2 · Introduction to East Asian Cartography

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SCOPE

"Asia" is a peculiarly European notion. It is an eccentric one by, say, Indian or Chinese standards. Asians seldom find the idea of Asia meaningful unless they have adopted Western categories of thought, and with them European ways of lumping things together. The word describes a nonentity. Asia is not a continent; it is divided by topographic obstacles almost impassable before modern times; it embraces a rich assortment of societies, cultures, and states; and through history it has juxtaposed some of the world's richest and poorest, as it does today.

Nor has any word resembling "East Asia" expressed a sense of unity among the countries that have drawn on Chinese institutions, ideologies, and techniques. The term did not exist in the vocabularies of any of its peoples until it was introduced from the West. We find no counterpart of "Europe" or "Western civilization" reflecting a shared consciousness, part of everyone's identity, that does not stop at frontiers. Except for Buddhist pilgrims, itinerant merchants, and occasional diplomats, East Asians, especially the ruling classes, stayed at home.

Whether the idea of East Asia has any value for the history of cartography depends on how one defines it. As a general term for Asia east of the great mountainous barriers, it has no significance beyond geography. Some of the cultures of that region adapted Chinese institutions and creeds, and others responded to the influence of India as borne by Hinduism and Buddhism. The border between these two zones shifted through history. Central Vietnam remained part of the Indianized Champa state until the 1470s, and the Mekong basin belonged to the Khmer world until the mid-eighteenth century. "East Asia" has of course been defined and redefined to fit various geopolitical ambitions. Those who pushed the Greater East Asia Co-Prosperity Sphere, that watchword of Japanese territorial ambitions in 1940–41, would have been delighted to include India.

"East Asia" is useful mainly as a cultural label. We mean by it the parts of Asia that were governed by a system based more or less on the bureaucratic hereditary monarchy of China. The connection was more than political. In these countries the elite before this century generally were educated in the Chinese classics and literature, wrote in classical Chinese, and were exposed to Neo-Confucianism. The last began as a quest for private self-cultivation leading to conscientious public lives, based on the teachings of Zhu Xi (1130–1200) and others. It kept that emphasis in independent lineages, but these influenced only a minority of intellectuals. The upper crust generally accepted and enforced state-sponsored orthodoxies based on rigid authoritarian interpretations of Zhu's philosophy, beginning in China early in the fourteenth century. In the fifteenth century in Korea and Vietnam, and in the seventeenth century in Japan, the state began promoting such orthodoxies. The illiterate or barely literate majority of the population were indirectly affected by the shared "Confucian" ideology of their rulers. Unlike the peoples of Southeast Asia, they directly experienced Buddhism in its Mahayana version, as recorded in Chinese-language canons that literate priests and monks studied.

These "East Asian" characteristics unite China, Japan, Korea, and Vietnam, the last with qualifications. Although these influences did not strongly affect the southernmost parts of its modern territory until about five hundred years ago, the northern part entered the Chinese cultural sphere in the second century B.C. Through history the north was repeatedly conquered and repeatedly fought free of Chinese control. Its elite even when independent wrote in the Chinese language, and continued to do so for some time after all of Vietnam became a French colony in 1884.

To sum up, despite its geographic and political shortcomings, "East Asia" is unobjectionable as a cultural designation. That suits the needs of this volume. Some maps are geographic, but cartography is culture.

As the authors make clear, mapmaking and map use in the four countries have been locally diverse, but before the twentieth century they were as marked by commonalities as what we find in Europe (which is, after all, a smaller part of the world). But those commonalities do not extend to Southeast Asia—Thailand, Cambodia, Laos, Burma, and Malaya—and so our remarks do not extend to it either. As for the Mongol and Manchu peoples of northeast Asia and the Tibetans, on the whole

their elites depended on China for neither language nor forms of governance. When Mongols and Manchus conquered part or all of their rich agricultural neighbor, however, their leaders quickly grasped both language and bureaucracy. That does not make them essentially East Asian in culture, but this volume is an obvious place for reports on Greater Tibet and (more briefly) Mongolia.

The Variety of East Asia

To assume that adaptations of Chinese culture made East Asia uniform would leave us unable to account for the distinct visual worlds that the maps in this volume reveal. Vietnam, Korea, and Japan had their own cultures long before they came under Chinese cultural influence. Their material cultures, from food and housing to ceramics and metal-working; their archaic ruling structures; their religious traditions, both ancestral rituals and popular forms of reverence for nature and gods; the vernaculars in which they spoke, thought, and remembered: all of these differed fundamentally.

