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Provenance in Contest: Searching for the Origins of Jesuit Astronomy in Early Qing China, 1664-1705

ALTHOUGH CHINESE INTELLECTUALS have used the term *xixue* (Western learning) since the seventeenth century, the meaning they give to it and the context in which they use it change over time. Today, Chinese historians disparage or praise interest in such knowledge depending on their perspectives. To some, China, bound by tradition, showed by its failure to adopt Jesuit astronomy its incapacity to plant the seeds of modern science; to others, the Jesuit agenda influenced neither literati ideology nor scholarship.[1] Japanese and American scholars such as Yabuuchi Kiyoshi and Nathan Sivin accept that the agendas of both Jesuits and literati determined the extent of the appropriation of Jesuit astronomy.[2] Hashimoto Keizō, following Yabuuchi, explains how its systematic appropriation under the late Ming and the early Qing led to the compilation of the *Critical Compendium of Calendrical Phenomena* (*Lixiang kaochengi*), completed in 1722 and published in 1724.[3] From this perspective, the development of Jesuit astronomy in China formed the backbone of astronomy under the early Manchu regime.

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1 The word 'literati' was first used by the Jesuits to translate *shi*. I use it to refer to those members of the gentry who, after demonstrating literary qualifications in the civil examinations, maintained their status as Confucians in the élite class of imperial China. See J. Gernet, 'Chinese Heaven, Christian God', *China and the Christian Impact* (Cambridge, 1997), pp. 193-247; Xi Zezong, 'Lun Kangxi kexue zhengce de shiwu', *Ziran kexue shi yanjiu*, xix (2000), 18-29. Cf., Du Weiyun, *Qing qianjia shidai zhi shixue yu shijia* (Taipei, 1962), p. 3; B. Elman, *From Philosophy to Philology* (Cambridge, Mass., 1990), pp. 75-6.

2 Yabuuchi Kiyoshi, 'Min-shin jidai no kagaku gijutsu shi', in *Min-shin jidai no kagaku gijutsu shi*, ed. Yabuuchi Kiyoshi and Yoshida Mitsukuni (Kyoto, 1970), pp. 1-26; N. Sivin, *Science in Ancient China: Researches and Reflections* (Brookfield, 1995), pp. 63-103; J. Henderson, 'The Assimilation of the Exact Sciences into the Ch'ing Confucian Tradition', *Journal of Asian Affairs*, v (1980), 15-31 and 'Ch'ing Scholars' Views of Western Astronomy', *Harvard Journal of Asiatic Studies*, xlvi (1986), 121-48.

3 Hashimoto Keizō, 'Rekishō kōsei no seiritsu', in *Min-shin jidai no kagaku gijutsu shi*, ed. Yabuuchi and Yoshida, pp. 49-92.

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In discussing the appropriation of Jesuit astronomy, historians of Chinese science occasionally mention as a by-product the eighteenth-century surge in the 'origin narratives' which reinvented Chinese antiquity. Chinese scholars who take them seriously dub the reinvention 'the discourse on how Western learning originated from ancient China [*xixue zhongyuan shuo*]'.[1] Quan Hansheng, who established their chronological order, shows that they proliferated from the 1750s to the 1880s,[2] while Han Qi attributes them to the Kangxi emperor (r. 1662-1722) and to the mathematician and calendrical specialist Mei Wending, the former influenced by the Jesuit, Joachim Bouvet.[3] These scholars, who treat the reinvention of antiquity in isolation and sometimes dismiss it as an anti-modern myth, fail to recognize its ties to the appropriation of Jesuit astronomy.[4]

The two developments are tied together by the process of legitimating Jesuit astronomy in different circles at the imperial court. When the Kangxi emperor tried to persuade literati officials of the validity of imperial patronage of Jesuit astronomy by stressing its utility and precision, both he and they needed to devise an authorized language in which to talk about the issue.[5] Thus, the emperor, the literati, and the Jesuits took parallel steps to foster the acceptability of Jesuit astronomy in early Qing China that led to Mei's audience with the emperor during Kangxi's fifth southern tour in 1705. For three days, Kangxi discussed mathematics and astronomy with Mei, thus making official Mei's co-operation with the Manchu state and inspiring Mei to write an origin narrative of Jesuit astronomy.

The first part of this article traces the ascendance of Jesuit astronomy at the Qing court and the intellectual and political consequences. The second part shows how the application of Jesuit astronomy benefited both the ascending Jesuits and the expanding Manchu empire, but not the literati. The third part analyses the different explanations the Jesuits and the literati gave for appropriating or rejecting Jesuit astronomy based on their readings of astronomy and mathematics in ancient texts. The process of seeking legitimacy for appropriating Jesuit astronomy created the necessary conditions for rapid changes in astronomy and mathematics at the imperial

1 Jiang Xiaoyuan, 'Shilun qingdai xixue zhongyuan shuo', *Ziran kexue shi yanjiu*, viii (1988), 101-8; Liu Dun, 'Qingchu minzu sichao de shanbian ji qi dui qingdai tianwen shuxue de yinxiang', *Journal of Dialectics of Nature*, xiii, 3 (1991), 42-52.

2 Quan Hansheng, 'Qingmo de xixue yuanchu Zhongguo shuo', *Zhongguo jindai shi luncong*, 1st Collection (Taipei, 1956), v. 216-58; T. Huters, *Bringing the World Home: Appropriating the West in Late Qing China* (forthcoming), ch. 1.

3 Han Qi, 'Bai Jing de *Yijing* yanjiu he Kangxi shidai de "xixue zhongyuan" shuo', *Hanxue yanjiu*, xvi (1998), 185-201.

4 Wang Yangzong, '"Xixue zhongyuan" shuo zai ming qing zhiji de youlai ji qi yanbian', *Dalu zazhi*, xc (June 1995), 39-45.

5 P. Bourdieu, *Language and Symbolic Power* (Cambridge, Mass., 1991), pp. 103-59.

court and in the lower Yangzi, as well as for the intellectual reinvention of ancient China.

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The Jesuit mission to China, which dated from the beginning of the seventeenth century, produced many Christian texts in Chinese which most literati regarded as coming from a geographically remote place previously unknown to them.[1] Converts to Christianity are estimated to have numbered 200,000 between 1695 and 1703, the middle period of the Kangxi emperor's reign, and the number of missionaries and clergy reached a peak of 140-60 around 1700.[2] In comparison with orthodox Confucianism, Buddhism, and Taoism, Catholicism remained insignificant in China. Nonetheless, despite the scarcity of Catholics in the provinces, at the Qing court the Jesuits had a visible influence over court-sponsored scholarship after Ferdinand Verbiest's victory in 1664, in a dispute over the calendar, consolidated the Jesuits as an important faction at court. As their status now compelled the court literati to take notice of their astronomy, the Jesuits shared in the reconstruction by 1700 of Chinese astronomy and mathematics.

The political transition between the fall of the Ming in 1644 and consolidation by 1680 under the Qing launched the Jesuits on the road to success. After rebels against the Ming took control by 1641 of the North China plain and captured Beijing, the Manchu Prince Dorgon, helped by a Ming general, Wu Sangui, expelled them in 1644. The Jesuits in Beijing quickly sided with the new Manchu regime under the Shunzhi emperor (r. 1644-61), even though their colleagues elsewhere were more hesitant.[3] After the Manchus and their Mongolian and Han Chinese allies welcomed the Jesuits' backing, Adam Schall, the leading Jesuit astronomer and cannon-founder to the Ming, seized the opportunity in 1644 to present Dorgon with a calendar based on what he called 'a new method from the West Ocean [*xiyang xinfa*]'.[4] The calendar pleased the emperor who directed the Jesuits at court to extract what they could from the order's

1 W. Peterson, 'Learning from Heaven: The Introduction of Christianity and Other Western Ideas into Late Ming China', *The Cambridge History of China*: VIII: *The Ming Dynasty, 1368-1644*, part 2 (Cambridge, 1998), pp. 789-839.

2 N. Staendart, 'Number of Christians', *Handbook of Christianity in China*: I: *635-1800* (Leiden, 2001), pp. 380-93, and 'The Jesuit Presence in China (1580-1773): A Statistical Approach', *Sino-Western Cultural Relations Journal*, xiii (1991), 4-17. I thank Eugenio Menegon for this reference.

3 See L. Pfister, *Notices biographiques et bibliographiques sur les Jésuites de l'ancienne mission de Chine, 1552-1773* (Shanghai, 1932), pp. 130, 257; E. Menegon, 'A Different Country, the Same Heaven: A Preliminary Biography', *Sino-Western Cultural Relations Journal*, xv (1993), 27-51.

4 See Chen Yuan, *Tang ruowan yu mu chenmi* (Beijing, 1980), pp. 510-15; Ruan Yuan, *Chouren Zhuan* (1810; repr. Taipei: Baibu congshu series 44), cxvi-cxxxvii. 45: 1a-2a; Huang Yi-long, 'Qingchu Qintianjian zhong ge mingzu tianwenxuejia de quanli qifu', *Xinshixue*, v (1991), 75-108, esp. 77-81.

Astronomia Europaea, and put Schall in charge of the Directorate of Celestial Surveillance (Qintianjian), the imperial institution that monitored celestial patterns, forecast anomalies, devised calendars, and chose dates and sites suited to state rituals.[1] Schall had been given a difficult assignment: at a time when physical astronomy in Europe was making rapid advances, the Jesuits at Beijing, with limited access to recent developments, had to work with whatever materials were at hand.[2]

By cannon-founding and recalculating the imperial calendar, Schall showed during his years at court – he died in 1666 – how the Jesuits could advance their mission by playing a role in court politics.[3] The translation of religious and scientific texts into classical Chinese, by which the Jesuits distinguished themselves as a cultural élite and as religious leaders in China, remained their major evangelical tool.[4] Their strategy for success in applying it, however, was to win over the dynasty and the literati first to their science, and then, they hoped, to Catholicism.[5]

The first challenge to the Jesuits in the early Qing arose in 1664 from a dispute with Yang Guanxian's faction at court over the calendar.[6] During the 1660s, the Manchu empire had yet to obtain a strong hold on China, and the seven-year-old Kangxi emperor's accession in 1662 under a regency postponed the attempt to consolidate the regime's hold over China proper until he gained personal control by about 1680. Yang, a literati official from the lower Yangzi basin, and his faction began their attack on the Jesuit calendar in 1659. Between 1659 and 1664, Yang repeatedly presented himself to the Shunzhi emperor and subsequently to the regents of his son, the Kangxi emperor, as the defender of the literati's textual tradition: after several failures, Yang persuaded the regents in 1664 to put him in charge of the directorate, to banish the court Jesuits to Macao and

1 N. Golvers, *The Astronomia Europaea of Ferdinand Verbiest, SJ: (Dillingen, 1687): Text, Translation, Notes, and Commentaries* (Nettetal, 1993); C. Hucker, *A Dictionary of Official Titles in Imperial China* (Stanford, 1985), p. 169. Hucker uses the term 'the Directorate of Astronomy' and Joseph Needham 'the Directorate of Astronomy and Calendar'. The Jesuits in the eighteenth century usually called the directorate the 'Mathematical Tribunal'.

2 U. Libbrecht, 'What Kind of Science Did the Jesuits Bring to China?', *Western Humanistic Culture Presented to China by Jesuit Missionaries (XVII-XVIII centuries)*, ed. F. Masini (Rome, 1996), pp. 221-34.

3 Huang Yi-long, 'Cong tangruowang suobian mingli shixi qingchu zhongou wenhua de chongtu yu tuoxie', *Tsing-Hua Journal of Chinese Studies*, xxvi (1996), 189-220.

4 J. Spence, *The Question of Hu* (New York, 1988).

5 F. Hsia, *French Jesuits and the Mission to China: Science, Religion, History* (Chicago, 1999). For a similar strategy in Siam, see R. S. Love, 'Monarchs, Merchants, and Missionaries in Early Modern Asia: The Missions Étrangères in Siam, 1662-84', *International History Review*, xxi (1999), 1-27.

6 L. Kessler, *K'ang-hsi and the Consolidation of the Ch'ing Rule, 1661-84* (Chicago, 1976), pp. 53-73. On calendar disputes, see Huang Yi-long, 'Qingchu tianzhujiao yu huijiao tianwenjia jian de zhendou', *Jiuzhou Xuekan*, v, 3 (1993), 47-69 and 'Zeri zhizheng yu kangxi liyu', *Tsing-Hua Journal of Chinese Studies*, xxi (1991), 247-80; Hashimoto, 'Rekishou kousei no seiritsu', pp. 49-92, esp. 56-61.

