

Numerology and Calendrical Learning: The Stories of Yang Guangxian and Liu Xiangkui*

CHU Pingyi

Institute of History and Philology, Academia Sinica, Taiwan

Introduction

This paper employs the stories of Yang Guangxian 楊光先 (1597-1669) and Liu Xiangkui 劉湘燿 (c. late 17th-18th century) to explore the tension between numerology and calendrical learning after European missionaries had successfully imported new calendrical technique into the Qing court in 1644. Numerology in this paper designates the Chinese “*shushu*” 數術 (or 術數, the art of numbers) or “*shuxue*” 數學 (the learning of numbers), which treats numbers not only as a quantity measurement but also a quality measure associated with the cosmic forces of *yinyang* and *wuxing*, which numerology employs to manipulate by which to predict the future or to account for the operation of the phenomenal world. Typical numerology includes geomancy (*fengshui* 風水), physiognomy (*xiangshu* 相術), astrology (*xingzhan* 星占), and genethliology (*bazi* 八字), many of which rely on the calculation of time and location, and involve consulting an almanac issued by the imperial court. Although numerologists were not astronomers who made the calendar, they were experts from whom people sought advices for daily life.

However, some scholars denied this expertise and distanced numerology from astronomy and mathematics, which had been indispensable for calendar-making since the eighteenth century. Their opinions crystalized in the *Chourenzhuan* 疇人傳 (Genealogical Biographies of Calendrical Experts) compiled by the famous scholar-official Ruan Yuan 阮元 (1764-1845) in 1795.¹ When Ruan initiated this

Received 28 Jan. 2015; Revised and Accepted 26 May 2015.

* This paper is part of my research result while I served as a visiting scholar of the Templeton “Science and Religion in East Asia” Project. I appreciate Prof. Kim Yung Sik’s and Lim Jongtae’s enormous intellectual discussions, criticisms, and hospitality while I stayed in Seoul National University. The final product is finished while I was affiliated with the Cluster of Excellence “Asia and Europe in a Global Context” at Heidelberg University. I thank Prof. Joachim Kurtz and Dr. Martin Hofmann for their supports and inspirations.

¹ My translation of the title follows Ruan Yuan’s indication in the general guideline. Ruan Yuan, *Chourenzhuan* (Genealogical Biographies of Calendrical Experts), in *Xuxiu siku quanshu* 續修

project, he did not intend to compose a collective biography of the progenitors of what we now call “scientists” (*kexuejia* 科學家), a term which did not appear until 1904.² Since the *Chourenzhuan* was a record about important figures who were well-versed in astronomical or mathematical computations in Chinese history, modern historians justifiably consider Ruan’s book a prosopography of Chinese scientists.³ The literary meaning of the term “*chouren*” 疇人 refers to those who calculate with counting rods. This term was not uncommon, so was its significance in the eighteenth century. Ruan, however, invited another scholar Tan Tai 談泰 to inspect the etymology of *chouren*, which Tan concluded as calendrical experts who worked like diligent farmers, plowed their lands, wore out their lives against time to achieve their expertise, and passed down their skill generation after generation (*shiye* 世業).⁴

While acknowledging calendar-making as an expertise, Ruan made it clear that he would not include numerologists in his collection and disconnected the tie between calendar-making and numerology. Ruan’s contemporaries shared his distaste of numerology. For instance, the compilers of *Siku quanshu* 四庫全書 (The Complete Collection of the Four Treasuries) also asserted that numerology bore no relation with mathematics.⁵

The key question, then, is what was at stake. Why did Ruan take so much trouble to redefine *chouren* and why did Ruan and his colleagues feel the urgency to redraw the boundary between numerology and calendrical learning? To answer these questions, we have first to come back to the so-called the 1664 “Calendar Case” and see how Ruan Yuan dealt with the controversial figure, Yang Guangxian.

四庫全書 (Sequel to the Complete Collection of the Four Treasuries, hereafter XXSKQS), vol. 516 (Shanghai: Shanghai guji chubanshe, 1997).

² “Diji daxiao yu dingkou shumai wei wenhua chisu bili chashuo” 地積大小與丁口疏密為文化遲速比例差說, *Shenbao* 申報 (1904. 7. 15), 1.

³ For studies of the *Chourenzhuan* see: Wang Ping 王萍, “Ruan Yuan yu Chourenzhuan” 阮元與疇人傳, *Bulletin of the Institute of Modern History, Academia Sinica* 4 (1974), 601-611; Fu Zuohua 傅祚華, “Chourenzhuan yanjiu” 疇人傳研究, in Mei Rongzhao 梅榮照 ed., *Ming Qing shuxueshi lunwenji* 明清數學史論文集 (Nanjing: Jiangsu jiaoyu chubanshe, 1990), 261-293; Jonathan Porter, “The Scientific Community in Early Modern China,” *Isis* 73 (1982), 529-544.

⁴ Tan Tai, “Chouren jie” 疇人解 (An Explication of the Meaning of *Chouren*), in Ruan Yuan, et al., *Chourenzhuan* (Taipei: Shijie shuju, 1982), 1-4.

⁵ Yong Rong 永榕, et al., *Siku quanshu zongmu* 四庫全書總目 (Analytical Catalogues of the Complete Collection of the Four Treasuries), in *Siku quanshu* 四庫全書 (Complete Collection of the Four Treasuries, hereafter SKQS), vol. 3 (Taipei: Shangwu yinshuguan, 1983), 278.

Should Yang Guangxian Be Included in the Genealogy of the *Chouren*?

