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THEMATIC DOSSIER
EMPIRE UNDER THE NIGHT SKY: RECORDING ASTRAL-COSMOGRAPHY IN QING DYNASTY CHINA, 17TH – 19TH CENTURIES

An Encounter of Incommensurables: European Cosmological Knowledge in the *Fenye* Chapters of Chinese Local Gazetteers (1660-1820)

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Abstract: It has often been argued that the introduction of early modern European cosmology at the turn of the seventeenth century by Jesuit missionaries—subsumed under the generic term "Western learning" (*xixue* 西學)—signalled the demise of traditional *fenye* (分野, or "field allocation") theory, as the concept of Earth's sphericity and the widened sense of world geography are fundamentally at odds with the Sinocentric worldview underpinning *fenye*. However, the *fenye* chapters in Qing dynasty local gazetteers tell a different story: in comparison with earlier Ming gazetteers their proportion increased. These chapters rarely take a stance against Western learning. Rather, they invoke Western learning as part and parcel of the imperially sanctioned astronomy to be reckoned with, or even suggest it as a remedy for flaws in traditional *fenye* techniques, leading to a plurality of discourses in which Sino-Western relationships become entangled with tension between the imperial and the local. This phenomenon is particularly visible in the peripheral regions of the empire, such as Guangxi, as these were traditionally marginalised in the Sinocentric cosmology of the *fenye* system. This paper explores cosmological discourses to answer the following questions: What were the agendas that Western learning was made to serve in these gazetteers? How did local endeavours relate to court-sponsored imperial projects? What were their sources of knowledge on matters of Western learning, and how can we map out the geography of Western learning based on these local sources?

Keywords: field allocation (*fenye*); Western learning; local gazetteers; geography of knowledge; scientific incommensurability

Introduction

This article explores the circulation of new European cosmological knowledge on the local level in Qing China. Around the end of the sixteenth century, Jesuit missionaries entered China and soon enabled the first direct intellectual contact between China and Europe. Jesuits translated European scientific works in collaboration with Chinese literati, participated in the calendar reform at the end of the Ming dynasty (1368-1644 CE), and served as imperial astronomers during more than a century under the Qing dynasty (1644-1911 CE). The scientific and technical knowledge they transmitted, most importantly in the field of mathematical and astral sciences, came to be known by the generic term "Western learning" (*xixue* 西學).[1] Such knowledge has been most successfully studied in contexts where it was associated with emperors, influential scholars, and key imperial institutions such as the Imperial Astronomical Bureau. Our understanding of Western learning is therefore confined to the empire's few cultural core areas (the capital, the lower Yangzi Delta or Jiangnan area) or the personal trajectories of certain literati and their networks (such as that of Fang Yizhi and his disciples, who in the mid-seventeenth century were active mostly in the northern Jiangxi region).[2] Yet how much did Western learning circulate in the regional and intellectual peripheries of China, amongst less prominent literati? A closer look at the *fenye* (分野, "field allocation") chapters in local gazetteers brings us closer to an answer to this question.

A key component of traditional China's correlative cosmology, the *fenye* system established a correspondence between celestial regions and territorial units for the purpose of prognostication. As an authoritative way to situate a locality within the spatial framework of the empire and the civilised world, *fenye* chapters (alternatively called *xingye* 星野) feature in two thirds of Qing period local gazetteers. Using the Local Gazetteer Research Tool (LoGaRT) which includes 3067 titles of Qing period gazetteers, we find 66.4%, or 2036 titles contain either a *xingye* or a

[1] Nicolas Standaert, ed., *Handbook of Christianity in China, vol. 1, 635-1800* (Leiden: Brill, 2001), 689ff.

[2] To cite but a few significant examples, Catherine Jami et al., ed., *Statecraft and Intellectual Renewal in Late Ming China: The Cross-Cultural Synthesis of Xu Guangqi* (1562–1633) (Leiden: Brill, 2001); Catherine Jami, *The Emperor's New Mathematics: Western Learning and Imperial Authority During the Kangxi Reign (1662–1722)* (Oxford: Oxford University Press, 2012); Qiong Zhang, *Making the New World Their Own: Chinese Encounters with Jesuit Science in the Age of Discovery* (Leiden: Brill, 2016); Sun Chengsheng 孫承晟, *Guannian de jiaozhi: Ming Qing zhiji xifang ziran zhexue zai Zhongguo de chuanbo* 觀念的交織：明清之際西方自然哲學在中國的傳播 [The Interweaving of Ideas: The Circulation in China of Western Natural Philosophy in the late Ming and early Qing] (Guangzhou: Guangdong renmin chubanshe, 2017); Ping-Ying Chang, *The Chinese Astronomical Bureau, 1620–1850: Lineages, Bureaucracy and Technical Expertise* (London: Routledge, 2022), etc. I have offered a more detailed reflection on the geography of Western learning in Huiyi Wu, "From Civilisational Encounter to Microhistories: Putting Western Learning in Local Places," *East Asian Science, Technology, and Medicine* 55, no. 1–2 (2023): 50–84.