Canton, and to close their churches.[1] The China mission survived by mounting an effective counter-attack. After the Kangxi emperor seized power from the regents in 1664, the faction led by Schall's successor, Verbiest,[2] undermined Yang's faction: the emperor dismissed Yang and his faction from the directorate after only seven months. According to Verbiest, the Jesuits owed their victory to their skill at '[astronomical] measurement and verification [*ceyan*]'.[3] Even if the emperor's notion of astronomy was nebulous, his decision had important political implications: the Chinese élite could no longer ignore the Jesuits' political influence.[4] The dispute had profound intellectual consequences for the next generation of Jesuits and literati alike, as Verbiest bid for imperial patronage while trying to cope with the literati's resistance.

Yang's challenge, summarized in his *Budeyi*, provoked Verbiest's rebuttal in *Budeyi bian*, a group of essays designed to justify Jesuit astronomy and buttress the emperor's patronage.[5] 'The study of celestial patterns', Verbiest proclaims, 'is the practical politics for our dynasty.' At the same time, he urged the emperor to recognize that the study of celestial patterns 'is also concrete studies [*shixue*] for Confucian literati'. In the essays, he repeatedly emphasizes that the crucial aspect of astronomy is the measurement and verification necessary for making accurate calendars.[6] Celestial patterns such as solar or lunar eclipses, the solar traces on a celestial sphere, the shape of the moon, and the orbits of the five planets, being external to the observer, transcend factional politics: if Jesuit, Muslim, or Chinese astronomers impartially observe celestial patterns (*hetian*) and verify their observations against their models of the cosmos, their methods will be valid.[7] Conversely, if they cannot verify their measurements, their methods will not be valid.

As Verbiest was trying to convince the emperor of Yang's technical in-

1 P. Rule, *K'ung-tzu or Confucius? The Jesuit Interpretation of Confucianism* (Boston, 1986), pp. 101-8; *100 Roman Documents Concerning the Chinese Rites Controversy (1645-1941)*, trans. D. F. St Sure, ed. R. Noll (San Francisco, 1992), pp. viii-ix.

2 It consisted of Louis Buglio (1637-82) and Gabriel de Magalhaens (1640-77). See Pfister, *Notices biographiques*, pp. 230-43, 251-5.

3 F. Verbiest, *Qinding ceyan jilue* [Paris], B[ibliothèque] N[ationale] Chinois 4992. See N. Standaert, 'The Investigation of Things and the Fathoming of Principles (*Gewu qiongli*) in the Seventeenth-Century Contact between Jesuits and Chinese Scholars', in *Ferdinand Verbiest: Jesuit Missionary, Scientist, Engineer, and Diplomat*, ed. J. Wittek (Nettetal, 1994), p. 407.

4 Chu Pingyi, 'Scientific Dispute in the Imperial Court: The 1664 Imperial Calendar Case', *Chinese Science*, xiv (1997), 7-34.

5 Verbiest, *Astronomia Europaea*. The texts are to be found in BN Chinois 4984, *Budeyi bian*; Chinois 4998, *Wanzhanbian*; Chinois 4995, *Wantui jixun bian*; Chinois 4993, *Wanzebian*; Chinois 4992, *Qinding ceyanjilue*; Chinois 5002, *Chongzhen bibian*. See also, Verbiest, *Budeyi bian*, *Tianzhujiao dongchuan wenxian* (Taipei, 1965), pp. 333-471.

6 Verbiest, *Budeyi bian*, BN 1b-2a.

7 Ibid., BN 1b-2a.

competence as an astronomer, he emphasized the value of measurement in preference to textual evidence: 'measurement and verification are the basis of all my defences.'[1] Verbiest understood that most literati would have obtained information about the heavens (*tian*) from either historical records or classical texts, and in suggesting that observation and measurement should take precedence over such sources, he directly challenged the authority of the calendar section of the imperial archives. He attributed to measurement, which enabled the model of the cosmos to approximate celestial patterns, an elevated, detached posture suited to the highest imperial authority, while Yang's scholarship he dismissed as 'the satisfaction of human demands [*heren*]': factional, selfish, and suited only to the pursuit of personal advantage. Verbiest proposed to the emperor that, at court, the first should take precedence over the second.[2] What benefited the emperor would also benefit the Jesuits: as measurement required astronomical and mathematical knowledge unfamiliar to the literati, and the skill to use astronomical instruments, its precedence would introduce Jesuit astronomy at court and reinforce the Jesuits' influence.

In order to prove to the emperor the superiority of Jesuit astronomy, Verbiest stressed that the object of measurement was precision, derived from the accumulation of knowledge over a long period:[3] astronomers had observed the heavens and amended the calendar over several millennia. The Jesuits' role was merely to transmit this knowledge to China. Verbiest portrayed himself to the emperor as fortunate to have been born at a time when calendar-making had become so precise, and if Jesuit astronomy were valuable, he suggested, the credit should be given to its methods rather than to his ability to apply them:[4] it was an aspect of God's glory, and he only the instrument used to bring it to China. In his reports to his superiors in Europe, however, he boasted that this line of argument would eventually convert the imperial house to Catholicism.[5]

Verbiest's attack on correlative cosmology in China challenged the belief system of many literati, for he claimed that, by Western standards, Yang's techniques were bound to lead to false predictions.[6] According to Verbiest, astronomers, who *measured*, differed from astrologers, who *interpreted* the paths of the five planets in the sky on the basis of *fengshui* (lit., wind and

1 Verbiest, *Budeyi bian*, BN 5b-6a.
2 See B. Elman, *A Cultural History of Civil Examinations in Late Imperial China* (Berkeley, 2000), pp. 468-71.
3 Verbiest, *Budeyi bian*, BN 47b-57a.
4 Ibid., BN 2b.
5 Verbiest, *Astronomia Europaea*, pp. 54-8, 97-8. See also, Hsia, *French Jesuits*, pp. 66-75.
6 See J. Henderson, *The Development and Decline of Chinese Cosmology* (New York, 1984), pp. 119-73; N. Sivin, 'Cosmos and Computation in Early Chinese Mathematical Astronomy', *T'ung Pao*, lv (1969), 1-73.

water; geomancy) and *xuanze* (lit., selection), in order to select dates and sites for funerals, buildings, and special events in accordance with geomantic principles and the civil calendar.[1] Issued by the imperial house each year, the calendar contained extensive commentaries on the significant dates and sites, each of which was chosen on the basis of an interpretation of the paths of the planets.[2]

The civil calendar confronted Schall and Verbiest with the problem of whether to assist the imperial house on heretical and superstitious matters. As both of them decided to do so, they justified the decision to their superiors on the grounds that the selection of dates and sites was a practical matter of daily life. In China, the astrological prognostications contained in local almanacs were based on the recorded traces of the planets sanctioned by the imperial house in the civil calendar. Thus, both Schall and Verbiest held the view that the daily need for astrological prognostication was a practicality rather than a superstition.[3]

Verbiest, who treated Yang merely as an astrologer, cited the following items to demonstrate Yang's incompetence at predicting celestial patterns:[4] his inaccurate delineation of the fortnightly periods of the solar year; false claim to the existence of purple ether; acceptance of two imaginary planets in Buddhism, Rahu and Ketu, which personified the ascending and descending nodes of the moon's path and had been devised to account for lunar eclipses; reversal of the sequence of the *shen* and *zui* star lodges (*xingsu*); and false techniques for watching the ether. Of these examples, only the sequence of the star lodges was a dispute over measurement; the others were disputes over what to measure.

Verbiest's attack on Yang's astrology implied that Catholicism and Jesuit astronomy shared a common logic. Whereas Yang treated the dispute over the calendar as one between two sets of values and world-views, one sublime and the other absurd,[5] Verbiest's response equated Jesuit astronomy with Catholicism: literati would otherwise have dismissed Jesuit astronomy owing to the absurdity of Catholicism in their eyes. Verbiest described in 1687 how literati wandered everywhere 'inside our residence, in our library, our church, and our garden, and with great admiration they contemplate long and intensely the paintings, and other European objects that

1 Verbiest, BN Chinois 4995, *Wantui jixun bian*, p. 2a. For Verbiest's attack on the Chinese cosmology, see BN Chinois 4998, *Wanzhan bian*; BN Chinois 4995; BN Chinois 4993, *Wanze bian*.

2 Verbiest, BN Chinois 4995, *Wantui jixun bian*, pp. 14b-21b. See also, Yang Guanxian, *Tianzhujiao dongchuan wenxian xubian* (Taipei, 1965), pp. 1163-7.

3 Schall and Verbiest, BN Chinois 4982, *Mingli puzhu jiehuo*.

4 Verbiest, BN Chinois 4995, *Wantui jixun bian*, p. 1b. See also, Huang Yi-Long and Chang Chih-ch'eng, 'The Evolution and Decline of the Ancient Chinese Practice of Watching for the Ethers', *Chinese Science*, xiii (1996), 82-106.

5 Yang Guanxian, *Budeyi*, *Tianzhujiao dongchuan wenxianxubian* (Taipei, 1965), pp. 1103-56.

we intentionally exhibit there, especially those things that reveal some work of rare skill ... we also meet mandarins who otherwise would have remained unknown to us and to whom our Religion otherwise would hardly have gained access.'[1] Moreover, Verbiest postulated the road the literati would take in converting to Catholicism. They would reason that 'when all European matters and sciences [Jesuit astronomy] are so developed and based on such a foundation, then there is no doubt that their religion, which they hold in such high esteem and which they prefer above all other sciences, must [also] be founded on great and most firm foundations.'[2] The Jesuits thus needed to use their astronomy as a lure to demonstrate the superior logic of Christianity; to convince the emperor and the literati that Jesuit astronomy and Catholicism were inseparable.[3]

The emperor and his counsellors, however, distinguished between Jesuit astronomy and Catholicism. When the literati official, Lu Longqi, recorded in 1675 his impressions of touring the Jesuits' church in Beijing and of the strength and shortcomings of Western learning, he divided the latter into two parts, one useful and the other untrustworthy. Whereas Jesuit astronomy helped one to calculate solar traces in the sky or the difference from the average length of a year, the stories of Adam and Eve, and of the birth of Jesus Christ, were ridiculous. In fact, Lu boasted of how he obtained a copy of the *Table of Solar Traces* from Verbiest and discovered the similarities between European calendars and the methods used by the thirteenth-century astronomer Guo Shoujin during the Yuan dynasty (1271-1368).[4]

A discussion between the emperor and his counsellors at the observatory at Nanjing (then Jiangning) in 1689 illustrates the imperial endorsement of Jesuit astronomy while disregarding Catholicism, and the literati's resentment of both.[5] Both Han Qi and Hashimoto Keizō emphasize the discussion's significance, one arguing that it shows how one of the emperor's favourite grand counsellors, Li Guangdi, mediated technical expertise between the imperial house and the literati, the other that it led to an important synthesis between Chinese and Western learning.[6] The

1 Verbiest, *Astronomia Europaea*, p. 131.

2 Ibid.

3 R. Westman, 'The Copernicans and the Churches', *God and Nature*, ed. D. Lindberg and R. Numbers (Berkeley, 1986), pp. 76-113; W. Ashworth Jr., 'Catholicism and Early Modern Science', ibid., pp. 136-66; C. Jami, '"European Science in China" or "Western Learning"? Representations of Cross-cultural Transmission, 1600-1800', *Science in Contexts*, xii (1999), 420-2.

4 Lu Longqi, *Lu Longqi nianpu* (Beijing, 1993), pp. 235-6.

5 *Qingshilu* (Beijing, 1986-7), v. 139. 30a-33b (no. 2, pp. 526-7).

6 Han Qi, 'Junzhu he buyi zhijian: Li Guangdi zai Kangxi shidai de huodong jiqi dui kexue de yingxiang', *Tsing-Hua Journal of Chinese Studies*, xxvi (1996), 421-5; Hashimoto, 'Rekisho kosei no seiritsu', pp. 49-92.

discussion, moreover, reveals how multi-ethnic factional politics operating behind the scenes conditioned the production of knowledge by determining how favours, money, power, and other resources were allocated. The outcome was the reformulation of Confucian orthodoxy as the emperor reconfigured the state apparatus: he enhanced his power by facilitating the creation of a network of political and scholarly factions. In the event of disagreements among them, he could either wait until they produced a result or support a particular faction during the struggle.[1]

The emperor, whose intervention in factional politics could be decisive, often acted on the basis of what he read. For example, the discussion at the observatory originated in the emperor's study of history. In the 'Annals of Muzhong' in the *History of the Liao Dynasty* (907-1125), he read that the Khitan minister, Xiao Siwen, reported to the Muzhong emperor that as the Old Man Star (*laorenxing*) was visible, Muzhong should declare an amnesty.[2] Although the incident was of particular interest to the Kangxi emperor because the Manchus believed they descended from the Jurgens, the unified tribes living in Manchuria who had conquered the Khitan or Liao dynasty, he disputed the authority of the ancient history texts. According to the 'Book on Celestial Officials in Historical Record' in *Shiji*, considered by court officials and literati as the first reliable dynastic history, Kangxi read that 'there is a big star below the Wolf Star, which we call the Old Man of the southern pole. If the Old Man Star is visible, the polity will be stable; if it is not visible, then wars will follow.' Although Xiao was following an ancient tradition in advising the Khitan emperor when to act, the Kangxi emperor doubted that Xiao in the far north could in fact have seen the Old Man Star near the South Pole.[3] To prove his point, he arranged a theatrical as well as quasi-empirical performance for the literati at the observatory at Nanjing.

