

## 20 • Concluding Remarks

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In this book we have sought to provide an adequate description and characterization of the wide range of cartographic phenomena that flourished in premodern Islamic and South Asian societies before the impact of Western cartographic influence. Together the nineteen essays represent a new contribution toward our stated goal of broadening the canon of cartography beyond the more familiar products of Western mapmaking. The difficulties of delineating a corpus of maps for cultures for which nothing comparable has hitherto been written should not be underestimated. Much of the material in this book will be new to most Western (and indeed many Eastern) readers both in itself and as a corpus. Moreover, the essays go beyond mere description. They offer interpretations from which generalizations about the nature of cartography in these non-Western societies can be advanced for the first time.

As editors we have set ourselves three tasks in these concluding remarks. First, we want to focus on the salient similarities between the cartographic histories of premodern Islamic and South Asian societies on the one hand and of Christian Europe and the Mediterranean before A.D. 1500 on the other. Second, we shall review the interaction of maps and society within the Islamic and South Asian cultures described in this book. And finally, we shall try to identify the agendas for future research that have emerged from the essays as a whole.

### COMPARATIVE CARTOGRAPHIES

A relativist approach risks seeing premodern cartography as impervious to outside influences. By setting traditional Islamic and South Asian cartography in a wider cultural context, however, and by identifying characteristics common to premodern mapping in general, we see that this in fact was never the case. This is true despite the slow pace of cartographic change and innovation in the periods and regions described in this book, especially as compared with the rate of change in the Western world since A.D. 1500. As many of the essays demonstrate, the cartography of premodern Islamic and South Asian societies did not develop in isolation from external influences, and each in turn contributed to the mapping knowledge of

distant cultures. Such relationships remind us that it is a mistake to divide, as is usual in the history of cartography, the Old World into East and West as if these were two separate as well as distinctive parts. Long before the rise of Europe in the sixteenth century, trade and other cultural exchanges bound Asia, Europe, and the Mediterranean regions, however loosely, into one vast Old World system. In this system, cartography and cartographic relations had their place. Not surprisingly, both Islamic and South Asian mapmaking shared in the cartographic experiences of other societies in the premodern world at the same time as they retained many aspects unique to themselves.

One of the characteristics common to the history of the mapping covered in this book and that of the Old World regions described in volume 1 is the way both the making and the use of maps were geographically fragmented. Though we have included in our scope mapping processes involved with building houses and geomancy, and even the use of “mapping” the body as an aid to prognostication, centers of map production were like islands in a sea of cartographic silence. As in the case of the classical Mediterranean societies or those of medieval Christian Europe, such silence cannot be dismissed as a result of the loss of historical records, even in areas where their chances of survival admittedly were poor. The likelihood is that, away from the main cities of South Asia and of the Middle East in the Islamic period, entire populations existed with little or none of the cartographic knowledge our authors have described. This should not surprise us, given the unevenness of mapping and map use in the modern world. But why cartography should have become established in some areas and not in others is an interesting question. Why, for example, was the production of portolan charts and of local and regional maps in Europe in the late medieval period concentrated within a relatively small number of areas in Italy, Catalonia, and northern Europe? Why, in premodern India, did terrestrial mapping develop particularly in Kashmir and Rajasthan or marine mapping in Gujarat?

In its details, the regional mosaic of mapping traditions was of course always more complex than such bald questions imply, but they remind us that what we have to

interpret is not so much the distribution of a “generic cartography” as the distribution of often quite separate map genres, each with its own history. Although, for example, a distinctive Greco-Islamic form of celestial and terrestrial cartography had developed in the Islamic heartland by the Middle Ages, this appears not to have been diffused to either non-Islamic India—at least not until the time of Sawai Jai Singh of Jaipur—or to large areas of western Europe. Yet there are few clues to explain these discontinuities and little to show why we should differentiate the medieval Islamic world and South Asia from Christian Europe or from the earlier cartographic cultures of the Mediterranean area that preceded them. We have to begin from the premise that even among literate populations a knowledge of maps was less usual in earlier periods than it is today.

The essays here deal with each island in the cartographic archipelago of the Islamic world and South Asia. At the same time they point to a broadly similar level of map consciousness that existed within these regions and in the classical and medieval Christian societies of Europe and the Mediterranean. By “map consciousness” we mean the relative awareness of cartographic knowledge vis-à-vis other aspects of learning and artistic skills. We discover that, if ever the notion of cartography was articulated in traditional Islamic or South Asian societies (remembering that the word “cartography” is a nineteenth-century neologism), it would have conveyed concepts much closer to those of premodern Europe than to those of the modern world.