Yang Guangxian possesses an ambiguous position in the *Chourenzhuan*. He defended Confucian orthodoxy against “devilish Christian teaching” at the cost of overthrowing the European calendar-making technique which had been acknowledged and used as the orthodox system by the Qing court since 1644.⁶ Modern historians of Chinese science condemn Yang as a conservative who hindered the progress of science. Yang formed a coalition between Muslim astronomers and other officials at court to get rid of Adam Schall von Bell (1591-1666), the Director of Astronomical Bureau after 1644, from his position in 1664.⁷ Most importantly, Yang openly declared that he was completely ignorant about the technical issues of calendar-making. Instead of defeating the Jesuits on the grounds of calendrical problems, he outwitted them with his *fengshui* 風水 knowledge. Yang accused Schall and his Christian associates on several accounts: treachery, altering the calendar, and usurping the emperor’s right to calendar-making. In the end, however, Schall was sentenced for choosing a wrong date for the funeral of the son born by Shunzhi 順治 emperor’s favorite concubine. The judicial authority at court seems to have associated the inauspicious date chosen for the deceased newborn’s funeral with the emperor’s own early death. Schall, other Jesuits at court, and some Chinese converts who were court astronomers were jailed, tried, and sentenced to death; others in the provinces were to be deported to Macau.⁸

Since Yang Guangxian was not an expert of calendar-making, he should not be included in the *Chourenzhuan*, according to Ruan Yuan’s standard. If we consider the *Chourenzhuan* in terms of Chinese historiography, however, not only should Yang occupy a place, but he should be one of the first on the list since he was the only Han Chinese official who had ever formally presided at this position before the first publication of the *Chourenzhuan*.⁹ In the *Qingshi gao* 清史稿 (Draft History of the Qing), Yang’s role is so important that a special section is preserved for him and does not group him with other *chouren* of the Qing. He is grouped with Adam Schall and Ferdinand Verbiest (1623–1688), because Yang’s pugnacious story

⁶ The Muslim section of making calendar survived the Ming-Qing dynastic transition, but we do not know how it operated at the beginning of the Qing.

⁷ Huang Yi-Long 黃一農, “Qingchu tianzhujiao yu huijiao tianwenjia de zhengdou” 清初天主教與回教天文家的爭鬭 (The Struggle between Christian and Muslim Astronomers in the Early Qing), *Jiuzhou xuekan* 九州學刊 5:3 (1993), 47-69.

⁸ Chu Pingyi 祝平一, “Scientific Dispute in the Imperial Court: The 1664 Calendar Case,” *Chinese Science* 14 (1992), 7-34.

⁹ Mei Juecheng 梅穀成 (1681-1763) used to act for this position for a very short period of time.

would be incomprehensible without his enemies.¹⁰ This arrangement is appropriate for the dynastic history because they were the first three leading figures in the Astronomical Bureau who had entangled with the development of calendrical learning of the Qing.

In contrast to Yang's conspicuous place in the *Qingshi gao*, the *Chourenzhuan* begins the Qing section with Wang Xichan 王錫闡 (1628-1682), the poignant critic of the Western methods, who, unfortunately, upheld a politically incorrect position as a Ming loyalist, resenting the conquest dynasty more than the Westerners. Nevertheless, Wang made strong criticism from the technical point of view. Unlike Yang, he knew the nuts and bolts of calendar-making. To be sure, Yang had criticized the Westerners and their calendrical methods as much vehemently as Wang did. But Yang chose to stand with the powerful and to pledge his loyalty to the new rulers in order to fight for his Confucian cause. He actually had the opportunity to get rid of the "Western barbarians" (*xiyi* 西夷), although, alas, he was not able to overcome the technical obstacles to produce an acceptable calendar.

Ruan's contemporaries, who shared Yang's Confucian identity, were well aware of the dilemma that Yang Guangxian had created for them. Ling Tingkan 凌廷堪 (1757-1809) once wrote to Ruan Yuan:

This event was the key to the competition between China and the West in our August dynasty ... [However], it was cloudy in both public and private books. Unless [we] seek for his book, *Budeyi* 不得已 (I cannot do otherwise), and consult old people to reveal the details of the event in time, it will go by without notice as time elapses.¹¹

Although he realized the significance of the event, Ling was not sympathetic to Yang's incompetence in the technical problems of calendar making at all. He wrote to Sun Xingyan 孫星衍 (1753-1818), Yang's biographer and enthusiastic supporter, insinuating that Sun's treatise of supplementing Yang's argument for a square earth had gone too far.¹² Nonetheless, despite Yang's incompetence, Ling showed a great concern about Yang's activities and his work, and feared that such a critical event would be buried in the dust. Ruan shared Ling's concern and admitted that his motivation for compiling the *Chourenzhuan* derived from Yang's failed attempt to drive out the Westerners:

¹⁰ Zhao Erxun 趙爾巽, et al., *Qingshi gao* 清史稿 (Draft History of the Qing) (Beijing: Zhonghua shuju, 1977), 10019-10025.

¹¹ Ling Tingkan 凌廷堪, *Jiaolintang wenji* 校禮堂文集 in *XXSKQS*, vol. 1480, 264: "此我朝中西爭競之大關鍵...此事官私之書皆不詳。不及此時覓其不得已書, 并訪諸耆舊, 附見顛末, 則愈久而愈湮沒矣。"

¹² *Ibid.*, 272-273.

Must our August Qing's eternal calendrical methods turn to Europe? Surely this must not be the case. Whoever is well-versed in mathematics should know that one needs to stand on one's own feet.¹³

The failed competition between the Chinese and Western methods was the source of Ruan's anxiety. Yang's biography recorded this failure and thus it became the leverage of the *Chourenzhuan* from which the history evolved and extended to the remote past. Ruan remarked that "Guangxian was not deep into calendrical learning and his quick fall was appropriate (光先于步天之學本不甚深, 其不旋踵而敗, 宜哉)."

Ruan's and Ling's attitude were well spread among scholars of their generation who had some understanding of calendrical learning. They were sympathetic to Yang's cause but could not bear with his bold claim that he did not know the technicalities of calendar making, which had caused his failure to challenge the European calendric experts. The Jesuits were equally resented. They had implanted the European calendrical technique into the Chinese calendrical form and created a hybrid calendar. Although they might have better predicted celestial phenomena, their methods changed the rules of thumb for setting up the leap month. The calculation of the leap month became more complicated and could only be handled by those who followed the Western methods and could gain access to instruments and tables. Even though the court had legitimated the new calendar, almost no Chinese scholar endorsed this change of setting up the leap month.