The emperor's performance involved both many factions at court and their social networks in the lower Yangzi basin, which they organized to buttress their political standing, an arrangement crucial to the distribution of appointments following success in the civil examinations.[4] Two rival factions were established at court in the early 1660s, both headed by

1 L. Struve, 'The Hsü Brothers and Semi-official Patronage of Scholars in the Kang-hsi Period', *Harvard Journal of Asiatic Studies*, xlii (1982), 254-66; S. Wu, *Communication and Imperial Control in China* (Cambridge, 1970), pp. 34-65; B. Elman, *Classicism, Politics, and Kinship: The Ch'ang-chou School of New Text Confucianism in Late Imperial China* (Berkeley, 1990), pp. 275-317.

2 For the identification of the Old Man Star in modern astronomy, see J. Needham, *Science and Civilisation in China* (Cambridge, 1954), iii. 238. Needham identifies the Old Man Star as Canopus (Carina), the second brightest star in the sky.

3 *Kangxidi yuzhi weji* (Taipei, 1966), 29: 3a-b; 'Shiji tianguanshu', *Zhongguo tianwen lifa shiliao* (Taipei, 1977), pp. 3-66, laorenxing passage, p. 20.

4 See Elman, *Civil Examinations*, pp. 1-61.

members of the Manchu élite: Mingju, a Manchu noble bannerman, recruited many literati, whereas Songgotu, another Manchu bannerman and adviser to the Kangxi emperor, recruited Manchus and Jesuits. Their factions underwent a significant mutation when Mingju lost the emperor's favour in 1688, leading to the emergence of factions headed by Li Guangdi, Xu Qianxue, and Gao Shiqi, among others.[1] Li portrays himself in his memoirs as drawn into the struggle between Xu and Gao, who worked together to overthrow Mingju but, after their success, became rivals.[2] The rise of the factions at court coincided with the literati's emphasis on the exegesis of orthodox Confucianism (*daoxue*) in the civil examinations, which were themselves the principal instrument of Manchu state building.

The discussion at the observatory took place in 1689 during the emperor's tour of the lower Yangzi delta, after he gave an audience at Nanjing to two leading Jesuits, Jean de Fontaney, the head of the French mission, and Jean Gabiani.[3] Having asked them to tell him everything they knew about the Old Man Star, he visited the observatory the same day.[4] In reply to his questions about the star, his major advisers, Li Guangdi (at the time a chancellor of the Hanlin Academy) and Zhang Yushu, replied: 'We do not know anything about it!' Li's memoirs portray the incident as an attempt by his enemies at court to expose his ignorance, a challenge to his learning designed to embarrass him.[5]

The record of the conversation in the Veritable Records (*shilu*), which provide more technical details from a different perspective, however, reveals the emperor's true motive. The first part of the conversation reveals that he accepted Verbiest's claim that measurement took precedence over textual evidence. He questions Li about the sequence of the *zui* and *shen* lodges:

Kangxi Emperor: 'How many star lodges [*xingxiu*] can you recognize?'
Li replied: 'I cannot recognize all twenty-eight of them.'
The emperor ordered Li to point out what he knew.
The emperor asked Li: 'In the ancient calendar, *zui* lodge was listed before *shen* lodge in the stipulation of twenty-eight star lodges, but our current calendar reverses the order. Why is that the case?'
Li replied: 'I do not understand this.'
Kangxi then instructed him: 'If you use the instrument in this observatory to

1 Xie Guozhen, 'Qingchu shunzhi kangxi jian zhi dangzheng', *Mingqing zhiji dangshe yundong kao* (Beijing, 1981), pp. 96-118; Wang Jingqi, 'Gao wenque yishi', *Dushutang xizheng suibi* (1928; repr. Hong Kong, 1967), pp. 36a-37a.
2 Li Guangdi, *Rongcun yulu*, pp. 736-43.
3 D. Mungello, *The Forgotten Christians of Hangzhou* (Honolulu, 1994), pp. 41-67.
4 *Zhengjiao fengbao*, ed. P. Hoang (Shanghai, 1894), pp. 98-101; Han Qi, 'Junzhu he buyi zhijian', pp. 427-9.
5 Li Guangdi, *Rongcun yulu*, pp. 736-43; Han Qi, 'Junzhu he buyi zhijian', pp. 425-7.

measure them, the *shen* lodge is indeed listed before the *zui* lodge. Hence you should believe that our calendar is not mistaken.'[1]

The twenty-eight constellations functioned as reference points in the heavens for the tracing of the planets. Literati had long argued about the sequence of the *zui* and *shen* lodges. The fact that the emperor chose to discuss the sequence shows that he was aware of the controversies underlying the dispute over the calendar: when Yang's faction accused the Jesuits of altering the sequence of *shen* and *zui*, the Jesuits replied that they relied on measurement and verification.[2] The emperor was now implying that it was in the interest of the imperial house to map celestial patterns more accurately; that, in order to do so, it should endorse Jesuit astronomy and give observation priority over the historical records.

The second part of the conversation reveals that the emperor echoed Verbiest's claim that textual evidence alone was insufficient. To prove the claim, he needed to point to an inconsistency between textual records in the past and observable celestial patterns in the present; also that small errors, by accumulating, become significant over a long period:

> Kangxi asked Li: 'How far has the central star [*zhongxing*] moved since the Yao time?'
> Li replied: 'According to previous scholars, it has moved about fifty degrees.'
> Kangxi asked: 'Do the stars [*hengxing*] move?'
> Li replied: 'According to our new calendar, the stellar sphere [*hengxing tian*] rotates, but very minutely.'
> Kangxi then instructed Li: 'The reason why Guo Shoujing's instruments [from the Yuan dynasty] cannot be used today is that he did not know that the stellar sphere also moves.'[3]

Here the emperor suggests that the central star, which the *Document Classic* (*Shujing*) treated as the linchpin of ancient Chinese astronomy, had moved to such a degree that it was no longer useful as a reference point. Worse, he attributes the inaccuracy of the Ming imperial instruments to the system based on an immobile central star, the same system defended by Yang Guangxian in the dispute over the calendar: Yang had written his 'Explanation of the Central Star [*Zhongxing shuo*]' as a challenge to Jesuit astronomy, arguing that as the ancient sage-king Yao had selected the star as the reference point in the sky, its authority should not be challenged.[4] Its role was preserved not only in Muslim and Mongol astronomy but also

1 *Qingshilu*, v. 139: 32a (no. 2, p. 527).
2 Huang Yilong, 'Qingqianqi dui zuican liangsu xianhoucixu de zhengzhi', in *Jindai zhongguo kejishi lunji*, ed. Yang Cuihua and Huang Yilong (Taipei, 1991), pp. 71-93.
3 *Qingshilu*, v. 132: 32b (no. 2, p. 527).
4 Yang Guanxian, 'Zhongxing shuo', *Tianzhujiao dongchuan wenxian xubian* (Taipei, 1965), pp. 1157-61.

in the Ming's *Great Concordance Calendar* (*Datong li*). By now ignoring this line of transmission, the emperor implicitly discarded the Ming astronomical system and authorized the Jesuit alternative.

The emperor concluded the conversation by attacking correlative cosmology.[1] After stressing the significance of celestial patterns, he unrolled a more detailed map of the stars, pointed to a big star near the horizon to the south, and told his officials: 'This is the Old Man Star.' Whereupon, Li immediately remarked: 'According to our historical records, a visible Old Man Star is symptomatic of a humane and prosperous empire.' The emperor, who had expected the comment, replied: 'If you calculate the position of the Old Man Star from the northern pole, then we should be able to see it from Jiangning [Nanjing]. However, if you are in Beijing or far north, then we would not be able to see the Old Man Star at all. It is completely irrelevant to associate the visibility of the Old Man Star with the prosperity of the empire.'[2]

Despite denouncing Chinese correlative cosmology on the grounds that the Old Man Star did not indicate the empire's prosperity, the emperor nonetheless told his officials later in the year that 'if our administration is at fault on earth, Heaven will respond with calamities from above.'[3] In contradicting himself by denying the correlation between the visibility of the Old Man Star and prosperity on the one hand, while claiming a correlation between human faults and calamities on the other, he revealed his willingness to use correlative cosmology to control local officials who sent misleading reports on droughts, floods, and prospects for the harvests. The duplicity he used in appropriating Jesuit astronomy would not have succeeded but for the existence of the rival factions, because most of the literati objected to his patronage of it.

After the Ming-Qing transition, some of the Jesuits' critics, who took an anti-Manchu stance and claimed to be seeking political alternatives to Manchu rule, nonetheless stressed the need to observe natural phenomena and tried to cope with the inconsistency between observation and text.[4] Qu Dajun, for example, who observed the Old Man Star from Canton, understood that it is visible there only because Canton is located in southern China; that being near the South Pole, the star serves like the Big

1 J. Henderson, *The Development and Decline of Chinese Cosmology* (New York, 1984), pp. 175-206. For a critical reading of Henderson's work, see W. Peterson's review in *Harvard Journal of Asiatic Studies*, xlvi (1986), 657-74.

2 *Qingshilu*, v. 132: 33a (no. 2, p. 527).

3 Shengzu renhuangdi shengxun, edict of 1689, 4.3b-4, cited and translated in Wu, *Communication and Imperial Control in China*, p. 34.

4 Fang Yizhi, *Wuli xiaoshi*, 1664 (Chengdu, 1998), esp. 1: 16b-17b; W. Peterson, *Bitter Gourd: Fang I-chih and the Impetus for Intellectual Change* (New Haven, 1979), pp. 146-69.

Dipper near the North Pole as a reference point.[1] The courtiers' ignorance of mathematics and astronomy does not imply that Chinese scholars were equally ill-informed.[2] The task of the Manchu imperial house was to cajole and convince, rather than coerce, gentry-literati well aware of the significance of the discussion.

For the second half of the seventeenth century, the emperor manipulated the factions at court in an attempt to consolidate his vast yet unstable empire. The support of the literati, who were the most important members of the imperial bureaucracy and who dominated local society as landed gentry, was crucial. The emperor also recognized the tension between his need for the literati's political support (*zhitong*, political legitimacy) and his endorsement of Jesuit astronomy. Conversely, the literati sometimes found political support incompatible with the orthodox transmission of literati values (*daotong*, cultural legitimacy).[3] Notwithstanding the emperor's sponsorship, Jesuit astronomy was not yet included among the orthodox literati values worthy of transmission. This disjunction between political and cultural legitimacy required careful negotiation between the imperial house and the gentry-literati. The emperor, who was keenly aware of the disjunction, had to find the means of legitimating his endorsement of Jesuit astronomy.

* * *

Under imperial patronage, the Jesuits and literati at court imported early modern European mathematics and astronomy previously unfamiliar to most literati in China. The rapid pace of the appropriation cannot be explained solely by patronage, for under the Manchus, Jesuit astronomy became a tool used for state building .

The imperial house continued its patronage of the Jesuits despite Verbiest's death in 1688, when the Jesuits split into French and Portuguese factions competing for imperial favour.[4] The French Jesuits – sent to China by the Académie des Sciences, founded in December 1666 and dubbed the Mathématiciens du Roy to symbolize both their national and scientific agendas – had disrupted the organization and financial structure of the existing 'Portuguese enterprise' in China, Japan, and South-East Asia.[5] The emperor's wish to be able to recruit Jesuit scholars and

1 Qu Dajun, *Guangdong xinyu* (*c.* 1680) (Beijing, 1985), p. 7.

2 See Sivin, *Science in Ancient China*, pp. 45-66.

3 Elman, *Civil Examination*, pp. 476-7. Cf. T. Wilson, 'The Construction of Truth and Its Traditions: The Problem with Origins', *Genealogy of the Way: The Construction and Uses of the Confucian Tradition in Late Imperial China* (Stanford, 1995), pp. 112-43.

4 D. Alden, *The Making of an Enterprise: The Society of Jesus in Portugal, Its Empire, and Beyond, 1540-1750* (Stanford, 1996), pp. 229-54.