One symptom of such affinities lies in the lack of a specific word for map, not only in ancient Greek and Latin but also in languages such as Persian, Arabic, Sanskrit, and Hindi. In Ottoman cartography, where there was a specific term for marine charts, one word had to serve for terrestrial maps as well as for drawings and pictures. We would not go to the extreme, as some historians of cartography have done recently, of inferring from such etymological details that maps were practically unknown in the medieval world. At the same time, we do recognize that much of the technological terminology of our own times is imposed on traditional or earlier societies only with an element of risk.

A similar caveat applies to the occupational specializations of modern cartography. Neither in the premodern cultures of Christian Europe and the Mediterranean regions nor in those of the Islamic and South Asian worlds do we encounter an exclusive maker of maps, a “cartographer,” or even any group of people engaged in a mapmaking “profession”—yet another anachronistic concept. Only the portolan chartmakers of some of the Mediterranean ports later in the Middle Ages, such as the family of al-Sharafī al-Şifāqī, or many of the instrument makers of the Islamic world who specialized in

astrolabes, quadrants, and globes constituted exceptions. More usual were the Indian temple artists who were specialists in religious art and who sometimes made maps. And like their counterparts in medieval Europe, the calligraphers, scribes, and illuminators were never exclusively cartographic illustrators in the Islamic book arts. Such characteristically capitalist divisions of labor had little place in the traditional workshops where most of our maps were made.

The danger of inserting anachronisms is no less real in the theoretical aspects of early Islamic and South Asian mapmaking. The ancient scholars who copied or translated texts and their illustrations cannot properly be referred to as “cartographic scholars” or even “geographers” or “astronomers” in the modern disciplinary sense. Many were polymaths aspiring to be possessors of *adab* (general culture) rather than specialists. Their intellectual interests ranged widely, and their skills were equally considerable. Even a practitioner as influential in establishing a mapmaking tradition as was al-Balkhī would have devoted himself no more exclusively to maps than did the authorities to whom medieval maps are traditionally attributed in a European context. Nor do we find in the essays in this book much evidence for the existence of a discrete body of theory concerning mapmaking. Even Ptolemy, in both his *Geography* and his *Almagest*, was addressing the substantive problem of where places are as well as such theoretical aspects of cartography as projections. Other writings touching on the theory and practice of mapping are—like the maps themselves—scattered widely throughout the traditional literatures. They are to be found (to adopt a modern classification of knowledge) in texts on subjects as diverse as astrology, astronomy, engineering, geodesy, geography, history, linguistics, mathematics, natural science, philosophy, law, and theology. This lack of a central focus for cartography identifies yet another similarity in the organization of knowledge between the societies described in volume 1 and those described here.

This conceptual and functional gulf separating both Islamic and Indian mapping from the cartography of the modern world leads us to seek a new interpretation of their history. In the absence of a cartographic science in the modern sense, an internalist historiographic approach—studying mapmaking as a discrete practical and intellectual activity—is hardly likely to advance our understanding of the cultures described here. Those who made maps seeking to chart a divine order in the heavens or on the earth were not bound by the same canons of rationality and positivist criteria for proof or accuracy that characterize most science today. So even the most esoteric cosmographical diagram was not merely an idealist conception but was linked to a wider body of philosophical lore, speculation, and practice. Premodern

cartography, in the Islamic world and in India as much as in Christian Europe, was no autonomous development, whatever form it took. It is understood only as part of the wider history of representation and thought: artistic, literary, and scientific. Within these broader contexts cartography continuously interacted with other images and texts but seldom claimed a discrete territory in the modern sense.

The way is now open for a more appropriate interpretation of the history of Islamic and Indian cartography. We can no longer exclude from our scholarly agenda those maps, whether derived from tenth-century Europe, thirteenth-century Islamic society, or eighteenth-century India, that apparently lack a scientific basis. Nor can we regard societies without “advanced” mapmaking skills, according to Western practice, as “primitive,” meaning intellectually inferior or lacking some innate ability shown by those peoples who value the techniques of accurate measurement. The day has passed when an Islamic specialist such as Marshall G. Hodgson could dismiss the maps of the Balkhī school in a line as “crude, not standardized by printing.”

Similarly, we now recognize that it is inappropriate, for example, to compare Greek and Indian cartography only by assuming that the Greeks had invented a global reference system inherently superior for all purposes. Many Jain cosmographies are of—at the very least—comparable intellectual sophistication to those of the Romans or inherent in the *mappaemundi* of Christian Europe. If the drawing of a Vedic altar or of a qibla diagram has in the past been deemed less “cartographic” than the *Forma Urbis Romae*, it was merely because the latter better fit the modern notion of what a map ought to be.

Thus, in aiming at a general appreciation of non-Western cartography, it may be that more attention must be paid to cognitive similarities than to external differences of form and content. Many of the maps described and illustrated in this book reveal a curiosity about the nature of space beyond the immediate environs of the mapmakers that is no less keen than that of today. To understand this curiosity better, and to see how it was translated into a mapping impulse and with what results, we now turn to aspects of the social history of the regions concerned.

