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*Also by*

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EXILE IN MID-QING CHINA:  
BANISHMENT TO XINJIANG, 1758-1820

# THE SEXTANTS OF BEIJING

GLOBAL  
CURRENTS  
IN  
CHINESE  
HISTORY



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less important, a whole range of Chinese goods, ideas, and people went abroad, diffusing Chinese intellectual and material influence as well as some of China's most characteristic institutions, such as its system of government. In short, the flow went in both directions, into and out of China, creating a mesh of relationships that spread right across Asia. China was ineluctably caught up in this network in innumerable ways well before Europeans appeared on the scene; their arrival extended its reach over even greater distances.

## CHAPTER TWO



## China and Catholicism in the Sixteenth through Eighteenth Centuries

... What would you say if I sent a troop of Buddhist monks into your country to preach their doctrines? You want all Chinese to become Christians. Your Law demands it, I know. But in that case what will become of us? Shall we become subjects of your king? The converts you make recognize only you in time of trouble. They will listen to no other voice but yours. I know that at the present time there is nothing to fear, but when your ships come by the thousands then there will probably be great disorder. . . . The emperor, my father, lost a great deal of his reputation among scholars by the condescension with which he let you establish yourselves here. . . .

The Yongzheng Emperor (1723-1735)

Portugal, seizing on the rich possibilities for European expansion suggested by the exploratory voyages of such men as Ferdinand Magellan and Vasco da Gama, had by the late fifteenth century identified two main goals in Asia. The first was economic: it wanted to wrest control of the lucrative spice trade between Asia and Europe from the Muslim traders who had dominated the sea routes since the decline of Ming naval power. The second was religious: it hoped to regain in Asia, as well as in Africa and in Brazil, some of the ground the Catholic Church had lost in Europe as a consequence of the Protestant Reformation.

In the late fifteenth century Portugal and Spain reached a general agreement to divide the world outside Europe between them. In the 1494 Treaty of Tordesillas, Pope Alexander VI pur-

ported to give formal recognition to Spanish and Portuguese domination of world trade routes by allocating to Portugal Asia, except the Philippines, as its sphere of influence, and to Spain the New World, except Brazil. This was a remarkable formula to draw up before all the newly discovered territories had been thoroughly mapped. In effect, it aimed to deliver control over European expansion into Catholic hands just as Catholic authority was undergoing the first assaults of the Protestant Reformation.

Portugal and Spain were, however, unable to exclude other Europeans from East Asian markets. They remained the principal European traders in East Asia—the Portuguese in Macao, with a more substantial colonial center in the Indian port of Goa, and the Spanish in the Philippines—only until the British and Dutch East India companies, founded in 1600 and 1602 respectively, successfully took over part of the market in spices. The Dutch soon established rival colonial trading bases in Batavia, Indonesia, and on the island of Taiwan, where Spain also maintained an outpost. Iberian and hence Catholic domination of the “market” in Asian souls proved more tenacious. Although the expansion of Islam offered Catholicism some competition in parts of Southeast Asia, in China Islam was less pervasive, and moreover, no European Protestants challenged Catholicism’s monopoly for another two centuries. Thus the period from roughly 1600 to 1800 has been described as China’s “Catholic centuries.”

This chapter examines the introduction of European Catholicism into China, focusing in particular on its most conspicuous proponents, missionaries of the Society of Jesus. Although it is hard to separate the reception of Western religion, on the one hand, from the exchange of goods and secular knowledge, on the other—as the Chinese themselves often found—for clarity’s sake we shall examine them more or less separately in this and the next chapter. Although this approach requires some unavoidable chronological overlap, this chapter deals primarily with Christianity during the period from the late sixteenth century, when the Ming was entering its declining phases, to the early eighteenth century, when for a number of reasons the tide turned decisively against the foreign religion. The next chapter focuses on the international exchange of goods and ideas and principally covers the reign (1736–1795) of Qianlong, under whose watch both foreign trade and the interest in European secular knowledge reached new heights.

Contrary to conventional wisdom, China rarely rejected foreign knowledge on the ground of pure outlandishness. Foreign origins were neither a recommendation nor an absolute bar to acceptance. China’s reception of Christianity was influenced mainly by three factors. The first was the degree of compatibility between certain traditional Chinese beliefs and the Christian requirement that devotees should venerate the Christian God alone. The second factor related to the way Jesuit missionaries—Christianity’s leading exponents in China—used their knowledge of such secular topics as mathematics and astronomy to attract Chinese interest before they ever raised the issue of religion. Attract interest they did, but this approach backfired because it raised doubts about their true intentions. The third factor influencing China’s reception of Christianity was the momentous political changes taking place in China. In 1644 the Ming empire (1368–1644) which had expelled the Mongols from China, itself was replaced by Manchu invaders from the northeast, who established the Qing empire (1644–1911). To the majority of ordinary Chinese, the dynastic transition may have meant little more than the cessation of military activity and the resumption of the normal cycles of their lives. But for the educated classes, who were the prime targets of Jesuit mission efforts, the devastating experience of Manchu occupation completely colored their outlook, among other things disinclining them toward foreigners and foreign cultures. We turn now to a sketch of the situation in China at the time European missionaries first arrived in 1583.

#### LATE MING CHINA

On the surface late Ming China appeared truly thriving. Its population surpassed 150 million, far more than that of Europe at the time, which China roughly resembled in geographic size. Unprecedented agricultural prosperity gave commercial transactions a new importance, fueling the expansion of both regional and national markets. At the same time, the government consolidated the old forms of taxation in kind and in labor services into a single payment in silver, into which people converted the copper currency they used in everyday life. In other words, at about the same moment, the use of money, and silver in particular, became much more prevalent, both in the newly vital market economy and in the system of state revenues.

In practice Ming loyalism took two main forms. The first involved active armed resistance and often resulted in death. The second, longer-term and more subtle, led to a significant shift in the intellectual environment. Many scholars debated, in an agony of self-reproach and wide-ranging recriminations, the reasons for the cataclysmic Ming collapse. As they searched for explanations, many condemned what they saw as the loose intellectual and moral atmosphere of the late Ming, when, they believed, there had perhaps been too much of a sense that "anything goes" and too little emphasis on pursuing practical goals for the benefit of the country. As a consequence, a revival of the rigorous moral ethic of orthodoxy, accompanied by renewed interest in classical studies and practical statecraft, returned to the ascendant among Han Chinese intellectuals, who hoped to find a way to compensate for having tolerated the fatal laxity of the Ming's declining years. From this point of view, support for the new regime was particularly objectionable.

Such issues also resonated with the new Qing rulers. Without intellectuals' support, the new regime's legitimacy remained open to question. Besides, the Manchus were so much in the minority that they desperately needed a degree of cooperation from Chinese scholar-officials just to enable them to rule. Hence intellectual orthodoxy also received official encouragement from the Qing because it helped to identify them as upholders of Chinese traditions and thus to confound those who might question their legitimacy.

Overall neither the champions of the fallen Ming nor the new incumbents regarded a neutral stance as sufficient. Choices made in this volatile atmosphere determined the all-important judgment both of contemporaries and of history. These issues had much to do with the fate of the Catholic religion in China.

#### THE EARLY CATHOLIC MISSIONS TO CHINA

Catholic missionaries were at the forefront of China's introduction to Europe and its culture. Among the members of the several different religious orders that sent missionaries to China at this time, the most numerous and conspicuous were priests of the Society of Jesus (the Jesuit order), founded in 1540 with the express purpose of converting the heathen overseas. The first Jesuits took up residence in China in 1583 in the hope of gaining vast numbers of con-

verts to their version of Christianity. Many spent the rest of their lives in China, living among Chinese people, speaking their language, and learning about their culture.

Constituted in 1540 by the soldier-mystic Ignatius of Loyola (1491-1556) as a highly militant order with the specific goal of converting "infidels" overseas, the Society of Jesus led the mission field in China. Sometimes referred to as the Shock Troops of the Counter-Reformation, the Jesuits called their leader a general and conceived of their overarching purpose as the conquest of the world for Christ. Christ himself was "transformed from an object of quiet reverence into a militant figure leading his disciplined order into battle against the devil."<sup>2</sup>

The Jesuits placed great stress on education. They used their colleges both to promote the Catholic education of the European upper classes and to provide future missionaries with a thorough grounding in the Western classics, history, theology, mathematics, physics, metaphysics, astronomy, logic, and moral philosophy, among other topics. Young Jesuits also were rigorously trained to draw connections between the different branches of their knowledge in order to be able to analyze and defend their faith. In short, the missionaries, who were often among the first to represent European culture abroad, came from the intellectual vanguard of their times. In China this was particularly appropriate because of the longevity and sophistication of its civilization, and because of the resulting cultural self-assurance of the Chinese intellectuals, who the missionaries hoped would lead the way in converting to Christianity.