As Ruan Yuan was well aware of Yang's incompetence in calendrical learning, he had to cope with the problem of how to position Yang in the *Chourenzhuan* in which Ruan attempted to undermine Yang's claims regarding the legitimate role of numerology in calendar making without downplaying too much of his importance. Ruan dealt with this problem carefully. First, he violated the general principle of chronology in the *Chourenzhuan* and placed Wang Xichan before Yang. Yang then occupied the second position and shared a biography with Xue Fengzuo 薛鳳祚 (1600-1680) who was keen on European astrology.¹⁴ In the abridged version of the *Chourenzhuan* in the *Huang-Qing jingjie* 皇清經解 (Commentaries of Classics of the August Qing), Ruan even deleted the biographies of Xue and Yang so as to form an unbroken lineage of Confucian *chouren* of the August Qing.¹⁵ In addition,

¹³ Ruan Yuan, *Chourenzhuan*, 443: "我大清億萬年頒朔之法, 必當問之于歐邏巴乎? 此必不然也。精算之士當知所自立矣。"

¹⁴ Ibid., 352-353; Nicolas Standaert, "Qingchu Zhongguo de Ouzhou xingzhanxue: Xue Fengzuo yu Mu Nige dui Kaerdanuo Tuolemi Sishu pingzhu de hanyi" 清初中國的歐洲星占學: 薛鳳祚與穆尼閣對卡爾達諾《托勒密〈四書〉評注》的漢譯 (European Astrology in Early Qing China: Xue Fengzuo's and Smogulecki's Translation of Cardano's Commentaries on Ptolemy's *Tetrabiblos*), *Ziran kexueshi yanjiu* 自然科學史研究 29:3 (2010), 339-360.

¹⁵ Ruan, *Chourenzhuan*, in *Huang-Qing jingjie*, vol. 238 (1860, reprinted edition).

Ruan also exerted great efforts to craft Yang's biography. He cited directly from the *Budeyi*, a manuscript he had just acquired, to describe Yang's criticism of the Western methods, and affirmed his ideological thrust that an important task such as calendar-making should not be vested in the hands of the foreigners. Ruan further cited a comparison between Chinese and Western methods of a prediction of a certain solar eclipse in Yang's book to assert that both were deviated from the actual observation and the errors of the Chinese method was smaller.¹⁶ The implication is that neither method was precise enough, and therefore, there could be no claim for the superiority of the Western method. Ruan also pointed out that some of Yang's criticisms regarding the change of the calendrical methods, particularly the rules of setting up the leap month, should not be abandoned.¹⁷

More interesting, instead of directly reproaching Yang's technical incompetence, Ruan cited Wang Shizhen 王士禎 (1634-1711), a leading literary figure in the Kangxi era, and his sarcastic remark on Yang's quixotic challenge to the Westerners. Ruan then cited Qian Daxin 錢大昕 (1728-1804) who quoted Dai Zhen's 戴震 (1724-1777) testimony regarding the Westerners' hostility to Yang. According to Dai, the Jesuits had paid a high price to buy Yang's works and then burned them.¹⁸ Dai's accusation is in accord with the recently unearthed account book of François de Rougemont (魯日滿, 1624-1676), according to which de Rougemont paid 0.06 *taels* for three copies of harmful books in 1674 and 0.4 *taels* for printing books debunking Yang Guangxian.¹⁹ The resentment went so deep that a remark, left in the copy of the *Budeyi* that Ruan had acquired, asserted that Westerners poisoned Yang when he was pardoned and travelled back to his home town.²⁰ Ruan also pointed out Wang's mistake, claiming that Yang did not die of death penalty, as Wang Shizhen had claimed.²¹ This textual operation undermined the credibility of Wang's assessment of Yang Guangxian. Ruan hunted the rare book *Budeyi*, appealed to the authorities in the field, and downplayed the unfavorable comment from Wang to vindicate Yang. In the seemingly neutral evidential scholarship, Yang was presented as a tragic hero, even though he was not an expert of calendrical study.

¹⁶ Ruan, *Chourenzhuan*, 353.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Noël Golvers, *François de Rougemont, S.J., Missionary in Ch'ang-shu (Chiang-nan): A Study of the 'Account Book' (1674-1676) and the 'Elogium'* (Leuven: Leuven University Press, 1999), 210, 227.

²⁰ Ruan, *Chourenzhuan*, 353.

²¹ Ibid.

Numerology and Calendrical Learning

It remains puzzling that Yang Guangxian dared to challenge the European calendrical experts, while loudly asserting his ignorance of calendrical knowledge. Yang's bold confidence derived from two sources. He was a Confucian scholar who had fathomed the *li* 理 and therefore was obliged to defend the imperial interests against the foreigners and correct the wrongs they had committed. In addition, he was a specialist of mantic arts, which he thought to have shared principles with calendrical-making, not in the sense of detailed calculations but in the understanding and manipulation of cosmic forces. Ruan stipulated clearly in his guidelines of the *Chourenzhuan* that it would not include mantic specialists on the ground that mantic arts and calendrical learning had historically been separated in the dynastic histories.²² However, many practitioners were often well-versed in both. As Yuan Shushan 袁樹珊, a promoter of mantic arts in the Republican era, protested, many *chouren* collected in the *Chourenzhuan* were also experts of the mantic arts and blurred the boundaries between mathematical astronomy and mantic arts.²³ Theoretically, numerology, astronomy, and mathematics shared the same cosmology and were all in the range of Confucian pursuit since Zhu Xi 朱熹 (1130-1200) fostered his grand system of thought. The phenomenal world was connected by *qi*, and hence, comprehensible once one understood its *li*, namely how cosmological forces such as *yinyang* and *wuxing* worked.²⁴ Yang thus did not feel any shame in claiming that he had known nothing about the details of calendar making. In fact, most literati of his time probably knew more about numerological uses of the calendar than the details of calendar-making. Once numerology was considered a legitimate pursuit and a part of the system of knowledge that literati often consulted, Yang's challenge to the Jesuits, who did not fully comprehend the relationship between numerology and the calendar, does not seem so offbeat.

Unfortunately, Yang did not expect his quick downfall. Neither did he apprehend that he would have stepped on the epistemological juncture which Ruan and his colleagues were to punctuate under the influences of Yang's own actions. Yang thus became an ambivalent figure for later Qing scholars who were interested in astronomy and mathematics. These scholars agreed that in addition to fathoming the *li*, the nuts and bolts of how the *li* operated should also be included in their pursuits. It was therefore illegitimate for them to claim that one knows only the *li* of calendar-making without knowing the methods of calculation, measuring, and op-

²² Ruan, *Chourenzhuan*, 57.