### CARTOGRAPHY AND SOCIETY

Neither the form nor the content of the knowledge expressed in maps in any society can be understood apart from the social basis for the production and use of that knowledge. Thus Islamic and South Asian maps reflected the particular interactions of their respective societies; the maps are social constructions. Their history does not conform to any “grand theory” of cognitive development, nor can the rise of cartography be associated with sci-

entific revolution or technical progress toward an Enlightenment ideal of a carefully measured geographical truth. As noted above, many of the maps reviewed here are not purely geographical in content, nor do they represent actual measurement in the modern sense. To take account of this all-important difference, our authors deliberately adopted a culturally relative position. They have attempted to interpret the maps they describe in the light of both the long-term social and religious beliefs of the mapmaking society and the ever-changing distribution of political power. They have viewed their maps as expressions of local situations and of circumstances that either encouraged or inhibited the transmission of map knowledge. They are sensitive to the way all maps are inextricable elements of a people’s culture as a whole and to their function as visual expressions of the terrestrial, celestial, or cosmological knowledge held by that society. In providing a historically relevant framework for their explorations into premodern Islamic and South Asian cartographic history, our authors have moved toward an understanding of the reciprocal interactions between society and its cartography.

From our authors’ individual assessments, we can draw our own more general conclusions. Three points in particular call for brief elaboration here. All concern some aspect of the social context of mapping. The first is perhaps the simplest. We are struck, once again, by the remarkable continuity of mapping practice over long periods in those areas traditionally engaged in mapmaking. Though often modified or exhibiting stylistic variation, cartography was usually an inherited rather than a newly invented knowledge. Even where most of the surviving maps are no earlier than the seventeenth century, as in much of South Asia, many undoubtedly descended from earlier models. We know that Indian cosmographical mapping—as befits the Indian soteriological tradition—was of great antiquity, with roots extending back to the *bhuvanakōsā* portions of the encyclopedic Puranic texts. The power of tradition is well illustrated also by the pilgrimage maps that are still being produced for mass consumption. The longevity of Islamic cartography is even better documented, with roots reaching back into the pre-Islamic period. Qibla mapping has survived for over a millennium until today, and the maps of classical Arab geographers, such as those from the Balkhī school (initiated in the tenth century A.D.), were still current in the nineteenth century. World maps based on al-Idrisi’s work were still being compiled in the early modern period. Constellation pictures, under new names, remained basically unchanged in astronomical manuscripts from the eleventh century to the eighteenth. Even a series of political events as far reaching and disruptive as the rise of the Mongol Empire, the Crusades, and the Turkish infiltration into the Islamic world did not lead

to a new beginning in the ways the world was conceived and mapped.

Our second point also relates to this matter of continuity. It draws attention to the mechanisms of cartographic transmission. In traditional Islamic and Indian mapping, it was the authority of the text that provided scholarship in general and cartography in particular with its elements of continuity. With the exception of some world maps, marine charts, and astronomical instruments, it was the literary treatise—often written in the lingua franca of Arabic and characteristically devoted to a multiplicity of subjects—that became the primary vehicle transmitting the information maps were based on or the narrative texts that maps sometimes illustrated. Only toward the end of traditional mapping, and more markedly in South Asia (perhaps because of the comparative modernity of the surviving artifacts as opposed to those of the Islamic societies), does this union of map and text break up. Up to then, however, it was the textual format that constrained cartographic development. Most obviously, the page or folio limited the physical size and detail of maps, but more subtly it influenced the balance of intellectual authority in map-text relationships. In some instances, as with al-Idrīsī, the roles were reversed and the map played the primary role in structuring the text or in facilitating the compilation of tables of geographical coordinates. Generally, however, maps were subordinate to text. One clue to this is the way scribes sometimes left spaces in books for maps and other illustrations. Blanks in a text may suggest the lack of a competent artist or even the loss of a patron at some point in the bookmaking process. But such gaps also show how in these cases, and in instances where no attempt was made to integrate map and text, that the word was the primary medium and always more authoritative than the picture. In premodern culture, apart from astrolabes, globes, and some world maps, the “independent” map was the exception in the spectrum of cartographic representation.

The relation between marine charts and written sailing directions illustrates another aspect of the map and text problem. There is no unequivocal evidence for the existence of Indo-Islamic sea charts in the Indian Ocean before 1500. Nevertheless, it is tempting to surmise, owing to the survival of later fully developed examples, that an earlier indigenous charting tradition might have existed. This, however, may be an example of a retrospective attempt by scholars to impose on the premodern Islamic world modern Western sailors’ practice of using charts, even though Muslim and Indian navigators might have found oral or written instructions wholly sufficient for wayfinding at sea.