Some nine hundred Jesuits worked in China in the seventeenth and eighteenth centuries. Other orders—Franciscans, Dominicans, Augustinians, and the secular French Society of Foreign Missions—also were well represented in China, but their numbers were consistently fewer, and they kept comparatively low profiles. Members of different religious orders often vehemently disagreed with one another on doctrinal or tactical matters, and on some points contention existed even within a single order. The bickering and mutual antagonism such disagreements generated had significant repercussions for the long-term goals of the missions in China because they undermined respect for the people involved and for the cause of Christianity.

The total number of Chinese converts is hard to fix with any cer-

tainty since missionaries sometimes retrieved and converted the dying while some converts later renounced the faith; besides, we cannot always assess the accuracy of missionary claims. The numbers of converted Chinese probably amounted to at least tens of thousands in the first half of the seventeenth century. At the end of that century, according to the estimate of a contemporary Jesuit observer, the 60 or so missionaries from all orders working in China were converting perhaps as many as 500 or 600 people each every year, making an annual total of more than 30,000, not including the additional several thousand abandoned children whom missionaries took under their wing each year. During the course of the eighteenth century periodic repressions caused considerable attrition; nonetheless, it is estimated that by 1800 200,000 to 250,000 thousand converts to Christianity may have been spread across China. This result was in no small measure due to the efforts of Jesuit missionaries.

### JESUIT MISSION POLICIES

#### I: THE TOP-DOWN STRATEGY

The policies of the Jesuit missionaries brought them both their greatest successes and their greatest failures. Credit for many of the most significant is usually attributed to Matteo Ricci (1552-1610), among the first Jesuits to reach China in 1583, who set the standard for Jesuit mission work in China for the next two hundred years. The first policy we consider is that of focusing attention on educated, upper-class Chinese rather than on the ordinary people targeted by other religious orders. It was as the result of this top-down strategy that Jesuit missionaries were ensconced at the court of the emperor of China.

A two-fold rationale underlay the top-down strategy. First, the Jesuits wished to gain Chinese political support for the introduction of Christianity. Second, they hoped for a snowball effect. Jesuits assumed that once the elite converted, the common people would follow their social superiors into the foreign religion's fold. Of course, Jesuits did not abide rigidly by Ricci's guidelines. Even during his lifetime some of his colleagues were actively proselytizing among ordinary people, and by the end of the seventeenth century the vast majority of their converts were commoners.

Ricci's conversion of three leading scholars, all of whom gained high political office, was the most conspicuous vindication of the top-down strategy. Known to posterity as the Three Pillars of the Early Christian Church in China (*kaixiao san dazhushi*), together they provided the missionaries with powerful patronage. Each was impressed by the personal qualities of the European missionaries they came to know, and all were deeply interested in Western scientific knowledge. But that was also true of many Chinese who did not in the end adopt Christianity. What seems to have tipped the balance for these men, and other highly educated converts of this first generation of Chinese Catholics, was Christianity's promise to provide moral certainty at a highly unsettling time.

The first of the three to be baptized was Xu Guangqi (1562-1633), whose native place of Xujiahui, now part of the city of Shanghai, later housed a Jesuit library and the Cathedral of St. Ignatius. Xu was deeply impressed by Ricci when they first met in 1600 and was baptized in Nanjing a few years later. Shortly thereafter he passed the highest level of the civil service examinations and was assigned to work at the prestigious Hanlin Academy in Beijing. Xu then embarked on a collaboration with Ricci that produced some of the first translations of European books into Chinese. Together they translated works on Western geography, astronomy, hydraulics, and mathematics, notably the reworking of the first six books of Euclid's *Elements of Geometry* done earlier in the century by Ricci's own teacher in Rome, Christopher Clavius. Xu also adapted Western ideas in some of his original work on agriculture and trigonometry. He later became a grand secretary, one of the highest political offices in the empire. He was thus well placed to promote the Jesuits' cause.

The second of the Three Pillars was Li Zhizao (d. 1630), a native of Hangzhou whom Ricci himself baptized in 1610. By then the two men had been acquainted for nine years. Li, whose initial attraction to Ricci was the Jesuit's knowledge of geography, formed the opinion that here was an extraordinarily learned and virtuous man whose sense of right and wrong seemed almost infallible. At first Li resisted conversion, possibly because he did not wish to send away his concubine, as Church doctrine insisted. Only after Ricci had nursed him through a serious illness did Li finally agree to receive baptism and give up the concubine. Ricci died soon afterward, but Li became a powerful supporter of the missionaries, not least because of his strong interest in the Western scientific discov-



In the long run the Jesuits' switch of allegiance to the new regime had fatal consequences for their mission in another way: it largely discredited them among the ethnically Chinese scholarly classes. Such men had lost political power, but they remained numerically strong and socially influential. Formerly both the prime source of support for the Jesuit mission and the main target of its conversion efforts, they now regarded the foreign missionaries both as political traitors and as pawns in what they perceived as a Manchu assault on Chinese culture. Chinese scholars despised the missionaries on both counts. This gradual alienation was fueled by Qing policies deliberately restricting contact between the missionaries and the Chinese gentry. By welcoming the missionaries into the Manchu camp, the new regime consciously deprived the Chinese elite of this potentially uncontrollable source of intellectual and spiritual stimulation and kept it for themselves. The Jesuits' abandonment of their original policy of concentrating on the Chinese elite, in favor of focusing their attention on the new sources of power at the Qing court, thus turned out in the end to have been a terrible miscalculation.

In the highly charged climate surrounding the transfer of power, the role of Catholic collaborators further damaged the Jesuits' position. One such man was Zhu Zongyuan (b. 1609), baptized with the name of Cosimo at Hangzhou, Zhejiang, in 1631. In Hangzhou, which had a thriving Christian community, Zhu gathered a considerable following through his writings, which he hoped would convince people to convert to Christianity. He argued that different countries had different values but that difference did not necessarily signify inferiority. It followed, he said, that it was misguided to stigmatize foreigners as barbaric and that China had much to gain from other cultures. Christianity could serve as a pointer to the true Way. Pursuing these arguments to their logical conclusion, Zhu later threw his support to the Manchus, carrying with him many of those whom he had already persuaded to convert to Christianity. Zhu's arguments prefigured those of late-nineteenth- and early-twentieth-century thinkers who suggested that foreign influences had often revitalized Chinese culture just as it had reached a point of stagnation.

In the early Qing it happened that the new governor of Zhejiang and Fujian provinces was a northern frontiersman who had converted to Christianity along with members of his clan. He had served the

Manchus before the conquest and had encountered Christianity when the Manchus occupied Beijing. So under the political leadership of the Catholic governor, and urged on by Zhu Zongyuan and his band of Catholic converts, the formerly staunch province of Zhejiang fell to the Manchus. In this case the snowball effect of Christian conversions sought by the Jesuits led to a large-scale transfer of political allegiance. To Ming loyalists, the unexpectedly rapid fall of this prosperous coastal province to the Manchus thus seemed inseparable from the Christianity of Chinese collaborators.

After the 1630s the Jesuits rarely met with successes as spectacular as their conversion of such politically powerful men as the Three Pillars or the eunuch Pang Tianshou. But Christianity did not peter out among educated Chinese, and it persisted especially among the less elevated ranks of the scholarly. Some of the second and third generations of elite Chinese Christians assimilated the foreign religion to a greater extent than had their predecessors. By the middle to late seventeenth century, becoming a Christian was not always in itself so remarkable an event as it had once been. In fact, many of these later-seventeenth-century Chinese Catholics became Christians for the simple reason that their fathers had been Christians before them. It was, so to speak, a family matter, and many of these later converts never came into direct contact with European missionaries. But as Christianity was passed down from generation to generation, sustaining one's belief also acquired overtones of Confucian filial piety.