²³ Yuan Shushan, "Liyang" 例言 (Guidelines), in Yuan Shushan ed., *Zhongguo lidai buren zhuan* 中國歷代卜人傳 (Taipei: Xinwenfeng chubanshe, 1998), 1

²⁴ Kim Yung Sik, *The Natural Philosophy of Chu Hsi, 1130-1200* (Philadelphia: American Philosophical Society, 2000).

erating the instruments. However, neither could this group of evidential scholars approve Christianity, which had been proclaimed a heterodoxy for decades. Thus they were sympathetic to Yang's cause but they could not forgive his technical incompetence.

According to Ruan's and his colleagues' diagnosis, it was Yang's attempt to revive the numerology, the old occult tradition of *houqi* 候氣 (waiting for the *qi*), not the Chinese calendrical tradition, that had failed him. They had excluded numerology as they mined the Chinese calendrical tradition, attempting to recover the Chinese methods that had been transmitted to the West. They collected the newly re-discovered corpus of mathematical treatises and built on them a foundation for Chinese calendrical methods. These new *chouren* who could maneuver through the technicality of mathematics and astronomy should also be Confucian scholars, according to Ruan Yuan.²⁵ Ironically, he arrived at a similar conclusion as Yang Guangxian: calendar-making should not be vested in the hands of the foreigners. Confucians, who comprehended the *li* and governed the empire, should be the ideal candidates for calendar-making.

For most people, however, the numerological contents were the most significant part of an almanac that they relied upon for daily decision-making. Although the compilers of the *Chourenzhuan* attempted to ward off numerological components in their genealogy of knowledge, they could not prevent others from thinking that those who had comprehended the secret of celestial phenomena could somehow coordinate these cosmological forces and manipulate them for numerological purposes. The common denominator of a sharing cosmology bridged numerology and the calendar reified in the almanac, the end product of calendar-making. European astronomers, who avoided being involved in numerology, nevertheless, challenged this sharing cosmology with new methods and instruments for defining and calculating calendrical parameters. These changes in the calendar would then eventually redefine the variables of numerology in the rest of the Qing period.

As Verbiest had pointed out, Yang Guzangxian was a spokesman for interests of diviners who did not understand the new calendrical methods.²⁶ Verbiest's complaint was not unfounded. For instance, as Director of the Astronomical Bureau, Yang

²⁵ Chu Pingyi, "Scientific Texts in Contest, 1600-1800," in Florence Bretelle-Establet ed., *Looking at It from Asia: The Processes that Shaped the Sources of History of Science* (Boston Studies in the Philosophy of Science, vol. 265) (Dordrecht: Springer, 2010), 141-166.

²⁶ Ferdinand Verbiest, *Wangze bian* 妄擇辯 (On the Absurdity of Choosing Auspicious Dates); *Wangtui jixiong bian* 妄推吉凶辯 (On the Absurdity of Prognostication); *Wangzhan bian* 妄占辯 (On the Absurdity of Astrology), in Nicolas Standaert 鐘鳴旦, Ad Dudink 杜鼎克, and Nathalie Monnet 蒙曦 eds., *Faqiao guojia tushuguan Ming Qing Tianzhujiao wenxian* 法國國家圖書館明清天主教文獻 (Chinese Christian Texts from the National Library of France) (Taipei: Ricci Institute, 2009), vol. 16, 265-272, 287-336, 337-375.

had changed the direction of the door of the temporarily lodge (*huiguan* 會館) in Beijing for the people from She 歙 county, for reasons of *fengshui*.²⁷ He also pointed out that the Astronomical Bureau had chosen an incorrect date for the funeral of Shunzhi emperor's son.²⁸ Yang's charge was confirmed by a certain geomancer named Fan Yuefeng 樊越鳳 during the trial.²⁹ Although Verbiest had powerfully rebutted Yang's theory and practices of mantic arts to defend the Western calendar after the Jesuits were vindicated,³⁰ he could not prevent another litigation brought forward by Yang Jingnan 楊燦南, a diviner who in 1673 accused Verbiest, based upon similar grounds as did Yang Guangxian.³¹ This case was soon dismissed and proved that the court strongly supported the new calendar. Nevertheless, numerology remained haunting the Jesuits and their calendar, even though later some Chinese scholars agreed with them that all numerological elements should be removed from the calendar.

Diviners were indeed confused after the Jesuits had redefined the 24 fortnight periods by the true positions of the sun instead of the equal span of the average length of a year. The rule of setting a leap month lost its regularity and there were so-called "fake leap months," which could only be determined by experts who had the instruments, calculation tables, and an understanding of the Western methods at their disposal.³² A text published for diviners clearly revealed their difficulty in grasping the nuances of the new calendar. In 1716, Mou Zhijin 繆之晉 replied to his friends' inquiries about the almanac. He composed a commentary to the alma-

²⁷ Xu Shangyong 徐上鏞, ed. "Xulu yizhuang houji" 續錄義莊後集 (Combined Records of Welfare Farm), in *Chongxu Shexian huiguan lu* 重續歙縣會館錄 (Supplement to the Records of the She Landsmannschaften) (Peking: Shexian huiguan, 1834), 1a.

²⁸ Huang Yi-Long, "Court Divination and Christianity in the K'ang-hsi Era," trans. Nathan Sivin, *Chinese Science* 10 (1991), 1-20.

²⁹ "Manchu Archive of the 1664 Calendar Case", trans., An Shangcheng 安雙城 (unpublished manuscript), dated the third month of the thirteen days, 1665. I thank Dr. Huang Yi-Long for sharing this document.

³⁰ Chu Pingyi, "Against Prognostication: Ferdinand Verbiest's Criticisms of Chinese Mantic Arts," (forthcoming).

³¹ Huang Yi-Long 黃一農, "Yang Jingnan: zuihou yiwei shugao xifang tianwenxue de baoshou zhishifenzi" 楊燦南: 最後一位疏告西方天文學的保守知識份子, *Hanxue yanjiu* 漢學研究 9:1 (1991), 229-245.