The people of these countries were not passive recipients of Chinese influence. They welcomed it at times, at other times rejected it,[1] and to a remarkable degree decided for themselves what suited their own circumstances. Buddhism and then Neo-Confucianism indeed became a cultural cement, but despite their dependence on common canons they varied locally in important ways.[2] Chinese popular religion had some influence on folkways elsewhere, but its specialized outgrowth Daoism (which borrowed extensively from esoteric Tibetan religion and other traditions of Buddhism) had practically none.[3]

Another example of discriminate appropriation is classical Chinese itself. Koreans, Japanese, and Vietnamese made it a language of learning much as Europeans did Latin, but what they recorded would not have been understandable in many respects to Chinese contemporaries. In any case few Chinese were curious about foreign writings. They also used the written characters to transcribe their own vernaculars, eventually abbreviating and stylizing them to form the Japanese *kana* and Vietnamese *chữ-nôm* scripts. The alphabet that has replaced Chinese graphs in Korea is an essentially independent invention, and modern Vietnamese still use the spelling that the French imposed on them.

These adaptations are scarcely surprising. It is natural to think of China as a homogeneous cultural and political unit, but it is too large for that, even today. Just as dynastic change was often barely felt in distant provinces, the diversity of which we have just given examples is mirrored within the country. We can, for instance, find consistent local variations in the writing of classical Chinese, and recorded dialects used graphs (some of them not found in so-called Mandarin) in idiosyncratic ways. Just as histories of all Europe are not a staple genre, it is becoming clear that China is too large for much of the generalization customary among historians.[4] The linguistically diverse peoples of the isolated southern provinces also chose and adapted from the culture of the political and commercial centers.

Thus we see that East Asia did not begin as culturally Chinese, and as every reader knows, it did not end that way. After discussing the ancient Chinese terminology for maps, we will return to the cartographic multiplicity that these civilizational differences bred. (For a generalized time line of East Asian history, see table 2.1.)

Terms

The Chinese written language was, until about the third century B.C., largely built on the idea that (proper names aside) one word should be expressed by one graph. This led to magnificent concision, but since the number of graphs remained limited, it meant that a given graph might stand for many related ideas. Ambiguity was later avoided by combining graphs to make compounds; but in the first phases of writing, one avoided it by making sure the context was specific. Chinese writers did that with great skill. The problem with reading the early classics is not generally that their diction is unclear, but that scholars today know too little about the resonances of individual

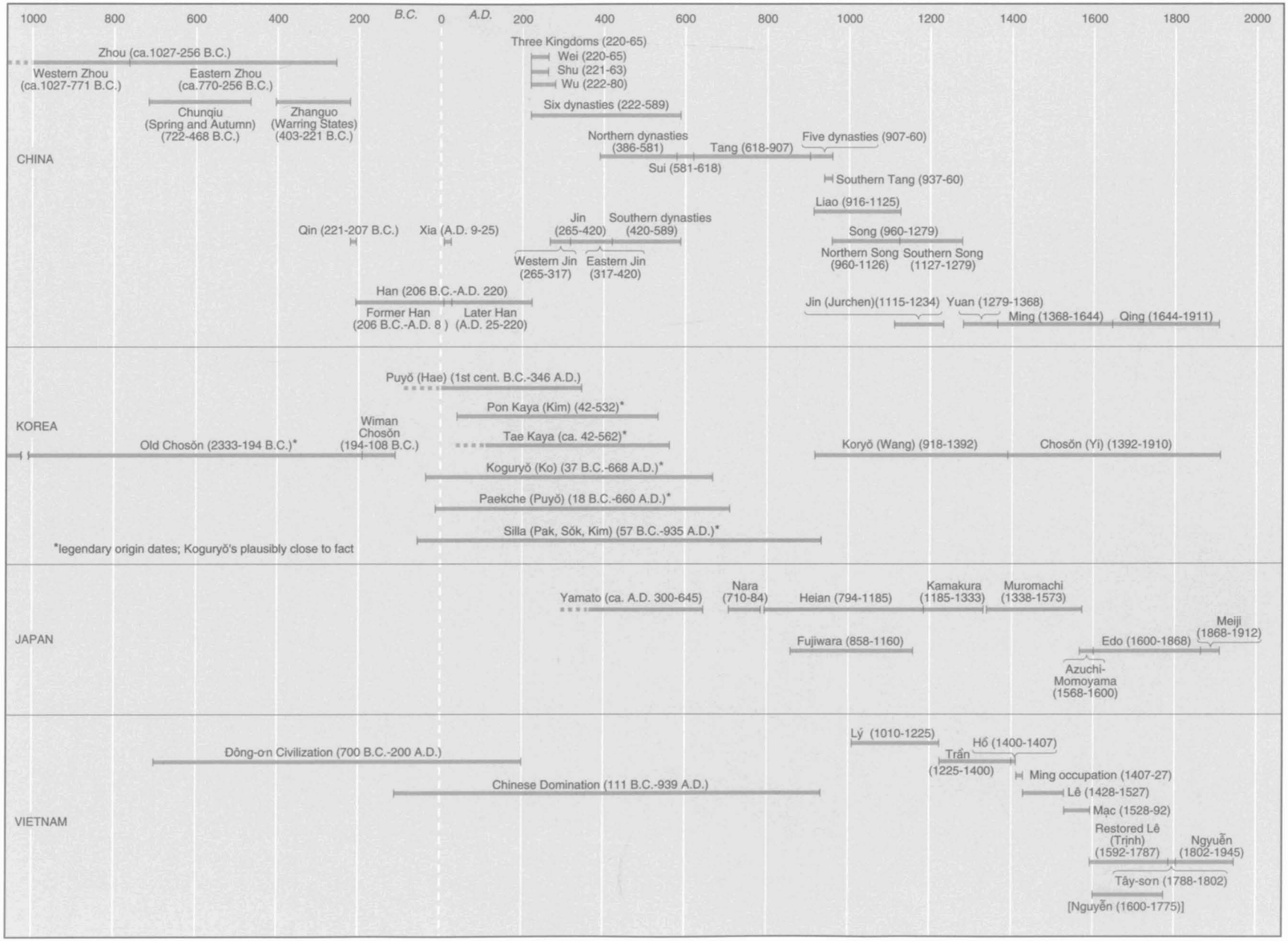
1. On this point see, for example, Masayoshi Sugimoto and David L. Swain, *Science and Culture in Traditional Japan: A.D. 600–1854* (Cambridge: MIT Press, 1978). This book organizes its narrative around alternating periods of "cultural waves," first from China and then from Europe, and periods in which contacts with foreign countries were cut off as new ideas and usages were assimilated.