For these later educated converts, Christianity often became a creative force within their own culture. Their search for compatibilities between Chinese and Christian beliefs stimulated them to reexamine traditional Chinese concepts in ways that earlier scholarly converts had not. Some, for example, devoted their lives to cross-cultural studies, setting out to demonstrate the ways in which Christianity reinforced traditional Confucianism while Buddhism contradicted it. For instance, the five human relationships of Confucianism—between ruler and subject, father and son, husband and wife, older and younger brother, and friends—as well as the associated virtues of benevolence, morality, propriety, wisdom, and trust seemed entirely consonant with the law of the Christian God, while one of the perennial Chinese criticisms of Buddhism was its disregard of this ordering of society. The later converts also placed far greater emphasis than had their predecessors on expressing

their Christianity through the promotion of social welfare:

Their overall approach, sometimes called inculturation, was qualitatively different from that of men such as the Three Pillars. For Yang Tingyun, for example, Christianity's strongest appeal lay in its moral firmness at a time of uncertainty, whereas for the later generations that kind of attraction, while still present, was complemented in a deeply meaningful way by the insight that Christianity could in effect do something for Confucianism. These second and third generations of elite Chinese Christians have been relatively little studied, so we do not yet know a great deal about them and their beliefs, nor are they thought to have been very numerous. We do know that although they generally lacked significant influence among their scholarly contemporaries, they sometimes acquired considerable local followings and thus contributed to the spread of Christianity in the countryside.

## II: THE USE OF SECULAR KNOWLEDGE

The second distinctive mission strategy of the Jesuits in China was their use of secular knowledge as a lure. They hoped to establish a more or less equal intellectual relationship before any question arose of trying to convince Chinese of the ultimate truths of Christianity. In addition, recognizing the unusual antiquity and sophistication of Chinese civilization, they feared that an immediate challenge to fundamental Chinese values might easily prove counterproductive.

This policy was fairly successful, but it had two important consequences in China. First, the strategy of postponing any discussion of possible conversion raised doubts among some Chinese about the Europeans' true intentions. Initially it had seemed that the missionaries simply wanted to discuss science, technology, and ethics, to exchange information. Only gradually did Chinese come to understand that the Europeans hoped to persuade them to adopt Christianity. Second, many Chinese pursued the scientific and technical knowledge they acquired from missionaries with at least as much zeal as they addressed to grasping European religion and philosophy. In other words, Chinese caution about Christianity had much to do with the way in which it was introduced to them.

Once again, Ricci set the tone. His erudition and his mastery of Chinese language and culture enabled him to publish in Chinese a number of works that helped ingratiate him with his Chinese read-

ers. *On Friendship*, for instance, published in 1595, drew on the Western classical tradition in much the same way as a Chinese scholar might draw on the Chinese classics. Popular among Ricci's learned friends, it had an uplifting message that was designed as a recommendation for some of the loftier aspects of European culture, not including its religious aspects. Ricci also made a profound impression with extraordinary feats of memory, which greatly appealed to Chinese scholars, for whom public success depended on the ability to absorb vast amounts of classical scholarship.

Ricci also began a tradition of presenting such elegant and intricate objects as prisms made of Venetian glass, elaborate clocks, mechanical toys, and engravings. Given the late Ming enthusiasm for imported luxuries, these went down very well, although their popularity prompted some Europeans to jump to the inaccurate conclusion that Chinese admired trivia above all else. Another skill Jesuits used to draw in educated Chinese was cartography. Ricci, for instance, hung on his wall a map of the world, on which he traced for visitors his itinerary from Rome to China. The map drew on existing sources, both Chinese and European, not all of which met the standards of accuracy he was striving to demonstrate. Yet many found it riveting, prompting him to make a series of world maps for the Chinese that incorporated some of the latest European discoveries. As we shall see in the next chapter, Jesuit cartography came to form an important part of the introduction of Western knowledge into China, as did Jesuit astronomy.

By their transmission of secular knowledge, Jesuit missionaries helped attract attention to some of the most exciting aspects of their native cultures. The emperors they served employed them primarily because they were all, in varying degrees, extremely interested in the information and skills these learned Europeans of multiple talents had to offer.

The Kangxi Emperor (1662-1722), in particular, was passionately interested in Western scientific knowledge and set out to learn their skills himself. Jesuits at his court instructed him in a wide range of subjects and gave lessons to some of his many sons, as we can see from the reconstruction of the old emperor's musings done by Jonathan Spence:

In the early 1690s I often worked several hours a day with them. With Verbiest I had examined each stage of the forging of can-

nons, and made him build a water fountain that operated in conjunction with an organ, and erect a windmill in the court; with the new group—who were later joined by Brocard and Jartoux, and worked in the Yang-hsin Palace under the general direction of my Eldest Son Yin-T'i—I worked on clocks and mechanics. Pereira taught me to play the tune "P'u Pen chou" on the harpsichord and the structure of the eight-note scale. Pedrini taught my sons musical theory, and Gherardini painted portraits at the Court. I also learned to calculate the weight and volume of spheres, cubes, and cones, and to measure distances and the angle of river banks.

On inspection tours later I used these Western methods to show my officials how to make more accurate calculations when planning their river works. I myself planted the measuring device in the ground, and got my sons and bodyguards to use their spears and stakes to mark the various distances. I held the calculating tray on my knee, wrote down the figures with a stylus, then transposed them with a brush. I showed them how to calculate circumferences and assess the area of a plot of land, even if its borders were as jagged as dogs' teeth, drawing diagrams for them on the ground with an arrow; and calculated the flow of river water through a lock gate by multiplying the volume that flowed in a few seconds to get a figure for the whole day.<sup>4</sup>

The use of secular knowledge did not lead to large-scale Chinese conversion to Christianity. Apart from arousing suspicions among a number of Chinese about missionaries' true intentions, another major disadvantage was that Jesuits tended to make science seem rigid, unchanging, and, like religious truth, endowed with eternal value because they hoped that the revelation of scientific accuracy would lead to Chinese recognition of the perfection of the Judeo-Christian God. Yet scientific knowledge was constantly undergoing transformation. The reality was that the Jesuits used their secular knowledge only as a means to an end, and they offered no more than what they deemed necessary to achieve their conversion goals. We return in more detail to Jesuit missionaries' secular activities in China in the next chapter.

#### THE POLICY OF ACCOMMODATION

The policy of accommodation conformed with the unusual Jesuit policy of respecting the indigenous cultures of those they sought to convert. Such a policy recalled the very early days of the Church, when it had perforce adapted to Greek, Roman, and other cultures,

but in the course of the medieval period this kind of cultural modesty had dissipated. To many sixteenth- and seventeenth-century Europeans, heathenness was equated with inferiority and accommodation seemed not so much pragmatic as simply inappropriate. The adoption of the policy of accommodation in China is attributed to Matteo Ricci, who believed that some degree of accommodation was essential if Jesuits were to shepherd China into the Church. This view was borne out by the extreme reluctance of otherwise receptive Chinese to abandon certain of their traditional practices.

Accommodation meant adapting to Chinese ways to the greatest extent possible without compromising the integrity of Catholicism. It was a question of reaching a balance between two sets of firmly held principles and assumptions, each of which derived from the premise that the other would eventually recognize the universal truths of the other culture. It was for this reason that Jesuits undertook the several years' study required to learn the Chinese language. They tried to understand Chinese civilization within its own context, by studying Chinese classical texts with their scholarly commentaries. They learned about Chinese religion, Chinese culture and customs, and China's political system, and most of them dedicated their whole lives to the missionary endeavor. They came to dress and live like Chinese scholars in the hope of confronting them, as nearly as possible, on equal terms.

There were three main areas in which the Jesuits found their beliefs or principles in conflict with Chinese ways: the question of Chinese "rites," or reverence for one's family ancestors and Confucius; the question of what terminology was appropriate for "God" and other Christian concepts; and the Christian insistence on monogamy versus the upper-class Chinese practice of concubinage.

The issue concerning Chinese customary practices of reverencing one's ancestors and paying homage to Confucius was as follows. If these practices were fundamentally religious, they would constitute a form of idolatry. In that case would-be converts to Christianity would have to be persuaded to abandon such practices before they could be admitted to the Church. But if they were merely civil observances of a secular nature, then Chinese converts could continue to perform them.