5 See Hsia, *French Jesuits*, pp. 1-62 and J. Witek, *Controversial Ideas in China and in Europe: A Biography of Jean-François Fouquet (1665-1741)* (Rome, 1982), pp. 13-72.

technicians gave the French the entrée at court. Thus, the French Jesuits created a national mission in China,[1] and by pursuing their own national, scientific, and religious agenda, undermined the authority of their superiors there, and provoked a confrontation with the Portuguese Jesuits. Verbiest's death was a blow to the French Jesuits because his successor at the directorate, the Italian Claudio Filippo Grimaldi, sided with the Portuguese, thereby creating two Jesuit factions at court.[2]

The rival factions assisted the imperial house primarily on technical matters. In October 1689, when the emperor returned from his tour of the south, he began an intensive study of mathematics and astronomy with his Jesuit instructors. At first these were Thomas Pereira and Antoine Thomas, the Portuguese Jesuits at court who were temporarily in joint charge of the directorate, as Grimaldi, whom the emperor had sent to Russia in 1686, travelled to Rome before returning to Beijing. However, Joachim Bouvet and Jean-François Gerbillon, French Jesuits who had arrived at Beijing in February 1688, learned Manchu in a bid to take over the emperor's tuition: they record in their diaries that they learned enough of the language to tutor in mathematics and astronomy while Thomas and Pereira still had difficulties. Although they may have exaggerated their proficiency to make their rivals look incompetent, in November 1689 they did take over, although their rivals remained in charge of the directorate.[3]

Between 1689 and 1692, the Kangxi emperor acquired what he later termed *sanjiaoxing suanfa* (lit., the mathematics of triangles, or trigonometry), after devoting perhaps as many as three hundred hours to 'lessons' given to him by French Jesuits.[4] Thus armed, he boasted of his knowledge to his Chinese counsellors; but whether he was much of a mathematician matters less than the extent of his knowledge of the cosmic models on which he drew when assessing the merits and demerits of Jesuit astronomy. Although he wished to appropriate it, he also wished to downplay its ideological claims; he therefore ordered the Jesuits to translate their astronomical works into Chinese or Manchu to be issued in the name of the imperial house.

The series of manuscripts the Jesuits issued in translation made a significant contribution to the imperial compilation *The Essence of Mathematical Principles* (*Shuli jingyun*, 1709-23). Bouvet and Gerbillon persuaded the

1 Rule, *K'ung-tzu or Confucius?*, pp. 126-9.

2 Witek, *Controversial Ideas in China*, pp. 58-64.

3 I. Landry-Deron, *Les Leçons de Sciences Occidentales de L'empereur de Chine Kangxi (1662-1722) par les Pères Bouvet et Gerbillon* (Paris, 1995), pp. 83-101; Witek, *Controversial Ideas in China*, pp. 58-64; Kessler, *K'ang-hsi*, pp. 149-54.

4 Isabelle Landry-Deron has constructed an unpublished bar chart on the Jesuit tutoring (1689, 1690, and 1691) based upon Bouvet's diary (BN 17240). I thank her for allowing me to make use of it.

emperor that Ignace-Gaston Pardies' *Élémens de Géométrie* (Paris, 1671) was a better textbook than Xu Guangqi and Matteo Ricci's translation in 1607 of Christopher Clavius' Euclidean geometry, *The Original Book of Geometry* (*Jihe yuanben*). Although Thomas and Pereira tried to prevent the substitution, and thereby the French from acquiring greater influence in the directorate, the emperor agreed that Pardies' text, being easier to follow, should be used for his lessons.[1] Some portion of the *Mathematical Principles* derives from what the emperor regarded as the 'clear and useful' synopsis given in the French Jesuits' mathematical textbooks.[2] Bouvet and Gerbillon used them to explain to the Kangxi emperor both plain and spherical trigonometry by applying the pedagogical techniques they had learned at college.

The lessons faltered and eventually ceased in 1692, owing to the preparation for war against the Mongols which, in its turn, led to colonial conquests and the need for a new calendar for the immense territory the Qing now controlled. The Russian and Mongol empires had competed with the Manchus for control of Inner Asia since the 1680s. As early as 1679, when the Mongolian khan, Galdan, completed his conquest of Eastern Turkestan, the Kangxi emperor acknowledged the challenge by awarding him the title of Bushktu Khan of Eleuths. In return, Galdan stayed quiet for ten years before launching another wave of expansion which led to a confrontation with the emperor in 1696. The emperor's strategic goal was to prevent the Russian empire from assisting Galdan – the reason for Grimaldi's mission in 1686 – and he led three military campaigns against the Mongols in person until their defeat after Galdan's death from smallpox in 1697.[3] The victory left the Qing empire, which had nearly doubled in size, with an enormous administrative challenge.

Peter C. Perdue and Nicola di Cosmo show that Inner Asia's present-day borders derive from a combination of war, treaties, and map-making among the Manchu, Mongolian, and Russian empires. The need for colonial administration in Inner Asia set the Lifan Yuan, which administered the Manchu empire's outer provinces, a huge task in coping with the unique conditions of the North-West territory.[4] To stabilize its rule, the

1 C. Jami, 'From Clavius to Pardies: The Geometry Transmitted to China by Jesuits (1607-1723)', in *Western Humanistic Culture*, ed. Masini, pp. 175-99; P. Engelfriet, *Euclid in China: The Genesis of the First Translation of Euclid's Elements in 1607 and Its Reception up to 1723* (Leiden, 1998), pp. 132-206.

2 Li Di, *Zhongguo shuxue shi jianbian* (Shengyang, 1984), pp. 253-77; Liu Dun, '"Shuli jingwen" zhong "jiheyuanben" de diben wenti', *Zhonguo keji shilao*, xii (1991), 88-96.

3 P. C. Perdue, 'Boundaries, Maps, and Movement: Chinese, Russian, and Mongolian Empires in Early Modern Central Asia', *International History Review*, xx (1998), 263-86; Kessler, *K'ang-hsi*, pp. 97-105.

4 P. C. Perdue, 'Military Mobilization in Seventeenth- and Eighteenth-Century China, Russia, and Mongolia', *Modern Asian Studies*, xxx (1996), 757-93; N. Di Cosmo, 'Qing Colonial Administration in

empire needed both to survey its new territory and to bestow a new calendar as a symbol of its authority.

Grimaldi, who had come back from Rome in 1694 to head the directorate, drew up the astronomical tables required to incorporate the new territory. This involved measuring the latitudes of the conquered cities, calculating the time of dawn and sunset at each of them, forecasting eclipses, and recording the trajectories of the five planets. Although the emperor had asked Grimaldi to explain the principles of Jesuit astronomy to enable the imperial bureaucracy to work out these technical problems itself, without depending on the Jesuits for help, Grimaldi preferred to work out the tables himself while giving the emperor only a brief explanation.

Owing to Grimaldi's reluctance, the Manchu imperial house noticed that although the Jesuits answered questions, they did not volunteer information: they hesitated to supply systematic knowledge of mathematics and astronomy because they preferred to retain a monopoly that left the imperial house dependent on them. Moreover, they wished to demonstrate the continued usefulness of the astronomical instruments such as the celestial globe made by Schall and Verbiest:[1] their goal was to buttress their political influence at court by preserving the dominance of their astronomy without contradicting their predecessors on technical matters.

Grimaldi, who claimed to the emperor that the new astronomical tables would both meet the administrative requirements of the new territory and celebrate the empire's political success, applied his predecessors' assumption about the cosmos, that the earth and heaven are perfect spheres (*hunyuan*) concentric to each other. But the emperor maintained a strict control over what was measured. In an attempt to anticipate the criticism that the Qing court was introducing the Jesuit calendar, the emperor appropriated Jesuit astronomy partly to apply it to cartography: the empire-wide survey *Huangyu quanlan tu* (lit., *Map of a Complete View of Imperial Territory*) he undertook known as the Kangxi Atlas, begun in 1690 and officially finished by 1720. As Funakoshi Akio explains, its most significant assumption was that the earth is a sphere rather than a square, a controversial issue ever since Matteo Ricci had provoked the debate about it in 1602.[2] To represent a sphere on flat paper requires projective drawing techniques as well as the ability to indicate longitude and latitude. In the

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Inner Asia', *International History Review*, xx (1998), 287-309.

1 A. Chapman, 'Tycho Brahe in China: The Jesuit Mission to Peking and the Iconography of the European Instrument-making Process', *Annals of Science*, xli (1984), 417-43. See also, P. M. D'Elia SJ, 'The Double Stellar Hemisphere of Johann Schall von Bell SJ', *Monumenta Serica*, xviii (1959), 328-58; Yi Shitong, 'The Kangxi Celestial Globe: A Milestone in the History of Sino-Western Cultural Exchange', in *Ferdinand Verbiest, SJ*, ed. Witek, pp. 165-81.

2 Chu Pingyi, 'Kuawenhua zhishi chuanbuo de gean yanjiu – mingmo qingchu guanyu diyuanshuo de zhenyi, 1600-1800', *Bulletin of the Institute of History and Philology*, lxix (1998), 602-34.

Kangxi Atlas, the Jesuits also introduced different weather zones in high and low latitudes, as well as the Atlantic Ocean and the European states.[1]

The utility of Jesuit astronomy in the 1700s therefore depended on territorial expansion, the empire-wide land survey, and more systematic use of astronomy and mathematics by the directorate. The outcome, the Kangxi Atlas, was a remarkable achievement of the Manchu state,[2] and the appropriation of Jesuit astronomy ran concurrently with its creation. Imperial patronage and the proven utility of Jesuit astronomy constituted the mid-range political and material conditions on which to rest the proliferating narratives of its origins.

* * *

By 1701, the Kangxi emperor assumed that the most uncontentious way to appropriate Western learning was to domesticate it: showing its correspondences with Chinese learning by combining Jesuit astronomy with the orthodox Confucianism (*daoxue*) of Song learning. As the utility of Jesuit astronomy derived from its precise measurements, the literati, the emperor suggested, should look for similar attributes in their own tradition; thus were the origin narratives conceived. The emperor therefore instructed Zhang Yushu and Li Guangdi, with whom he had conversed at the observatory, as follows:

> We must measure carefully in order to be precise. The principle of our measurement is the mathematics of triangles [*sanjiaoxing*]. Although we do not find this particular name in our history books, this kind of mathematics must have an origin in our past. For example, the *gougu* method is part of the mathematics of triangles; hence, the method must have been passed on to us from antiquity. Unfortunately, we cannot find it in books. That is why we do not know where [or when] the mathematics of triangles came from.[3]

In declaring that the imperial house must put Jesuit astronomy to use, the emperor was not merely forbidding his officials to question its practice and instruments, but also implying that the ancients' lack of trigonometry was remediable: the literati should reconstruct a new line of transmission from ancient China to contemporary Jesuit astronomy. Although several forms of appropriation were already under way at the time of this edict, it unified the various discourses among the literati into one imperially sanctioned form.

Three lines of argument were available to the imperial house. By the

1 Funakoshi Akio, *Sakoku Nihon ni kita 'Koki-zu' no chirigakushiteki kenkyū* (Tokyo, 1986), pp. 19-68; *Memoirs of Father Ripa during Thirteen Years' Residence at the Court of Peking in the Service of the Emperor of China*, comp. F. Prandi (London, 1855), pp. 19-66.
2 *Qingshilu*, vi. 283: 7a-8a (no. 3, p. 765).
3 *Kangxidi yuzhi weji*, 3: 4a-5a.

first, the central principality of ancient China diffused its civilization among the surrounding barbarians in four directions: it invented the prototype of astronomy, lost it after the destruction of the classical texts during the reign of Qin shihuang (r. 246-210 BC), and regained it in a refined form from the Jesuits.[1] By the second, when the sons of Noah were scattered abroad after the Deluge, some of their descendants migrated to China where, two hundred years later, they laid the foundation of the empire and taught their descendants to fear and honour 'the Sovereign Lord of the Universe'. Such teaching, encrypted in the ancient *Five Classics* (*wujing*) – the five Confucian texts which formed the basis of all subsequent Chinese learning – therefore shared attributes with Christianity and Jesuit astronomy.[2] By the third, if a sage (or prophet) had risen in the East, he would have been endowed with the same mindset and principles as the one who rose in the West because mindsets and principles are independent of those who speak for them.[3]

These options provide the ideal types of origin or counter-origin narratives available in late seventeenth- and early eighteenth-century China. A semiotic analysis, using the semiotic square as a heuristic tool, will capture the structural relationships among them and make the historical specificity of each more comprehensible. The first and the second options are placed diagonally to one other in the square because the mirror images of 'Chinese' and 'Catholic' origins are complementary yet opposite. The third option, which becomes the antinomy of both of the others, has at least two connotations: first, that origins do not matter, what matters is universally valid principles and values; and second, that even if particular knowledge and values originate in a specific location, they will eventually ascend to join the set of universal principles as long as the intellectual stake remains high. Each of these two implications negates one of the other options, and each represents a corner in a semiotic square.

