive field of knowledge-representations which constitute our understanding of the world. The poststructuralist archive is no longer the coherent and ordered archive as it traditionally has been envisioned: it is fractured, ambiguous, duplicitous, and nuanced. The coherency and order of the archive is an ideological myth.

The British archive for South Asia's geography comprised all the various images, maps, censuses, and textual descriptions which they produced, all of which are embedded in the empire's complex economic, social, and cultural negotiations. In particular, the British representations of their empire were appropriative in character: they commodified the knowledge and aesthetic aspects of the landscape for their own consumption. Indeed, visual representations were generally treated in the eighteenth century as if they were private property. They deny presence—the sharing of time and space by the observer and observed—so that through its representation, the observed is removed, appropriated from its original context, and recast within the archive's discourse.[5]

The Scope of Geography in the Enlightenment

The process of knowledge creation presumes some archive—literal or figurative—to which all new knowledge can be related. In the case of geography, the purpose of the archive is to relate knowledge about particular places to a larger conception of space. Knowledge of South Asia's space was thus essential not only for its pragmatic uses in mili-

tary and revenue affairs, but also for the structuring of all forms of geographical knowledge spanning all aspects of the physical environment and of human endeavor. Geographers followed a methodical process of comparing the attributes of each new *region* against those of previously defined regions; similarities were noted, differences were explored at length. Geographers observed the physical world and its human occupants with the overt intention of arranging the observed phenomena according to their spatial distribution.

But what is it that defines a region? Is it the inhabitants and their material cultures (density, ethnicity, character, architecture, economy, manufactures, cultural forms, social forms) or is it the physical environment (landforms, rocks, minerals, plants, climate, agriculture)? While some contemporary geographers, like present-day historians of geography, attempted to impose neat boundaries to the scope of their investigations, none succeeded.[6] There could be no disciplinary boundaries in the eighteenth-century's "ferment of knowledge."[7] That is, in examining the geography of India, in transforming India from a land of spectacle into a comprehensible empire, the British examined all aspects of the human and physical environments and distinguished between them as they varied in space.

Geographical discourse was therefore not limited to the map, and geographical observers did not necessarily make cartographic observations. Nonetheless, the map was essential for geographical knowledge, such that the common eighteenth-century conception of the "geographer" was as a mapmaker. Geographers made maps. ("Cartography" was only coined by the viscount de Santarém in 1839.) When, for example, the newly formed Asiatic Society of Bengal in 1799 listed topics which needed to be addressed by its members, it conceived of geography in the narrow sense:

> II. Geography
>
> 1. A catalogue of the names of Towns, Countries, Provinces, Rivers, and Mountains, from the *Shasters* and *Puránas* [Sacred Texts of the Hindus], with their modern names annexed; and a correct list, according to the oriental orthography, of the Towns, &c. mentioned by Major Rennell, and other *European* Geographers. The etymology, as far as practicable, would also be desirable.
>
> 2. What were the geographical and political divisions of the country before the *Musulman* invasion?[8]

Yet these two locational questions were clearly inseparable from those of the vernacular languages and political histories of India. As such, it was impossible to draw hard and fast lines between geography and the

other broad categories of knowledge the Asiatic Society propounded: religion, policy, jurisprudence, manners, and customs; biography (historical); commerce, natural history, *materia medica;* medicine and surgery; and, language and literature.

Before the eighteenth century, the scope of geography was defined in terms of the scale of enquiry. Classical scholars distinguished between *geo*-graphy (earth-description) and *choro*-graphy (region-description). Geography entailed the study of the world as a whole and of mapmaking (general or mathematical geography) and the listing of all of the world's constitutive regions, described by their broad physical, demographic, and economic attributes (descriptive or special geography). Chorography was the description of a particular region and its inhabitants without reference to the rest of the world and placed a great deal of its emphasis on history (genealogy, chronology), antiquities, and topography; for very small areas, local folklore was used to distinguish one region from otherwise similar neighbors. On strictly etymological grounds, some geographers denied that chorography was part of geography; others, however, were more open to the apparently intuitive, but actually quite conventional, position that both dealt with the same object of study—the world in its spatial extent—but at different scales.[9]

Lesley Cormack has recently argued that "the three related branches of mathematical, descriptive, and chorographical geography" developed "each with distinct practitioners and different topics of investigation." She nonetheless concluded that geography "in all its guises was forced, *by its very nature,* to employ a methodology of incremental fact gathering," whether those facts were locations by latitude and longitude, social and economic data, or antiquarian-historical information.[10] A point Cormack does not build upon is that each of the three subdisciplines used maps to provide a mental image with which to organize the various observations and to define the limits of study. Chorography might have been the study of particular places without reference to a larger geographical realm, but the provision of a map of the area examined—which was standard after 1677—indicated a spatial ordering of data and the study's ultimate potential for aggregation into the larger geographic realm.[11]

By the end of the seventeenth century, the distinct scales of European cartographic enquiry were becoming so blurred that it was increasingly hard to discern any clear boundary between the two. This merger was effectively complete by 1750: geographic data were held to be conceptually scaleless so that the scale-based distinction between chorography and special geography dissolved.[12] Enlightenment geographers therefore adopted new criteria for classifying the scope of their subject. The

new categories of geographical knowledge reflected the objects of observation—physical as opposed to human features of the landscape—in accordance with the Cartesian dualism between mind and matter and the contemporary idea that the natural world is a stage for human action.[13]

Several times between 1752 and 1762, for example, Philippe Buache set out his "Idée Générale de la Géographie." This formal analysis of the purpose and content of geography distinguished between mathematical, physical, and historical geography, which is to say between the geometrical and astronomical processes of mapmaking (which I follow Eric Forbes in calling "mathematical cosmography"), the study of the terraqueous globe, and the study of all of the spatial aspects of human existence and history.[14] Again, in his eleven-volume *Neue Erdbeschreibung* (1754–92), which was highly popular in English translation, Anton Friedrich Büsching distinguished between "civil or political" and "natural" geography, with the latter comprising "mathematical" and "physical" geography. Modern historians have tended to give to Büsching's natural geography the name of its principal proponent, Alexander Humboldt, as in the "Humboldtian" project or science. A further indication of the new classification is Immanuel Kant's separation of "anthropology" from "physical geography" after 1772.[15]

When the East India Company's highly peripatetic officers examined South Asia, they accordingly did so with a very broad understanding of what features and aspects of the landscape ought to be studied. The clearest example of this breadth is the long list of itemized "heads of enquiry" issued by Colin Mackenzie to guide his assistants on the survey of Mysore (1800–1807). They encompassed all portions of geographic knowledge: immediately cartographic data (positions of and distances between towns and rivers); cultural information (languages, religions); social and economic information (population counts, legal codes, industries); as well as mineralogical, botanical, and zoological information (table 2.1). Similarly, Francis Buchanan was instructed to examine a very broad range of topics in Mysore in 1800–1801 (table 2.2) and in Bengal between 1807 and 1814 (table 2.3).

Such a wide-ranging scope was not some unattainable ideal. Mackenzie's assistant surveyors were able to gather much of the required information. On one occasion, Lieutenant John Warren left his survey of the eastern border of Mysore to follow up a rumor that gold had been discovered. He found quite extensive areas of gold-bearing earth that had long been mined by the local inhabitants; his report went into great detail concerning their methods and tools for mining and separating the gold, although there proved to be insufficient gold to warrant further

Table 2.1 Categories of Data for Colin Mackenzie's Survey of Mysore, 1800–1807

1. Modern names of the circar, pargana, taluk, or district to which each village belongs (also provincial designations if beyond Mughal subdivision into circars).
2. Ancient names of districts.
3. Names of capitals, cusbas, etc.
4. Distances in coss or other Indian measures along the road to compare with the measured road distances, so as to form a conversion factor from Indian to British measures.
5. Computed distances to significant places to either side of the route.
6. Names of rivers (ancient and modern), their confluences etc.
7. Names of remarkable hills, tablelands, ghats, passes, etc., plus their forests, minerals, and productions.
8. Remarkable springs, fountains, lakes, etc., and associated temples.
9. Most remarkable pagodas, which are especially important for examining revenues and land grants.
10. Languages spoken by the natives.
11. Remains of ancient structures and any local lore about them.
12. Modern history of the country, before and after the Mughal conquest.
13. History of the rajas, poligars, etc.
14. Extent of each pargana or taluk.
15. Districts belonging to hindu rajas.
16. "Productions of the country," including plants and the character of the soil.
17. Minerals, fossils, ores, etc.
18. Manufacturing and the arts.
19. Interior and foreign commerce.
20. System of government and revenue management.
21. Peculiar customs of the natives, and especially any differences of established customs.
22. Books and depositories of native learning.
23. Native legal codes.
24. Alphabets and the characters used.
25. Population of districts by caste, family, villages etc. (tolerable estimate only).
26. Land revenue under Hindus, although too complex for easy examination.
27. Prevailing winds, rains, seasonal changes, etc.
28. Diseases, remedies, medicines, etc.
29. Remarks on the aspect of the country in general, including sketches of the general outline of hills and ridges, with names and computed distances.
30. Animals (wild and tame) peculiar to the area.
31. Principal towns, forts, etc.
32. Positions determined by astronomical observations whenever possible.

Source: Colin Mackenzie, "Hints or Heads of Enquiry for Facilitating our Knowledge of the More Southerly Parts of the Deckan, 1800," ca. 1800, IOR Eur F/128/213 is an 1804 copy.

Table 2.2 Categories of Data for Francis Buchanan, Mysore, 1800–1801

1. Agriculture, "the first great and essential object":
   (a) esculent vegetables: kinds, modes of cultivation, implements of husbandry, manures, irrigation, use of machinery, use as food and fodder;
   (b) cattle and horses: breeds, modes of breeding, species used for draft, potential for improving other breeds;
   (c) farms: extent, tenures, price and payment of labor, as compared with those in Bengal, potential for improvement.
2. Natural productions of the country, "the next immediate object":
   (a) cotton, pepper, sandalwood, cardamoms: cultivation and trade, nature and extent, means of improvements;
   (b) mines, quarries, minerals, and mineral supplies: produce, modes of working, treatment and conditions of labor, potential medicinal qualities of mineral springs.
3. State of the manufactures: exports and imports, labor rates, etc.
4. The climate and seasons of Mysore: prevailing winds, effects of air on human body, areas of salubrity compared with the rest of India.
5. Forests: extent, nature and species of trees, modes of lumbering, etc.
6. "Condition of the inhabitants": food, clothing, habitations; sects, tribes, laws, customs, personal traffic, weights and measures, currency, and "such matters, in respect to their police, as may seem to you to have an immediate or particular tendency towards the protection, security, and comfort of the lower orders of the people."