2. It is well known that this is true of Buddhism. There has been much less comparative study of Confucianism, but see in particular William Theodore de Bary and Irene Bloom, eds., *Principle and Practicality: Essays in Neo-Confucianism and Practical Learning* (New York: Columbia University Press, 1979).

3. Except, remarkably, among peoples on the non-Mahayana southern periphery of China. This topic has only recently come under active scrutiny by anthropologists. See Michel Strickmann, "The Tao among the Yao: Taoism and the Sinification of South China," in *Rekishi ni okeru minshū to bunka: Sakai Tadao Sensei koki shukuga kinen ronshu* (Peoples and cultures in Asiatic history: Collected essays in honor of Professor Tadao Sakai on his seventieth birthday) (Tokyo: Kokusho Kankōkai, 1982), 23–30. The peoples studied in northeast Thailand and Laos are non-Han but originated within the historical borders of China. We refer to the Daoist religious movements, not to the early philosophic classics that became part of the common literary heritage first of East Asia and then of the world.

4. The most widely used set of smaller units are the physiographic "macroregions" of G. William Skinner. His most eloquent argument for a history based on them is his "The Structure of Chinese History," *Journal of Asian Studies* 44 (1985): 271–92.

TABLE 2.1 Generalized Time Line of East Asian History



words to interpret them as readers did when they were written. In all four societies literacy (defined by contemporary standards) was rare, and the elite tended to share great provinces of allusion and symbol.

Nevertheless, in reading ancient documents one often comes across a word that, regardless of context, refers to what modern readers consider two or more quite different things. It would be foolish to assume that the language of the time was incapable of resolving the ambiguity. As we can see in one instance after another, the linguistic ambiguity is there because the ancients' convictions about what ought to be kept separate do not happen to agree with ours. We can learn from this equivocality if we are attentive to their opinions about the fitness of things without being distracted by our own. The etymology of "map" is a case in point.

Tu is the word used consistently in archaic writing to designate maps, but it never referred to maps alone.[5] One can draw no conclusions about etymology from the form of the graph. Compilers of dictionaries classify it by the "enclosure" radical, shown in the modern form at the far left of figure 2.1 as the box around the outside. This system of radicals was applied very late, probably first in *Shuowen jiezi* (Explanation of writing and explication of graphs), the great etymological dictionary compiled ca. 100. Radicals often have nothing to do with the original meanings of graphs. The "enclosure" box often occurs as a part of graphs whose meaning has to do with the enclosure of space, but one cannot conclude from this observation that the character represents a map of some sort. In its forms in early bronze inscriptions, of which figure 2.1 shows examples, the design inside the box varies too greatly to invite speculation about what it portrays. The character as a whole is certainly not a simple pictograph. If it is an ideograph (what early lexicographers called *huiyi*), present knowledge is not adequate to decipher its origin.

Nor for that matter was the knowledge of early etymologists adequate to reliably explain graphs that had been in use for nearly two millennia; their explanations are sometimes far-fetched. For instance, the *Shuowen jiezi* defines *tu* as "difficulty in planning" (*huaji nan ye*), a meaning that does not occur in earlier texts. The dictionary analyzes it into an enclosure and the enclosed part. The latter, it avers, means "difficult." But it is easily seen that, of the three early bronze forms in the figure, only the second even remotely resembles what the dictionary says is the original form. This definition is useful only as an indication that scholars in the second century A.D. connected its origins with planning (the Han meaning of the compound *huaji*). It is interesting, but not significant, that they did not connect this origin with mapping.[6]

Tu is unusual in lacking both homophones with clearly related meanings and other characters that share its graphic form. Ingenious etymological speculations have accumulated over the centuries, but the means to choose between them are so far missing.