The square contains a structural complex of possible meanings of Chinese origin narratives without representing any kind of deep structure lurking behind the historical process.[4] Each corner refers to a specific historical setting within which literati or Jesuits could manipulate various

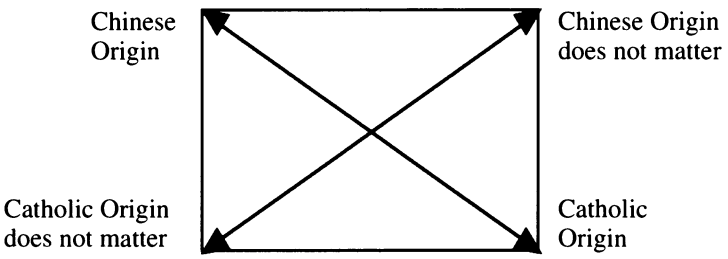
1 Mei Wending, *Lixue yiwen bu*, in *Meishi Congshu Jiyao*, ed. Mei Juecheng, rev. Mei Zangao, 1874 (Taipei, 1971). See also Liu Dun, 'Qingchu minzu sichao de shanbian ji qi dui qingdai tianwen shuxue de yinxiang', *Journal of Dialectics of Nature*, xiii (1991), 46-8.

2 J. Bouvet, *Tianxue benyi* [The Vatican], B[iblioteca] A[postolica] V[aticana] Borg. Cinese. 317 (15). See also, J.-B. Du Halde, *The General History of China*, trans. R. Brookes (London, 1741), pp. 14-30.

3 Liu Zhi, *Tianfang xingli*, 1760, copy at Los Angeles, UCLA East Asian Library; Sato Minoru, 'Liu Zhi zhu "Tianfang xingli" no henghon ni tsuyite', *Tōhō shukyo*, xciv (Nov. 1999), 60-9; Chen Jiujin, *Huihui tianwenxue shi yanjiu* (Nannin, 1996), pp. 292-305.

4 See F. Jameson, *The Prison-House of Language* (Princeton, 1972), pp. 162-8, and *The Political Unconscious* (Ithaca, 1981), pp. 163-9.

sources of legitimacy. Literati and Jesuits, treated as an intellectual élite, are placed along both political and intellectual lines of demarcation between the court and the lower Yangzi.



The proliferation of origin narratives can be traced back to the dispute over the calendar in 1664. Schall's Chinese disciples in the directorate, among them Li Zubai, were executed at the time for advocating the descent of ancient Chinese from Noah: Li had suggested that the first inhabitant of China must have been the ancient legendary figure Fuxi who descended from Adam and Eve.[1] In 1672, the Jesuit Louis Buglio combined this story with Verbiest's narratives in a syllogism designed to prove that the Chinese descended from Europeans: if the Chinese did not descend from other people in a different region, other people must have descended from them. Buglio's examination of ancient records in both China and the West revealed no information about Chinese who travelled to the Far West, only records of how the first inhabitants of Judaea travelled to the Far East: thus, the claim that other people descended from the Chinese must be wrong, and the opposite claim that the Chinese descended from another people must be true. Migrants from Judaea must have arrived in China before true religion and culture had been established: thus, China achieved its high level of civilization because the Chinese were able to follow Holy guidance in promoting ritual, music, literature, and art, and enforcing morality.[2] That some later developments had Catholic origins was irrelevant because in ancient times civilization was universal. In relying in support of this claim on the seventeenth-century Chinese proverb – 'If a sage [or prophet] had risen in the eastern end of the world, he would have been endowed with exactly the same mindsets and principles as the one in the western end of world'[3] – Buglio tried to persuade

1 Li Zubai, *Tianxue chuangai*, *Tianzhujiao dongchuan wenxianxubian* (Taipei, 1965), pp. 1055-62. I thank Benjamin Elman for this source. See also, Mungello, *Forgotten Christians of Hangzhou*, pp. 85-8.
2 Louis Buglio, BN Chinois 4989, *Budeyi bian*, pp. 53a-54b.
3 Lu Jiuyuan's [Xiangshan 1139-92] famous motto.

the literati that the civilizing mission of the ancient sages was more or less Christian. Unlike Verbiest, who addressed the imperial house, Buglio addressed the literati of the lower Yangzi, who found his ideas disparaging of China. Their resistance to them proved insurmountable.

Other than Li, Chinese converts to Catholicism under the early Qing (1644-64) located the origin of Chinese culture in China. Liu Ning, who lived until 1715, circulated throughout Hangzhou in the early 1660s several manuscripts defending Christianity against Buddhism entitled *Records of True Awareness* (*Juesilu*). The first two sections, 'On Fundamentals' and 'The Name of Our Lord Did Not Come from Western Regions', are pertinent here.[1] Liu, unlike Buglio, argues that the origin of the line of transmission of *dao* was located in ancient China; only after the transmission was corrupted during chaotic times had the *dao* become obscure.

According to Liu, the Jesuits from the Far West, without whom the Chinese could not have known the true guidance of the ancients, revealed the *dao* deeply rooted in ancient China.[2] Liu distinguishes Jesuits from their predecessors from the Western regions (*xiyu*), the phrase used in Chinese records since the Han dynasty (206 BC-AD 220) to refer to the home of foreign travellers from Inner Asia, and applied by literati after the consolidation of the Ming regime to outsiders such as Mongols, Tanguts, Muslims, Tibetans, Persians, Turks, Nestorians, Jews, and Armenians. Liu, by removing the label of outsider from the Jesuits, treats them as a link in the orthodox transmission of literati values from antiquity.

The communities of converts who lived along the lower Yangzi adopted Liu's narrative and forwarded it to the Jesuits at court. After the persecution of the Jesuits at Hangzhou in 1691, they and their converts along the lower Yangzi exchanged their ideas about origins more frequently;[3] and after Bouvet's return in 1696 from a mission to Europe, bringing with him ten more Jesuits, they, too, helped to promote at court the Catholic version of the origin narrative.

Zhang Xingyao, a convert and Liu's friend, wrote a preface for Liu's book in 1702 and another in 1715. According to David Mungello, Zhang's arguments parallel Liu's. Both of them stress that contemporary literati failed to comprehend the true wisdom of the ancients; that Buddhism is evil; and that Confucianism and Catholicism complement each other.[4] The

[1] Liu Ning, BN Chinois 7172, *Juesilu*, which mentions Schall's title in court (*Tongwei jiaoshi*) on page 5 of the third essay. See also, K. Lundbaek, *Joseph de Prémare (1666-1736) – Chinese Philology and Figurism* (Aarhus, 1991), pp. 142-5. For the title *Tongwei jiaoshi*, see Chen Yuan, 'Wu Meicun ji tongxuan laoren longfu zhu jieti', *Chenyuan xueshu lunwenji* (Beijing, 1980), pp. 374-6.

[2] Liu Ning, BN Chinois 7172, *Juesilu*, p. 3b of the second essay.

[3] Han Qi, 'Zhang Xingyao yu qinming chuangjiao yueshu', *Sino-Western Cultural Relations Journal*, xiii (2000), 1-10.

[4] Zhang Xingyao, BN Chinois 7171, *Tianru tongyi kao*. See also, Mungello, *Forgotten Christians of*

circulation of ideas about origins among Jesuits and their converts led to a compromise between the two groups about origins which balanced the Chinese and Catholic origin narratives into their antinomies in the semiotic square. Each told a story that joined Catholics with Confucians, and all implied an ecumenism that tolerated both sides. The compromise did not go unchallenged for long, however, once Bouvet's alternative narrative began to circulate at court.

Bouvet's origin narrative was rooted in a specific European context. He belonged to a small group of Jesuits who consciously thought and wrote in the tradition of Platonic Christianity derived from what D. P. Walker calls 'ancient theology', which is

> a certain tradition of Christian apologetic theology that rests on misdated texts. Many of the early Fathers, in particular Lactantius, Clement of Alexandria, and Eusebius, in their apologetic works directed against pagan philosophers, made use of supposedly very ancient texts: Hermetica, Orphica, Sibylline Prophecies, Pythagorean Carmina Aurea, etc., most of which in fact date from the first century of our era. These texts, written by the Ancient Theologians Hermes Trismegistus, Orpheus, Pythagoras, were shown to contain vestiges of the true religion: monotheism, the Trinity, the creation of the world out of nothing through the Word, and so forth. It was from these that Plato took the religious truths to be found in his writings. In order to preserve the uniqueness of the Judeo-Christian revelation, it was usual to claim that this pagan Ancient Theology derived from Moses; but sometimes it was supposed to go back further, to Noah and his good sons, Shen and Japhet, to antediluvian Patriarchs, such as Enoch, or even to Adam.[1]

By 1700, theologians at the Sorbonne were decrying both the ancient theology and many of the ideas laid out by Louis Le Comte in his *Nouveaux Mémoires sur l'état présent de la Chine*, published in 1696. Le Comte, like Bouvet, was a Mathématicien du Roy sent to China in 1685, who returned to France seven years later to argue that the ancient Chinese possessed true knowledge of the Christian god through descent from Noah, and that the purity of the Christian god had become degraded after Buddhism appeared in China. His critics, however, emphasized the absence of grace and morality in Christian worship in ancient China, and discredited the notion of the Confucian heaven.[2] Clement XI's condemnation in 1704 of the Chinese rites proved fatal to the Jesuit interpretation of Confucianism, and the papal legate who delivered the ruling to China in

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Hangzhou, pp. 95-167, and A. Dudink's critical review in *T'oung Pao*, lxxxiv (1998), 196-213.

1 D. P. Walker, *The Ancient Theology: Studies in Christian Platonism from the Fifteenth to the Eighteenth Century* (London, 1972), p. 1.

2 D. E. Mungello, *Curious Land: Jesuit Accommodation and the Origins of Sinology* (Honolulu, 1985), pp. 329-53. Cf. E. Van Kley, 'Europe's "Discovery" of China and the Writing of World History', *American Historical Review*, lxxvi (1971), 358-85.

1705 signalled the destruction of what Paul Rule calls the 'Confucian-Christian symbiosis'.[1]

Many philosophers in eighteenth-century Europe, however, were sympathetic to the Jesuits' ideas. For Gottfried Wilhelm Leibniz, who published *Novissima Sinica* in 1697 after reading the Jesuits' correspondence, China remained a consuming interest from 1689 until his death in 1716. Leibniz was just as interested in the work on ancient cultures of ancient theologians such as Athanasius Kircher and Pierre-Daniel Huet, both of them important sources for Bouvet.[2] In 1700, Leibniz, who defended Le Comte against his critics, wrote to Bouvet: 'I find it strange that there should be such an outcry against your colleagues who have written that the ancient Chinese had the true religion. What harm is there in that? Even if it were false, is it a mistake that would have dangerous results? Not at all.'[3] The correspondence shows that Bouvet was not intellectually isolated from his European colleagues, and Leibniz's interest in ecumenism, his belief in mathematical and linguistic emblems, and his support for the Jesuits in China greatly encouraged Bouvet.[4]

Bouvet proposed that the message of the Sovereign Lord of the Universe should be decoded from the ancient texts of every civilization. On his voyage back to China in 1696, he devised his 'figurism', an allegorical reading of biblical emblems, Egyptian hieroglyphics, and Jewish Cabala.[5] The Sorbonne's condemnation of Le Comte, however, meant that such an allegorical and comparative reading of ancient sources would find almost no audience among Jesuits in Europe. Nonetheless, Bouvet expected his work to make an important contribution, given the emperor's sponsorship, despite the fact that his philological approach challenged the empiricist emphasis on measurement and verification by which Verbiest had convinced the emperor in the dispute over the calendar. When the rites debate flared in China from 1702 to 1707, Bouvet devoted himself to elucidating the Chinese classics: the audience he sought to persuade, after all, was the emperor, not the pope.[6]

The arrival of the papal legate, Charles-Thomas Maillard de Tournon,

1 Rule, *K'ung-tzu or Confucius?*, pp. 134-7; Walker, *Ancient Theology*, pp. 194-230.

2 Cf. P. Findlan, 'The Janus Faces of Science in the Seventeenth Century: Athanasius Kircher and Issac Newton', *Rethinking the Scientific Revolution*, ed. M. Osler (Cambridge, 2000), pp. 221-46.