Source: C. R. Crommelin to Buchanan, 24 Feb 1800, ¶3-8, BPC 14 Mar 1800 §3, IOR P/5/11.

interest.[16] This is, however, a fairly untypical example. The reports and memoirs produced by Buchanan, Mackenzie, and others were generally the result of far more prosaic geographical investigations. They typify the manner in which the British observed languages, economies, historical chronologies, geology, botany, and demography, all within an implicit cartographic framework. That is, geographical observation relied on social conventions and accepted topics for its choice of objects. Geographical observation implicitly constructs new knowledge based on the spatial distribution of phenomena, in which respect it is firmly rooted in the map and mapmaking, but observation itself is part of the larger knowledge discourses constituted by texts, maps, images, and statistical censuses.[17]

Systematic Observation: Vision Directed by Reason

The dominant epistemology of the eighteenth and early nineteenth centuries was strictly visual and mechanistic. By the mid-1600s, the *camera obscura*—the darkened, monocular box which captured images of the world—had been accepted as the dominant model for vision.

Sitting within its darkened interior, the viewer is defined as "isolated, enclosed, . . . autonomous" and "withdrawn from the world." A divide as discrete as the walls of the *camera* is established between the individual and the objectified, "exterior" world. The *camera* explained the functioning of the eye-brain system: vision captures the image and impresses it directly on the viewer's brain, just as images are thrown against the rear wall of the *camera*. Furthermore, the single aperture of the *camera* legitimated and authenticated linear perspective as the dominant concept of vision. The "awkward binocular body of the hu-

Table 2.3 Categories of Data for Francis Buchanan, Bengal, 1807–1814

1. Topographical account of each district: extent, soil, plains, mountains, rivers, harbors, towns, and subdivisions; air and weather; plus "whatever you may discover worthy of remark concerning the *history* and *antiquities* of the country."
2. "The condition of the inhabitants": population, food, clothing, habitations; common diseases and cures; education; poor relief.
3. Religion and customs of each sect or tribe; the emoluments and power enjoyed by priests and chiefs; potential sources of popular discontent.
4. "Natural productions of the country": animal, vegetable, and mineral, especially:
   (a) the fisheries: extent, operation, obstacles to improvement and extension;
   (b) the forests: extent and situation re water conveyance, species, value, improvements;
   (c) the mines and quarries: produce, manner of working, state of employees;
5. Agriculture, especially:
   (a) "the vegetables cultivated for food, forage, medicine, or intoxication, or as raw materials for the arts": modes of cultivation, value, extent, improvements;
   (b) agricultural implements: defects and advantages, potential for improvement;
   (c) manures and irrigation;
   (d) flood control and potential improvements;
   (e) the domestic animals: food, use in labor, value, possible improvements;
   (f) use of fences and their utility;
   (g) "the state of farms": size, expense, rents, wages, condition of laborers, tenures, possible improvements;
   (h) "the state of the landed property" and tenures.
6. "The progress made by the natives in the fine arts, in the common arts, and the state of the manufactures": architecture, sculpture, and painting; different processes and machinery used by workmen; relation of manufactures to locally produced raw materials; possible improvements.
7. Commerce: exports and imports, trade; regulation of money, weights, and measures; transportation of goods by land and water; possible improvements.
8. "In addition to the foregoing objects of inquiry, you will take every opportunity of forwarding to the Company's Botanical garden . . . whatever useful or rare and curious plants and seeds you may be enabled to acquire in the progress of your researches, with such observations as may be necessary for their culture."

Source: Robert Montgomery Martin, *The History, Antiquities, Topography, and Statistics of Eastern India* . . . (London: Wm. H. Allen, 1838, 3 vols.), 1: viii–x.

man subject" was replaced by the *camera* as "a more perfect terminus for [the] cone of vision."[18]

Vision was constrained as a strictly mechanical phenomenon that depended on the pregiven world of independent truth. Jonathan Crary quotes Nietzsche's summary of this epistemology: "the senses deceive, reason corrects the errors; consequently, one concluded, reason is the road to the constant; the least sensual ideas must be closest to the 'true world'."[19] Of all of the senses, sight was the most mechanistic, least sensuous, and hence was closest to truth. Sight's almost exclusive privilege as the means by which to know the world was only reinforced by the use of artificial technologies of vision. In addition to the *camera obscura* itself, telescopes and microscopes underscored the mechanical character of vision by enhancing human faculties and so allowing more of creation to be seen and examined. Vision could also be extended to encompass otherwise intangible and invisible attributes of nature by the use of measuring instruments, such as graduated rulers or thermometers. Measurement became a surrogate for vision and the natural sciences became progressively more instrumentalist after 1750.[20]

Eighteenth- and early nineteenth-century epistemology was thus rooted in a vision which, with its surrogates, established an almost physical distance between the viewer and the viewed, between the subject and the object of vision. That which is viewed is pushed away from the viewer into the external world of objects, an action exaggerated by the use of instruments to see and measure the "true world." Although the *camera obscura* and the mechanistic model of vision rapidly fell victim after 1820 to the more sense- and emotion-oriented issues raised by the Romantics, the Enlightenment's instrumentalist empiricism has remained a strong epistemological force well into the twentieth century.

But vision, while essentially truthful in itself, was inadequate. In discussing eighteenth-century concepts of vision, Crary makes a key distinction between the "spectator" and the "observer." "Spectator" bears the connotation of the passive witness who literally "looks at," in the original Latin meaning of *spectare.* The spectator does not necessarily comprehend his or her visual perceptions; indeed, cultural historians often link the spectacular to the exotic, strange, and unknown. In contrast, and again reflecting Latin etymology, observation (from *observare*) carries the extra connotation of "conforming one's actions to" or of "complying with," in the sense of observing rules, codes, conventions, and practices.[21] Observation is guided vision; the observer looks at the world in a controlled manner.

The Enlightenment's acknowledged guide to vision was "reason."[22]

A loosely defined concept, which accounts for its flexibility and power in Enlightenment thought, reason encompassed both logical procedures and the human mental faculty. It was held to be necessary for making sense of the phenomena an individual viewed. It was the viewer's reason that defined those objects worth noticing and those to be passed over. Guided by reason, the viewer can focus on those aspects of the physical and human environments worthy of remark. With reason, the viewer can make sense of his or her world; without it, the viewer remains mired in savage ignorance. The development of reason was determined by the individual's education: John Locke's arguments that the human mind is a *tabula rasa* waiting to be filled were widely accepted. Accordingly, because sight is a common attribute for all but a few humans, the distinguishing factor between classes and races was the quality of education and of reason (compared with the western European standard). This was of great importance for the British in India and for their understanding of how they differed from the indigenous populations. In particular, it contributed to the denigration of Indian education and mysticism, a topic I discuss in greater detail in Part Four.

Enlightenment thinkers accepted Bernard de Fontenelle's 1699 characterization of rational thought as an *ésprit géometrique.* Denis Diderot and Jean d'Alembert, the editors of the great *Encyclopédie* (1751–65), explained this phrase as meaning "a spirit of computation and of slow and careful arrangement, which examines all parts of an object one after another and compares them among themselves, taking care to omit none."[23] They also used the taxonomic schemes developed by Linnæus (Karl von Linné) and other botanists as the paradigm for geometric reasoning. Modern commentators have followed Diderot and d'Alembert's lead in using natural history as the paradigm of the manner in which a larger description of the world is constructed in an archive through numerous observations of the surficial aspects of natural objects. Perhaps the best known is Michel Foucault, who tied vision and reason together with the aphorism that "the blind man in the eighteenth century can perfectly well be a geometrician, but he cannot be a naturalist."[24]

The goal of natural historians was to identify each plant's structure, which is to say the composition and arrangement of the plant's visible parts. Their debates focused on which of those parts most properly define the character of plants and so allow them to be compared and classified. Most famously, Linnæus used the sexual organs of plants as a limited set of characteristics with which to define and categorize each specimen; this technique was the "System." In contrast, advocates of the "Method" deduced the requisite characteristics for categorization according to the empirical circumstances of each object being observed.

There could be any number of Systems, each artificially restricted to a small and rigid set of characteristics which would delimit observation; there was only one Method, utterly flexible, in which observation of each new object was guided by its character and the results of previous observations. Despite their procedural difference, both approaches required the construction of that larger description in the archive: "the differences of distance [were] factored out" as "one by one the planet's life forms were . . . drawn out of the tangled threads of their life surroundings and rewoven into European-based patterns of global unity and order."[25]

Nonetheless, the eighteenth century possessed a broader understanding of "systematics," in which the observer distinguished degrees of identity and difference between objectified phenomena. Eighteenth-century systematizers carried this classificatory project from the vegetable, animal, and mineral worlds into the realms, for example, of analytical geometry, mechanics, linguistics, and human society.[26] Thus Georg Forster, one of the naturalists on Captain James Cook's 1772–75 circumnavigation, opined that all scientific observers "should have the penetration sufficient to combine different facts and to form a general view from thence, which might in some measure guide him to new discoveries, and point out the proper objects of farther investigation. . . ."[27] The nature of that "general view," and the process of its construction, was explicitly cartographic. Albrecht von Haller, a critic of Linnæus described it thus:

> we perceive with precision from those which we do possess, those things which we lack . . . A theoretician of Nature acts like a land surveyor, who begins a map on which he has determined some locations, but lacks the positions of other places in between. [He] nevertheless makes an outline, and according to half-certain reports, indicates the remaining towns, of which he still has no mathematical knowledge. If he had made absolutely no sketch in which he combined the certain and uncertain [components] in one composition, then his work of determining more exactly the locations and boundaries which still remained would be much more difficult and almost impossible. Indeed, it would not be possible, because [the work] would have no coherence, and would constitute no whole.[28]

The Enlightenment conception of archive-construction was clearly shaped by a cartographic metaphor. Within the abstract space of the archive, each new observation could be located in its proper *place*. Furthermore, "white space" in the archive indicated gaps in knowledge, much as it was assumed to do on maps, and so indicated arenas for future investigation.[29]