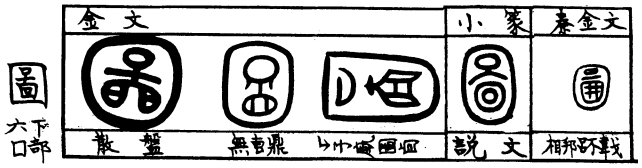


FIG. 2.1. EARLY FORMS OF THE GRAPH *TU*. The small graph at the far left is the modern form as written with a brush. The graph at far right is the "small seal" version associated with the dictionary *Shuowen jiezi*. The three graphs in the middle are from Zhou dynasty bronze inscriptions. The first is from the ninth-century basin, the *San pan*, discussed below. Reproduced from Zhang Xuan (Chang Hsüan), *Zhongwen changyong sanqian zixing yishi/The Etymologies of 3000 Chinese Characters in Common Usage* (Hong Kong: Hong Kong University Press, 1968), 171.

Tu as it occurs in writings before 300 B.C. has a great many meanings. It can refer to pictures, diagrams, charts, and tables. As a verb it can refer to planning, anticipating, giving thought to, or dealing with something. In many documents, as Cordell Yee shows below, it is impossible to tell which sense is meant, because we do not share the knowledge of context that ancient authors expected of their readers. Some instances are clear enough. One of the earliest occurs in an inscription of 359 graphs on a large bronze basin that was probably cast in the mid-ninth century B.C. It commemorates the settling of a boundary dispute between San and a state so obscure

5. The classic reconstruction of early phonetics, Bernhard Karlgren, *Grammata Serica Recensa* (Stockholm, 1957), reprinted from the *Bulletin of the Museum of Far Eastern Antiquities* 29 (1957): 1–332, esp. 37, item 64a–c, proposes the Old Chinese reading **d'o* (roughly 700 B.C.). More recent authorities posit an assortment of alternatives: *dag* (Li Fanggui), *dɔ* (E. G. Pulleyblank), *da* (Axel Schuessler), *d/la* (William Baxter). By the second century A.D. the word's pronunciation in northern China was perhaps closer to **d'âⁿ*. Its Early Middle Chinese pronunciation (ca. A.D. 600) was *dwo*. See Edwin G. Pulleyblank, *Lexicon of Reconstructed Pronunciation in Early Middle Chinese, Late Middle Chinese, and Early Mandarin* (Vancouver: UBC Press, 1991), 311; Axel Schuessler, *A Dictionary of Early Zhou Chinese* (Honolulu: University of Hawaii Press, 1987), 615–17; and William H. Baxter, *A Handbook of Old Chinese Phonology* (Berlin: Mouton de Gruyter, 1992), 649.

6. Xu Shen, comp., *Shuowen jiezi*, 12:13a, in *Shuowen jiezi yuezhu* (*Shuowen jiezi* with a simple commentary), ed. Zhang Shunhui, 3 vols. (completed 1971; Loyang: Zhongzhou Shuhua She, 1983). Karlgren (*Grammata Serica Recensa*, item 847a–d [note 5]) uncharacteristically speculates that *hua* depicts a hand drawing a map, but even if this were true, *huaji* clearly refers to planning. It is possible that *nan* is a kind of wordplay (paranomasia), meant to be taken not literally but by the way its sound (something like **t'nân* in the second century A.D.) echoes that of **d'âⁿ*, probably the contemporary pronunciation of *tu*.

that it has never found its way into the geographical dictionaries. After officials set up boundary posts and exchanged solemn pledges never to encroach on each other's territories, a *tu* was executed. Whether this was precisely a map is impossible to say, but the context makes it reasonably certain that it was some sort of diagram rather than a written record.[7]

It is interesting to compare the meanings of *tu* with those of its counterparts elsewhere. Late Greek *chartes*, from which "cartography" derives, refers to a sheet of papyrus, and late Latin *mappa* means "a cloth"; both are words for the material on which a map is drawn. In the main premodern Islamic languages we find a number of words derived from roots for "form," "draw," or "paint," at least as broad in scope as *tu*. The word for map in most Indian languages, derived from an Arabic word, may mean not only a picture but a general description or report. With respect to *tu*, China would thus be intermediate in concreteness between Europe and India.[8] It shares with modern European languages the overlap of sense between "map" and "plan."