The essays in this book thus document a variety of relationships between text and map even within a single

cartographic tradition. This variety suggests that maps were subject to frequent modification as they were transmitted in the literate Islamic and Indic cultures. Abridgment or enlargement of the text could alter the scope for cartographic inventiveness and artistic embellishment. Surviving maps from a single textual stemma show considerable variations. The textual medium, we may decide, was in some respects extremely flexible and, far from stultifying cartography, may have stimulated it, at least in certain directions. For instance, we have seen how the iconography of celestial maps, or the maps in various versions of the texts of al-Idrīsī and Pīrī Re’īs, were adapted to local artistic tastes and to local conventions. Transmission was seldom simply a matter of copying.

Even more significant—especially in the Islamic societies—to understanding the mechanism of transmission was the process of translating key texts. This determined both the eclecticism and the cosmopolitan nature of traditional cartography. Among the translations of texts dealing with the making of maps, or actually containing maps, we can include not only the crucial translations of key Greek works into Arabic from the ninth century onward but also a series of intermediate or secondary translations into or from Syriac, Hebrew, Middle and New Persian, Sanskrit, and Turkish, and in the European Middle Ages some retranslations into Latin or Western vernacular languages such as Castilian or Italian. If translation was the principal means of cartographic dissemination, such moments of linguistic naturalization constituted the threshold of cartographic innovation. In the case of the instructions for mapmaking in Ptolemy’s *Geography*, only partial translations were made into Arabic, with few changes to the text; but in other cases, as with the astronomical and geographical tables of coordinates, revision and supplementation were soon put in hand. Yet while cultures shared a capacity for absorbing cartographic knowledge, they could equally well resist it. There was nothing inevitable about either transmission or translation. Islamic craftsmen did not follow the precise instructions for making celestial globes translated from Ptolemy’s *Almagest*, but they adapted these instructions to make superior instruments of their own design. There was also a conscious resistance to innovation. Some Islamic scholars were opposed to the “foreign sciences,” and Hindu mapping practices have been shown to be remarkably immune to Islamic influence.

Thus our third concern, the social factors of transmission—those that impinged on or modified cartographic knowledge as it passed from generation to generation or workshop to workshop—can now be identified. A different key word applies here: appropriation. The process of transmission, the essays in this book make clear, was never a simple one, merely the mechanical passing on of information or technique. We cannot

ascribe loss of information from an original text to a “failure” of translation. What we find is a highly selective operation, determined by the social agenda of individuals at particular periods. Two main motives—perpetuating established religion and maintaining the political power of rulers—underlay the patterns of intention and appropriation in premodern Islamic and Indian cartography.

The common denominator was religion. Few maps in these cultures were not touched in some way by religious belief. Even on essentially secular maps, such as those found in Maṭrākçı Naşūh’s *Mecmū‘a-i menāzil*, religious sites were emphasized to an unusual degree. Religion gave authority to particular types of representation, just as it did to the states that were their patrons; religion decreed the uses of cartography; and religion inhibited the development of some types of mapping. Yet there is danger in overgeneralizing. Religion in India, beyond the alien Muslim sphere of influence, resulted in maps that were very different from those of the Islamic world.

In India, especially for adherents of the Jain religion, whose maps tended to take the form of an artistic image unconstrained by any textual format, maps had a much more central place in the practice of religion than they did in areas of Islamic faith. Cosmographs, often of great complexity and beauty, not only dominated Indian cartographic representation but, as symbolic articulations of the universe, in whole or in part, were also tools of religious instruction and adjuncts to the performance of certain rituals. As vertically or horizontally oriented scrolls, wall hangings, or murals, whether anthropomorphized as pictures, expressed as mandalas, or codified in sacred symbols such as the conch or the lotus, maps were often microcosmic analogues of the universe. Displayed in the temple or monastery, they enshrined talismanic powers and were objects of meditation. Cosmographic maps did not just represent territory, they *were* the territory, an expression of the created universe, and routed the soul on its future journeys. Invariably they expressed otherworldly beliefs. With the exception of astrolabes, the geometric divination charts used for astrological purposes, and maps of pilgrimage routes, the Indian maps were not primarily instruments for objective wayfinding or measuring. One consequence may have been that preparing accurate terrestrial maps was not given particularly high priority in cultures where religious maps were of such importance, despite the existence of appropriate mathematical knowledge.