Both Linnæan system-ists and the rival method-ists likened their final classifications to maps. Linnæus, for example, referred to his taxonomic system as the *mappa naturae,* the map of nature. Michael Adanson, the Method's initial proponent, used geometrical and cartographic metaphors for the process of classification, treating vegetable species as if they were landed property demarcated by sharp boundaries: "find the most sensible point that establishes the line of separation or of definition between the family of Scabiosa and that of the honeysuckle."[30] More generally, Ephraim Chambers called his 1728 classification of the various branches of human inquiry a "map of knowledge," while Diderot and d'Alembert described the *Encyclopédie* as "a kind of world map." The construction of maps and the prosecution of substantial surveys was thus widely recognized as exercises in the systematic ordering of observations to create a new knowledge, whether in the office or in the field.[31]

The reference by von Haller to the manner in which the surveyor, or systematist, makes half-certain reports certain is of central importance. The employment of reason was widely acknowledged as the method to remove the errors which, in practice, affected individual acts of observation. Astronomers and surveyors, for example, recognized that there was a degree of uncertainty in their measurements of the world, but they believed themselves able to submerge the uncertainty beneath the certainty of systematic analysis. The dramatic improvement in measuring instruments over the course of the eighteenth century led to the increasingly sophisticated mathematical modeling of observations, but this did not displace the basic assumption that there is a kernel of truth common to all observations of a phenomenon, and that the truth can be revealed through the comparison and mutual reconciliation of those observations.[32] Systematic analysis—reason—was sufficiently flexible to handle any flaws. The geographer in the field might be unable to observe a phenomenon or might wish to record information which cannot be actually *seen.* In either case, the geographer then had to rely on indigenous informants who were treated as if they were themselves mechanical instruments or self-propelled *camerae obscurae.* The British prefaced information from a single informant with the same statements which preface the use of instruments and which affirm the quality and worth of the instrument. Information from many informants was subjected to a process of corroboration and combination to derive singular facts.

Without the reasoned combination and comparison of observations, the communal archive could only remain an incoherent and incomprehensible mass of trivia. There could be no knowledge without reason.

Chapter 3 provides a more detailed analysis of the logical system which underlay the construction of the geographic archive of British India while the remainder of this chapter focuses more on the conventions of observation in the eighteenth and nineteenth centuries and on the presumed autonomy of observed facts.

The conventionality of observation was acknowledged to some degree by the educated elite of the eighteenth and nineteenth centuries. They recognized, with such a highly visual epistemology, that any properly educated individual, who would therefore reason properly, would be able to make trustworthy observations about any subject of interest. Colin Mackenzie, the first surveyor general of India, justified his own historical researches in such terms:

> That science may derive assistance, and knowledge be diffused, in the leisure moments of camps and voyages, is no new discovery; but . . . I am also desirous of proving that, in the vacant moments of an Indian sojourn and campaign in particular (for what is the life of an Indian adventurer but one continued campaign on a more extensive scale), such collected observations may be found useful, at least in directing the observation of those more highly gifted to matters of utility, if not to record facts of importance to philosophy and science.[33]

Mackenzie presented the contemporary conception of knowledge creation as an inherently genteel enterprise. Like other Company officials who came from humble origins, Mackenzie consciously emulated, if not exaggerated, the conventions of his higher-class patrons in order to demonstrate the extent of his learning and therefore his suitability for social and professional advancement. Yet neither Mackenzie nor his colleagues recognized those conventions as being in any way artificial.

When it came to examining the physical and human features of South Asian landscapes, the Company's officials all adhered to a common set of epistemological assumptions and practices. Most particularly, the British believed that their sketches and descriptions were true and correct replications of the environment. But the sketches they drew were not realistic illustrations; the maps they constructed did not mimic the landscape. The British only thought they did. In practice, their examination of the landscape was thoroughly ideological in character. Their very ability to observe and survey was a direct outgrowth of their military, economic, and political power. Each instance of observation was backed by the desire to improve India. The British engineer-surveyor looked at Indian landscapes as a surgeon looks at his patient, as an item to be thoroughly investigated, measured, and prodded so that maladies and imperfections might be identified, understood, adjusted, controlled, and so cured.[34]

Plain Observation: The Scientific Gaze

The manner in which the British looked at the Indian landscape, its features, and its elements was conceptually akin to the way modern states examine and discipline their populations. The purpose of discipline is to create order from social chaos through the rigorous partitioning and hierarchical structuring of society, of time, and of space. The general manifestation of the disciplinary gaze is the examination—Michel Foucault's "ceremony of objectification"—in which individuals are compulsorily visible to those higher in the power hierarchy; examinations are generally repeated, continual, and accepted by all concerned as a basic fact of life. Thus soldiers parade daily before their officers; hospital patients submit themselves to examination by doctors and nurses. The examination creates an archive of documentation through which each individual is described. That archive enables and requires individuals to be compared with each other, a process which establishes them as members of a larger population. Indeed, examination *creates* individuals. It extracts them from the mass one by one and monitors them for any abnormalities. After examination, and after any deviations from the norm which might have been identified have been cured, the individual is reinserted into the mass. The mass itself is therefore created by the sum of all examinations.[35]

The basis of all of the empirical sciences, including geography, is thus examination and investigation. The analogy between social examinations and investigations of the natural world is not perfect. To begin with, the landscape is not animate and cannot be aware of being observed. Foucault's concept of discipline requires that awareness to ensure the subject's obedience and subordination to state power. A further difference is that the empirical sciences invert the respective movements of the empowered examiner and examined subject. By and large, the examiner is stationary as the subjects parade before them. But to examine the world requires the examiner to move purposefully through geographic space and the stationary objects of observation. In 1807 and 1816, for example, Alexander Johnstone "made two journies [*sic*] by land for the express purpose of inquiry *on the spot* into the history, religion, laws, and customs of the Hindoos in the southern peninsula of India."[36] Even so, the manner in which the British *looked* at South Asian geography was as empowered, as privileged, and as concerned with identifying deviation and abnormality as the discipli-

nary gaze of the doctor or judge. "Gaze" is used to reflect the "prolonged, contemplative" act of observation that regards "the field of vision with a certain aloofness and disengagement," which is characteristic of discipline.[37]

In looking at India, the British employed two principal gazes: the scientific gaze, whose analogous individuals are a wide array of plants, animals, rock outcroppings, whole vistas, and cultural artifacts; and, the aesthetic Picturesque gaze, whose analogous individuals are landscapes. The analogy between the Picturesque and disciplinary gazes is actually quite close: if the view at hand (at eye?) failed to meet the established Picturesque norms, then the observer could alter (that is, cure) the view in its graphic representation until it agreed with those norms. Overall, the various "natural" gazes replicate the power relations inherent in social discipline. The act of observation embodies the observer's physical (military, political, gendered) power over the observed; it also embodies a moral power in that it defines and creates and normalizes the observed.

Barbara Stafford has intensively explored the character of the "scientific aesthetic of discovery"—the scientific gaze—during the period of 1760 to 1840. She explicitly distinguishes it from the aesthetic "concurrently espoused by the followers of the Grand Tour or mere seekers after Picturesque scenery." The scientific gaze was the examination and graphic reproduction of landscape views and of the features of the natural landscape. It was concerned with recording the facts of the external world. It was justified philosophically by two epistemological assumptions: that an exact image of the real world is impressed onto the mind; and, that the viewer cannot help but be "intently engaged by the aggressive identity of a particular object." The scientific gaze dealt not with the general, but with the individual and particular. It did not glide over each object, or the landscape as a whole, but instead was highly focused. The products of the scientific gaze were "plain" and in the same factual style which the scientific report possessed. The graphic products of the scientific gaze were expected to be incorporated into written texts: writing was inherently flawed and one needed to replicate visual observations to complete the presentation of the objects described.[38]

The goal of the scientific gaze is to see, and to record, the world as it is, which of course entails an ontological imposition on the world. The world is considered external to the viewer. The graphic results of the scientific gaze, whether they be of the landscape itself or of a particular object within the landscape, adopt a specific bifurcation of space between foreground and distant panorama. Highly focused images of

specific objects stressed the foreground, and often ignored the background altogether (see figure 2.3). This style of graphic was the common form for architectural drawings. Figure 2.1 is a typical example from Colin Mackenzie's collection of drawings: an 1812 rendering of a temple in Java. Alternatively, those images with a larger compass place most emphasis on the distance and play down the foreground. Both forms of representation draw the viewer's attention to the object of study; there is no ambiguity as to what the illustration is about. At the same time, the images serve to hold the viewer at a distance and to keep the viewer separated from the external world represented.[39]

The scientific gaze claims to be a naturalistic gaze which, when the object of the gaze is the landscape, creates "topographical drawings." The ability to make topographical drawings, to portray physical features in a precise and correct manner (with or without the use of instruments like the *camera obscura*), was an ability expected of any well-educated individual of the upper classes. It was a prized skill for army and engineer officers and featured prominently in the military education of the period, where it was closely allied to mapmaking and reconnaissance. The first superintendent of the British Royal Military College (founded in 1799) held that "everything which is put down in writing of necessity takes on some colour from the opinion of the writer. *A sketch map allows of no opinion.*" One reason for a similar academy created at Madras in 1804 was the conviction that it was only by observing and reproducing the landscape that young officers could obtain a proper "knowledge of the ground," which would, in turn, give to their maps "the character of truth" when drawn with "the plainest method and stile [*sic*] . . . equally distant from . . . gaudy coloring and miniature elegance as from undistinct roughness."[40] Indeed, it is the map-like quality of "naturalistic" landscape views—their evident empirical truth and unambiguous representation—which has lead art connoisseurs to lump them together into a single and artificial category of topographical drawing, which can then be derided for lacking creativity and artistic sensibility.[41]

Stafford insists that the topographical drawings produced by the scientific gaze are antithetical to the "artistic" landscape images of the Picturesque. This assertion might be read in part as a reaction to the connoisseurs' cultural elitism. She might also be read as actively denying the ideology that permeates topographic views. The estate view, focused on the manor with home farm and property spread about, was as ubiquitous and as obviously celebratory of landed values as the large-scale estate map. More subtle in its ideology was the British genre of "rustic" landscapes, which have often been derided as "realist," but