In the fourth and third centuries B.C., nouns began more often to take the form of two-character compounds, which restrict the possibilities of ambiguity at the cost of added information. A number of terms that mean "map" and nothing else appear beginning at this time. The most prevalent, *ditu*, combines *tu* with *di*, the common graph for land or place.[9]

The appearance of compound words does not mean we are no longer frustrated by passages that may or may not be about maps. The problem, as the authors of this section explain, is a matter not of language but of cultural practice. Graphical maps and informational texts in China form a unit that it is not always possible to dissociate, an important point to which we will return.

Contents

Chapters 3–14 on East Asia use the broad definition of "map" characteristic of this *History*. They include separate chapters on geographic cartography, with attention to the cosmological and religious significance of maps, in China, Korea, Japan, and Vietnam, and on celestial cartography in China, Japan, and Korea. The chapters on geographical maps in China present a strikingly new interpretation of their general character. Its potential utility for the history of cartography is so great that it calls for full statement and documentation. To understand in what sense this argument is a new departure, it is necessary to pause briefly over the historiography of Chinese mapmaking. But we should emphasize that the rest of the volume is amply innovative in ways that reflect the new scope and emphases of the series.

Historiography

Western historical studies in East Asian cartography began just after the turn of the century with an essay by Chavannes.[10] This excellent contextual study of what were then the two oldest extant Chinese maps was published in Hanoi and then ignored for decades by European compilers of histories. Chavannes, probably the greatest Sinologist of his era and certainly the broadest, rather than using the maps primarily to illuminate Song culture, concentrated on the question of accuracy in mapping. So did his successors.

In China the "evidential research" scholars who, beginning in the seventeenth century, undertook a massive critical study of the classical heritage were curious about old maps as well as every other relic of antiquity.[11] Modern studies began with two papers in a geological journal in 1911.[12] A book-length survey by Wang Yong (1958)

7. The *San pan* is one of the most celebrated bronzes in the old Palace Museum, now in Taipei. A rubbing is clearly reproduced in *Chinese Cultural Art Treasures: National Palace Museum Illustrated Handbook*, 3d ed. (Taipei: National Palace Museum, 1967), diagram 10. Because two characters in the sentence after the one we summarize are unreadable, the syntax is somewhat uncertain. For translated examples of the earliest meanings, "to plan," "planned," "a plan or map," see Schuessler, *Early Zhou Chinese*, 615–17 (note 5). This book adduces only a few bronze inscriptions, however, and those that document *tu* are not among them. For additional classical meanings see Karlgren, *Grammata Serica Recensa* (note 5).

8. See the preface and Ahmet T. Karamustafa, "Introduction to Islamic Maps," in *The History of Cartography*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1987–), 1:xv–xxi, esp. xvi–xvii and nn. 7 and 13, and vol. 2.1 (1992), 3–11, esp. 7–8.

9. A chapter with this title occurs in the eclectic *Guanzi* ([Book of] Master Guan), which was compiled in the first century B.C. from materials written as early as the fifth century. The chapter seems to be a fragment of a lost military manual and probably belongs to a late stratum. It is translated in W. Allyn Rickett, trans., *Guanzi: Political, Economic, and Philosophical Essays from Early China* (Princeton: Princeton University Press, 1985–), 1:387–91. Some commentators give *ditu* an alternative sense of terrain (a rare but not unique usage). This rather than "maps" may be the meaning of the title. The subject of the chapter is in fact terrain and a number of other concerns of the tactician. Although Rickett does not query the translation "maps," see his remarks on 389.

10. Edouard Chavannes, "Les deux plus anciens spécimens de la cartographie chinoise," *Bulletin de l'Ecole Française d'Extrême-Orient* 3 (1903): 214–47. Earlier writings on the topic, such as William Huttman, "On Chinese and European Maps of China," *Journal of the Royal Geographical Society* 14 (1844): 117–27, are much less adequately informed.

11. For instance, Hu Wei's 1697 reconstruction of a map in the *Yu gong*; see his *Yu gong zhuizhi* (Using an awl to gauge the depths of the *Yu gong*), in *Huang Qing jing jie* (Explications of the classics from the Imperial Qing, compiled 1825–29), ed. Ruan Juan and Yan Jie, 27:53b.

12. Zhang Yi, "Zhongguo gudai ditu zhi bijiao" (A comparison of ancient Chinese maps), *Dixue Zazhi* 2, no. 5 (1911): 1–8, and Tao

largely defined the field but has been partly superseded by a new general history.[13]

There are now a few specialists, of which the best known, in addition to the authors of these chapters, are Cao Wanru in China, Mei-ling Hsu in the United States, Funakoshi Akio in Japan, and Yi Ch'an (Chan Lee) in Korea. They share with their predecessors the viewpoint of the cartographer or geographer; that is, a concern with ancient mapmakers as predecessors of modern mapmaking technique (and, particularly in the People's Republic of China, science). Scholars in East Asia for more than two generations have concentrated on finding the documents, setting them in order, and describing them to a readership of cartographers and others. They have studied them as unique objects whose documentary and social matrices are only incidentally relevant. This largely antiquarian and philological effort has accelerated with the general growth of institutions in the history of science and with the remarkable frequency of important archaeological discoveries since the 1950s.