The emphasis was different in the Islamic provinces. Though the Qurʾān encouraged its adherents to observe nature, and though there are a number of Muslim maps of paradise, maps were seldom elevated to become emblems of sacred space as in the Christian and indigenous Indian religions. There was no place for a map in a mosque, for example, as a mandala was displayed in

an Indian temple or a *mappamundi* in a Christian cathedral. What our authors have revealed is that maps, astrolabes, and globes (especially the last two) became practical instruments used in determining religious ritual or in astrological practice but were not themselves objects of veneration. The use of maps as tools rather than icons was due not so much to some universal iconophobia—for scientific manuscripts translated from Greek, Iranian, and Indian texts were often illustrated—as to the requirements of day-to-day ritualistic needs. Celestial mapping thus developed to help calculate the religious calendar and to determine the hours of prayer, which varied with the seasons. The astrolabe, diffused widely throughout the Islamic world from Spain to India, functioned for the same purpose. Such instruments—like the qibla maps and charts—were products of an applied religious science that sometimes displayed the distance to Mecca or could be used to determine the azimuth of Mecca and the Kaʿba. Though they encouraged a high level of mathematical and graphic sophistication and might show Mecca as the center of the world, they were not a surrogate in the Indian sense for firsthand experience of the sacred territory.

It is thus often impossible to disentangle the sacred from the profane in the cartography of the major cultures described in this book. Geographical maps in India, as well as the maps in Indo-Islamic illuminated histories, often emphasized religious topography but neglected other material aspects of the landscape. And in the Islamic world, political and religious strategies sprang from a single discourse. The Qurʾān commanded Muslims to search the earth for God’s patterns in nature and in the affairs of men and women, and this gave legitimacy and form to geographical inquiry. The maps of the Balkhī school, for example, were part of a religiously motivated trend toward Islamization as much as an attempt to better reflect geographical reality. Nevertheless, though the distinction between the secular and the religious was less clear than in Christendom, the role of state politics in the development and spread of mapping in these traditional societies was considerable. Maps were as much a means of demonstrating the power of the state as an expression of piety. They were at once the product of sovereignty and practical and symbolic instruments by which that political and military power was legitimized or maintained.

The patronage of mapping shows how closely cartographic knowledge was linked with political power. Wherever we encounter a center of mapmaking or a flourishing cartographic tradition—usually associated with major cities—we find it had been developed with the support of a powerful monarch or local potentate. Indeed, the expansion of cartographic learning from the cities of the Mediterranean to those of the Middle East

that occurred from the sixth century can be related to the rise and fall of empires. The roll call of imperial cartographic patrons extends from the rulers of the early Abbasid Empire in the eighth century to those of the Ottoman and Mughal empires in the sixteenth and seventeenth centuries. It covers the royal courts of Muslim Spain in the West and those of India in the East.

The long-term cartographic influence of individual imperial patrons varied. Apart from the unified caliphate from the seventh century to the early tenth century, and the Ottoman Empire from the fifteenth century to the early twentieth century, there were no enduring political units in either the premodern Islamic or the Indian region that possessed the power and coherence in their heyday of the Roman, Byzantine, or Chinese empires. The ever-changing map of imperial conquest and accession did, however, channel the course of cartographic appropriation and use. It was not by accident, for example, that the powerful Abbasid Empire, with rulers such as the caliphs al-Manṣūr and al-Ma'mūn, was closely linked to the core traditions of Islamic cartography. With the political and territorial disintegration of the caliphal state, centers of cartographic activity were correspondingly fragmented and thus weakened, divided among a series of virtually autonomous states. A succession of local or regional rulers created highly individual cultural foci and patronized only those aspects of mapping described in the available texts, or promoted by individual scholars and craftsmen, that most interested them.

Thus in Islamic Spain, individual rulers of Castile and Seville at different times involved themselves in map-making. So did King Roger II in Sicily in the twelfth century, the Fatimid caliphate in Egypt, the Buyid rulers of Persia, and in India, the Mughal emperors at Delhi or Agra or their feudatory Rajputs of Jaipur. Our authors note that the activities of these and many other individual patrons did much to impart a strong regional character both in the practice of cartography and in the form and content of the artifacts themselves. For instance, we learn that the making of the universal astrolabe usable at various latitudes long remained unknown outside southern Spain; that there was less interest in producing spherical astrolabes in the Indian areas of the Islamic world than elsewhere; and that terrestrial maps were often reflections of regional spheres of territorial influence. Even the geographic scope of astrolabes, globes, and maps was often adapted to such regional geopolitical factors.

Palaces and courts became nodes of scientific transmission as well as innovation. Scholars were invited, attracted, or otherwise brought to court from rival or conquered states; translations were initiated from "imported" texts; workshops were established to produce illuminated manuscripts and scientific instruments; libraries were created; observatories were built; and

uniquely, under the patronage of al-Ma'mūn, geodetic measurements were ordered in an attempt to establish the length of a degree. The history of cartography in these traditional societies was driven, we can now see, by innumerable undocumented decisions taken by individual patrons and their advisors, who appropriated knowledge to meet the needs of the political establishment. These needs—as much as the sum of knowledge theoretically available—fashioned cartographic artifacts. Moreover, the exigencies of practical use help explain the apparent gap between theory and practice noted in several essays. The decision not to use Ptolemy's *Geography* according to Ptolemy's own instructions, for example, could be interpreted not as an intellectual failure among Arab scholars but an improvisation or preference in the light of local circumstances.