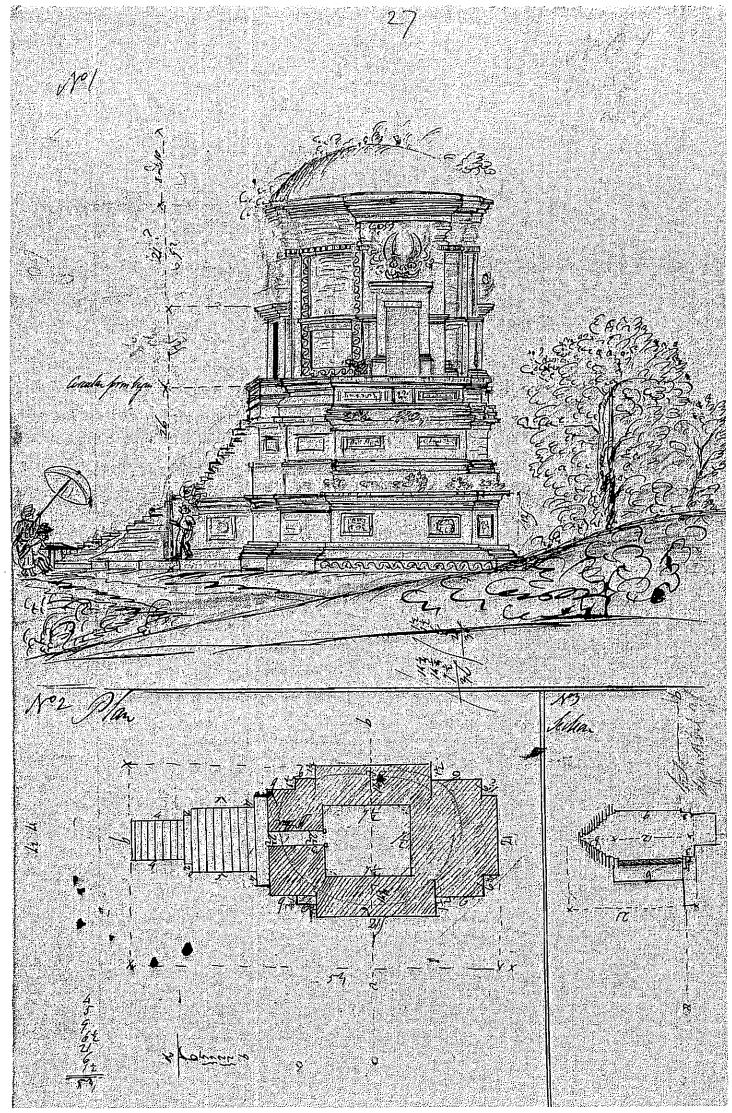

Figure 2.1 Untitled manuscript sketch (ink over pencil) of the east face, floor plan, and vertical section of a temple in Java, 1812, from the Mackenzie collection of drawings. Note the European officer sketching at left, and the pole-bearer in the front providing scale for the officer and making explicit that the various dimensions did indeed come from actual measurement. IOR prints WD 913 is a more polished and less immediate version (partly colored) of the elevation. (By permission of The British Library, IOR prints WD 914.)

which, Ann Bermingham has demonstrated, presented "an illusionary account of the real landscape while alluding to the actual conditions existing in it." Again, Hugh Prince has argued that all of those few landscape views of *named* locations in Britain (excluding estate portraits) which possess identifiable topographic features nonetheless constitute idealized representations of harmonious and ordered rural communities which ignored the economic, social, and technological turmoil that those communities actually experienced. Most fundamentally, the claim to possess a realist and naturalistic view is itself an ideological statement of power.[42]

Landscape Observation: The Picturesque Gaze

Connoisseurs and academic artists at the turn of the eighteenth century recognized how mapping complemented the landscape view, but they considered mapping and topographic views to be "too indelicate a display of power." In contrast, the aesthetic of the Picturesque offered a more refined, subtle, and delicate manipulation of nature through the dominant visual epistemology.[43] The etymology of *picturesque* refers to the idea that a natural scene or object will be more aesthetically pleasing if it deserved to be part of a composed picture, such as the elements of a still-life; such objects were "like a picture." By 1800, Picturesque-with-a-capital-P had come to be almost exclusively applied to landscape and had been codified with a very specific set of rules.[44]

The Picturesque aesthetic blended the themes of Roman pastoral poetry with the style of Italianate landscape art. The former were part of any genteel Englishman's education; the latter was popularized by the aristocrats who embarked on the Grand Tour. Idealized landscapes emulated Claude's Arcadian scenes, halfway between civilization and wilderness, peopled by carefree shepherds and their flocks, as in Virgil's *Eclogues;* or they emulated Poussin's landscapes, improved by the labor of honest rustics guided by gentry in honest retirement from urban life, as in Virgil's *Georgics* and Horace; or they emulated "savage" Rosa's wild scenery. Despite their various subject matter, the Italianate landscapes shared some important compositional characteristics. They were executed in mellow browns, deep greens, and golden yellows and were bathed in a glorious, yet "improbable Italian light." They shared the same structure, derived from the theater stage. In the foreground was the staffage, the idle gypsies and beggars, georgic rustics, shepherds, and so on, who served to enliven the image; the foreground itself was darkened, the result of the shade cast by the trees or ruins which framed the image like the wings of a stage. The result was a *repoussière*

effect that forced the eye to focus on the brightly illuminated middle distance wherein is placed a city, castle, church, or other item of interest. Beyond the middle distance is the background, often indistinct and dominated by the golden sky at the horizon. These conventions were steadily augmented through the eighteenth century by more overtly nationalistic elements. The skies became damper and more clearly British; the classical ruins were replaced by ruins of churches and castles from Britain's medieval past; the high perspective of Claude was lowered to bring the viewer into the image, although this eased the strict differentiation between the three grounds; finally, the subject matter became increasingly wild and decreasingly georgic and arcadian.

The intention of the Picturesque was for each landscape to elicit emotional responses from the observer. Medieval ruins (castles and abbeys) were already established in British landscape art for sentimental, antiquarian, moral (*memento mori*), and political-historical reasons; now the Picturesque used them for the "pleasing melancholy" induced by their consideration. Alternatively, wild scenery and mountains could be expected to impress on the beholder the "agreeable horror" of the sublime, especially when mountains were drawn from a low perspective so as to increase their bulk and imposing character. Both ruins and wild scenery were rough, never smooth, so that the artist could employ a free and bold touch in contrasting colors and tones, all to achieve the desired aesthetic effect.

The Picturesque was not limited to the studio artist's creation of idealized landscapes. It required the active application of its precepts to nature: the tourist went in search of Picturesque landscapes. Stimulated by art and directed by detailed guidebooks, the British gentry who could not afford the Grand Tour through Europe instead toured Wales, Scotland, and the English Lake and Peak districts in search of the Picturesque, so that they might appreciate it and draw it for themselves. Yet the Picturesque was an ideal and could only be uncovered by *art*, which is to say by human agency and the active creation of the Picturesque by the observer. Mellow colors could be attained with tinted glass or the Claude Glass, a distorting mirror which brought the foreground into prominence. Guidebooks and maps informed the tourists of the best routes to take so that they might be sure to experience dramatic vistas; the Picturesque was to be appreciated all the more when suddenly impressed on the anticipating mind. The guidebooks gave precise instructions for where to stand and in which direction to look so as to see the most Picturesque view. The guides also instructed the tourist in how to modify that view in their own drawings in order to enhance their aesthetic value: smooth mountains and ridges became

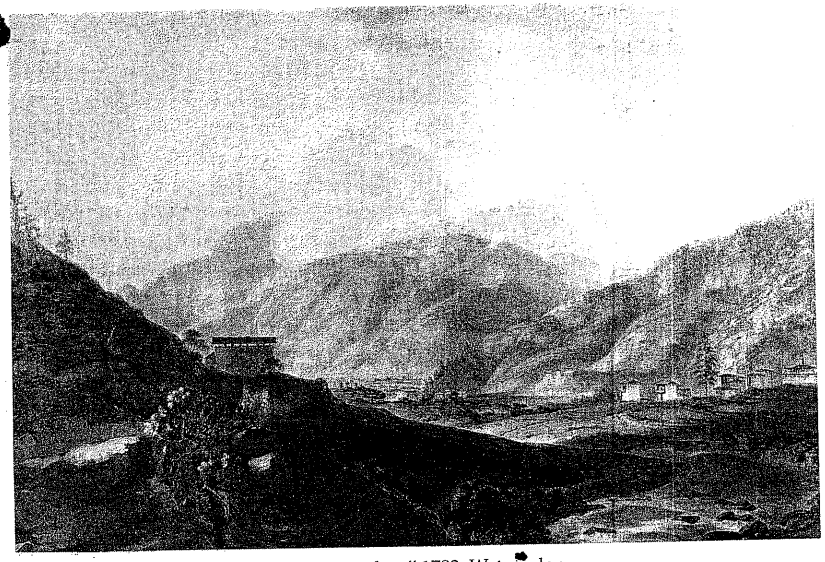

Figure 2.2 Samuel Davis, "Near Tacisudon," 1783. Watercolor.
Michael Aris, *Views of Medieval Bhutan: The Diary and Drawings of Samuel Davis, 1783* (London: Serindia Publications; Washington, DC: Smithsonian Institution Press, 1982), p. 11, makes the mistaken assumption that because Davis was a draftsman and surveyor, his views were accurate and naturally Picturesque: "the tone of his writing is secular and his art possesses a clear naturalism, neither of which are conducive to false dreams . . . even behind the reworkings aimed at the nineteenth-century public one senses the sober, open eye of Davis." (By permission of The British Library, IOR prints WD 3269.)

rugged, and cliffs and ruined walls were foreshortened to tower menacingly over the viewer; trees were sharp and angular, smooth buildings were turned into rough ruins.[45]