3 Walker, *Ancient Theology*, p. 199.

4 See *The Preface of Leibniz's Novissima Sinica: Commentary, Translation, Text*, comp. D. Lach (Honolulu, 1957); G. W. Leibniz, *Discourse on the Natural Theology of the Chinese* (Honolulu, 1977). For Leibniz's correspondence with Bouvet, see D. Mungello, *Leibniz and Confucianism: The Search for Accord* (Honolulu, 1977), pp. 46-62.

5 Rule, *K'ung-tzu or Confucius?*, pp. 154-67; Witek, *Controversial Ideas in China*, pp. 143-53.

6 A. S. Rosso, *Apostolic Legations to China of the Eighteenth Century* (Ph.D. dissertation, Columbia, 1948); Luo Guang, 'Jiaoting yu zhongguo shijieshi', *Luoguang quanshu*: XXVII (Taipei, 1996).

in December 1705, had a dramatic impact on Bouvet's search for intimations of Catholicism in the Chinese classics. The Jesuits at court, Portuguese and French, who did not know ahead of time that Tournon would ban the worship of heaven and Confucius by Catholics in China, had tried to buttress their claim that the Chinese heaven referred to the Christian God with a collaborative project to gloss the Confucian terminology used throughout the *Five Classics.* Led by Bernard-Kilian Stumpf, who would succeed Grimaldi in 1711 as the head of the directorate, they drafted a manuscript entitled *Tractatus*, composed of translated quotations from the *Five Classics* designed to link the Chinese heaven with the Christian God. Bouvet, an enthusiastic participant, even translated the *Tractatus* into Chinese in the hope of persuading the Kangxi emperor. In Bouvet's hands, the *Tractatus* turned between 1701 and 1703 into a book called *Mirrors of Ancient and Modern Worship of Heaven – The Essentials of the Learning from Heaven (gujin jingtianjian tianxue benyi)*,[1] in which he synthesized the evangelical position the pope had sent Tournon to China to condemn.

Bouvet tried to combine the origins of Jesuit astronomy with Catholicism, thus moving the semiotic square back to the Catholic origin of Chinese culture. However, he also hoped to use the insights of the ancient theologians to renew Ricci's strategy of accommodation, owing to the failure of Verbiest's attempt to use Jesuit astronomy to lure the imperial élite to Catholicism. Grimaldi explained to the Jesuit visitor-general, Tyrso Gonzalez de Santalla, in October 1705 that, as Bouvet had located Christian messages in ancient Chinese classics more effectively than Ricci had a hundred years earlier, Tournon's condemnation of him and the order to the bishop in Beijing to prohibit the circulation of his book must be attributable to a conspiracy among the provincial Jesuits, who had Tournon's ear, against the Jesuits at court.[2] For Jesuits attached to imperial institutions such as the directorate and the atlas, Jesuit astronomy had proved its utility. The next step was to prove to the literati, from their own classical texts, that celestial patterns and the laws of nature were the result of the omnipotence of the Lord of Heaven. To the Jesuits at court, Clement XI's condemnation of the Chinese rites jeopardized their missionary work.

Bouvet used the term *tianxue* (learning from heaven) to merge the im-

1 I found two versions of *The Essentials of the Studies of Heaven* (*tianxue benyi*) in the Biblioteca Apostolica Vaticana: Borg. Cinese. 357 (9) and Borg. Cinese. 317 (15), and another two versions in the Bibliothèque Nationale (BN Chinois 7160 and 7162). Borg. Cinese. 357 (9) contains detailed yet formative argumentation, and Borg. Cinese. 317 (15) is a more presentable version with Han Tan's preface. I rely on Borg. Cinese. 317 (15), which dates from 1707 and has the complete title *gujin jingtianjian tianxue benyi.* Cf. D. Mungello, 'Unearthing the Manuscripts of Bouvet's Gujin after Nearly Three Centuries', *Sino-Western Cultural Relations Journal*, x (1988), 34-61.

2 C. von Collani, 'Claudio Filippo Grimaldi SJ zur Ankenft des Päpstilichen Legaten Charles-Thomas Maillard de Tournon in China', *Monumenta Serica*, xlii (1994), 329-59.

perial interest in Jesuit astronomy with Catholicism. He not only enriched the meaning and scope of *tianxue* in origin narratives among the early Qing literati, but also revived the debate on a similar topic from the early seventeenth century. As Howard Goodman and Anthony Grafton show, Jesuits under the late Ming had discussed with the literati the inscrutable content of the *Change Classic* (*Yijing*), which required unusual interpretative strategies, and a knowledge of all kinds of Chinese sciences and their religious implications, to tease out its meaning. Bouvet should be viewed as continuing the dialogue.[1] Similarly, Willard Peterson explains how Chinese converts and Jesuits under the late Ming extended the meaning and scope of *tianxue* to include the laws of nature and an omnipotent Lord who makes them.[2] In continuing the discussion, Bouvet aimed to prove one point: that the ancient classics should be interpreted as prophesying a messiah in ancient China.[3]

For Bouvet, the Jesuit astronomy of celestial and terrestrial spheres (*tianli*) was one of the principles the Creator had revealed to mankind (*renxin*) in the beginning, that is, in ancient China. Bouvet used orthodox Song-Ming Confucian language to explain the metaphysical and cosmological dimension of his argument in order to turn Confucianism against itself. He argued that reverence for heaven (*Jingtian*) – awe towards the omnipotent and transcendental being – had always been both the most significant component of Confucianism and the basis for social order in China. However, according to Bouvet, contemporary literati worshipped heaven differently from the ancients; thus, Bouvet turned Song-Ming scholarship, which many literati regarded as orthodoxy, against itself by pointing to antiquity as the legitimating source of Catholicism.[4]

According to Bouvet, the ancient literati, living closer to the 'origin of learning from heaven [*tianxue zhishi*]', understood that it had come from a unique, impartial, and omnipotent Lord, whereas medieval literati (Song-Ming Confucians), who despised the ancients' teachings and failed to comprehend them, invented misleading doctrines which transmitted Confucianism without the true message: the ritual survived, but its meaning and purpose were lost. Thus, all the classics had become obsolete. The entire argument bypassed Song-Ming Confucianism to relocate the true science and religion in remote antiquity.[5]

1 H. Goodman and A. Grafton, 'Ricci, the Chinese, and the Toolkits of Textualists', *Asia Major*, iii (1990), 95-148.
2 W. Peterson, *The Cambridge History of China*: VIII: *The Ming Dynasty, 1368-1644*, part 2 (Cambridge, 1998), pp. 824-33.
3 J. Bouvet, BAV Borg. Cinese. 317 (15), *Gujin jingtianjian tianxue benyi*, pp. 5a.
4 Ibid., pp. 25a-28b, 47a-48b, 72a-74a.
5 Ibid., pp. 1a-3a.

The form of Bouvet's book was also as telling as its content. Bouvet described it to Leibniz as 'a complete collection of all the most beautiful expressions which are found in the classical books of China relating to the divinity, arranged in the form of a catechism'.[1] To explain the book's format when presenting it to the emperor, Bouvet borrowed a metaphor from optics (*mushi xue*): the true and omnipotent Lord was not revealed whole by any single Chinese text, as each of them merely revealed fragments. Bouvet's task, by collecting the messages they carried and by using a set of mirrors to decode them, was to project them as a complete image. The first part of the book contains forty-two Catholic dogmas, followed by a series of quotations from and interpretations of the *Five Classics* and the *Four Books*. The second part contains forty-one abbreviated dogmas more or less corresponding to those in the first part, each followed by three quotations drawn respectively from commoners' custom (*minsu*), literati convention (*shisu*), and the classics (*jingwen*). The collection, according to Bouvet, manifested a complete picture of the Lord who governed both the natural and the human realms.[2]

Bouvet, a courtier rather than a missionary, based his research upon the exegeses of the classics compiled by court scholars, with the aim of persuading the emperor; he confronted the Jesuit hierarchy on almost every issue. Like the emperor's literati counsellors, Bouvet had access to the daily lectures on the *Five Classics* (*jingwen rijiang*) given to the emperor by such outstanding scholars as Zhu Yizun, and to a compilation of ancient texts made at court around the 1680s entitled *A Lake Mirror of Ancient Prose* (*Guwen yuanjian*), from which he retrieved interpretations of Mengzi (Mencius) and Zhuangzi, two scholars of the Warring States period (475-221 BC).[3] Bouvet mined these sources, compiled by the pioneers at court of evidence-based scholarship, in search of classical references to a transcendental and omnipotent Lord, while distancing himself from orthodox Confucian scholarship at court by arguing for the Creation. Bouvet did succeed in reaching his goal of attracting the emperor's attention: the manuscripts of the work housed in the Bibliothèque Nationale contain commentaries (*yupi*) by the emperor on several drafts which conform to Bouvet's view of the social hierarchy, as well as his dismissal of what he viewed as heretical teachings.[4]

* * *

The Jesuits were not alone in trying to turn Confucian terminology to their

[1] Quoted in Rule, *K'ung-tzu or Confucius?*, p. 162.
[2] J. Bouvet, BAV Borg. Cinese. 317 (15), *Gujin jingtianjian tianxue benyi*, pp. 5a-5b, 86b-99a.
[3] See Kessler, *K'ang-hsi*, pp. 137-46; Struve, 'Hsü Brothers', p. 249.
[4] J. Bouvet, BAV Borg. Cinese. 317 (15), *Gujin jingtianjian tianxue benyi*, pp. 83b, 84a-b, 85a-86b.

advantage: Muslims in China also tried to show that Islamic and Confucian science and religion derived from the same set of principles.[1] When literati searched the past for the origins of their own astronomy, they stumbled across the legacy of Muslim astronomers. Hence, the literati's comparison between Muslim and Jesuit astronomy illustrates that they did differentiate between useful knowledge and heresy.

The appropriation of Muslim astronomy began when the Ming dynasty (1368-1644) expelled the Mongols in 1368 and took over the Mongol empire's Muslim Bureau of Astronomy. During the Ming regime, Muslim astronomers employed at court compiled two important works: *The Muslim Calendar* (*Huihui lifa*) and *The Book of Celestial Patterns Translated during the Ming Dynasty* (*Mingyi tianwen shu*).[2] The first contained the most up-to-date achievements of the Arabic astronomers of the day; the calendar not only calculated the days allotted to the twelve zodiacal constellations in the sky but also predicted eclipses and the movement of planets. The Ming court, despite bestowing on Muslim astronomers the honorific title of Shaikh al-Islam and the directorship of the Muslim Directorate of Celestial Surveillance (*Huihui qintianjian*), nonetheless regarded them as outsiders: Muslim astronomy and astrology fell into the geographical and cultural category 'Western regions'.

Muslim literati, who fell out of favour at court after the dispute over the calendar in 1664 exposed their technical incompetence, tried to show that Islamic doctrine was the most compatible with the *xingli* system, the fundamental notion of nature and principle in Confucian doctrine. Being outsiders, during the late Ming they had to combat every other discourse, including Jesuits such as Alfonso Vagnoni who had made the same claim.[3] The Muslims claimed that nature and principles as explicated in the Koran were public knowledge for everyone. The patron of the Muslim literati at court, Xu Yuanzheng, explained in 1708 that Buddhism had dismissed *xingli* as an obstacle to attaining Nirvana, and that although the Cheng brothers and Zhu Xi had revived the *xingli* system during the Song dynasty, Wang Yangming had distorted it under the Ming, and the Jesuits, who came to China last, had exaggerated their 'techniques and arts' in order to distract the literati from the fundamental issue that only Islam was

1 Yamada Keiji, *Chugoku no kagakuto kagakusha* (Kyoto, 1978); Kodo Tasaka, 'An Aspect of Islamic Culture Introduced into China', *Memoirs of the Research Department of the Toyo Bunko*, xvi (1957), 75-160.

2 Chen, *Huihui tianwenxue shi yanjiu*, pp. 231-47. Chen also provides detailed annotation and commentary on *Huihui lifa*: see pp. 309-75.

3 A. Vagnoni (Gao Yizhi), *Kongji gezhi*, Jiangzhou (Shanxi), 1633. See also Qiong Zhang, 'Demystifying Qi: The Politics of Cultural Transformation and Interpretation in the Early Jesuit Mission to China', *Tokens of Exchange: The Problem of Translation in Global Circulations*, ed. L. H. Liu (Durham, 1999), pp. 74-106.

compatible with Confucianism.[1] The Muslim literati, in claiming that their sacred text, the Koran, despite originating in the Western regions, propounded universal principles, tried to make an ahistorical argument by avoiding the issue of origins and positioning themselves as the antinomies of both Chinese and Catholic origin narratives in the semiotic square.