³² Helmer Aslaksen, "Fake Leap Months in the Chinese Calendar: From the Jesuits to 2033," in Alan K.L. Chan, Gregory K. Clancey, and Hui-Chieh Loy eds., *Historical Perspectives on East Asian Science, Technology, and Medicine* (Singapore: Singapore University Press/World Scientific, 2002), 387-393.

nac, the *Da Qing Shixianshu jianshi* 大清時憲書箋釋 dated 1723.³³ That an almanac needed a commentary for its reader to understand and use it was an unprecedented event in the history of Chinese astronomy and calendar. Judging from the preface written by Yunyizi 雲逸子, this group of people had concerns about the almanac which had to follow the new calendar issued by the courts. To flatter Mou as a scholarly diviner who could quote from various texts to explain the meaning of almanac to his audience, Yunyizi used an episode in the Han dynasty to praise “numerologists” (*fangshi* 方士) who were sometimes more capable than “official astronomers” (*taishi* 太史) in solving calendrical problems.³⁴ Mou himself humbly remarked that his book simply explained the meaning of the terminology of the almanac and thus avoided offending the court, which possessed the authority to oversee calendar making. However, Mou continued, the court issued the almanac without having explained “why it was so made” (*suoyiran* 所以然). According to Mou, this was a great problem for the users, because it would leave a lot of room for diviners to add insignificant things when compiling an almanac. This unacceptable situation, Mou wrote, motivated him to commentate on the *Shixian* 時憲 calendar.³⁵

Despite Mou’s claims, one may doubt his knowledge about the *suoyiran* of the calendar for the most important point in his commentary is to remind the reader of the phenomena of time lag in different provinces in the new almanac. This reminder is certainly important and implies that users of the calendar had to check the real time against their locations. However, Mou does not mention the cause of this adjustment but only takes it as given. The rest of his commentary follows the order of a special term that appears in the almanac and interprets why certain dates were auspicious or inauspicious for certain actions. From our perspective, Mou’s commentary does not mention any details of calendar making and is mainly numerical in content. But Mou considered himself someone who comprehended the principles of the calendar (*lili* 曆理), the same claim to expertise that Yang Guangxian once made.

The Jesuits and their Chinese associates in the Astronomical Bureau indeed transmitted new techniques, measures, calculations, tables, and instruments to reform the Chinese calendar but the final product appeared in the form of almanac, which the major three mantic arts—astrology, geomancy, and genethliology—

³³ Mou Zhijin 繆之晉, *Da Qing Shixianshu jianshi* 大清時憲書箋釋 in *XXSKQS*, vol. 1040. The current manuscript copy must have been produced after the Qinglong period, judging from its avoidance of the emperor’s name Hongli 弘曆.

³⁴ *Ibid.*, 657-658.

³⁵ *Ibid.*, 660-661. Although it was illegal to compile a private almanac, the statute was rarely observed. Many diviners compiled their own almanacs by consulting the official calendar issued by the court.

relied on. Therefore, the underlying principle of the calendar/almanac was more about how one could understand the mutual production and conquest of the cosmic forces of *yinyang* and *wuxing* than the technicality of astronomical calculations. In other words, Yang's and Mou's understanding of the principle of the calendar sought to comprehend the cultural significances and usages of the calendar/almanac rather than the details of its calculations whose importance they would not deny. In any case, calendar and almanac are referred by the same Chinese character *li* 曆. Therefore, if one knows the *li* of the almanac, one might as well claim to have understood the *li* of the calendar.

However, the rules of calculations had been changed and the fortnight periods were redefined, which impacted the determination of when a day, a fortnight period, and the placement of leap months would be in the calendar. These changes immediately confused the users about when an auspicious date or moment was. The diviners who used to be able to calculate these now lost their potency and could only rely on the almanac issued by the court. They were even more confused by the fake leap months, which broke the regularity of placing the leap month in the Chinese calendrical tradition that had lasted for thousands of years. For Yang Guangxian, this proved that the Westerners did not understand the *li* of the calendar/almanac even though their techniques might be better.

Adam Schall was certainly aware of the subtleties of this situation. He justified his comments on the appropriateness of dates on the calendar,³⁶ and wrote a short treatise entitled *Minli puzhu jiehuo* 民曆鋪註解惑 (Enlightening the Bewildered Regarding the Commentary in the Almanac) in 1662. In addition to explaining that annotating the almanac in an orderly way was a civil and political matter rather than a religious one, he had also asked the emperor to replace the Chinese almanac commentaries with Aristotelian meteorology in 1644 soon after he had assumed the directorship of the Astronomical Bureau. He wrote a short introduction to European meteorology entitled the *Tianwen shiyong* 天文實用 and dedicate it to the emperor. But the emperor had not replied to it, and Schall had had no choice but to continue the practice of annotating the almanac. He tried to distance himself from these duties, assigning them to one of the sections within the Astronomical Bureau.³⁷ It is important to note that the Manchu rulers were also very cautious, at least during the early years of the dynasty, to avoid a dramatic change in Chinese customs.

Despite Verbiest's strong protest against the possibility of using the almanac for mantic purposes, the Kangxi emperor did not neglect its significance for the mantic arts. Kangxi had noticed the inconsistencies between the calendar and the almanac

³⁶ Florence Hsia, *Sojourners in a Strange Land: Jesuits and Their Scientific Missions in Late Imperial China* (Chicago: University of Chicago Press, 2009), 30-50.