The British found the Picturesque to be a perfect intellectual tool for imaging the landscapes of South Asia (figure 2.2). It is true that very few British tourists went out to India during the Company period. Only viscount Valentia, accompanied by his secretary and draftsman, Henry Salt, used India for an aristocratic Grand Tour, in 1803–5. Again, William Hodges and Thomas and William Daniell were the only professional artists to tour the country in order to paint landscapes, doing so in the late eighteenth century. There was always far more money to be had painting portraits and historical-dramatic scenes, and that required the professionals to stay close to their clients in Bombay, Madras, and especially Calcutta.[46] On the other hand, the duties of many Company's

officials were of a peripatetic nature. Other officials emulated the tours of mountainous Britain by making tours of conquered territories, usually in the northern plains and the foothills of the Himalayas. And as they moved across a strange land, as they observed new sights and landscapes armed with an educated taste for Picturesque scenery, the British recapitulated the Picturesque traveler who sought that elusive view which might be captured before passing on, ultimately to return to the comforts of civilization where those landscapes might be appreciated and remembered at leisure.[47]

In reviewing British travel literature in India, Ketaki Kushari Dyson found innumerable "verbal vignettes celebrating the beauty of mountains and valleys, hills and forests, corn-fields and rivers," and which were couched in the jargon of the Picturesque. These vignettes were in direct opposition to the general disparagement by the British of smooth and unending plains. The inclusion of "corn-fields" in Dyson's list might appear incongruent, except that the picturesque did encompass arcadian and georgic sentiments as well as those of the wild sublime. The naturalist and geographer Francis Buchanan, for example, seemed only to have noticed the landscape through which he passed when it was well-farmed, prosperous, and the epitome of *improved* agriculture.[48]

For the British, India was "naturally" Picturesque. One reason was that the key terms of the Picturesque aesthetic had become hackneyed clichés by 1800. It was *de rigueur* to use "picturesque," "sublime," or "romantic" when describing any landscape, even industrial ones. The realist and Picturesque views merged in India because the subcontinent seemed to possess all of the required elements for properly Picturesque views. The dark, evergreen flora and dusty brown plains eliminated the need for the Claude Glass. The luxuriant, jungle vegetation and lofty, jagged mountains provided wilder and more sublime scenery than any which might be constructed in the increasingly tamed British Isles. Much of the architecture was not smooth and seemed to the British, even when intact, to be crumbling before their very eyes. The ruins were as aesthetically and morally redolent as any ruined church or castle. When published in London, the picturesque views of India appealed to a much broader audience than just the "Anglo-Indians," as when Colonel Charles Forrest's *Picturesque Tour along the Rivers Ganges and Jumna* (London: Ackermann, 1824) was advertised as the companion to the same publisher's *Tours of the Rhine and Seine*.[49]

An example of the aesthetic shared by the British in India is provided by William Lambton, founder of the Great Trigonometrical Survey. Lambton kept a journal of the march in 1799 of a large British army column through newly conquered Mysore. The journal contains several very self-conscious and revealing statements of aesthetic principle

which seem to have been intended to impress his noble-born superiors and patrons with the extent of his education and cultural erudition. (The surviving copy of the diary is found in the papers of Lord Wellesley, governor general of India, and elder brother of Lambton's regimental colonel, the Hon. Arthur Wellesley, who also commanded the column; both brothers were Lambton's patrons.) Two comments in particular illustrate a conviction that it was unnecessary to manipulate or even create any landscape features because India was inherently picturesque: "the scenery the whole way is wild and sublime; and to those irregular features of nature, which constitute the picturesque, is added, the ruins of art seldom introduced into landscape painting"; and "the numerous flocks and herds which are scattered in all directions, give a rural sweetness to the face of nature, and the Mysore [country], like antient [*sic*] Arcadia, both from the mildness of its climate, the variety of its beauties and the simplicity of its native inhabitants (Gentoos), may afford abundant subjects for pastoral poetry."[50]

The Picturesque conventions were slowly naturalized in India. Many people in Britain had already succumbed to the hegemony of visualism, assumed that Picturesque views were *supposed* to be realistic, and so criticized the guidebooks because the illustrations were not true to nature.[51] Their "double desire to be professionally accurate while being artistically conventional" in their landscape images did not pose as much of a problem to the British in India as it did in other parts of the empire.[52] They treated their Picturesque landscapes as possessing the same characteristics of accuracy and objectivity as might be expected of a view made for military or architectural purposes. They "claimed their work to be . . . the communication of facts."[53]

The Indian Picturesque was an imperial Picturesque. No statement expresses India as a site of naturally occurring beauty, to be appropriated and enjoyed by the British, better than this by the Daniells:

> Science has had her adventurers, and philanthropy her achievements: the shores of Asia have been invaded by a race of students with no rapacity but for lettered relics: by naturalists, whose cruelty extends not to one human inhabitant: by philosophers, ambitious only for the extirpation of error, and the diffusion of truth. It remains for the artist to claim his part in these guiltless spoliations, and to transport to Europe the picturesque beauties of these favoured regions.[54]

But the British did not find a naturally Picturesque landscape in India: they created it in line with the highly selective and appropriative nature of the Picturesque aesthetic.

The reverend William Gilpin, the first theorist of the Picturesque, ex-

plained the key principal in 1801. "Magnificent nature," he wrote, is the "grand storehouse" of all "picturesque ideas," yet it is the human eye which must add the "little requisites" of artistic forms, such as light and the balance of foreground, which make a scene into a picture. "Nor do we depreciate nature, but exalt her. With an open hand she gives us corn; but she does not condescend to make a loaf." Reacting to the order and structure imposed on nature by European culture, the Picturesque did not hesitate to perform its own improvements and turn the raw ingredients provided by nature into consumable form. The Picturesque gaze was highly selective. It ignored the "succession of high-coloured pictures," which the tourist is normally subjected to, until the "transient glance" suddenly and unexpectantly revealed "a good composition," at which point Gilpin would give "any price to fix and appropriate the scene."[55]

Landscape had become a commodity to be defined, acquired, and consumed by the observer. The Picturesque gaze was, moreover, an inherently elitist and class-based aesthetic; it was an educated taste. Its possession was the hallmark both of gentlepersons, who were confident of their social position and their natural right to own and to shape the land and its products, and of social climbers like Lambton who asserted their right to such status. The Picturesque secured titillating representations of nature that could only be enjoyed by the elite, because only they were properly versed in the conventions. The Picturesque reinforced the elite's comfortable self-perceptions as the owners and controllers even of wildest nature; it brought that nature into their homes and libraries and personalized it. The Picturesque gaze constituted a process of examination, an act of discipline, in which the natural world is viewed, represented, and through that representation is cured and improved.[56]

This was the aesthetic gaze which enabled the British to create Indian landscapes. The smooth and regular geometry of Islamic architecture could be negated by the proper perspective, by the addition of strategically placed trees to break a smooth line, or by the total falsification of a landscape element. When Hodges painted the tomb of emperor Sher Shah (reigned 1540–55), he gave the surrounding rectangular tank an uneven edge in order to redefine the nature of the tomb. No longer isolated and detached from its environment, as intended, the tomb was represented as an integral element of the whole landscape.[57] Mildred Archer has remarked how the many landscapes drawn by British engineers and surveyors in the field all possessed the same elements: their shadows are sepia-washed, while "some interesting feature occupies the middle distance and the foregrounds are enlivened with small

figures or animals." Like the Picturesque itself, these drawings have achieved their own formulae and conventions. They are highly selective and manipulative in their content. The frame, the subject matter, the coloring (sepia for that favored mellow brown tint), the composition of three grounds . . . all collude with each other to provide a uniquely British form of description and landscape conceptualization.[58]

Members of the British elite observed an alien land with a common technology, bringing it into comprehensible and personalized forms. In its imperial manifestations, the practitioners of the Picturesque might have thought themselves to have been innocent and "guiltless," but the necessary effect was to draw a divide between the rulers and the ruled, between the rulers and the land, and thus contributed to the developing logic of empire. There was little that was genteel about the gaze in its imperial setting. Most Company officials who engaged in landscape painting were concerned with examining, disciplining, and improving India. They were up-country magistrates, district revenue collectors, army officers on station, engineers building roads, and, especially, officers undertaking cartographic surveys. All these "adventurers" who embarked on "an Indian sojourn and campaign," as Colin Mackenzie expressed it, constructed a particular view of India based on their power over it. "To be a European in the Orient," writes Edward Said, "*always* involves being a consciousness set apart from, and unequal with, its surroundings."[59]

Whatever their claims to naturalism or creativity, British representations of the Indian landscape resulted from an objectifying and appropriative examination. The scientific and Picturesque gazes, and the geographical gaze which depended on both, created power relationships regardless of the political context. Western culture has traditionally drawn an analogy between the inequalities of observation and the gendered inequalities of society. Several commentators, notably Gillian Rose, have remarked on the manner in which nature has been feminized by European culture since the Renaissance. In an imperial setting, the construction of the subordinate Other as feminine is simply all the harder to overlook and ignore.[60] The gaze, or concerted observation, is always appropriative, domineering, and empowered.

Geographical Observation and Narratives

The difference between the scientific and Picturesque gazes is one of conceptual scope. Individual objects that were the focus of examination were represented in the plain style of the scientific aesthetic. Even for the large vistas of topographical drawings, the artist's gaze has a definite

focus, be it a mountain, a field or farm, or a manor house. Entire landscapes were constructed through the Picturesque aesthetic. Whereas Stafford might set the two gazes in opposition, they provided basic and complementary tools for the British geographical investigation of the human and physical landscapes of South Asia. Wielding those gazes, a diverse group of Company officers examined different aspects of India and placed their observations in a spatial context. Just as natural historians placed each new plant observation within an artificial space of botanical taxonomy, so geographers placed each observation of the land into the larger spatial framework. Geography requires an *overview* that subsumes and supersedes the individual *view*. That overview is the communal image of space constructed through maps.

It was not necessary for geographical observers to construct maps themselves: observations are spatially recontextualized as long as the observer has a mental image of spatial structures. That mental image comes from two sources. First, it derives from the geographer's cognitive and social reading of maps, which establishes a much broader image of spatial features than direct personal experience can provide. Second, the manner in which geographers move through the landscape means that each observation is automatically placed in a position relative to all other observations. That is, each observation can be tied, in principle, to a specific place on the geographer's route. The route can be fitted into that larger framework, thereby tying each observation into an absolute space. As the gazes themselves are inseparable from the images they produced, so geographical observation is inseparable from the geographers' narratives.