Jesuits grasped that outlawing the traditional forms of displaying respect for ancestors would strike at the core of Confucian values of filial piety, a linchpin of China's social and political structure. Even



the most convinced Christian converts would find that hard to swallow. So accommodation emerged out of pragmatism. Jesuits themselves were sharply divided on the issue of the Chinese "rites." Some sincerely believed that because the Chinese practices did not involve the same kind of worship as the worship of the Christian God, they did not contradict Catholic theology. Others saw accommodation as a provisional but necessary expedient without which conversion would be well-nigh impossible.

Other pressures strengthened the Jesuits' commitment to the principle of accommodation. Since they had consistently portrayed Chinese people as highly civilized, in order to gain extra credit in Europe for their eventual conversion, they could hardly admit that the rituals to which such civilized people were so attached were in effect pagan in nature because pagans were by definition uncivilized. So some Chinese customs had to be clearly defined as nonreligious in order to avoid their being deemed to be pagan practices, and if they were not religious, there ought not to be any reason to require converts to abandon them. The Jesuit position became increasingly entrenched as they defended themselves against attacks from other orders.

Whatever the practical justifications, the accommodation policy caused the Jesuits many problems. In China it laid them open to charges of caprice. Some missionaries, for instance, advised their converts to worship God in the same place where they paid their respects to their ancestors, either a family temple or the main room in their homes. But to Chinese that seemed to equate the Christian God with the ancestors and hence to contradict missionaries' claims of overarching supremacy. Other recommendations Jesuits made to their Chinese converts more directly contravened Chinese laws and customs. For when Christianity placed its God and his earthly representative, the pope, above China's emperor, it plainly interfered with the proper political order. Ricci himself, in a rare moment of imprudence, had advised his Chinese followers that obeying a superior father (i.e., the Christian God) at the expense of obeying an inferior father (i.e., the emperor or one's own parent) was perfectly in accordance with the requirements of filial piety. But in Chinese terms this was tantamount to incitement to insurrection or filial disobedience, both of which the criminal codes condemned as particularly heinous crimes, punishable by the execution of the perpetrator and his or her entire family. As one commentator sum-

marized it, "When they require people to consider the Master of Heaven as their closest relative and to abandon their fathers and mothers and place their sovereign in second place, giving the direction of the state to those who spread the doctrine of the Master of Heaven, this entails an unprecedented infringement of the most constant rules. How could their doctrine possibly be admissible in China?"<sup>5</sup>

In Europe accommodation laid the Jesuits open to charges of tolerating heresy. Such charges were repeatedly leveled against them in the course of the resulting debate, known as the Rites Controversy. This dispute lasted over a century and did a great deal of damage both to the Jesuit mission in China and to the Society of Jesus more generally. Critics insisted that since the Chinese "rites" involved paying respect to graven images and "worshipping" Confucius and the ancestors as though they were gods, accommodation made nonsense of at least two of the Ten Commandments of the Bible. Even if accommodation brought more converts, it thus was just as unacceptable to many European Catholics as, for different reasons, it was in China. But if they expected China to acquiesce meekly, they reckoned without the great Kangxi Emperor.

In 1692 Kangxi, against the recommendation of Chinese advisers who resented the Jesuits' influence at court, issued an Edict of Toleration, in effect allowing religious freedom to Christians in China. The edict permitted missionaries to worship in their churches, and while it did not expressly permit preaching and other evangelistic activities, neither did it explicitly forbid them. It seemed a major triumph for Christianity in China and raised the hopes of many Jesuits, who thought it a prelude to imperial conversion.

But Kangxi's formal toleration of Christianity did not signal imperial enthusiasm for the foreign religion. Kangxi raised the prohibition on Christianity partly in recompense for missionaries' technical services and partly in recognition of the Jesuits' accommodative efforts to comprehend and appreciate Chinese civilization. The Edict of Toleration appeared to suggest that the policy of using secular knowledge was working, but in reality the most it did was to acknowledge that Christianity promoted harmony and served public morality and hence differed from heterodox sects covered by the criminal law.

Papal attempts to formalize Rome's jurisdiction over Chinese Chris-

tians put an end to Kangxi's willingness to be broad-minded about the foreign religion. In 1705 the pope sent an emissary to China, seeking imperial approval for the extension of papal authority over Chinese Catholics. Kangxi rejected the proposal absolutely. In his view, the possibility that Chinese would owe allegiance to some authority other than himself posed a direct threat to his dominion over his people. A second papal legate, who reached China in 1720, was no more successful. Jesuit missionaries then looked for creative ways to circumvent the opposing views of pope and emperor. They tried, for instance, to modify some funeral practices without actually replacing them altogether, suggesting that relatives of the bereaved offer to pay for the coffin rather than to contribute silver to use in a burial sacrifice.

The papal missions and decrees heralded the end of China's toleration of evangelism by Catholic missionaries. Kangxi, already concerned that some Westerners might be passing themselves off as missionaries to disguise some darker purpose, instituted a system of signed certificates. All Westerners wishing to live in China had to make a commitment to remain for the rest of their lives, a requirement directed against spies and profiteers as much as against missionaries. Missionaries had to agree, in addition, to allow Chinese converts to reverence Confucius and the ancestors. Refusal to sign meant expulsion.

In part influenced by those within the European Church establishment who resented Jesuit successes, the pope soon decreed that ancestor worship and the sacrifices to Confucius were simply unacceptable. The first papal bull against the Jesuits' position was issued in 1707; it was confirmed in 1715 and again in 1742. In short, the Church declined to permit Chinese Christians to continue to perform their traditional reverences on the ground that these were idolatrous and incompatible with Christian practice. Any Chinese desirous of converting to Christianity must first renounce such practices. There was no middle ground.

When Kangxi read a Chinese translation of the 1715 papal decree, he commented in his own hand: "Having read this proclamation, I ask myself how these uncultivated Westerners dare to speak of the great [philosophical and moral] precepts of China . . . most of what they say and their arguments are ridiculous. Seeing this proclamation, I at last realise that their doctrine is of the same kind as the little heresies of the Buddhist and Taoist monks. . . . These are the greatest absurdities that have ever been seen. As from now I forbid

the Westerners to spread their doctrine in China; that will spare us a lot of trouble."<sup>6</sup>

The second main area of dispute concerning Jesuit accommodation was the question of whether to use existing Chinese terminology for the Christian God or whether such terms were too confusing and too tainted with "heathen associations." Like the issue of the rites, such debates were fraught with pitfalls. Ancient Chinese had worshipped *Shangdi* ("Lord on High") and *Tian* ("Heaven"), and some Jesuits were persuaded that these were very much the same as their own all-knowing, all-powerful God. But if Europeans used the identical terms for their own God, might Chinese fail to understand that the Christian God was in fact different? Was it preferable to create some new term such as *Tianzhu*, the "Lord of Heaven," or should the missionaries devise an appropriate transliteration for the name of God? While the Jesuits themselves could not agree about this, some Chinese found it either insulting or deceptive to equate the Sovereign on High of the Chinese classics with the God of the Western religion.

In the seventeenth century these issues became more contentious when they became part of an effort to prove that ancient Chinese ideas coincided with those of the Bible. Missionaries, who believed all human history was to be found in the Bible, devised a theory according to which the Chinese had migrated eastward from the Mediterranean area after the Great Flood of biblical times. The Europeans may have sincerely believed this theory, but for the Chinese, the implications were unacceptable. To identify Chinese history with Western, Judeo-Christian history in effect deprived the Chinese of their own history. It asked them to disown their ancestors. That was just what the Jesuits were resisting in the Rites Controversy.

The issue was muddled yet further by conflicting attempts on the parts of both Europeans and Chinese converts to demonstrate that, as the Pillar Li Zhizao put it, "There are the same minds and the same principles in the Eastern and Western seas."<sup>7</sup> They all sought to prove that the major points of the European religion were identical to the traditional ideas of the Chinese. The underlying purpose was very similar, but the emphasis was slightly different. Chinese tried to show the inherent Chinese-ness of Christian beliefs, while missionaries tried to show that ancient Confucianism was largely in accord with Christianity. They suggested that the Chinese had once known about the God of the Bible, but had somehow lost their

intellectual compass. In both cases the motivation was to demonstrate that the new ideas from the West amounted in essence to no more than a revamping of ideas formulated in Chinese antiquity, because they thought that in that case they would be far more likely to gain acceptance.