The positivist view of ancient cartography as a gestating technology is still prevalent in China, Japan, and Korea.[14] The philological work is generally high in quality and continues to add important sources to the accessible record, but evaluations tend to stress documents and "achievements." This is particularly true in the People's Republic of China, where the official view of history makes science an unproblematically progressive force, and where the imperatives of nationalism prod historians to find Chinese technical priorities. The result of this scientism has naturally been an emphasis on geographic information, accuracy of scale, and elaboration of map signs. There has been little attention to the socioeconomic, aesthetic, and moral dimensions. There has been none at all to the abstract cosmic diagrams of which John Henderson shows the historic importance in chapter 8, or to the maps of visionary space that were important in Buddhist and Daoist practice (see chapter 11 for Japanese Buddhism, and chapter 15 for Tibetan Buddhism).

The most important inquiry in the West, with not a little influence in East Asia, has been that of Joseph Needham. His 1959 essay of sixty-odd pages, "Quantitative Cartography in East and West," was (as the title indicates) no exception to the positivist and progressivist trend, and its "East" was China. But it was pathbreaking in several respects. He embedded it in a general reconnaissance of science and civilization. It focused on well-informed comparisons with European mapmaking. Needham's catholic view of science led him to make religious cosmology, Eastern and Western, an integral part of the inquiry, even though he did not examine it in depth. His curiosity about concrete routes of transmission led him to explore the role of the Islamic world as an intermediary between East and West.[15]

Cordell Yee shows below the fundamental flaws in Needham's demonstration that map grids evolved steadily from the Han up to the point when Chinese practice was replaced by European methods in the seventeenth century. Needham's essay was nevertheless a carefully articulated and fully documented argument, meant to encourage and ease studies that would test and improve upon it. In that it succeeded. Because of its erudition, it has not been superseded in any important respect until the survey in this volume, which not only corrects the interpretive errors of this pioneering work but replaces its problematic with a much more commodious one.

The Means and Ends of Cartography

This volume presents the challenge of several humanists to views that see mapmaking exclusively as science and technology. As Yee puts it, "To achieve literacy in traditional Chinese cartography, one needs grounding in the history of science and technology, art, literature, government, economics, religion, and philosophy—in short, the polymath range of the mapmakers" (p. 228 below). This is clearly not a view that excludes or diminishes the technical dimension of mapmaking. Yee sees it as one dimension of a larger picture, none of which will make sense without a rounded view.

Maps assuredly have been more or less accurate spatial representations that could guide exploration. But as Yee remarks below, the fact that Chinese cartography shared "the aesthetic principles of painting and poetry" could

Maoli, "Zhongguo dituxue faming zhi yuanshi ji gailiang jinbu zhi cixu" (The origins of cartographic invention and steps toward reform and progress in China), *Dixue Zazhi* 2 (1911): no. 11, 1–9, and no. 13, 1–9.

13. Wang Yong, *Zhongguo ditu shi gang* (Brief history of Chinese cartography) (Beijing: Sanlian Shudian, 1958). This is a revision of two chapters in Wang Yong's *Zhongguo dilixue shi* (History of geography in China) (1938; reprinted Taipei: Shangwu Yinshuguan, 1974). Four chapters are translated in Donald J. Marion, "Partial Translation of *Chung-kuo ti-t'u shih kang* by Wang Yung: A Study of Early Chinese Cartography with Added Notes, an Introduction and a Bibliography" (M.A. thesis, Graduate Library School, University of Chicago, 1971). The recent history is Lu Liangzhi, *Zhongguo dituxue shi* (History of Chinese cartography) (Beijing: Cehui Chubanshe, 1984). The most complete bibliography of essays in the field is in Yan Dunjie, *Zhongguo gudai kejishi lunwen suoyin 1900–1982* (Index of essays on the history of ancient Chinese science and technology, 1900–1982) (Nanjing: Jiangsu Kexue Jishu Chubanshe, 1986), 127–32 and 907, 79 items to 1982. For Western publications and publications on cartography elsewhere in East Asia one must use more general bibliographies.

14. We do not know what historical research and publication are under way in Vietnam.

15. Joseph Needham, *Science and Civilisation in China* (Cambridge: Cambridge University Press, 1954–), vol. 3, with Wang Ling, *Mathematics and the Sciences of the Heavens and the Earth* (1959), 525–90.

provide as adequate a theme for its history as could mensuration (p. 164). An impartial survey of maps' place in history cannot privilege one role or another. It is equally worthy of reflection that they were used for education, for aesthetic appreciation, to express emotional states, to represent power, to settle disputes, to symbolize submission or subordination, and to promise immortality. Yee is not merely suggesting that all these functions be studied as part of one picture; he and to varying extents the other authors show by example how it can be done.