In the following discussion of geographical observation and narratives, I refer extensively to a particular example: the account by Henry Walters of his excursion into the Khāsi Hills in October and November 1828. I use this example because Walters was neither a surveyor nor an explorer of territory hitherto unknown to the British. He nonetheless employed the rhetoric and technologies of the geographer. He was a judge who served in India between 1813 and 1838. In traveling from Dacca to preside over sessions at Sylhet in northeast Bengal, he took advantage of the peaceful relations between the British and the Khāsi rajas to leave the plains and play the tourist. He spent a fortnight in the hills, always on or near the road the British were then building across the hills to link Sylhet with the recently annexed province of Assam. There is no indication that Walters intended to publish his account of his journey: it reads like a personal account sent to a friend and would probably not have been printed in the *Asiatic Researches* were it not for the raja of Nongkhlao taking up arms against the British in April

1829. The Khāsis were still undefeated in 1832 when Walters's account appeared in print as a source of information on this hitherto enigmatic people. Walters's essay accordingly presents the viewpoint of the middle tier of personnel in India.[61]

Walters's account is a geographical narrative, a list of observations structured chronologically and therefore spatially. For each day, Walters lists the routes taken and describes the landscapes he passed through. He mentions the various economic and social activities of the Khāsis, as he saw them. The narrative structure of the account indicates a familial relationship with the hugely popular literary genre of travel and exploration accounts. Indeed, borrowing on that popularity, geographical narratives were preferred over more systematic texts for the popular writing of geography. When, for example, Alexander Gerard sent his hundred-page account of Kunawar—or Kinnaur, the Himalayan valley of the Sutlej River—to a family friend in the late 1830s, he described his manuscript as being "a description of the country, without any narrative; so perhaps it would not interest you." The friend's response was to edit both the account and Gerard's narratives for publication, thereby gaining the best of both worlds.[62]

The relationship between the geographical and other travel narratives was collateral, and not fraternal, in nature.[63] The character of the general travel narratives have recently been examined by Paul Carter. Perhaps their key characteristic is that they are written very much in the first-person. This self-referential quality transforms an erstwhile travel account from the record of traveling into one of stopping places and of the conditions under which writing was possible. The autobiographical character of the travel narrative leads to the inclusion of much personal matter. For British travelers in India, there are descriptions of the writer's British hosts and acquaintances, of their characters, and of the circumstances of their lives in India. Indians are recorded both as individuals and as depersonalized, generalized "natives." Travelers' diaries stress novelties; this is certainly the case with the explorer's account. The quotidian circumstances of travel and exploration, for example, are downplayed; they might be prominent at the start of a narrative, but references to them rapidly disappear from the narrative once the newness of travel wears off. Travel diarists did establish a distance between themselves and the objects and events they recorded, but that distance is permeable and recognized to be so within the narrative itself.[64]

There is much overlap between geographical and travel and exploration narratives. It was impossible to write a purely geographical narrative without being influenced by at least some of the features of the

dominant literary form. Accordingly, Walters's account did have some of the character of a general narrative. He included, for example, the funeral description obligatory for all European travelers in India and he accompanied it with similarly stereotypical observations on the Khāsis' "most perfect indifference" to death (27 Oct.).[65] Even so, he couched this description in the objectivity of empirical observation. He did refer to himself in the text, but only in reference to personal acts of seeing and reasoning: "My eyes opened . . ." (1 Nov.); " . . . and I imagine" (3 Nov.); " . . . some of which I collected" (4 Nov.). However, he depersonalized the acts of his traveling with an idiosyncratic syntax which omitted the personal pronoun; the account begins with "Left *Dacca* on the night of the 19th October 1828 . . ." and is riddled with similar statements, such as "After some trouble succeeded in making a start . . ." (27 Oct.), or "Rose by moonlight this morning . . ." (28 Oct.).

Geographical narratives are distinguished from the more common travel and exploration accounts because they reject self-reference. Geographical observation was turned outward from, not in toward, the British self. It was the textual equivalent of the purely mechanistic vision that creates an unassailable distance between the observer and the observed, between (in India) the Company official on the one hand and the Indians and their land on the other. Geographical observation focused on not the new and novel but the everyday and common in order to classify all aspects of a region. The geographer's comprehensive overview of each region had to incorporate all occurrences of even the most mundane features. Geographical observation passed beyond the "primary discoveries" that fill the explorer's account and concentrated instead on the "commonplace, secondary associations." There was a gender difference between the narratives: geographical (and exploration) narratives were universally the products of male writers, whereas a significant portion of the travel literature was written by and for women.[66]

The geographical narrative is characterized by the empiricist rhetoric of observation. Throughout his narrative, Walters matched motion with observation with statements of fact. In doing so, he proclaimed that his statements were correct and trustworthy from being based on actual empirical observation. He had gone into the landscape and had *seen* for himself the facts that he now presented. He made no distinction between the observation of landscape and the observation of material activities. Thus, at the village of *Surarím:*

> passed over a coal region, the coal cropping out of the ground—road tolerable so far. Here iron-smelters reside—entered one of the forges, the bellows are curious, and are worked by women, who stand on the top, and move them with their feet; the furnace is made of clay, hooped with iron: the ore is broken into small pieces, and put into the furnace with charcoal—the iron melts and runs out at the bottom, it is then taken up and cut into large lumps for exportation to the plains. It is very good, and is used for all purposes in this part of India. (30 Oct)

It is reasonable to expect that Walters did indeed glean much of his information *en route* and from single instances of direct observation. Only the more generalized statements seem to depend on a much broader knowledge base, yet they were nonetheless encompassed by Walters's rhetoric of vision so that they too acquire the privileged quality of empirical data. This tension between the representation and process of observation is most acute when Walters turned his attention to Khāsi society and culture:

> The *Cásias* are a stout athletic race; fair, as compared with the inhabitants of the plains, and with muscular limbs. They are devoted to chewing *paun* and betel, very fond of spiritous liquor, and eat and drink whatever comes their way. In religion they follow some of the *Hindu* customs. They have no written character, and their language is different from that of the *Garos* and other surrounding tribes; they all appear to be but different dialects of the same original language. Theft is unknown among them, and they are true to their word. In moral character, they tower, like their mountains, over the natives of the plains. They always go armed either with bows and arrows, or long naked iron swords. . . . Their houses are surrounded by yards fenced with neat stone walls; and the villages are usually erected on the side of a hill, the houses rising one above the other. Property descends to the nephew of the occupier, by his sister. They are governed by numerous petty Rajas, who exercise but little control over them. On all occasions of importance, the Queen Mother, and the elders of the tribe, are consulted, and nothing can be done without their consent. Their pigs are a small handsome race, like the Chinese; their cattle large and sleek, and in good condition, the pasturage on the hills being excellent. (27 Oct.)

By recording these statements on diverse topics *en masse* under a single day, Walters implied that they were all based on information derived in a single session of observation. He juxtaposed the observable (the Khāsis go armed, they build walls, they are stout, etc.) with the unobservable (matrilineal inheritance, political structures, religious observances, linguistic relations, etc.). The result was a rhetorical presentation of all information, no matter its source, as being trustworthy and true.

Walters's reliance for knowledge upon local informants was glossed over and submerged beneath the rhetoric of his personal, reliable, singular, and correct observation.

In classifying and categorizing the phenomena encountered, the geographical observer relied very much on their observed, superficial characteristics. As might be expected, this strategy is most apparent in his notes on natural history, in which he constantly identified specific plants and minerals:

> The cinnamon tree grows here wild—the leaves and young branches are exported to the plains for sale. Also a species of holly is found; in fact, here is an ample unexplored field for a Botanist—also for a Mineralogist. I procured some specimens of the coal, and of other rocks. (4 Nov.)

Part of the distinguishing and classifying process involved appeals to what was known. In recording the few occasions when something reminded him of Britain, Walters intimated how *unlike* Britain were the rest of the phenomena he observed.

Walters's urge to classify is also apparent in his antiquarian and ethnographic descriptions. He categorized the many stone funerary monuments erected by the Khāsis, compared them with the megaliths of Britain, and suggested that British cromlechs originally served the same funerary purpose. He allayed his personal unease with such a radical idea with an appeal to epistemology. Are not any doubts concerning the purpose of the British monuments, he asked, "dissipated *by observation*, as to the actual use of similar monuments in this country at the present day?" (3 Nov., emphasis added). Furthermore, the erection of monuments constituted a characteristic by which the Khāsis were to be distinguished from other Indian groups. The equivalence of surficial form with function allowed Walters to equate the hillmen with the ancient occupants of Britain, an equation which served to distinguish yet further the Khāsis from the modern British. (Another contemporary commentator likened the Khāsis to ancient Romans.)[67]

The lengthy ethnographic description quoted above also comprises a litany of classification. The Khāsis were separated from their neighbors in terms of their physiognomy, religion, and language; their essential trait as a fiercely independent people was established. At the same time, Walters was careful to distinguish them from Europeans: they had no writing, and so were barbaric, and their polities approached the anarchic.

The empirical character of Walters's account is reinforced by the extraction of hard data from the environment. As noted above, Walters

collected specimens of the plants and rocks he encountered, following the contemporary fetish for collecting rather than any specific scientific plan. He also measured individual objects and whole landforms. Here again he was not as rigorous as other, more dedicated investigators. His own figures were rather vague, such as "the elevation [of Cherrapunji] is about five thousand feet" or "one slab . . . , a circular stone, measured twelve feet in diameter by about two feet thick" (29 Oct.). He did give precise values—for example, "*Lombray* stands at an elevation of 5914 feet" (31 Oct.)—during the short period when he was at Nongkhlao in the company of a surveyor, Captain John Jones, who can be expected to have been equipped with a thermometer and barometer. Jones was probably also responsible for Walters's numeric postscript:

> Latitude of *Nanklow* 25°40′30″ N
> Longitude 91°32′0″ E[68]
> *Range of the Thermometer at Nanklow*
> From 23d to 31st May, thermometer varied from 67°4′ to 75°5′
> From 1st to 14th June, thermometer varied from 68°6′ to 72°5′

Overall, the scattering of numeric observations reinforce the truthfulness and correctness of the more qualitative observations. The final flourish asserts that, when all is said and done, the text is a collection of similarly unambiguous facts. Other geographers used quantification—and the census—as an efficient means to represent the mundane aspects of their studies. For example, Francis Buchanan and others sampled the density of houses in villages and towns, and estimated the number of people per house, in order to derive values for the population (total and by caste) in each district (see table 2.3).[69]

Graphic Images and the Visualism of Geographic Rhetoric

Henry Walters's account exemplifies the use of graphic images to underscore the empirical truth of the linear narrative. Walters drew, in a plain manner, some examples of artifacts which were all too large to be moved or too complex to be sampled, specifically some of the standing stones and the curious bellows used in smelting iron (figure 2.3). Each item drawn is easily matched with a specific description in the text and so proclaims the visual truth of Walters' statements.