fenye chapter.[3] Their broad geographic scope allows a view to areas outside China's cultural core where we can find other (sometimes surprising) responses to the new European knowledge. We will analyse the variegated discourses that Western learning has been made to serve in these gazetteers, and ask how the agendas of local authors differed from those of their more prominent peers closer to the imperial centres. Tracing the sources of knowledge on matters of Western learning for specific local authors, and examining the intertextual web of citations in these documents, we will identify the specific mediums that circulated Western learning. They include works by missionaries and their Chinese interlocutors, but most often imperial scholarship that has incorporated and validated given elements of European astronomy and cosmology, and to a non-negligible extent, other local gazetteers. Moreover, we will ask if any meaningful geographical pattern can be discerned from the spatial distribution of these gazetteers, and how such patterns coincide with, or differ from, the geographies of other knowledge communities relevant for Western learning during the Qing period, in particular, the Catholic communities and the network of Evidential Studies (*kaozheng* 考證) scholars.

Focusing on the *fenye* chapters in local gazetteers and the geography of knowledge undergirding them, enables a reassessment of the history of *fenye* theory. It has often been argued that the introduction of early modern European cosmology into China signalled the demise of traditional *fenye* theory, as the concepts of the sphericity of the Earth and an expanded sense of world geography were fundamentally at odds with the Sinocentric worldview on which it was based. The fate of *fenye* theory is part of a broader narrative of alleged decline in traditional Chinese cosmology in the face of the inexorable ascent of early modern science.[4] The story we perceive in local gazetteers is quite different. After the introduction of Western learning, and throughout the seventeenth and eighteenth centuries, the proportion of Qing gazetteers containing a *fenye* chapter rose, compared to Ming period gazetteers prior to the impact of Western learning.[5] These chapters very rarely set themselves against Western learning. While some authors expressed incomprehension of alien concepts, most often they invoked Western learning as part and parcel of the imperially sanctioned astronomy to be reckoned with, sometimes even considering it a remedy for the existing deficiencies in traditional *fenye* techniques, thus leading to a plurality of rhetoric and discourses. The territorial expansion of

[3] Shih-Pei Chen, Calvin Yeh, LoGaRT: Local Gazetteers Research Tools (software) (Berlin: Max Planck Institute for the History of Science, 2023). https://logart.mpiwg-berlin.mpg.de/. For more details, see Shih-Pei Chen's contribution in this special issue. The data includes the section name of *fenye* (分野), *xingye* (星野) and their variants (分埜, 分墅, 星埜, 星墅).

[4] John Henderson, *The Development and Decline of Chinese Cosmology* (New York: Columbia University Press, 1984); Hsu Kuang-Tai 徐光臺, "Shiqi shiji chuan Hua xixue dui fenyeshuo de chongji" 十七世紀傳華西學對分野說的衝激 [The Impact of Western Learning on Astrological Field Allocation in Seventeenth-century China], *Jiuzhou xuelin* 九州學林 [Chinese Culture Quarterly] 7, no. 2 (2009): 2–42.

[5] The LoGaRT database includes 532 titles of Ming period gazetteers, 317 of them, or 60.6%, contain a *fenye* or *xingye* section.

the Qing empire during this period and the changing spatiality of "China" itself looms large in these discourses, entangling Sino-Western relations with imperial-local tension.

Looking at the encounter between *fenye* and Western learning, we also wish to reflect on the broader question of scientific incommensurability. The extent to which scientific dialogue is possible between competing paradigms—in other words, the threshold beyond which different paradigms are considered mutually incomprehensible or incommensurable—is a vast question for the history of science.[6] The debate is of particular acuity in the historiography of European science in China, as a perceived non-reception of Western learning by the Chinese has influentially fed into the thesis of an unbridgeable chasm between Eastern and Western ways of thinking, and that of untranslatability between Sinitic and Indo-European languages.[7] However, data from local gazetteers offers a different answer to the question: fundamental conceptual differences did exist between traditional Chinese and early modern European cosmologies; yet their encounter in China's local contexts led not to a state of non-communication, rejection, or the superseding of one by the other, but to a more complex result of coexistence and hybridisation. Following the process in China's local contexts sheds light on the epistemic and social mechanisms that allowed a knowledge tradition to reinvent and revitalise itself by absorbing and taking on board competing and incommensurable new ideas.