In considering integrally the uses of mapmaking, Yee reveals again and again the wishful thinking to which the sentimental view of cartography as a technical march of progress has led. He does not brush aside, as his predecessors have done, these important facts: that too few maps survive from before the eleventh century to permit generalizations about practice in the first millennium A.D., much less earlier; that it was usual even for careful planimetric maps to show certain features such as mountains and buildings in elevation; that a consistent scale over a whole map is the exception; that the grid found on Chinese maps is not based on a coordinate system but is primarily an aid for estimating distances between points; and that even so grids were still not the norm in officially sponsored nineteenth-century maps. To the contrary, he treats these characteristics as valuable evidence for situating cartography in the culture that created it. He thus corrects once and for all the common fallacy that cultures that reward literary, artistic, and bureaucratic pursuits cannot encourage technological achievement.

No one will deny, we are sure, that before we compare the achievements of two cultures, both ought to be understood in their own contexts. It remains true that this is practically never done, since it demands of specialists an effort at polymathy of precisely the sort Yee has described. But his example and those of the other authors will no doubt encourage others.

John Henderson's discussion of cosmological diagrams in chapter 8 is also characteristically innovative. He shares with Yee a strong sense of development and change over the two-thousand-year life span of imperial China. His contribution provides a model for discussing nongeographical maps. His examination of philosophical cosmology furnishes an interesting contrast with the visionary luxuriance of Indian cosmographic mapping as described by Joseph E. Schwartzberg in chapter 15 of book 1 of this volume. In this book Kazutaka Unno and Schwartzberg reveal the Japanese and Tibetan Buddhist visions of the spiritual macrocosm. F. Richard Stephenson and Kazuhiko Miyajima, both historians of astronomy, provide a great deal of reliable information about Chinese, Japanese, and Korean star maps. The survey of Korean cartography by Gari Ledyard is attentive to the cultural and social particularities that have shaped cartography, and to interactions with China and the West. John K. Whitmore has provided the little information about mapping in Vietnam that is available in present political circumstances.

Text and Map

Another portentous conclusion that emerges from this volume is that in the Chinese tradition, and to a large extent throughout East Asia, the map is not always the appropriate unit of study for the history of cartography. This conclusion was natural as a result of taking seriously the characteristics of East Asian maps—unavoidable, that is, for scholars free of the parochiality that has led many historians of science to take as their task explaining Chinese inferiority. Yee and his colleagues make a solid case that what appear to be limitations of East Asian maps arise from the fact that they are not used alone but are read in conjunction with text. Regularly it turns out that a map contains little quantitative information. In some cases, of course, the makers were incapable of providing it, but in others they intended their map merely to give a quick impression of spatial relationships alongside a text that itemizes distances and directions in great detail. A map mainly meant to complement verbal description, as was common even in late gazetteers, has no need for a scale.

Anyone familiar with East Asian art is aware that painting and calligraphy, depiction and writing, share methods, materials, languages of gesture, and aesthetics. It is obvious, once Yee points it out, that there is no firm line, even that of convention, between painting and map. Cartography was not the province of specialists. Any magistrate was expected to draw a presentable map when one was needed, because he was trained to write beautifully and to paint. His staff would probably do the legwork for a survey if the map were to be based on a new one rather than on old records, and he might have an artist on his staff, but there is no evidence that even the central government had a special cartographic staff except when special projects made it necessary to organize one.

It was obviously not easy for a literatus to meet the technical demands of mapmaking without a good bit of experience. But if gentlemen valued the fusion of description and subjective experience when they saw it in landscape painting (or in the calligraphy of a landscape poem), it is not surprising that they should be willing to combine depiction of mountains and buildings in elevation, as we experience them, with an overall view from above. This is another instance of the commonsense demand for multiple viewpoints that naturally limited the role of convergent perspective in the Chinese visual arts. The chap-

ters in this book make all of this clear. They teach us how important it is not just to look at the map, but to analyze the interaction between the graphic depiction and the legend on the map, and between the map and the textual description that accompanies it—or, more often, that the map accompanies.

We also learn that the shaping force of China on East Asian cartography was far from total. Both local practice and competing influences from elsewhere made the maps of each country distinct.

Although in China, as we have remarked, grids were meant primarily for estimating distances, the first grids in Korea (1791) established a countrywide standard. National maps had already been evolving for two generations toward fixed scale and orientation, a uniform grid for the whole country, and the more or less total banishment of text. The two maps developed on this basis in the nineteenth century used a grid primarily as coordinates. Their maker, Kim Chŏngho, who had no technical peer among makers of national maps in China, numbered his ranks and files to help users find places. Local maps made by others employed the same coordinate system.

There are many such examples of ideas that originated in one civilization but were used creatively in another. The science of siting (or "geomancy"), which studies the flow of vital substance (*qi*) through the contours of the land in order to find dynamically balanced sites for buildings and tombs, was Chinese in origin, but only Koreans used it as a structure for national cartography. Again, Islamic materials that the Chinese had found useful only for a map of the "Great Ming" made it possible for the Koreans to produce a genuine world map, the *Kangnido*.