Chinese and missionaries each compiled lists of quotations from the Chinese classics that seemed to reveal affinities with Christianity. One such work, for example, gives sixty-five occurrences of the terms *Shangdi* or *Tian* in Chinese classical texts: thirty-three from the Book of History (*Shujing*), twenty-six from the Book of Songs (*Shijing*), three from the Mencius (*Mengzi*), two from Confucius' Analects (*Lunyu*), and one from the Doctrine of the Mean (*Zhongyong*). All these texts were fundamental works of the classical Chinese canon. Such evidence was, however, open to reinterpretation by those who used it to try to discredit the Europeans by showing that Christianity was merely a later Western corruption of Chinese ideas. In the end, and not without dissenters, Catholic Christianity became known in China as *Tian Zhu Jiao*, "the Teaching of the Lord of Heaven."

The third great issue of the accommodation policy pitted Christian insistence on monogamy against the Chinese practice of concubinage. A Christian could have only one wife. Adultery was against God's law. But what was to be done when would-be converts had one or more concubines? It was a common practice among the better-off, justified by the filial need to produce male descendants to continue one's family line. Missionaries refused to convert a man who declined to send away his concubine. That was probably what had delayed the conversion of Li Zhizao in 1608. From a Christian point of view the issue was clear. But so it was for Chinese. A woman could not in all conscience simply be sent away. She was in effect used goods, whom her natal family would not necessarily take back in—that would involve terrible loss of face as well as expense—and quite likely no one else would want her. She could perhaps be given to a poor man unable to afford a wife or sold into prostitution.

The public confession made by Wang Zheng, a scholarly convert who committed suicide when he heard of the fall of the Ming, shows the traumas men as well as women sometimes suffered over the concubine question. Wang's agonizing, typical of many of his contemporaries as they considered conversion, shows one solution

to which many may have resorted, whether or not in good faith: they kept their concubines within their households but no longer slept with them. When Wang was converted to Christianity, he decided never to take a concubine. But because his wife had no son, his family overruled him. Later he repented and tried to send her away:

My wife wept and begged me to tolerate the concubine, and we nearly had a quarrel. The concubine too was so distressed that she nearly lost her life. She would on no account remarry, and she expressed her wish to become a Christian and observe chastity. . . . Throughout the whole night I reflected [saying to myself] that I am nearly seventy, and my behavior is no better than that of a youth of seventeen. . . . Now I promise before God that in future I will treat the concubine as a friend . . . and if afterward I again commit sin with her, the angels [will be my witness] and I am willing to die the penalty of death.<sup>8</sup>

The insistence on monogamy also raised questions about the status of concubines' children, as one outraged detractor of the missionaries observed: "My friend was old, poor and had no son. Fortunately, he had been able to buy a concubine and by her had a son who was just one year old. [The missionaries] told him that, in their country, it was believed to be virtuous not to have any concubines and thought to be of no importance not to have a line of descendants. My friend obeyed them and ejected the mother of this child. I do not know whether the child is still alive."<sup>9</sup>

The missionaries tried to devise ways to circumvent the concubine problem. If a male convert's principal wife refused to become a Christian, the missionaries allowed him to marry one of his concubines. But they had no authority to grant such permission; besides, such practices clearly contravened Chinese law. Sometimes Jesuits overlooked the presence of a concubine because they recognized the hardships involved. One critic charged that they did so when the would-be convert was especially influential. For good measure he also accused the missionaries of licentious behavior: "They would like all kings and sovereigns to adhere to their vicious doctrine, expel all their concubines from their women's quarters and live like common people with but a single wife. But in their residences they themselves invite ignorant women at nightfall to enter

plex in Beijing for fear that transporting them any farther might damage their delicate mechanisms, the embassy journeyed on to Rehe (present-day Chengde), the summer residence of the Qianlong court. At Rehe the Qianlong Emperor received Macartney with considerable signs of favor, together with emissaries from some of his Inner Asian dominions who were in Rehe to pay their respects in the time-honored way. With graciousness and condescension, the emperor bestowed valuable gifts upon Macartney but denied his requests, courteously dispatched him under escort back to his ships, and sent him on his way. He instructed his officials in Canton to keep a particularly sharp eye on traders in general and on the British in particular.

Most accounts of Macartney's embassy place great emphasis on the envoy's refusal to prostrate himself as expected before the emperor as the immediate source of its failure, but the reality, not surprisingly, was more complicated. The whole episode was fraught with mutual misunderstanding. Generally Macartney assumed that diplomatic relations could be conducted in China in the same way that they were in Europe, and on the same premises, while Qianlong assumed that Macartney would fall in with Qing ritual practices surrounding the reception of foreign dignitaries. Both were simply mistaken. The exchange of gifts was similarly beset by mutual confusion. Macartney, for instance, unaware that the golden scepter Qianlong handed him was valued as a symbol of peace and prosperity, dismissed it as inadequate and of little intrinsic worth. Qianlong, on the other hand, thought the lavish presents brought by the British to lubricate diplomatic machinery were not substantially different from or better than what he had already seen of European products. Then Macartney's constant shifting of ground, intended to show a spirit of accommodation, only provoked a growing conviction that the British were concealing their true purpose. It made the Qing extremely edgy, and in the circumstances they were in no rush to make any concessions.

To the Qing, in any event, British requests seemed illogical. They wanted an embassy in Beijing, but foreigners resident in the capital would be too far away from their fellow countrymen trading in Canton to serve much purpose; they would simply be another group requiring supervision. They wanted more trade out of more ports, but Chinese authorities saw no reason for the British to be

treated differently from other foreigners. The goods the British required were readily available through the hong system based in Canton, which ensured equal treatment of all Westerners. From China's point of view, Qianlong suggested, unmediated trade was just too risky; it threatened social order because too often greed led to conflict or at least to divided loyalties.

In retrospect the Macartney embassy was probably doomed from the outset. Certainly the British had an unfavorable advance billing in China as the result of their own overseas activities and from insinuations almost certainly made by Catholic missionaries at the Qianlong court, a majority of whom were French, about the untrustworthiness of their longtime national enemy, the Protestant British. In any event, whatever Qianlong's misgivings prior to the embassy's arrival, the actual encounter with Macartney further diminished Chinese confidence in British good faith and fueled British prejudices about Chinese reluctance to engage with the wider world. It was altogether an inauspicious beginning.

#### CHINA AND EUROPEAN ARTS AND SCIENCES

Notwithstanding his outward expression of uninterest in British manufactures, Qianlong and many others in China displayed considerable interest in all manner of things foreign, as is evident from a series of conversations he held in 1773 with the missionary Michel Benoist (1715-1774). Qianlong quizzed Benoist about Western science, philosophy, warfare, cartography, shipping, and navigational practices. In one such conversation he gravely asked Benoist whether "your Western philosophers have solved a problem that has much exercised our philosophers here: which came first, the chicken or the egg?"—an inquiry to which Benoist did his best to respond. Benoist was one of a number of Jesuit missionaries who lived and worked at the court of the Qianlong Emperor throughout his long reign, in the process also providing detailed information about China to Europe.

The technical skill and versatility of the Jesuit missionaries at the court of the great Qing emperors were astonishing. Missionaries built several astronomical instruments, including a quad-

rant, a sextant, a celestial globe, a theodolite, an azimuth, and several armillae, to equip an observatory that can still be visited in Beijing. They constructed fountains and a working windmill for the imperial palace. They designed a new summer palace near Beijing, at which they installed European-style fountains and plantings to surround elaborate structures adorned with European facades and interior decoration. They transplanted nasturtiums, bluebells, and other European plants and explained to courtiers how to cultivate them. They made elaborate clocks and mechanical toys. They built a harpsichord and gave music lessons. They provided technical advice on glassmaking and supervised its production, constructing furnaces of their own design. They taught themselves the art of enameling so as to be able to satisfy the imperial passion for this type of decoration. They built complicated hydraulic and other machinery, for the operation and function of which they provided detailed explanations in response to Chinese requests. They designed artillery pieces and supervised the foundries that produced them. They operated medical dispensaries and, with the help of traders down in Canton, supplied the emperor with rare European medicines: quinine for malaria and antimony sulfide to counter parasitic diseases. They assembled devices for applying electroconvulsive shock treatment for nervous illness, which by the late eighteenth century they were administering with some success to Chinese ready and willing to take the risk. They surveyed the entire empire, traveling to take measurements in newly conquered areas as soon as possible after hostilities ceased. Finally, they worked as court painters, producing portraits and, in particular under Qianlong, detailed records of the triumphs of Qing rule. In short, they worked extremely hard and with considerable success to satisfy imperial demands for both aesthetic pleasure and practical science and technology.