Broadening his gaze to encompass the broader scale of the region, Walters drew a landscape (figure 2.4). The Picturesqueness of this view

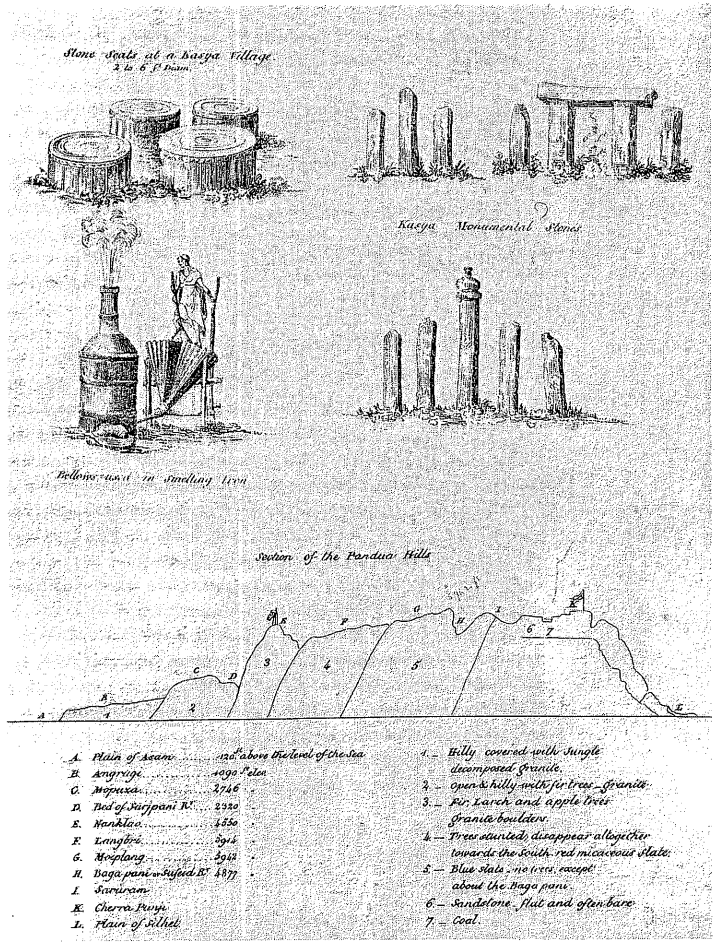

Figure 2.3 Illustrations of funerary monuments and an iron-smelting bellows, original sketches by Henry Walters, 1828. The geological cross-section is not mentioned by Walters and might have been added by an editor in Calcutta. Lithographed by Jean-Baptiste Tassin, Calcutta.

From Henry Walters, "Journey across the Pandua Hills, near Silhet, in Bengal," *Asiatic Researches* 17 (1832): opposite 502.

compliments the aesthetic sentiments repeatedly expressed in Walters's account, concerning sudden vistas, sublime gorges, and rough scenes filled with ruinous monuments. He was self-consciously a tourist in search of the Picturesque. After being diverted from the known road, and although he was worried about the potentially hostile intentions of some Khāsis, he was still able to appreciate a waterfall: "It is a noble fall, and well worth coming out of the way to see" (27 Oct.). In stereotypical contrast, the plains presented Walters with "an uninteresting inundated country" (19 Oct.). The inclusion of a Picturesque view was a natural adjunct to the text.

Significantly, the "View in the Kasya Hills" cannot be matched against any of the particular scenes described in the text. The image is taken to represent the *typical* or *characteristic* landscape of the region, the aesthetic essence of the hills, and the summary of Walters's own

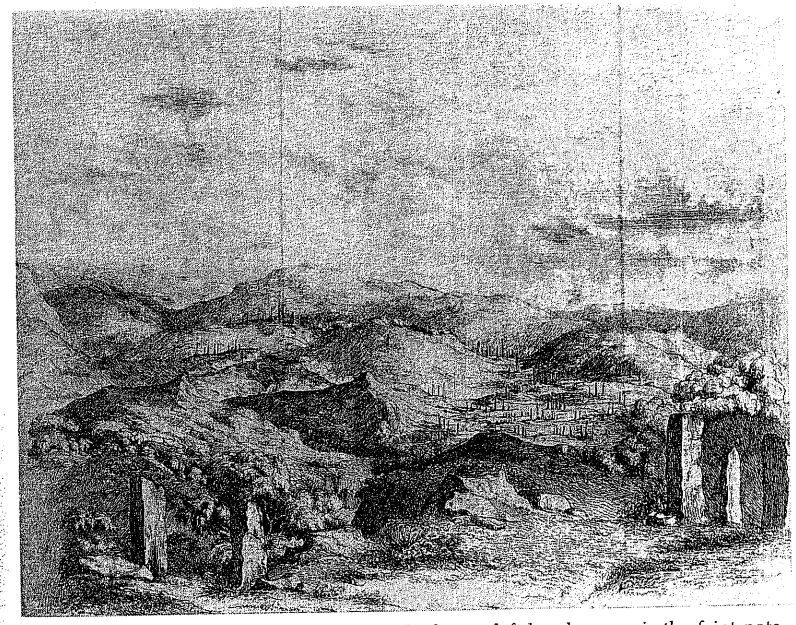

Figure 2.4 "View in the Kasya Hills." In the lower, left-hand corner is the faint note, "Etched by W. Prinsep, 182_"; in the lower, right-hand corner is the same note but with the date 1831.

From Henry Walters, "Journey across the Pandua Hills, near Silhet, in Bengal," *Asiatic Researches* 17 (1832): opposite 506.

Picturesque observations. Walters's Picturesque view is built on geography's ambiguous idea of "landscape." The idea refers first to the single, perspective examination of the land surface and its occupants (either immediate and within the land or indirect through a graphic representation), and second to the more abstract conception of a region's characteristic morphological form, which can only be ascertained by many observations. As a construction for composing the world, landscape is at once personal and social. It is observed by individuals, but the land and its observation are defined by social practices. Landscape is thus "an ideological concept" that constitutes an intermediate position between the observation of the land and the construction of maps.[70] Although socially defined, a landscape is nonetheless constructed as if it had in fact been seen from a specific vantage point.

The modern attitude to the map is similar: although socially defined, the map is the construct of vision. Some commentators persist in the attitude that maps are in some manner perspective images of the world, that they are what the earth looks like when seen from far enough away.[71] A more sophisticated approach has been to draw an analogy with divine omniscience, such that maps are held to provide a "God's eye" or Godlike view.[72] I would like to stress, however, that even this analogy is insufficient as it preserves the idea of viewing, of directly observing the world. Maps are constructs that combine numerous observations into an image of space *without perspective*, although they are then viewed by the individual in lieu of the world.

The impossibility of cartographic vision is suitably demonstrated in the third of Walters's graphics, a map of a cave (figure 2.5). The occasion of his cartographic exercise was his excursion in December 1828, with two other British gentlemen, to explore a deep cave in the limestone hills just to the northeast of Pandua, the account of which is appended to Walters's principal geographical narrative. Guided by a Khāsi, the three men measured distances by pacing and directions by compass, just as if they were on a route march above ground. Walters's map was accompanied in print by a map of different portions of the cave surveyed by John Jones.[73] This itinerary map sits at the cusp between the experience of observation and the general map's cognitive structure. On the one hand, it graphically recapitulates the epistemology of the traveler's observations but, on the other, the entire cave cannot be comprehended except through the compilation of all instances of observation into a single image. A second example of the idea of cognitive mapping is Walters's geological cross-section of the Khāsi Hills in which the strata below ground—unseen to human eye—are deduced from a few observations of minerals and the slope of the strata; interestingly,