These rulers found fewer secular uses for maps than those recognized either in a modern society or in the Roman Empire. Though al-Maqdisī wrote that geography is an absolute prerequisite for the merchant, the traveler, the sultan, and the *faqih* (legal scholar), in practice this did not always result in maps. Yet to some princes—such as Sawai Jai Singh of Jaipur and the Peshwa rulers of Maharashtra—terrestrial maps were recognized adjuncts of statecraft. However, though the route maps of the Balkhī school, with their travel distances, may have played a role in imperial government and administration or served some commercial purposes by depicting markets during the Abbasid period, similar bureaucratic uses for maps are not recorded for many of the smaller dynasties.

As in Rome, imperial propaganda was also a recognized function for maps. World maps, like that of al-Ma'mūn, were probably drawn principally to show the extent of worldly empires. The tenth-century maps of the Balkhī school, concentrating on the provinces of the Islamic empire, were similarly designed as statements about political identity to portray the Abbasid caliphate at its greatest extent. Al-Idrīsī, eager to laud the glory of his patron, drew his world map with the express intention that Roger should "accurately know the details of the land and master them with a definite knowledge." Such maps, though of practical use, were also symbolic articulations of imperial visions. The use of celestial symbolism by the early Mughal rulers of northwestern India, such as Jahāngir embracing Shāh 'Abbās atop a globe, and the commemoration of successful military campaigns in the itinerary maps of the Ottoman period served similar purposes.

More strictly utilitarian types of maps were little developed in these traditional Islamic and Indian cultures despite the many potential uses for cartography and the existence of a literate mercantile class in many cities. Maps were drawn for didactic purposes, a practical use in at least one sense. Only near the end of our period,

largely from the sixteenth century onward, as evinced by numerous Mughal, Rajput, Maratha, or Ottoman examples, were maps made for uses such as the planning and prosecution of military campaigns, siegecraft, navigation, engineering, and irrigation, or for taxation and resolving land disputes. By this time, however, both Islamic and Indian societies, though still maintaining an overall emphasis on religious rather than secular roles for maps, were being seriously challenged by the different cartographic values of the Western world.

### FUTURE AGENDAS

The essays in this book together constitute the beginning of a systematic account of the cartographic history of two major world regions in the premodern era. It is only a beginning, however. Despite the achievements of our authors—indeed, as a consequence of their achievements—it has become clear that much remains to be accomplished. The tasks are unevenly distributed. The foundation of earlier scholarship is shakier for South Asia than for the core Islamic regions, and the subcontinent offers future researchers some daunting tasks. At this juncture it may be useful to review what we can already see as the major outstanding lacunae in our knowledge of the history of cartography in the Islamic and Indian cultures. Since both the minutiae of map-by-map investigative work and broader issues are involved, a similar distinction is needed in our agendas. The dual tasks of basic scholarship and wider interpretation are intended, however, to be seen as entirely complementary.

In the essays on South Asia, our author has taken special pains to identify a number of directions for future research. For him “the study of the history of cartography in South Asia is still in its infancy.” There is still scope for expanding the cartographic corpus by continuing the search for yet more maps in other libraries and archives. One focus should be on the apparently blank areas, such as Bengal and Sri Lanka, of the present distribution of known cartographic activity in these traditional societies. Not only the standard documentary sources but also those of the art historian invite diligent searches: Who knows what remains to be discovered in the region’s vast reservoir of temples and private palaces? At the same time, new discoveries may not only add quantitatively to the cartographic record but in time also alter our perception of it by pushing back the record of known non-cosmographic artifacts beyond the seventeenth century. Another prime focus should be on the gaps in our knowledge of the different map genres found in the Indian areas. So far we have barely sketched the outlines of some of these traditions. Yet there are plenty of starting points. The production of architectural plans could have considerable bearing on hitherto unnoticed traditions of

large-scale mapping, for instance. The maplike elements in the vast corpus of Indian landscape painting merit further work, as does the evidence for celestial mapping in the designs of Tantric Hinduism, the symbolic role of the *axis mundi* in Indo-Islamic culture, the meaning and purpose of the divination charts of Rajasthan, and the products of cartographic hybridization resulting from the cross-cultural encounters of various mapping traditions.