³⁷ Adam Schall, *Minli puzhu jiehuo*, 495-515.

and ordered his ministers to unify the interpretations of the almanac as early as 1683. The whole project did not reify until Kangxi decreed the compilation of the grandiose encyclopedia *Lüli yuanyuan* 律曆淵源 (Origins of Pitchpipes and the Calendar) and collected scholars and Jesuits to work on the project in the Mengyangzhai 蒙養齋 (School for Tutoring the Young). Li Guangdi was in charge of the compilation of the *Xingli kaoyuan* 星曆考原 (Investigations of the Origin of Calendar and Astrology), which he accomplished in 1713. Li first mentioned the nine layers of crystalline sphere models in the Aristotelian cosmography in which not only heaven but also the earth is spherical. He also used the Western measures in the calendar; The circumference of heaven was divided into 360 degrees, and a day into 96 quarters. Li also reminded the reader of the change of the definition of the fortnight periods and the problem of the time lag. After giving all this new information, there was probably not much more *li* could have done to associate these new changes in the calendar with the traditional annotations in the almanac.³⁸

Since the beginning of the Qing dynasty, Chinese astronomers were aware how the new calendar would affect the numerological contents of the almanac. Scholarly astronomers like Mei Wending 梅文鼎 (1633-1721), Jiang Yong 江永 (1681-1762), and Dai Zhen all addressed the issue of how to make the calendar more convenient for common folks. Thus, strikingly, these best *chouren* of the Qing in the eyes of Ruan and his colleagues were also depicted as numerologists who could comprehend the correspondence of the cosmic powers and predict or manipulate them. I will use the famous Qing historian Zhang Xuecheng's 章學誠 (1738-1801) biography of Liu Xiangkui to illustrate this point.

The Greatest Numerologists of Our August Qing?

Liu Xiangkui was Mei Wending's student. Not only was he a good student of Mei's mathematical and astronomical learning, but also an expert of *fengshui*, even though he did not live on it. Liu was a unique scholar in that he was not interested in preparing for the examinations. Liu preferred practical knowledge, including learning of heaven (*tianxue* 天學, referring to mathematical astronomy), geography (*yudi* 輿地), hydraulic management (*shuili* 水利), classics and history (*jingshi* 經史), military defense (*bingfang* 兵防), current affairs (*shiwu* 時務), and crafts (*youyi* 游藝). All of these categories are from a table of contents that Liu prepared for his works. Unfortunately, he did not live long enough to publish them and most of his drafts are no longer extant. When Zhang Xuecheng wrote Liu's biography as part of a gazetteer project on Hubei Province, this list was the only material that he could find. Zhang highly regarded Liu's learning, and was sympathetic to Liu

³⁸ Li Guangdi, *Yuding xingli kaoyuan* 御定星曆考原, in *SKQS*, vol. 811.

whose career was similar to his own. Despite Zhang's learning, he had failed six times before acquiring his *jinshi* 進士 (presented candidate) degree in 1778, which, however, did not really help his career. He served briefly in the imperial library, and like Liu, became a freelance staff member (*muyou* 幕友), living on patronage. Zhang was a man with uncompromised character and insisted on methodological improvements in his historiography. He sneered at the trivial evidential studies fashionable in his time. As a maverick scholar, he was isolated from his patron and other jealous colleagues when he was hired to compile the gazetteer, and in the end left the project unfinished. Thus, like Liu, Zhang did not see his project published in his time.³⁹ One can sense Zhang's sadness and self-identification with Liu when he composed Liu's biography.

Zhang shared Liu's main concern of ordering the world (*jingshi* 經世). Liu, however, believed that to order the world one had to start with the learning of heaven, namely astronomy. In order to learn from Mei Wending, Liu sold his property and left his hometown. Mei regarded Liu's talent highly and discussed his own *Lixue yiwen* 曆學疑問 (Questions on Calendrical Learning) with Liu. The opening section of the *Lixue yiwen* bears the title "Lun lixue gushu jinmi" 論曆學古疏今密 which was identical to that of one of Liu's essays that he had intended to publish. Liu also did the final editing on the book. According to Zhang, this section of *Lixue yiwen* was Liu's contribution.⁴⁰

Liu's most important achievement lay in his study of Venus and Mercury. Liu pointed out that the tables of the *Jinshui lizhi* 金水曆指 (Calendrical Treatises of Venus and Mercury) in the *Xinfa lishu* 新法曆書 (Calendrical Treatises in Accordance with the New Methods) were inconsistent with its texts. Checking against the astronomical observations, the tables were more precise than the texts. He suspected that probably the producer of this text did not understand the methods of calculation.⁴¹ He wrote a book to discuss the calculations thoroughly, and Mei highly praised his ingenuity, summarizing Liu's book in the *Wuxing guanjian* 五星管見 (A Humble Opinion Regarding the Five Planets) and crediting him at the beginning of the book. Liu also wrote a textbook to demonstrate the methods of predicting solar eclipses. Employing the examples of wrong predictions made by the court astronomers as his teaching materials, he challenged the Jesuits and their associates in the Astronomical Bureau.

In addition to calendrical learning, Liu was also famous for his geography which he applied to military defenses and hydraulic management. He collated the maps made by the Jesuits during the late years of Kangxi's reign. His passion for geo-

³⁹ Zhang Xuecheng 章學誠, *Hubei tongzhi gao* 湖北通志稿, in *Zhangshi yishu* 章氏遺書 (Wuxing: Jiayetang, 1933), 26:16a-24b.

⁴⁰ Ibid., 26:20b.

⁴¹ This is caused by the continuous collation of these tables in the Astronomical Bureau.

graphic knowledge, however, brought him misfortune. When Mei expressed his gratitude to Liu in the *Wuxing guanjian*, his name appeared as Liu Zhu 劉著. Liu had changed his name to cover his identity when he was involved in a long unresolved literary inquisition because of a manual copy of Gu Zuyu's 顧祖禹 (1631-1692) *Dushi fangyu jiyao* 讀史方輿記要 (Synopsis of Reading Historical Geography) found in his possession. Gu was sympathetic to the Ming loyalist cause, which partly motivated his study of geography. It is not clear, however, whether Liu shared Gu's loyalist feeling. The accusation came at the time when Li Wei 李衛, the official who accepted the accusation of Liu, arrested a group of Ming loyalists led by Gan Fengchi 甘鳳池. In any case, no clear evidence could solidify the charges and Liu was released. Liu renamed himself as Liu Xiangkui 劉湘燾, a name which absorbed all the *wuxing*, which clearly implied that the change would improve his luck. He became a wandering scholar afterwards. Some modern scholars suggest that his unfortunate life story was written into Wu Jingzi's 吳敬梓 (1701-1754) famous novel *Rulin waishi* 儒林外史 (An Unofficial History of the Scholars) as the character Lu De 盧德.⁴² Wu's son, Wu Lang 吳烺, who was also included in the *Chourenzhuan*, once asked Liu ten questions about calendrical learning, to which Liu replied in detail.⁴³