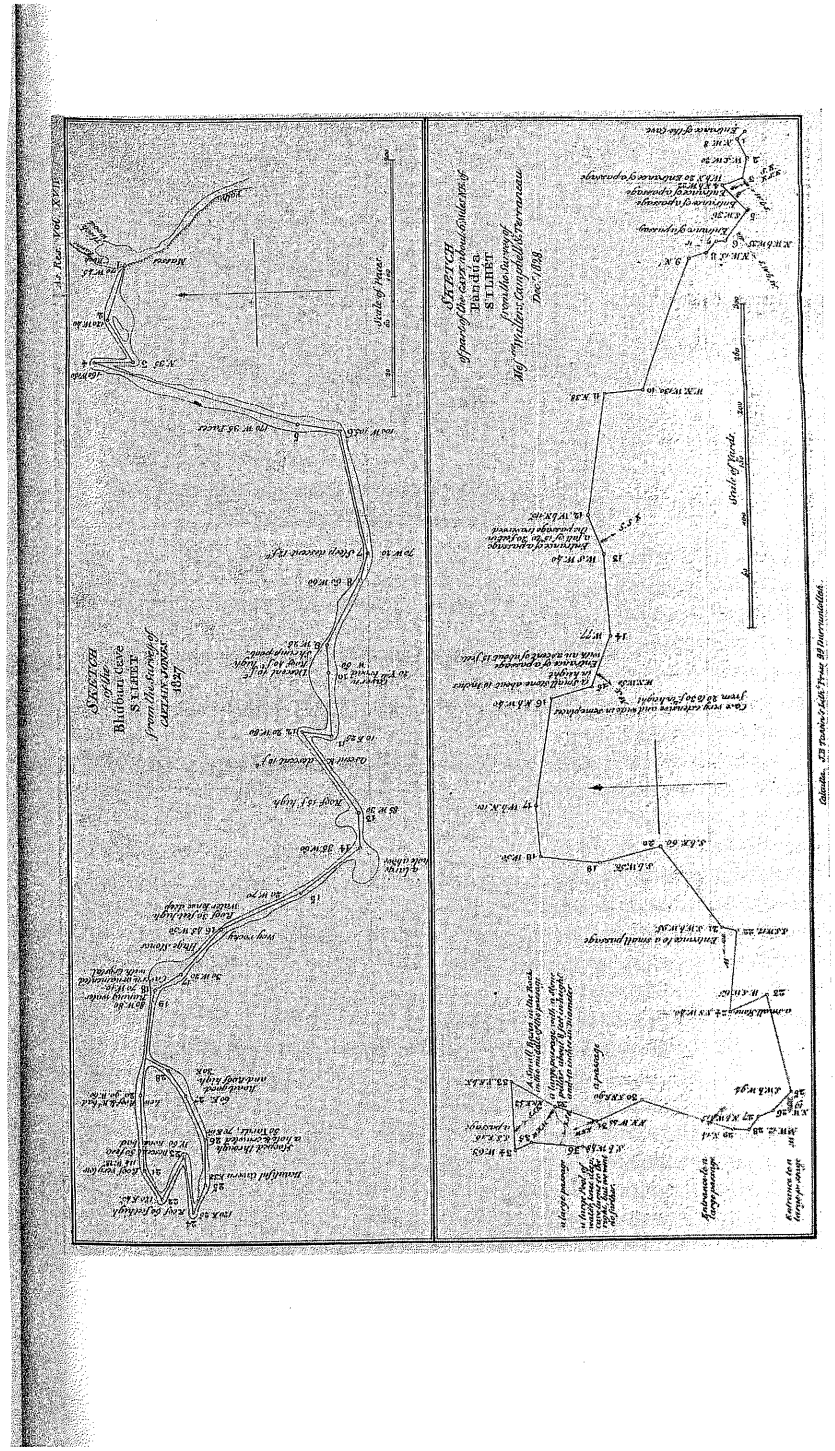

Figure 2.5 Sketch plans of the interior of caves in the Khāsi Hills, by John Jones (1827) and Messrs. Walters, Campbell, and Terreneau (December 1828). Lithographed by Jean-Baptiste Tassin, Calcutta. Jones's map might actually be of a different cave, or it has been inverted at some point.
From Henry Walters, "Journey across the Pandua Hills, near Silhet, in Bengal," *Asiatic Researches* 17 (1832): opposite 512.

it omits the limestone strata in which the caves were formed (see figure 2.3).

I stress these different graphic images created by Walters, and by all geographical observers, in order to reiterate the impersonal character of geographical observation and linear narrative. The geographer looks outwards; he might incidentally insert his presence into his text, but he constituted himself through his rhetoric as an autonomous observing machine. Mechanistic vision and the archive's spatial framework together established a clear-cut relationship between the geographer and the land: the geographer stands in a privileged position outside of the landscape, looking in. The geographer constructs an unassailable barrier between himself and the people, lands, and phenomena he observes. He divorces himself from the landscape. He moves through the landscape but he is never part of it.

Nicholas Dirks is correct to stress the manner in which the Enlightenment linkage of reason and discovery was consolidated within Europe's colonies. The appropriative character of the scientific and Picturesque gazes was most fully articulated in India. In Britain, the implications of the examination of land were somewhat ameliorated by long established cultural overtones, especially the common law rights of the rural masses and topophilic sentiments on the part of landowners. In India, however, those overtones vanished within new environments and new social hierarchies. A key indication of this subtle shift in the character of British aesthetics was the manner in which the emotive elements of the Picturesque slowly disappeared as the British reconfigured India to be naturally Picturesque.[74]

The rhetorical separation of the geographer from the landscape is borne out in the almost total lack of images of the surveyors themselves in the act of surveying and observing the Indian landscape. The archives contain literally thousands of the surveyors' maps and perhaps as many landscape views and plain images of landscape features; there are also a handful of portraits of surveyors, who are often shown posing, rather artificially, with their instruments. For the surveyors to be shown working *within* the landscape would subvert the entire ideology of geographical observation. It is therefore significant that the *one* image I have found of a surveyor *in action* is a caricature of the surveyor set within a parody of Picturesque conventions. The scene is beside a large river in the flat plains of the eastern Punjab; the surveyor is engaged in a project to modify the river to allow irrigation and thus improve the region's productivity. The moss-grown engineer, his servant, and his horse are the passive staffage symbolic of controlled nature and society; the *repoussière* reeds and the telescope direct the viewer's sight to the prominent architectural feature in the middle ground, the indigene's

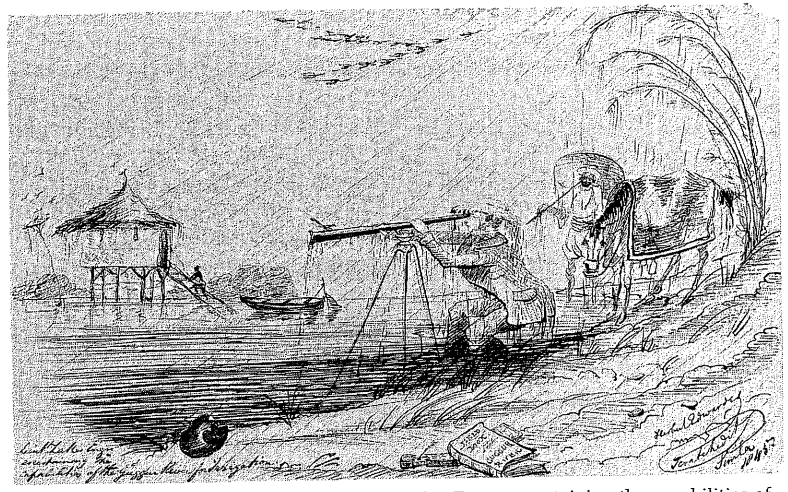

Figure 2.6 Sir Herbert B. Edwardes, "Lieut. Lake, Engr., ascertaining the capabilities of the Guggur River for irrigation. Herbert Edwardes scratched it," Simla, 1845. Pen and ink. (By permission of The British Library, IOR prints WD 1024.)

shack on stilts; while the vaguely sketched vegetation on the far shore stand in for the more usual distant background relief. The image's parodic elements remove the sting from its critique of the dominant epistemology (figure 2.6). In related circumstances, Godlewska has found that many French officers in Egypt between 1798 and 1801 drew themselves in the act of sketching monumental antiquities—perhaps indicative of the French attempt at self-definition by appropriating ancient Egypt—whereas "this auto-portrait tendency is *entirely absent* from" the images of contemporary Egypt.[75]

Walters, like all geographical observers, presented facts with little analysis. His geographical description is underscored by the observational foundations of his knowledge. The elements of the account—the fundamental structure of the pseudo-diary and its chronological conceit; his idiosyncratic grammar; the consistent referencing of the act of observation; the graphic illustrations—all combine in a powerful rhetoric of vision, empiricism, and presence. Walters *saw* what he recorded and he invited his reader (and, unwittingly, the larger public) to participate in the *same* vision. The immediacy of his vision, underscoring that it was Walters who observed and no one else, is borne out by the rejection of the Khāsis as active participants in the narrative. When Walters did include them, they appear only as guides (as in the caves), laborers (carrying him across rivers), or as stereotypical indige-

nes (misdirecting him out of caprice). Yet the Khāsis were central to Walters's ability to travel about, to observe, and to understand the hill country. They provided him with knowledge which he appropriated as his own, which he recast as the product of personal observation, and which was thus incorporated into the larger body of British geographical knowledge.

The people and the land were submerged beneath a geographical gaze that claimed to be totalizing and all-consuming. Yet it was not a totally efficient gaze. Traces of local knowledge and of the manner of its acquisition can occasionally be discerned, marked by textual ambiguity or inconsistency. Orthography is a case in point. Walters's account contained three variant spellings for "Khāsi": *Cásia* in Walters's narrative; *Kasya* in the illustrations, probably added by the lithographer; *Kásia* in the separate account of the spelunking expedition. Is the town *Silhet* (most mentions) or *Sylhet* (9 Nov.)? Such variation indicates a subtle linguistic gulf between the British and the Indians which had yet to be closed. In the second half of the nineteenth century, the ethnographic and linguistic surveys of India established firm orthographic rules and conventions which could then be followed (or *observed*) as part of geographical observation. It was those surveys which established the spelling "Khāsi," as used in the present-day *Times Atlas*, Joseph Schwartzberg's *Historical Atlas of South Asia*, and in the official *National Atlas of India*.[76] But in 1828, orthography still depended on the individual ability of the British to capture the sound of placenames.

The ironing out of the uncertainties over the spelling of "Khāsi" indicates the manner in which differences and even outright contradictions among geographical information are ultimately smoothed out within the archive. The individual observations of the narrative are subsumed within the larger geographic space of the archive. Indeed, the narratives were themselves constructed within the context of that more complete body of knowledge. Despite the geographer's claim to timeliness, that each observation was made at the specific point within the journey when it was recorded, even a cursory analysis of the texts reveal that the narratives were, of course, substantially edited before publication. The narratives themselves were significant components of the complex of graphic, cartographic, statistical, and written representations which together constitute the geographical archive. This is certainly the case when spatial locations of objects were being observed: the determination of the location of a particular place must be made, by definition, within the larger concept of space. These issues are explored next.

CHAPTER THREE

Surveying and Mapmaking

The geographical narratives used by the officers of the East India Company to record their observations of South Asian landscapes, their physical forms, and the cultures and societies of their human inhabitants were treated as literal representations. The British presumed that their graphic and written descriptions replicated the essential character of the objects that they observed. The narrative's linear form recapitulated the spatial sequence of the geographer's acts of observation. The narratives themselves enjoyed a certain cultural relevance because of their similarities with the hugely popular genres of travel and exploration writing. Even so, they were recognized as being rather incomplete as geographical descriptions.

The problem with geographical narratives was that they ordered their information according to the sequence in which observations were made. References to any given topic, such as agricultural practices or mineral resources, were intermingled with references to all other topics. To obtain a comprehensive conception of one topic would require gleaning the records of individual observations by a thorough reading of the entire narrative. The narrative's lack of topical *system* was seen as a serious drawback. The favored bureaucratic form of geographical writing was therefore the analytical and organized regional description. The production of such systematic texts entailed the careful arrangement and logical ordering of many observations extracted from the geographical narratives and surveys. What the reordered and clearly manipulated geographical accounts lacked in terms of rhetorical immediacy and narrative power, they made up for through their ability to present large amounts of information in a coherent and comprehensible manner. The distinction between observational narratives and archival descriptions was, accordingly, a question of the arrangement and systematization of observed facts.

Consider, for example, the case of the "statistical" survey of Mysore undertaken by Francis Buchanan in 1800–1801. Buchanan kept a chronological narrative of his survey, which was published in three volumes