Concerning individual maps, many of the tasks we take for granted in the historiography of Western cultures remain outstanding in the case of premodern Islamic and South Asian cartography. Some of these reflect language difficulties. Thus, particularly pressing is the need for translations of the legends and endorsements that appear on so many maps and globes, together with an index of the names of patrons and mapmakers with their places of origin. Future historians of cartography will have to deal not only with cartographic texts and contextual material of every variety in the better-known languages such as Persian and Sanskrit, but also with lesser-known vernaculars or scripts as Dhundari, Modi, or Kutchi that may hold clues to the origins and history of Indian maps. Other problems concern chronology. Many maps need precise dating. Stemmata and prototypes need to be reconstructed. Yet other maps await careful comparison with modern topographical maps before their geographical content can be precisely identified. Even so well documented a work as the Gentil atlas demands a detailed study of its content and style. One desideratum for the future would be the publication of a *Monumenta cartographica* on the European model for the history of Indian cartography, entailing a series of map facsimiles, each with full scholarly apparatus, designed so as to make each part of the existing corpus more widely available and to facilitate comparative studies of new maps as they come to light.

Notwithstanding the longer historiographic tradition of Islamic cartography, there remains a large and important scholarly agenda. As with India, it cannot be assumed that the corpus of known maps is representative of all Islamic mapping traditions. New maps continue to come to light, but significant gaps remain. There are many map genres and cultures we know little about. The study of cosmographical diagrams, for instance, is at an early stage. Tantalizingly little of a Persian cartographic tradition has been unearthed, though Persian, as the second major language of the Islamic world, was a lingua franca as far east as India. And despite the importance of the Ottoman Empire as a cultural bridge between European and Islamic practices, we probably know no more about it than we do about mapping in parts of the Indian subcontinent. We still need to search for maps, especially those that would document the transitional period up to the late nineteenth century, when traditional practices

declined in the face of western European influence. In truth, we need to search every corner of the Islamic world and beyond for more of the corpus that undoubtedly survives somewhere. Hitherto most research has focused on celestial and terrestrial mapping related to ancient literary traditions, but we may expect to find more maps of a practical nature from the modern period. Some pointers are available from the Indo-Islamic and Ottoman areas. Irrigation maps, maps for revenue collection, route maps, plans of fortifications, and delineations of property were all made, more or less frequently, in some parts of India under Muslim rule, so why should we not anticipate a similar variety awaiting rediscovery in other Islamic areas in the Middle East or North Africa?

In general, too, far more attention has been paid to the texts of individual manuscripts than to the maps they contain. Thus, before many of the central research questions can be answered, much more detailed analysis on the maps of particular traditions remains to be carried out. For instance, of the thirty or so known texts associated with qibla maps, no more than five have so far been published. The others require scholarly editing that alone will give proper weight to the illustrations. Even for the maps of the Balkhī school—the classical terrestrial maps of the premodern Islamic world—the identity of several manuscripts has still not been settled, others have yet to be given their place in a well-documented sequence, and in all cases the relation between maps and associated tables of latitude and longitude needs to be worked out. It is the same with the manuscripts of al-Idrīsī's works. We still do not know which Arabic version of Ptolemy's *Geography* he drew upon, and though the recensions of his text have been studied, thorough research now has to be conducted on the maps.

There are also a number of more general interpretive problems to be tackled before we can start moving toward a more complete understanding of the place of Indian and Islamic cultures in the general history of traditional, premodern cartography. Such questions often transcend cultural realms and the individual mapping traditions described in this book. The question of transmission is one such problem, still partly unresolved and promising to be yet more complex once the reciprocal lines of influence within the "Old World system" start to be reconstructed. Our knowledge is still incomplete. We do not know, for example, what happened to the cartographic traditions of the ancient Near East (described in volume 1 of the *History*) when the political systems that had formerly supported them started to decline. Nor is it certain that there really was a complete cartographic hiatus in this region between the third century A.D. and the ascendancy of Islam from the seventh century onward. Moreover, once a distinct Islamic cartography emerges, we shall still lack a firmer understanding

of the relative contributions of Indian, Iranian, Judaic, and Greek learning to this evolving form, and of the various routes by which each of these elements reached Islamic mapmaking. The cartographic interactions of premodern Islamic societies with Europe also still await a detailed examination, and little is known about the influence of China on the lands west of it. Joseph Needham believed the Chinese grid system, transmitted through an Arab intermediary, could be detected on Marino Sanudo's map of Palestine (early fourteenth century), but in fact we lack definite documentation of such a transmission.

Other lines of inquiry seem more promising. The cultural origins of the iconography on celestial maps have been traced on stylistic grounds, and this aspect of maps may illuminate the transmission of European, Byzantine, Islamic, Iranian, Indian, and Chinese conventions that appear on various maps discussed in this book. This could in turn help to resolve broader questions of cartographic diffusion from East to West or from West to East.