All these affirm Liu's qualification as a capable *chouren*. His views about calendrical learning were in tandem with his contemporaries. He embraced the idea that important knowledge for ordering the world originated from ancient sages, which showed clearly in his essay "Lun dili zhi xue qiyu sandai yiqian" 論地理之學起於三代以前 (That the Learning of the Principle of the Earth Should Have Originated before the Three Dynasties). Liu wrote "Lun dili zhi xue budang niyu shushu" 論地理之學不當泥於術數 (That the Learning of the Principle of the Earth Should not Mingle with the Technique of Numbers) to disassociate numerology from geography. Liu also shared Gu Zuyu's concept of *dili* (the Learning of the Principle of the Earth), which referred to an understanding of the landscape and distribution of the resources in the empire, since this was what the *Qingzhong shu* 輕重書 (On Evaluating the Significances) in Guanzi 管子 had alluded to.⁴⁴ His other essay "Chudi kuangshan kezi guzhu zhi yi" 楚地礦山可資鼓鑄之議 (A Proposal for Exploiting the Ores Founded in the Chu Area) further confirmed his concerns about how to utilize ores and natural resources (*jìn dili* 盡地利). All this evidence shows that Liu's thoughts coincided with Ruan's intellectual ideal.

In addition, Liu also comprehended the knowledge of the "experts of shape and form" (*xingfajia* 形法家), an intellectual category since the Han period referring to

⁴² He Zehan 何澤翰, *Rulin waishi renwu benshi kaolüe* 儒林外史人物本事考略 (Shanghai: Gudian wenxue chubanshe, 1957), 74-82.

⁴³ Zhang Xuecheng, *Hubei tongzhi gao*, 26:20b

⁴⁴ *Ibid.*, 26:21a.

geomancy and physiognomy. The following anecdote acknowledges his expertise in this regard. Suizhou 隨州 officials once attempted to move a Confucian temple back to its original location. They knew roughly that it was once outside the Eastern city wall but were unable to pinpoint the site. Liu was invited to help. He set up a gnomon, looked around, and spotted the location. People did not believe him at first but after digging down about one meter, they found the base of the temple exactly where Liu had said it was.

Not only does the Suizhou incident prove that Liu was a good geomancer, but it also strikingly informs us that Mei Wending was also a specialist of geomancy. Amazed by Liu's performance, people in the Suizhou were eager to know how he did it. He did not reply directly but told another story instead. He reported that his teacher-master Mei was often consulted by others to locate a proper gravesite. Someone once complained that the space ahead of his ancestor's graveyard that Mei had chosen was too narrow. Mei did not change his choice but calculated the proper time to bury the coffin. Suddenly, wind, rain, and thunder roared and the sands before the graveyard moved several *li* 里. Liu commented that whoever understood the meaning (*yi* 意) of geomancy could perform this as if the spirit had done the work (*xiao ruo guishen* 效若鬼神). Liu added that geomancy was the least significant in the technique of numbers (*shushu* 數術) involving calculations of the cosmic forces at specific time and space.⁴⁵ This remark demeaned the significance of geomancy and was in accord with the intellectual atmosphere of his time.

The story seems unbelievable to modern ears and one suspects that Liu was exaggerating to boost his fame. However, for Liu's contemporaries, who believed that one's knowledge and sincerity of the mind could resonate with heaven and earth, Liu's performance was simply a testimony to his capability. For instance, the Manchu governor-general Yin Jishan 尹繼善 ventured to report the occurrence of red-bean rains in Jiangnan 江南 but did not have sufficient knowledge about the significance of the omen to write the memorial. One county magistrate sought for Liu's help. He easily drafted the memorial and compiled the materials of similar incidences from historical and literary books into a chronology, which Yin read, checked, and immediately presented to the emperor. Yin's contemporaries were all surprised with his erudition but had no idea that he had hired a ghost writer.⁴⁶ The story indicates that knowledge about natural wonders, which might not sound possible for us, was part of the knowledge necessary for ordering the world. High officials used it for self-fashioning while a poor scholar like Liu relied on it for his livelihood.

Liu Xiangkui and Mei Wending were no doubt knowledgeable about geomancy and practiced it with critical consciousness. Liu for instance was involved in finding

⁴⁵ Zhang Xuecheng, *Hubei tongzhi gao*, 26:20a.

⁴⁶ *Ibid.*, 26:19b.

burial grounds for his friend Cheng Tingzuo's 程廷祚 (1691-1767) great-great-grandfather, great-great-grandmother, and mother. Liu travelled a long distance, disregarding the danger along the way, for which Cheng expressed his deepest gratitude.⁴⁷ Mei Wending was once the elder of his lineage, and therefore geomancy was practical knowledge for him in managing his lineage graveyard. In addition, he commented on at least two books of geomancy. But at the same time Mei argued against geomancy. His comments were in a sense similar to the Jesuits, emphasizing the significance of moral cultivation over that of an auspicious burial ground.⁴⁸

From the stories of Liu and Mei, both of whom were also practitioners of geomancy, we see a continuous distancing from geomancy, whose Chinese term is identical to geography (*dili* 地理). Ruan Yuan and his colleagues' attitude toward numerology in general were an ongoing trend under the impact of Jesuit's calendar-making. However, these *chouren* in the eyes of Ruan Yuan and his colleagues continued to perform numerology out of necessity and showed that in practice numerology and calendrical studies were not necessarily mutually exclusive.

Concluding Remarks

From the stories of Yang Guangxian and Liu Xiangkui, we do see an intellectual transition. Ruan Yuan and his colleagues attempted to dislodge calendrical learning from the mantic arts, and more importantly, from Christianity. They were uncomfortable with Yang Guangxian's arrogant claims of understanding only the *li* 理 of the calendar-making without knowing its nuts and bolts, which were exactly what had toppled him down. They redefined a *chouren* as an expert of calendar-making who accumulated knowledge and skill and passed them down generation after generation. This image of the *chouren* was similar to Schall's portrayal of European astronomers who were aligned in a linear transmission of the so-called "Western" calendrical tradition.⁴⁹ However, Ruan would cast a long Confucian shadow on the ideal image of the *chouren*, who not only understood calculation but would also be the manager of this sacred knowledge to serve the imperial cause. Thus the *Chourenzhuan* can be read as a manifesto to lift the status of the *chouren* to the height of Confucian scholars who ideally would be able to exclude the Westerners from calendar-making. To achieve this goal, numerology had to be marginalized so that scholars would concentrate on astronomical and mathematical research.