Unno's contribution makes clear the profound cartographic difference between Japan's Buddhist and Shinto cultures on the one hand and the Chinese and Korean combination of bureaucracy and "Confucian" orthodoxy on the other. In addition, from the seventeenth century on, merchants in the evolving Japanese urban milieu commercialized mapmaking. The travelers who filled the roads could choose from dozens of competing route maps, all in the colorful Edo style. In China and Korea, mapmaking was seldom tied to exploration, but the Bakufu's agents struggled through voyage after voyage to establish the outlines of Hokkaidō and Sakhalin. There is no doubt that Vietnamese cartography, once we know enough about it, will turn out to be equally distinctive.

Another point previously obscured by wishful thinking is the extremely limited impact of European cartographic methods and conceptions in China. In the early seventeenth-century Jesuit missionaries were able, in the exceptional circumstances of the Manchu occupation, to demonstrate the superiority of their eclipse prediction technique and in short order take over the Directorate of Astronomy. They succeeded because they and their hosts had the same uncomplicated view of what constituted a better prediction.

There was no such agreement about what constituted the best map. Chinese mapmakers did not see their task as projecting a spherical earth on a flat surface using rigorously geometric procedures. They did not see the earth partitioned by lines of longitude and latitude. They were familiar with these concepts long before the missionaries arrived, for their mathematical astronomy used ecliptic as well as equatorial coordinates; but they had no reason to project them on the earth. Their essentially numerical approach to astronomical prediction did not oblige them to decide whether the earth was flat, discoidal, or spherical. It is not precisely that mapmakers were convinced the earth was flat: that question did not arise in connection with their work. They simply acted as if they were transferring points from a very large flat surface to a smaller one.

Chapter 7 takes a fresh look at Chinese maps from the seventeenth century on and shows how little they were affected by Western innovation. That is true even though the maps Europeans produced for the 1718 national atlas, based on the Beijing prime meridian, represented the state of the art. Yee points out that because the eighteenth-century Jesuit maps rigorously used a standardized scale, they did not need a text that listed distances. They were among the first in China that were in principle independent of text. Shen Kuo in the eleventh century had claimed hyperbolically that his map of China could if necessary be reconstructed from his text; here were maps from which a geography handbook could be read.

But the Jesuit atlas did not change provincial and local practices; the graticule and scale were not widely adopted, even in late official maps, and no standard ever emerged for local government practices. The modernizers who spread information about the rest of the world were not cartographically up to date except in the maps they copied from foreign publications. Their aim was to improve policy, not mapmaking. Mixed pictorial modes remained common up to the twentieth century, and the popularity of religious and magical maps was not threatened. This is understandable given the discrepancy at the end of the imperial era in European and Chinese values, especially those that affected the weight given purely technical criteria.

European cartographic methods also had little impact in Korea but a great deal in Japan. Despite the Tokugawa regime's strict policy forbidding contact with foreign countries, Western maps continued to be imported and copied, and their sale flourished. Japanese were avid for marine charts, adding new data to the Portuguese orig-

inals. They were used for navigation to Southeast Asia and even became cultural icons, awarded to graduating navigators as a sort of diploma.

These differences in response and adaptation open up a broad set of questions about cultural interaction. Inquiries in this direction may yield something better than the trendy notions of "development" and "technology transfer," which assume that only suicidal irrationality keeps the "underdeveloped" or "less developed" from following the American path to the promised land.

Implications

It may seem paradoxical that this broader view of mapmaking as more than scientific brings the history of cartography into the mainstream of the history of science. The latter field has in recent years moved decisively away from the narrow focus on technical concepts and activity that was the norm fifty years ago. No longer obsessed by the myth of an unending march of progress, historians of science are now much better at explaining how values pervade theories, what scientific practice shares with the rest of human activity, and why the benefits and dangers of applying new knowledge are inseparable.

Equally stimulating in this audacious new look at old maps are its implications for other domains of the history of cartography. When Yee observes that Chinese maps are redolent of "power, duty, and emotion," what comes to mind is their lack of uniqueness in this respect. This redolence is true of all maps, geographic, cosmological, and religious; they differ in how it is true, and to what extent.

The studies in this book suggest that scrutinizing every dimension and connection of maps in a way sensitive to the unity of precision and aspiration is likely to yield a more adequate understanding of cartography in every place and time, including our own. There is need for more descriptions of individual maps as elegant and perceptive as these. There remain wonders of the quantitative imagination to be found and admired. But in demonstrating so persuasively that the antiquarian and technical approaches alone tempt us into blind alleys, and that a more attentive reading of all the evidence can keep us out of them, the contributors show how much can be gained from the broadened definition of cartography on which this *History* is based.