The spheres of Western knowledge in which Qing emperors showed the greatest interest were those capable of supporting Qing efforts to reconfirm their legitimacy as rulers of China, their military exploits, their imperial aspirations, and their efforts to control the historical record. Among these areas of interest, astronomy and the associated science of mathematics had the most intimate connection to Qing efforts to justify their political authority.

## ASTRONOMY AND MATHEMATICS

European astronomy was the mainstay of the secular knowledge that the Jesuits brought to China. Many Jesuits trained in astronomy before they embarked. Moreover, during the six months' sea voyage from Lisbon to Goa and the three more it took to get to Macao, they had ample opportunity to further their familiarity with the stars. Calendrical reform had been subject to extended debate in China not long before Ricci's arrival, so that Jesuit astronomers entered an existing fray; they did not initiate it.

In 1629 missionaries won a court-sponsored competition for the most accurate prediction of an eclipse, defeating existing officials, including Muslims using imported methods. As a result, and through the intercession of the Pillar Xu Guangqi, they were appointed to the Ming Imperial Bureau of Astronomy. As well as their superior eclipse prediction, their geometrical analysis of planetary motion, their concept of a spherical earth, and their ways of measuring its divisions consistently produced more accurate calculations than did the methods then in use in China.

Chinese acceptance of European astronomy's greater accuracy showed a proper caution, as the following statement, signed by ten officials of the Bureau of Astronomy in 1629, indicates:

At first we had our doubts about the astronomy from Europe when it was used in [1629], but after having read many clear explanations our doubts diminished by half. Finally by participating in precise observations of the stars, and of the positions of the sun and moon, our hesitations were altogether overcome. Recently we received the imperial order to study these sciences, and every day we have been discussing them with the Europeans. Truth must be sought not only in books, but in making actual experiments with instruments; it is not enough to listen with one's ears, one must also carry out manipulations with one's hands. All [the new astronomy] is found to be correct.<sup>4</sup>

During the 1630s European Jesuits and Chinese scholars published a huge collection of translations of Western works on calendrical methods, mathematics, surveying techniques, and other broadly scientific topics.



As we saw in the last chapter, Jesuit missionaries offered their services to the new Qing regime very shortly after the transfer of power in 1644. Their skills in astronomy were particularly useful to an alien group seeking ways to legitimate their rule. One of their number was appointed director of the Imperial Bureau of Astronomy, an important office of state charged with regulating the imperial calendar. This position, held by Jesuits for the next 150 years, both brought them prestige and offered the opportunity to influence the entire direction of astronomy in China.

At the outset of the two centuries or so of the Jesuit China mission, Europe was making extraordinary scientific advances, most notably in Copernicus's theory of heliocentrism, according to which the sun was the center of the universe and the earth and other planets all revolved around it, and Galileo's invention of the telescope. Although missionaries did tell their Chinese counterparts about the telescope and eventually produced one, they kept quiet about heliocentrism because the Church had condemned it as heretical; the Church considered that if the earth and the humans who inhabited it were not the center of the universe, the theological implications would be simply too terrible to contemplate. Instead missionaries, who felt unable to oppose Rome in public, propounded the system of the Danish astronomer Tycho Brahe (1546-1601), who placed the earth at the center of the universe and the sun at the center of the other planets' circular orbit.

Jesuit missionaries were reticent for so long because they feared that belated revelation would create inexplicable contradictions. Such fears proved justified. By 1760, when the missionary Michel Benoist finally brought heliocentric theory to the Qianlong Emperor's attention, Chinese scholars had, not surprisingly, become extremely skeptical about European astronomy, because of all the inconsistencies and inaccuracies they had noticed. What they now learned about heliocentrism seemed to fit into a discernible pattern of disclosure followed by contradiction. As a result, by the late eighteenth century imperial confidence in European knowledge was somewhat shaken, and the general view among Chinese astronomers was that their European counterparts had little to offer.

Conventional wisdom in the West has attributed Chinese skepticism about European science to an ingrained hostility to foreign ideas, but this assumption thus failed to reflect the true sequence of events. Indeed, one may question whether the incomplete way in

which the Jesuits relayed some of the new knowledge to China may not actually have interfered with scientific progress in China. Moreover, by fatally damaging their credibility as scientists, their reticence also cast doubt on the integrity of their religion and hence interfered with their ability to make conversions.

The theories of the universe Europeans transmitted into China required the introduction of new elements of mathematics. These included Euclidean geometry, practical astronomy, written arithmetic, and plane and spherical trigonometry. As in the case of astronomy, the Jesuits withheld information about all the new mathematical discoveries of the age. They did not refer to the creation of the calculation of probabilities, analytical geometry, infinitesimal calculus, the rebirth of numbers theory, or the evolution of symbolic algebra. They presented only such new ideas as were necessary to keep their astronomy accurate. The reality, after all, was that the Jesuits had not gone to China to spread European science but to spread Christianity.

Despite its limitations, the Jesuit introduction of Western science into China had a huge impact on Chinese scholars and on the whole tenor of Chinese mathematics and astronomy. As a distinguished historian of Chinese science has written:

Wang Xishan (1628-1682), Mei Wendeng (1633-1721) and Xue Fengzuo (d. 1680) were the first scholars in China to respond to the new exact sciences and to shape their influence on their successors. They were, in short, responsible for a scientific revolution. They radically reoriented how one goes about comprehending the celestial motions. They shifted from using numerical procedures for generating successive angular orientations to using geometric models of successive locations in space. They changed the sense of which concepts, tools and methods are centrally important, so that geometry and trigonometry largely replaced numerical algebra, and such issues as the absolute sense of rotation of a planet and its relative distance from the earth became important for the first time. They convinced Chinese astronomers that mathematical models can have the power to explain the phenomena as well as to predict them.<sup>5</sup>

The introduction of Western science also resuscitated interest in indigenous Chinese science. The fall of the Ming demonstrated that running a government on abstract principles alone simply did not

work, and it renewed scholarly interest in classical wisdom and practical statecraft. Intellectuals now turned their attention to such more utilitarian topics as astronomy, geography, and surveying, in addition to moral philosophy.

Part of this movement involved a repackaging of the sages of antiquity as initiators of Chinese technology as well as models of moral virtue. A leading example was that of the legendary king Yu, who was now praised as much for his role as "tamer of the floods"—a reference to his success in channeling China's major rivers—as for his outstanding moral caliber. At the same time, Chinese scientists such as Mei Wending asserted that scientific truth, including recent discoveries, transcended even the authority of the ancient sages. All these intellectual trends led to the growth of an important scholarly movement known as *kaozheng*, or evidentiary research—that is, a search for knowledge that could be verified empirically.

The goal of *kaozheng* scholars, at its simplest, was to seek truth from facts. They sought precision and accuracy in all aspects of scholarly enterprise, including not only the more technological subjects but also historical research, philology, and textual criticism, which enabled scholars to analyze ancient texts for authenticity and hence to rediscover true Confucian ideas at the source. In all these projects, the exact sciences, the revival of whose popularity derived from the Jesuits' introduction of Western scientific knowledge, provided fresh impetus. In other words, Western scientific knowledge, in addition to its intrinsic value, slotted into an ongoing reevaluation of the entire classical tradition and brought scientific methodology into the mainstream of intellectual endeavor.

To encourage serious attention to the new knowledge, eminent scholars created a myth that Western mathematics had evolved out of ancient Chinese ideas. This device did not spring from cultural chauvinism but from a desire to assure the acceptance of the foreign methods in China, where innovation gained quicker acceptance with the sanction of antiquity. Declaring a Chinese origin for Western science both gave the foreign knowledge legitimacy and made the study of mathematics and astronomy part of the scholarly movement to return to original Confucianism.

Chinese scholars worked systematically to recover their indigenous science. In the 1770s and 1780s, as many participated in a massive imperially sponsored project to collate all of China's most

famous literary and historical works into a single anthology, they rediscovered and critically examined ancient works of Chinese mathematics and science. Scholars commented repeatedly on the importance of this work of recovery for current evidential research.