Then there are all the technical aspects of the maps in our corpus remaining to be studied. Our general emphasis on the social context of mapping does not deny the importance of being sensitive to "internal" questions of how maps were graphically conceived and executed. The comparative study of early maps in Islamic society, in particular, has usually focused on geographical content and place-names while overlooking the intrinsic quality of the artifacts. Many studies have run the risk of misinterpretation as a result. Konrad Miller's reconstruction of al-Idrīsī's sectional maps as a single composite map in the nineteenth century (or Petrus Bertius's in the early seventeenth century) has thus implied, without reviewing the physical evidence of the artifacts, that al-Idrīsī created a large single world map by joining all the sectional maps. Similarly, the controversy concerning the world map in a manuscript of Ibn Faḍl Allāh al-'Umarī of the early fourteenth century, which bears a modern-looking graticule, is largely based on disagreement about the date when the actual manuscript was copied and whether it bears later additions. A resolution of this problem will surely include as careful a stylistic and physical examination of the manuscript as would be accorded a work of art of the particular period. We have not reached the enviable position of art history, in which much more of the corpus has been cataloged, analytically described, and—in the case of key artifacts—subjected to close chemical scrutiny of inks, pigments, and base materials such as paper and parchment. Such technical descriptions of maps will, however, need to take stock of other graphic media, such as painting, calligraphy, and the metalworking arts, to which mapmaking and geographical instrument making were closely allied. The best way forward may lie in interdisciplinary cooperation between



art history and map history.

In a similar way, the cartographic signs on Islamic maps require systematic comparative examination of the kind our author has attempted for South Asian maps. How closely, for example, does their design match the abstract quality of Islamic art in general? Do their color conventions relate to wider artistic practices, or did they embody some measure of color sensitivity to different environments?

Equally problematic is the orientation of maps. Despite the large sample of maps represented in this book, the resolution of this issue remains elusive. Many Indian maps were oriented to the east, but no dominant convention emerges from the evidence we have reviewed. There is, moreover, the complicating tendency, especially evident in the maps of Kashmir, for certain maps to have multiple orientations, with features (especially mountains) pointing away from the usual point of view of the observer. Clearly it would be premature to advance generalizations even for localized cultures. The evidence from Islamic society is no less ambivalent. Many Islamic world maps were oriented to the south, but by no means all maps, or all types of maps, share this feature. Among those with different orientations are some of the regional maps of the Balkhī school, the sectional maps in al-Idrīsī's shorter work, the *Rawḍ al-faraj wa-nuzhat al-muhaj*, and the world map in *Kitāb al-bad' wa-al-tā'rikh* dated 977/1050. This suggests there was no hard and fast convention. Given the powerful symbolism of orientation in the Islamic world in general, as in other cultures, absence of a "rule" dealing with map orientation in so formal a cartographic school as the Balkhī suggests that the question mattered less in Islamic mapping than in Western mapping, descended directly from the Greek tradition. One danger to bear in mind is that Europeans' reasoning about the influence of sacred directions on their own medieval maps has led to reading too much from the orientation of Islamic maps. Examples are the suggestion that a southerly orientation was derived from the Arabs' early conquest of the Zoroastrians, for whom south was a sacred direction, and the idea that the practice arose

because of Islamic reverence for the cities of Mecca and Medina. Other explanations are possible. A custom of southerly orientation could have been derived from accepted Greek cosmographic models, such as the Aristotelian tradition of the universe described in *De caelo*. But this is still conjecture. All we can say is that such differences of orientation exemplify the highly selective assimilation of knowledge that is so characteristic of Islamic cartography. Though it is clear that the Ptolemaic model was not followed in cases of southerly orientation, the exact reasons for this practice have to be researched in more detail before a definite conclusion is reached.

In sum, this book has offered many rich new perspectives on the history of Old World cartography in the premodern era. Whereas in our first volume we were in many respects still searching for the origins of Western modernity in the maps of the classical and late medieval worlds, here in both the Islamic and South Asian narratives an understanding of a cartography has been reached without recourse to Western models. No longer can one doubt the existence of a mapping impulse in these early societies. Each essay has made clear how different cultures created their own maps in just the same way as they created their own histories, their own literature, their own art. And we have been shown how, though distinctively indigenous in many respects, all these cartographies were at times transformed by social forces external to their area of origin. Interestingly, to the extent that it applied, such a cultural openness to the "foreign" can be seen as the very antithesis of later Western cartography, where a European "standard" of mapping was imposed on other areas of the world during the advance of European power and culture. Neither in the Islamic world, despite its remarkable degree of cultural unity, nor in South Asia was there ever any overarching cartographic paradigm. There was not even a consensus on how best to measure and represent earth, sea, sky, or universe. It is this unpredictability that makes traditional mapping in these areas of the premodern world at once so fascinating and so tantalizingly difficult to encompass from a late twentieth-century viewpoint.