According to Yang Xiong 揚雄, those who comprehend the Way of the Heaven,

⁴⁷ Cheng Tingzuo 程廷祚, *Qingxi ji* 青溪集 (Hefei: Huangshan shushe, 2004), 191-195.

⁴⁸ Mei Wending 梅文鼎, *Jixuetang wenchao* 積學堂文鈔 (Collected Essays from the Hall of Accumulating Learning), *juan* 5, in *XXSKQS*, vol. 1413, 423-424, 430-431.

⁴⁹ Chu Pingyi, "Scientific Texts in Contest, 1600-1800" (cit. n. 25), 141-166.

Earth, and Man would be a true Confucian, but those who fathom only the Way of the Heaven and Earth were simply to be called the skillful (*ji* 伎).⁵⁰ Ruan Yuan's plan for the *chouren* does not betray this Chinese intellectual tradition in which a Confucian was a generalist who knew everything. History often ironically betrays ideals, however. The cultural reproduction mechanism of the examinations based on Confucian classics tended to discourage most examinees from exploring technical knowledge such as calendar-making. Confucian scholar-officials produced in this channel of social stratification often become generalists who needed to know many different fields of knowledge to take care of their daily managerial tasks. The nuts and bolts of various crafts would be left to the skillful. Calculating capability in the Astronomical Bureau was associated with low functionaries in the imperial bureaucracy. A further ideological social stratification came from Zhu Xi when he followed the *Analects* to downplay the significance of all kind of technical expertise as the "minor way" (*xiaodao* 小道).⁵¹ The examination system, however, produced a surplus of literate population who often chose to become physicians or numerologists in late imperial China. Still others might pick up numerology and medicine as connoisseurship. Although the examination system had created a clear social distinction between scholar-officials and numerologists, they often shared the same cosmological outlook of the phenomenon world. Moreover, numerologists tended to rely on the *Classic of the Changes* (*Yijing* 易經) to justify their status and profession and tied numerology closer together to the world of literati.

The European missionary astronomers punctuated a rupture to this shared cosmology. They brought new cosmology, technique, instruments, calculation tools, and astronomical tables and redefined astronomical parameters. Moreover, their missionary status prohibited them from engaging in the compiling of the almanac, though they were held responsible. Yang Guangxian took over the Jesuits' posts at the court with geomancy, the Jesuits counterattacked Chinese numerology even more strongly after they regained their positions, arguing that calendar-making could only be performed by astronomy and mathematics which bore no relation with numerology. The imperative of compiling an almanac only followed the requirement of the imperial decree and was adapted to the Chinese custom. Thoughtful Confucian astronomers like Mei Wending and Liu Xiangkui agreed that astronomical calculations did not have to tie to numerology, with which they appeared to be familiar out of necessity. Ruan Yuan and his colleagues also distanced calendar-making from numerology. They were sympathetic to Yang's anti-

⁵⁰ Yang Xiong 揚雄, Wang Rongbao 汪榮寶, *Fayan yishu* 法言義疏 (Commentary to the Model Sayings) (Beijing: Zhonghua shuju, 1987), 514.

⁵¹ Yung Sik Kim, "Confucian Scholars and Specialized Scientific and Technical Knowledge in Traditional China, 1000-1700: A Preliminary Overview," *East Asian Science, Technology, and Society: An International Journal* 4 (2010), 207-228.

Christian sentiment but they realized that unless one could manipulate the technicality of calendar-making, it was impossible to reclaim the field of calendrical learning from the European astronomers. So they recast the meaning of *chouren*, absorbing it into Confucian identity. The almanac, the end product of the calendar, continued to be used mainly for numerological purposes by the common users who expected the maker of the calendar, the *chouren*, to be someone who could command the natural phenomena by his astronomical knowledge. For Ruan Yuan and his colleagues, however, a *chouren* should also be a Confucian state-craftsman. Certainly, a *chouren* could still be a numerologist but no longer *vice versa*.

Abstract

This paper employs the stories of Yang Guangxian 楊光先 and Liu Xiangkui 劉湘燧 to explore the tension between numerology and calendrical learning after European missionaries had successfully imported new calendrical technique into the Qing court in 1644. I argue that Yang's failed struggle against the Jesuits created an intellectual juncture for the Chinese calendrical tradition, and eventually led to the separation between numerology and calendrical learning, which crystallized in Ruan Yuan's 阮元 *Chourenzhuan* 疇人傳 (Genealogical Biographies of Calendrical Experts). Before the adoption of the hybrid calendar of the Jesuits, which retained its Chinese format but employed the European techniques, numerology and calendrical learning shared the same cosmological outlook. Therefore, someone like Yang could claim his authority in the field of calendrical study, though he did not know the nuts and bolts of calendrical computation. The Jesuits, however, strongly criticized numerology and claimed that it was unrelated to calendrical astronomy. Many Confucian astronomers also shared this view as they found that calendrical computations were different from numerological calculation which treats numbers not only as a quantitative measurement but also as a qualitative measure associated with the cosmic forces of *yinyang* and *wuxing* used in numerology to predict the future or to account for the operation of the phenomenal world. Ruan Yuan and his colleagues recast the meaning of *chouren*, expecting him to be a Confucian scholar who would be well-versed in calendrical computations. Nevertheless, numerology continued to be practiced by many *chouren* like Liu Xiangkui out of necessity. Certainly, a *chouren* could still be a numerologist but no longer *vice versa*. The common users of the almanac, the end product of the calendar, expected the maker of the calendar, the *chouren*, to be someone who could command the natural phenomena by his astronomical knowledge, however.

Keywords: numerology, calendar, Yang Guangxian, Jesuits, Ruan Yuan, divination