In 1799 a leading scholar published a collection of biographies of astronomers and mathematicians, thirty-seven of whom were Westerners, that brought together traditional Chinese and Western astronomy and drew attention to the latter. This work was influential because of the prominence of its principal compiler, Ruan Yuan (1764–1849), the director of an important academy where budding scholar-officials were trained to study science as part of the Confucian curriculum. Ruan encouraged students to think about such questions as the date and timing of the transmission of mathematics and astronomy to China from India and Persia, the source of most of the Muslim knowledge on which China had largely relied from the thirteenth century until the advent of the Jesuits; the relative merits of European and Chinese astronomy; and the possible Chinese origin of both European and Muslim astronomy.

The reaffirmation of mathematics and astronomy as an integral part of a proper Confucian education reached its height in the eighteenth century. Despite the skepticism to which Jesuit inconsistencies had led, Chinese scholars did not discard Western knowledge. Scholars attributed the lag in Chinese science to Song Neo-Confucianism's preference for metaphysics over mathematics; such a preference was no longer acceptable. As Qian Daxin (1728–1804), a leading mid-eighteenth-century *kaozheng* scholar, put it:

Comparing lands of the Eastern seas with those of the Western, we note that their spoken languages are mutually unintelligible and that their written forms are each different. Nonetheless, once a computation has been completed, [no matter where,] there will not be the most minute discrepancy when it is checked. This result can be for no other reason than the identity of human minds, the identity of patterns of phenomena, and the identity of numbers [everywhere]. It is not possible that the ingenuity of Europeans surpasses that of China. It is only that Europeans have transmitted [their findings] systematically from father to son and from master to disciple for generations. Hence, after a long period [of progress] their knowledge has become increasingly precise. Confucian scholars have, on the other hand, usually denigrated those who were good mathematicians as petty technicians. . . . In ancient times, no

one could be a Confucian who did not know mathematics. . . . Chinese methods [now] lag behind Europe's because Confucians do not know mathematics.<sup>6</sup>

In sum, there is no question that the introduction of Western astronomy and mathematics enormously affected the direction of intellectual activity in China. The scope of its influence extended well beyond the immediate fields of what we think of as science. To suggest that Chinese intellectuals resisted this type of Western knowledge, for whatever reason, is wrong. To the contrary. On the one hand, they paid close attention to European astronomy and mathematics to the extent that what they learned from the Jesuits made sense. On the other hand, their creative incorporation of Western scientific knowledge and its methods into preexisting scholarly debates dramatically shifted the direction and the parameters of intellectual endeavor in China.

#### CARTOGRAPHY

Unlike mathematics and astronomy, Jesuit cartography in China took great account of the strong Chinese tradition of cartography and geographical description. It also represented a cooperative rather than a competitive effort between Jesuits and their Chinese colleagues. Jesuits used maps to show where they had come from and to clarify Europe's geographical relationship with China. Their first major work of cartography was Ricci's world map, produced in 1584. It was a Chinese version of a European map of the world that he had brought with him from Europe and hung on his wall. This map attracted the attention of at least one of the late Ming emperors and intrigued Ricci's Chinese contacts, although not all the information it provided was as much of a revelation as Ricci supposed. In any event, he supervised the production of thousands of copies, and many more were pirated without his authority.

More Jesuit cartography followed. In 1623 Fujian-based missionary Giulio Aleni produced an illustrated geographical treatise that brought together European maps with information derived from Chinese sources; the geographer and Catholic convert Li Zhizao wrote a preface. In 1674 Ferdinand Verbiest, by then director of the Imperial Bureau of Astronomy, produced an updated

world map that synthesized new knowledge, accompanied by an expanded version of Aleni's work, and in the mid-eighteenth century Michel Benoist also drew a new world map for the Qianlong Emperor.

The most extensive Jesuit cartographical work in China was a survey of the Qing empire undertaken at the behest of the Kangxi Emperor. With the steady expansion of imperial territory, the Qing required accurate maps of the empire as well as accurate maps of the heavens. At first Kangxi authorized court missionaries to carry out relatively limited surveys of the Great Wall and of the environs of Beijing; pleased with the result, he soon sponsored a Jesuit-supervised survey of the entire empire.

The Kangxi survey took ten years, from 1708 to 1718. Missions traveled far and wide, taking advantage of their imperially authorized journeys into the interior for evangelistic as well as cartographical purposes. They plotted points by triangulation and did their best to fix latitudes and longitudes by carefully making astronomical and geographical measurements. Whenever possible, they gathered information from local officials and studied indigenous works and maps. They often used Chinese assistants, whom they trained in Western cartographical methods. These native sources and informants were all they had to go on when they produced maps of places they never visited, such as Tibet and Korea. The great Jesuit survey's reliance on Chinese cartographical experience was played down by its Jesuit publisher in Europe, who for political reasons gave all the credit to the missionaries.

In China the resulting maps were printed in four different editions during the period 1717-1726 and later were engraved on forty-four copper plates by the missionary abbé Matteo Ripa. The survey formed the foundation for subsequent geographical study of China for more than a century, both in Europe and in China, where partial reprints appeared in encyclopedias and subsequent atlases.

Jesuit surveying for the Qing continued with little interruption after the completion of the Kangxi project. In 1759 the Qianlong Emperor selected two missionaries to survey the newly conquered expanses of Central Asia known as Xinjiang. The maps they produced were kept in the palace and apparently were not made generally available probably because, then as now, maps of frontier regions were too sensitive to circulate. But the great Qianlong atlas that appeared in 1764 undoubtedly was based on their work and on

other cartographical work that Jesuits and Chinese scholars worked on together. In 1776 Qianlong sent one of the missionaries who had done the Xinjiang survey to western Sichuan, once again to survey a newly pacified region.

The Jesuits' work did gradually enter the public domain. It was almost certainly the basis for maps that appeared in published gazetteers of Xinjiang from the 1770s on and in works on Tibet of the same period. Many of the new maps were engraved in copper by the missionary Michel Benoist, a self-taught craftsman who trained Chinese in the art of copper engraving. So the results of Jesuit cartography did eventually become more generally known in China and in some cases remained for some time the most reliable sources of information available. In addition, for Chinese scholars, especially the many exponents of evidential research who collaborated in these mapmaking enterprises, Jesuit cartography represented another important way in which European knowledge contributed to their work of seeking truth from facts. It also marked a departure from the traditional wariness about giving foreigners access to cartographical information.

#### ART AND ARCHITECTURE

Jesuit missionary artists at the imperial court introduced Western artistic techniques, including perspective and the use of chiaroscuro, and learned to incorporate Chinese styles in their own work. Among the Jesuits' most famous paintings are their portraits of the emperors and their favorites and family members. In one example the Yongzheng Emperor wears a long flowing Western-style wig, while another depicts a woman, possibly the imperial concubine Xiangfei, dressed in armor in the manner of a Joan of Arc.

Artists of the Qianlong painting academy, both European and Chinese, became deeply involved in documenting the triumphs of the age, especially military victories. These pictorial records included, for instance, depictions of newly conquered areas (often based on information gleaned from the missionary surveyors), heroic action paintings, portraits of meritorious generals and officials, and highlights of military victory, as well as portraits of the emperor in numerous guises. Often such works were collaborative Jesuit-Chinese efforts. Qianlong preferred the European style of portraiture

to the flatter, less subtly shaded Chinese method and had missionaries depict the most important figures, while Chinese artists painted the backgrounds and the less important figures. Most of these paintings adorned halls and pavilions within the imperial palace complex. They formed part of a comprehensive historical record, compiled on imperial orders, of Qing imperial power.

Of Jesuit court art, some of the most famous was the series of battle paintings prepared to adorn a military hall of fame newly refurbished to celebrate the conquest of Xinjiang. In 1760 Qianlong commissioned four missionary artists to produce sixteen scenes depicting important battles and events in the conquest of Xinjiang. What prompted this commission? Through the missionaries the emperor was certainly aware of European depictions of war; he once questioned Michel Benoist: "There are a number of European prints that represent military victories won by your sovereigns. Who are they defeating, what enemies have they had to fight?"

Perhaps too, through the missionaries at his court, Qianlong was aware of the battle paintings produced in Europe, such as those displayed at Versailles in France and at El Escorial in Spain. Although the court limited access to the originals to a select few, Qianlong wanted to broadcast his military successes; the propaganda value was too good to squander. Spurred on by some engravings of original battle paintings done by the German painter Rugendas (1666-1742) that he saw, he decided to have mass reproductions of these war illustrations made. Since at that time no one in China recalled the techniques of engraving, the emperor decided, with strong missionary encouragement, to have the work done in France. Perhaps too Qianlong had heard enough of France's considerable power that he wished to take advantage of this opportunity to let his military might become known to the French king.