Late Ming literati did not pay much attention to the Muslim calendar, despite the technical orientation of the civil examination questions. The reform of the calendar begun under the late Ming shows that the literati were capable of revitalizing their own technical tradition, transmitted during the transition from the Ming to the Qing regime by adherents to the former dynasty (*yimin*), known mostly for their resistance to the Manchu state.[2] This small group made a detailed study of the Muslim calendar in order to compare it with Jesuit astronomy. For example, Mei Wending, Wang Xichan, and Huang Zongxi, all of whom studied Ming calendars and Muslim astronomy in the early stages of their careers, concluded that Muslims and Jesuits made common assumptions about the cosmos. Given the similarities, the *yimin* literati wished to establish a diachronic connection between Muslim and Jesuit astronomy which would allow them to place both along the orthodox transmission from ancient China.

In terms of the semiotic square, both Wang Xichan and Huang Zongxi from this group of *yimin* literati presented Jesuit astronomy as having originated in China.[3] Wang claimed that, even though Jesuit astronomy had developed only a few techniques more sophisticated than traditional Chinese ones, astronomers and literati at court were attracted by its oddity; they treated it as unprecedented because they did not understand the true 'implications [*yi*]' of the ancient calendars. Wang listed the correspondences between Jesuit terms and the terms the calendars used.[4] In their concern to preserve the legacy of antiquity, the *yimin* literati projected on to ancient calendars what they valued from a modified version of Jesuit astronomy.

Eventually, however, some of the *yimin* literati decided to co-operate with the Manchu state. In 1679, the special imperial examination by invitation – 'search for those of wide learning and illustrious words (*boxue*

1 Xu Yuanzheng, '"Xu" in Liu Zhi's (1660?-1730?) *Tianfang xingli*', UCLA.

2 W. Peterson, 'Calendar Reform Prior to the Arrival of Missionaries at the Ming Court', *Ming Studies*, xxi (1986), 45-61; Elman, *Civil Examinations*, pp. 461-81.

3 Huang Zongxi, *Huang zongxi quanji*, punctuated version (Hangzhou, 1985), pp. 562-3. See also, L. Struve, 'Huang Zongxi in Context: A Reappraisal of His Major Writings', *Journal of Asian Studies*, xlvii (1988), 474-502 and L. Struve, 'Ambivalence and Action: Some Frustrated Scholars of the K'ang-Hsi Period', in *From Ming to Ch'ing: Conquest, Region, and Continuity in Seventeenth-Century China*, ed. J. Spence and J. Wills (New Haven, 1979), pp. 321-65.

4 Wang Xichan, *Xiaoan yishu zhisi* (repr. Shanghai, 1994), pp. 1a-1b; Jiang Xiaoyuan, 'Wang Xichan de shengping, sixiang, he tianwenxue huodong', *Ziran bianzheng fa tongxun*, xi, 4 (1989), 53-62.

hongci)' – gave many of them the opportunity, for the examination was designed to recruit scholars loyal to the Ming dynasty for the *Ming History* (*Mingshi*) project. Of the group, Mei Wending, who like most resisters had trained on the Ming calendars, at first took a stance between resistance and collaboration, but eventually sent his grandson, Mei Juecheng, to serve the emperor. By the time he died in 1721, he had been the head of his kinship group (*zuzhang*) for thirty years; under his leadership, its numbers increased to several thousand, despite the fact that he remained merely a member of the landed gentry and a scholarly eccentric without an examination certificate.[1]

Mei spent the years 1675 to 1680 in Nanjing, the nearest city to his hometown of Xuangcheng, where he met Muslim astronomers and collected and studied mathematical and astronomical texts, some of them written by Jesuits. Despite the political uncertainty, Mei took the provincial examination four times, failing on each occasion, and this lack of a certificate handicapped his career as an official for the rest of his life.[2] By the time he went to Beijing in 1689, he had become an eclectic, as he revealed in 'The Synthesis of Chinese and Western Mathematics [*Zhongxi suanxuetong*]', written in 1680, which argued for combining Muslim, Jesuit, and traditional Chinese approaches.[3] Despite both his eclecticism and failure in the examinations, however, he found work with the *Ming History* project alongside other well-known literati reluctant to co-operate with the Manchu state.[4]

From Bouvet's perspective, the *Ming History* project gave the Jesuits at court the opportunity to sustain their credibility during the turmoil of Tournon's visit. In a letter to Antoine Thomas written in 1707, Bouvet rejoiced that the project would contain a biography of Ricci designed to emphasize the contribution made by the early Jesuits and to show them off as 'intelligent, learned, and honest men'.[5] Bouvet added that he had good connections with important scholars at court such as Xu Qianxue, Li Guangdi, Zhang Yushu, and Xiong Cilu, the group which Mei also hoped to meet.

1 Qian Baocong, 'Mei Wuan xiansheng ninapu', in *Qian Baocong kexueshi lunwen xuanji* (Beijing, 1983), pp. 608-38; Hang Shijun, 'Mei Wending zhuang', in *Daogutang wenji*, 1888, 30: 1a-16a.

2 Qian, 'Mei Wuan xiansheng ninapu', pp. 610-17; Li Di and Guo Shirong, *Mei Wending* (Shanghai, 1988), pp. 19-34.

3 Hashimoto Keizō, 'Bai Buntei no Rekisangaku', *Tōhō gakuhō*, xli (1970), 491-518 and 'Bai Buntei no sugaku kenkyū', *Tōhō gakuhō*, xliv (1973), 233-79; Liu Dun, 'Mei Wending zai jihexue lingyu zhong de ruogan gongxian', *Ming-Qing Shuxueshi Lunji*, ed. Mei Rongzhao (Jiangsu, 1990), pp. 182-218.

4 Elman, *From Philosophy to Philology*, pp. 100-12. See also, Zhang Yontang, 'Mei Wenging de shengping yu sixiang', *Mingmo qingchu lixue yu kexue guanxi zailun* (Taipei, 1994), pp. 105-76.

5 C. von Collani, 'Matteo Ricci in der Chronik der Ming-Dynastie der Bericht Joachim Bouvet SJ an Antoine Thomas SJ aus dem jahre 1707', *Menumenta Serica*, xli (1993), 189-203.

Before moving to Beijing, Mei made contact with another group of scholars working in the lower Yangzi, apart from the Muslim astronomers he had met in his travels to Nanjing. He interacted widely with adherents of the Ming dynasty in the lower Yangzi, many of whom were specialists in Ming imperial calendars. In addition, in 1673, Mei worked with Shi Runzhang on a Xuangcheng gazetteer.[1] Shi, who passed the special examination of 1679, invited Mei to Beijing and helped him to find work under Wan Sitong on the *Ming History* project, where, in turn, he met Zhu Yizun, who became a friend. Although these men broadened Mei's understanding of the Confucian past, technically he remained unqualified to work on the project. To make up for his failure in the special examination, he composed a rhyme-prose on the theme of the special examination of that year – 'cosmic models and astronomical instruments [*xuenji yuhen fu*]'– to prove his eligibility to work for the project's calendrical section.[2]

Mei did not work for the project for long. Li Guangdi, on his return to Beijing from his meeting with the emperor at Nanjing in 1689, invited Mei to visit him. By the time Mei returned to Xuancheng four years later, he had written fifty short essays which resolved most of the problems that had embarrassed Li during his conversation at the observatory with the emperor.[3] Being himself responsible for two major ideological collections – the interpretation of *xingli* (nature and principles) and the *Change Classic* – Mei transposed the discussion from the observatory into the principles of the Confucian calendar. Li published the essays with the title *Questions in Calendrical Studies* (*Lixue yiwen*) and submitted them to the emperor in 1702, the year after the emperor had made his demand to Li and Zhang Yushu. In the preface, Li asks the rhetorical question: 'Is it really so urgent to compose such a work?' He replies: 'If this is merely a matter for mathematicians [*chouren*] or astronomical officials [*xingguan*], then this kind of technical specialty is not urgent. But what Mei attempts to clarify are principles. Could you possibly say that the explication of Confucian principles is not an urgent task? Should we not understand principles?'[4]

Although Li elevated Mei's work to the level of the study of principles, the focus of scholars of orthodox Confucianism at court, in his memoirs he praises the technical attributes of Mei's mathematical astronomy and Gu Yanwu's phonology (*yinxue*). He emphasizes that both astronomy and phonology could prove useful to the emperor.[5]

1 Hang Shijun, 'Mei Wending zhuang', in *Daogutang wenji*, 1888, 30:1a-16a; *Guangxu xuangcheng xianzhi*, repr. of 1888 version (Nanjing, 1998), p. 10.
2 Mei Wending, *Jixuetang shiwenchao*, 1758 (Anhui, 1994), pp. 3-8.
3 Han Qi, 'Junzhu he buyi'.
4 Li Guangdi, 'Xu', *Lixue yiwen*, 3a.
5 Li Guangdi, *Rongcun yulu*, pp. 431, 485, 775.

From Mei's perspective, the book had been written to suit Li, who had suggested that Mei should build on Zhao Youqin's *New Studies on Calendrical Phenomena* (*Gexiang xinshu*), by providing a comprehensive explanation of mathematical astronomy and calendrical studies. Zhao's work was a Daoist explication of Zhu Xi's natural philosophy in which Zhao appropriated Zhu's orthodox Confucian language to draw cosmology into the *xingli* system. He also reinterpreted an ancient controversy between two models of the cosmos in which *gaitian* (lit., heaven that covers) cosmography postulated a flat heaven rotating about a vertical axis above, and parallel to, a flat earth, whereas *huntian* (lit., round heaven) cosmography developed the armillary sphere, which allowed ancient Chinese astronomers to take more accurate measurements of the sky. As the boundaries between the two models were vague, the *huntian* and *gaitian* models profoundly influenced each other. As Zhao modified the *huntian* model by introducing a spherical heaven and a square earth, Li's reference to Zhao's cosmological theory may have implied that Mei should employ the spherical model of heaven and earth.[1]

The request revealed to Mei that Li's level of comprehension was low, because Zhao's cosmological theory was qualitative rather than quantitative. More important, the request also revealed that Li was indirectly asking Mei, by refreshing Zhao's interpretation of Zhu's cosmology, to adopt a Tychonic model of the cosmos and thus to appropriate Jesuit astronomy. The emperor had instructed Li to examine the historical records with the 'correct principles' to discover the celestial patterns that would enable him to make an accurate calendar. By correct principles, the emperor referred to Zhu's principles of nature, the natural philosophy of orthodox Confucianism (*daoxue*). Mei discussed each manuscript with Li until he was certain that Li comprehended the 'principles' underpinning each technical detail of Jesuit astronomy. Li then asked Mei to make it the foundation of a calendrical astronomy.

Lu Longqi praised Mei for not only developing an astronomical system but also increasing the body of Confucian knowledge.[2] Mei's friends in the lower Yangzi were equally approving. Wei Xi, for instance, wrote a preface for Mei's *Questions in Calendrical Studies* in which he argued that only in calendrical studies could the moderns supersede the ancients.[3] Wang Yuan, who also wrote a preface, stressed that Mei's calendrical studies not only illuminated technical details, but also exposed the immorality of

1 Arai Shinji, 'Astronomical Studies by Zhao Youqin', *Taiwanese Journal for Philosophy and History of Science*, v (1996), 59-102; Yamada Keiji, *Shushi no shizengaku* (Tokyo, 1978).
2 Lu Longqi, *Sanyutangji* (repr. Taipei, 1967), pp. 28-9, 33, 138-9.
3 Wei Xi, 'Xu', *Lixue yiwen*, 8a-8b.

charlatans, a righteous Confucian act.[1] Mei recalled how a good friend from the *Ming History* project, Wan Sitong, encouraged him to finish this work. Wei, Wang, and Wan, all of them from the lower Yangzi, applauded Mei's calendrical studies as part of the 'practical knowledge' they were promoting.

Like Bouvet, Mei looked back to antiquity. Whereas Mei's origin narrative resembled Verbiest's in tracing the orthodox transmission back to antiquity, Bouvet relied on emblematic philology. Mei's *Questions in Calendrical Studies* assumed that mathematical astronomy was based on a mixed model of the cosmos. To be precise, he adopted the Ptolemaic model, which placed the earth in the centre surrounded by the sun, the moon, and the five planets with their epicycles. However, he also adopted features of the Tychonic model – that the sun and the five planets revolve around the earth, and the moon around the sun – and even the Keplerian eclipses. Although Mei argued that the key to accurate calendars was the testing of the model by accurate celestial and terrestrial measurement, the measurements required by Jesuit astronomy had developed from ancient Chinese prototypes.[2] The mathematical working of the cosmos was harmonious, orderly, and beyond human intervention; the goal of astronomical knowledge was the comprehension of the 'heavenly mandate' (*tianming*), which Mei viewed as a self-regulating pattern rather than a moral precept. Only the legitimate ruler (namely, *tianzi*, the son of heaven) was granted the privilege of comprehension, to enable him to maintain order under heaven by following the heavenly mandate. This political and ritualistic significance turned the precision of the calendars into a technical yet indispensable aspect of Confucian learning.[3]

Mei's argument has three dimensions: historical, geographical, and methodological. In an essay, 'On How the Moderns Become More Precise than the Ancients in Calendrical Studies [*Lun lixue gushu jinmi*]', he poses the question:

> Literati today state that the ancient calendar should have produced a permanent method [*bubian zhifa*]. This method was unfortunately destroyed by the fire of Qin and thus could no longer be verified. Therefore, astronomers and mathematicians frequently changed their methods to search for the reconciliation between celestial patterns and mathematical astronomy. The hope is to recover what has been lost in antiquity.[4]

1 Wang Yuan, 'Xu', *Lixue yiwen*, 9a-9b.
2 Mei Wending, *Lixue yiwen*, pt. 3, pp. 1a-19b.
3 Ibid., 11a-12b. Cf. C. Jami, 'History of Mathematics in Mei Wending's (1633-1721) Work', *Historia Scientiarum*, iv (1994), 159-74.
4 Mei Wending, *Lixue yiwen*, pp. 10a-10b.

Here, the restoration of the ancients' method has conservative implications. Mei, instead, emphasizes flexibility of method in the light of the accumulation of empirical data over time.

Mei offers two arguments in support for his claim that as 'constant renovation' in mathematics and astronomy occurs throughout history, one should not be content to apply an established method. First, the ancient sages had stated that the calendar and the seasons (*zhili mingshi*) derive from the *ge* hexagram in the *Change Classic*.[1] Two attached glosses provide an authoritative explication. The *tuan* commentary reads: 'Water and fire try to extinguish each other, so it is when two women live together and find their wills at odds. This is called *ge*.'[2] The commentary continues: 'Only on the day when it comes to an end does one begin to enjoy trust. This means, when the change occurred, people trust him. Such a person brings about joy through civility and enlightenment, and he shall have great prevalence thanks to his practice of righteousness. If the change were to happen and be right, any regret should consequently disappear.'[3]

According to Mei, the glosses show that calendrical studies derive from an image from the *Change Classic* of continuous generation and regeneration (*shengsheng buxi*). In addition to the authority of the *Change Classic*, Mei cites a controversial passage from astronomer-geographer and classicist Du Yu (222-84): 'Creating an astronomical system is a matter of conforming celestial patterns to find what [techniques] accord with them, not forcing accord so that predictions will be validated [by these patterns].'[4]

In Mei's view, in order to approximate the heavenly mandate, if the model of the cosmos did not accord with the celestial patterns, it should be altered. As Benjamin Elman shows, this line of reasoning underpinned late Ming examination questions.[5] As Mei wrote for an audience of literati familiar with such examinations, the argument for according with celestial patterns appealed to both literati who advocated such lines of enquiry, and the emperor who advocated the appropriation of Jesuit astronomy.

The model of the cosmos was not only subject to methodological adjustment, Mei suggested, but also depended on the accumulation of empirical knowledge. However similar to Verbiest's account, Mei's was cast nonetheless in ancient Chinese terminology. He argued that as celestial patterns have gradually altered over a long period, no one could have devised a model perfect forever. The cycles of days, months, and years might have

1 Mei Wending, *Lixue yiwen*, p. 10a.
2 Hui Dong, *Zhouyi shu* (Huang Qing Jingjie xuehaitang version, *c.* 1829, repr. Taipei, 1994), p. 224.
3 Ibid., p. 224. I use the translation from R. J. Lynn, *The Classic of Changes: A New Translation of the I Ching as Interpreted by Wang Bi* (New York, 1994), p. 445.
4 Cited and translated in Elman, *Civil Examinations*, p. 470.
5 Ibid., pp. 468-73.

been detectable, but the gradual movement of Mars, Jupiter, and Saturn around the ecliptic would not have been. These planets usually move eastwards through the constellations: both Mercury's and Venus's cycle of the zodiac averages a year; Mars' cycle averages 687 days, Jupiter's 12 years, and Saturn's 29. The crucial fact for Mei was that the constellation moved one degree in sixty to seventy years, and the entire stellar sphere one degree over twenty-five thousand years; a phenomenon, known to Mei as *suicha* (lit., annual difference, precession), crucial to the measurement of equinoxes and solstices. How, Mei asks, could ancient sages, however brilliant, have detected these movements without access to empirical data collected over time.[1] In summary, he argues that methodological adjustment, empirical accumulation of knowledge of the heavens, and the incremental improvement of the cosmic model, are indispensable to both measurement and the prediction of celestial patterns.

According to Mei, linear progression in the study of celestial patterns and calendrical mathematics governed both Chinese and Western astronomy. Although astronomy was universal in the sense that everyone studied the same celestial patterns, the punctuation of the line of progression was determined by the culture. China was best suited to mark the temporal line in accord with nature because calendrical sciences arrived there from all other regions. However, Mei distinguishes Muslim from Jesuit astronomy and disallows the Jesuits' claim to superiority over the literati by placing Jesuit astronomy on a linear progression within their own tradition.[2] The Jesuits belonged to the countries and cultures to the west of China including India, Persia, Central Asia, and Europe, each of which contributed in turn to China's understanding of the calendar.

For Mei, the vital characteristic of progress in both China and the West was precision, by which he meant matching the cosmic model more closely to celestial patterns: one either modified the model or took more measurements. Such progress characterized both Chinese and Western traditions. Mei begins an essay 'On the Similarity between the Chinese and Western Methods [*Lun zhongxi erfazhitong*]' with the question: 'The celestial patterns take time to be clarified, and the calendar also takes time to be made precise. Why did we follow all the new techniques from the Jesuit calendar, and abandon all we have accumulated before?'[3]

After comparing the observable variables from ancient China with the Jesuit models of celestial patterns, he replies that for each celestial phenomenon, an ancient Chinese set of variables corresponds with a similar

1 Mei Wending, *Lixue yiwen*, pp. 10a-10b; T. Kuhn, 'The Problem of the Planets', *The Copernican Revolution: Planetary Astronomy in the Development of Western Thought* (Cambridge, 1957), pp. 45-77.
2 Mei Wending, *Lixue yiwen*, pp. 13a-15b.
3 Ibid., pp. 11a-12b.

Jesuit set. Thus, Mei places both in one tradition, as 'the moderns become more precise than the ancients,' while allowing for cultural differences between the two sets of variables (for example, the trajectory of Mars, the location of the Old Man Star, how to divide fortnightly periods over a year, the movement of the planets, and the path of the sun).

This line of reasoning led Mei to dismiss the Jesuit notion of God. In 'On How the Moderns also Become More Precise', he asks the question: 'Our calendar becomes more precise because both we and the Jesuits accumulated our data and improved our techniques. But the Jesuits claimed that their calendar remained consistent from antiquity up to the present. Is their calendar bestowed by the "ruler on high" (*shen*) as they claimed?'[1] The answer given is a simple 'No!' He compares several calendars 'from the West' in chronological order, including the Buddhist calendar by the monk Yixing from India, the Persian and Arabic texts of the Mongolian calendar from the Yuan dynasty, and a modified version of the Yuan calendar from the Ming dynasty. The Jesuit calendar was the most precise because it followed a series of calendars from the West derived from Ptolemy and revised first by Copernicus, and later by Tycho Brahe. After the Europeans invented the telescope, they were able to observe celestial patterns more clearly and to approximate their cosmic models more closely. Thus the Jesuit calendar, rather than bestowed by the 'ruler on high', had been improved incrementally over a long period.

In 1705, the emperor, after reading both Mei's *Questions in Calendrical Studies* and Bouvet's *Mirrors of Ancient and Modern Worship of Heaven*, issued two works of his own: 'On the Mathematics of Triangles [*Sanjiaoxing tuisuanfa lun*]', and 'On Sky-Measuring Rulers [*Liangtianchi lun*]'.[2] In the second, he discusses the unfathomable nature of heaven, and argues that, although the celestial spheres cannot be measured directly, owing to the scale of heaven, one can measure celestial patterns indirectly by measuring the length of the shadow cast by a sundial. Thus, the ancients had not devised the calendar by accident, but by measurement (*ceiliang*) and calculation (*tuisuan*).

The emperor attributes the dispute over the calendar in 1664 to lack of technical competence at court (*juchao wuyou zhilizhe*) and sees it leading to a split between 'contemporary methods' (*jinfa*), meaning Jesuit astronomy, and 'ancient methods' (*gufa*), meaning the Chinese astronomy that preceded it. He argues that, although the contemporary methods differ from ancient ones, both of them originated in the central principality of ancient China (Zhongguo) surrounded by barbarians on four sides. Thus,

1 Mei Wending, *Lixue yiwen*, pp. 18b-20a.
2 *Kangxidi yuzhi weji*, 19: 6a-13b; Li Guangdi, *Rongcun yulu*, pp. 814-15.

all information derives from ancient texts. The historian-geographers who described the peoples at the margins of the classical world; the chroniclers of the barbarian invasions during the Han empire; and the early antiquarian accounts of astronomical instruments, all provide evidence for the diffusion of prototypical astronomy from ancient China.[1]

The emperor's origin narrative was devised to buttress his position as the head of a conquering dynasty, and his intended audience were literati officials at court charged with upholding the regime's political and cultural legitimacy. In 1705, the Kangxi emperor defined the legitimate form of the origin narrative which could have its intended effect only when its purpose was understood by its audience. As he had already learned from various groups that it would be understood, his authorized language was decisive and uncompromising.[2]

* * *

The purpose of analysing the structural relationships among origin narratives, and their relationship to Jesuit astronomy, is to show how the sense of a remote past and the impulse for renovation in the present combined to create the political conditions for cultural change in Qing China. In the eighteenth century, deliberate radical innovation could only be legitimated in a few ways. Innovation, in this instance the appropriation of Jesuit astronomy, was disguised either as a return to, or rediscovery of, an aspect of the past forgotten or abandoned, or by the invention of an ahistorical principle of superior moral force which enjoined the destruction of the present as well as the past, thus specifying a new future.[3] For most of Chinese history, the past usually set the pattern for the present, and the belief that the present should reproduce the past implied slow historical change. The process of legitimating Jesuit astronomy, however, was embedded in the rapid transition from the Ming regime to the Qing, followed in its turn by the Manchus' state building.

To invoke the recent past would have been potentially politically risky for the Manchus by distracting attention from contemporary problems without offering a solution to them. The demand to recreate a past so remote as to have little direct bearing on the present provided a vehicle for radical renovation in the appropriation of Jesuit astronomy. As both Mei and Bouvet broke away from orthodox Confucian discourse, and manipulated sources from a remote past to fabricate a new legitimacy for Jesuit

1 *Kangxidi yuzhi weji*, 19: 6a-13b.
2 Bourdieu, *Language and Symbolic Power*, pp. 103-59.
3 See P. Dear, *Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500-1700* (London, 2001), pp. 30-48; P. Reill, *The German Enlightenment and the Rise of Historicism* (Berkeley, 1975), pp. 75-99; M. Taussig, *Mimesis and Alterity: A Particular History of the Senses* (Routledge, 1993), pp. 112-28.

astronomy, the Qing regime co-opted their knowledge of classical, mathematical, and astronomical texts for the purpose of state building. Bouvet moved from Jesuit astronomy, by way of the principles of celestial and terrestrial patterns and the omnipotent Lord who governs nature, to the Catholic creation of the world. Mei defined history as a teleological, one-dimensional process towards precision. For Mei, precision itself gave legitimacy to Jesuit astronomy while anchoring it in a new conception of the remote past by the reinvention of Chinese antiquity. The irony lies in the fact that while Bouvet moved away from Verbiest's linear progress of astronomy and mathematics, Mei adopted it for Confucianism.

Several lines of development, although launched from sporadic locations, reached the same destination. The Jesuits became by 1689 an effective faction at the Qing court, which continued to rely on their technical expertise. They pursued their goal of converting the imperial house to Catholicism even while the arguments among them about the Chinese rites were set by 1705 to destroy their mission. At the same time, while many of the literati at court and in the lower Yangzi, who reoriented their scholarship towards 'concrete studies' for new purposes, turned to mathematics and astronomy, the Manchu élites were empire building along the borders and at home. Jesuit astronomy fit the political, military, and ritual needs of a new and increasingly powerful empire. Thus, the Kangxi emperor's meeting with Mei Wending in 1705 symbolizes the moment when the call to a wider literati audience to treat Jesuit astronomy as culturally legitimate might safely be made. The search for a method of legitimating it had simultaneously provided a necessary condition for the reinvention of Chinese antiquity, and for the rapid development of domestic astronomy and mathematics under the high Qing.

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