Copies of the sixteen war paintings were sent to Paris on French East India Company ships with orders for two hundred sets of copper engravings. In France the project was delegated to the celebrated printmaker Charles-Nicolas Cochin (1715-1790), who in turn arranged for eight of France's best-known artists to do the engravings. Although, in theory, the contract drawn up with the French East India Company preserved copyright for the Qing Emperor, the French made a few extra copies for their king and his ministers. As a result, a few complete sets are found today in Western collections. Qianlong had Father Benoist and his Chinese assistants pro-

duce further copies, which bedecked public buildings all over the empire and were distributed to deserving officials as a mark of official favor. Later Qianlong commissioned further portraits and battle paintings series to mark new victories, but these were drawn and engraved in China by Chinese artists and craftsmen.

Emperors also employed Europeans as architects. In 1747 Qianlong ordered the Italian missionary Giuseppe Castiglione (1688-1766) to design him an entire European palace complex, just as his grandfather Kangxi had once had missionaries build him a windmill and a fountain. In Qianlong's case this use of European architectural styles may perhaps have been intended to express a wishful mastery of the nations where these originated, as was the thinking behind the reproduction of Tibetan architecture at other Qing palaces.

The buildings of the Yuan Ming Yuan palace complex, on the northwestern outskirts of Beijing, exemplified European and Chinese collaboration in terms of both building techniques and decorative styles. Chinese-style tile roofs were combined with baroque pilasters and cornices that were European. Moreover, whereas in the West the gray stone walls of such a palace would have remained unadorned, the Beijing palace was brightly colored, with walls of vermilion; roof tiles of imperial yellow, blue, green, red, and purple; and elaborate ornamentation in porcelain or gilded bronze. The interiors were decorated with paintings, engravings, tapestries, and painted wallpaper in the European style, given by foreign embassies or acquired through the merchants in Canton. Used to display Qianlong's large collection of European scientific instruments and decorative arts, the palaces were appointed with European-style furniture, probably made by Chinese craftsmen from engravings shown them by the Jesuits. The gardens also displayed a blending of Chinese and European styles, combining rockeries and plantings in the Chinese taste with European-type fountains and topiary.

These palaces were not destined to last long. The fountains ran dry before Qianlong's death in 1799, and in 1860 the whole complex was sacked by British and French troops under Lord Elgin. Before the Qing fell from power in 1911, successive depredations had reduced the Qianlong Emperor's European-style showpiece to little more than rubble.

Even shorter-lived than the Yuan Ming Yuan were the Western-style festive pavilions, galleries, and gateways often erected for spe-

cific occasions along the processional routes between the summer palaces and the Forbidden City in the center of Beijing. On such occasions it was de rigueur for every prince and high-ranking metropolitan official to have a special structure put up at his own expense. Once the occasion was over, these structures were dismantled; we know of them now through paintings that recorded the events they were built to celebrate. For example, in 1752 several structures showing distinctly Western features were erected along the route of a procession from a palace northwest of Beijing to the empress dowager's palace on the occasion of her birthday. One had Corinthian columns and a series of enameled plaques depicting figures with wavy brown hair looking up to heaven against a background of radiant light and clouds, looking, in fact, distinctly Christian. Another had a Western clock face in its gable, set with Roman numerals at five to eleven. Whether these were actually built by Jesuits is unknown, but whoever the artisans were, they clearly were familiar with many basic features of European architecture.

Like European chinoiserie, however, which faded as Europeans became disillusioned with the partly imaginary China they had once so admired, the Qing passion for European-style architectural features had worn off by the end of the eighteenth century. Not so their interest in European artillery.

#### ARTILLERY

European artillery played a part in China's many wars of the seventeenth and eighteenth centuries. Gunpowder had found its way with the Mongols from China to Europe. There, spurred by the constant warfare between the European states, the use of artillery had developed to a more advanced stage than was the case in China. However, while Western cannon was relatively lighter and more mobile, the evidence suggests that China still retained the edge in the technology of gunpowder, as distinct from that of weapons construction. In the early sixteenth century European traders had brought their armaments and their casting techniques back across the world to China by way of Japan, India, and Southeast Asia. Ming China had begun importing Dutch cannon by no later than 1604. By the 1620s Chinese workmen were casting cannon in Macao under the direction of Portuguese gun founders, whose work was already greatly in demand



throughout colonial Asia. At the suggestion of high-ranking Chinese converts, Ming supporters more than once either purchased Macao-made cannon or invited Portuguese artillery technicians to bring their weapons to use against the Manchus. The Manchus also used European artillery against the Ming.

By 1642 the Ming were desperate. The missionary Adam Schall (1591-1666) had already made a large number of converts at court and shown his proficiency in astronomy, so that many people held him in great respect. His lucidity on the subject of cannon, in a discussion about defending the capital, led to an imperial order that he direct the casting of cannon for the falling dynasty. Schall's principal improvement over the indigenous cannon lay in the ability to produce smaller and less unwieldy siege guns. He reduced their size from seventy-five-pounders to forty-pounders, and produced more than five hundred pieces. With a Chinese colleague, he also wrote a work on gunnery, *Huo Gong Jie Yao* ("Essentials of Gunnery"), that is still extant.

After the Ming fall European weapons continued to find favor with the Manchus. In 1673 the Kangxi Emperor, beset by rebellion, ordered his director of the Imperial Bureau of Astronomy, Ferdinand Verbiest, to establish another cannon foundry. Reluctant to comply, Schall had been before him, Verbiest tried to insist that priests were men of peace with little knowledge of the affairs of war. But the emperor threatened to expel all Christians from China unless Verbiest complied, so the missionary felt obliged to yield. Not surprisingly, these activities were virulently attacked by the Jesuits' critics in Europe, but the pope took the view that Jesuit arms founding in China came into the category of "using the profane sciences for the safety of the people and the advancement of the Faith."<sup>8</sup>

Verbiest's task, much as Schall's had been, was to cast lighter and more mobile artillery than the Manchus already had—including the cannon imported earlier—for Qing troops badly needed cannon that would be capable of traversing mountains and rivers. From his designs, Chinese craftsmen produced imported Western types and improved on Chinese cannon, chiefly by lengthening the barrel. Some were made from bronze, including recycled metal melted down from old and damaged cannon. Others were made of iron with a bronze ring around the mouth and a bronze ball at the rear, the whole being covered by painted wood. Many were beautifully decorated. There were various types, all of them front-loading.

The emperor took a personal interest in the production of cannon. Usually Verbiest would produce a blueprint and build a sample cannon with which trials would be made at the Lugouqiao (Marco Polo Bridge) testing site near Beijing. Provided these proved successful, the emperor, who sometimes personally attended test firing sessions, would order several cannon of that type to be cast. The emperor's observation of the testing led him to realize the importance of aligning the sights and the target. He then ordered that soldiers attend the experimental firings so that they could learn the principles of aiming more accurately. He was so pleased with Verbiest's work that he offered the missionary his own sable coat, a rare gesture indeed.

Over a fifteen-year period Verbiest's foundry produced over five hundred cannon, more than half the total number of cannon cast during the entire Kangxi reign (1663-1722). Chinese records give some of their names, including *shenwei* ("wonderful and terrible") and *zhongtianshao* ("gun for attacking heaven," a type of trench mortar popularly called *xigua pao*, "watermelon gun," after its bulbous shape). Verbiest, as had sometimes been the practice in medieval Europe, gave each cannon the name of a saint and blessed it before sending it out. A number of these weapons are now to be found in European museums, having been captured by Western troops during the numerous conflicts of the nineteenth and early twentieth centuries.

Verbiest wrote a work on artillery, now lost, that he entitled *Shenwei Tushuo* ("Explanations and Illustrations of [the Cannon Named] Wonderful and Terrible"). In this work he wrote on the importance of uniformity in the weight of cannonballs and of knowing that weight and on the critical difference that a cannon's angle of elevation could make to its accuracy in firing. Among other things, this meant that if soldiers knew the exact distance between their targets and their guns, their cannonballs would accurately hit those targets. The unmistakable implication was that good cannon could be used to best effect only when accurate land surveys were available.

The cannon made by Schall and Verbiest remained an important part of the imperial arsenal until the end of the dynasty. Verbiest's cannon foundry continued in operation after his death in 1688, and his designs continued to be used in China at least until the Opium War (1839-1842).