Fenye before the Jesuits

Fenye has long been a neglected section of traditional China's astral knowledge, arguably because it is not a good fit for a history of science defined by modern standards: the holistic cosmology which served as its theoretical basis has been definitively discarded; and unlike the observational records of celestial portents that deal with comets, supernova, and conjunctions, field allocation is a conceptual exercise, to the extent that the historical documents it generated are unusable as astronomical data. Joseph Needham and Ling Wang's *Science and Civilisation in China* volume on Chinese sciences of the heavens makes no mention of it.[8] Scholars who turned their attention to it mainly did so from the perspective of a history of ideas, such as John Henderson who spoke of it as an epitome of the "correlative thinking" prevalent in

[6] Mario Biagioli, "The Anthropology of Incommensurability," *Studies in History and Philosophy of Science Part A* 21, no. 2 (1990): 183–209; Hasok Chang, "Incommensurability: Revisiting the Chemical Revolution," in *Kuhn's the Structure of Scientific Revolutions Revisited*, ed. Vasso Kindi and Theodore Arabatzis, 153-176 (New York: Routledge, 2012).

[7] See Jacques Gernet, *Chine et Christianisme: La Première Confrontation,* 2nd ed. (Paris: Gallimard, 2009); Jean-Claude Martzloff, *Histoire des Mathématiques Chinoises* (Paris: Masson, 1988); Lydia H. Liu, ed., *Tokens of Exchange: The Problem of Translation in Global Circulations* (Durham: Duke University Press, 1999).

[8] Joseph Needham and Ling Wang, *Science and Civilisation in China,* vol. 3, *Mathematics and the Sciences of the Heavens and Earth* (Cambridge: Cambridge University Press, 1959).

Han China;[9] Edward Schafer whose cultural historical study of the Tang dynasty approach to the stars dedicated a section to *fenye* in the chapter on astrology, describing the scheme as a "disastrous geography;"[10] and Tang Xiaofeng whose work on the history of ancient Chinese geographical thinking described the scheme as the "territorialisation of the mandate of Heaven" (天命的區域化).[11] It is only recently that David Pankenier's work, focusing on the pre-Qin period, and Qiu Jingjia's monograph offering the first general history of *fenye*, have delved into the technical aspects of the scheme, seeking to unravel its actual working.[12]

From this literature we retain one thing: that the *fenye* system was from the onset a variety of heterogeneous schemes. Pankenier lists five different schemes, while Qiu Jingjia counts as many of sixteen schemes under the rubric of "astral-territorial *fenye*" (*xingtu fenye* 星土分野) that varyingly correlate given territorial units to different asterisms: they include the seven stars of the Dipper, the Five Planets, the twenty-eight lodges (*ershiba xiu* 二十八宿),[13] the twelve Jupiter stations (*shi'er ci* 十二次), etc.[14] If the latter two schemes featured predominantly, we shall see that other more marginal schemes are far from unknown nor irrelevant to the local gazetteer authors we will encounter.

As time went by, the inconsistencies that marred the *fenye* scheme from the onset would only worsen. Later practitioners of the scheme would grapple with increasing difficulty, as the scheme is based on a Sinocentric cosmology in which the world equals China, and it originates from a time when China equalled the Central Plain. Pankenier shows that the original correlation between the heavenly asterisms and the earthly principalities made both celestial and topographical sense. If we look at the sky from the viewpoint of inhabitants along the Yellow River during the Warring States period (403-211 BCE), the map of the sky was quite straightforwardly projected on earth.[15] But this coherence was bound to be lost when changes occurred to the geography of the earthly realm—when the Yellow River changed its course, when principalities conquered each other, when the feudal fiefs became centrally

[9] Henderson, *Development and Decline*, 68–70.

[10] Edward H. Schafer, *Pacing the Void: T'ang Approach to the Stars* (Berkeley: University of California Press, 1977), 75–84.

[11] Tang Xiaofeng 唐曉峰, *Cong hundun dao zhixu: Zhongguo shanggu dili sixiangshi shulun* 從混沌到秩序: 中國上古地理思想史述論 [From Chaos to Order: A History of Ideas on Ancient Chinese Geographical Discourses] (Beijing: Zhonghua shuju, 2010), 133ff.

[12] David Pankenier, *Astrology and Cosmology in Early China: Conforming Earth to Heaven* (Cambridge: Cambridge University Press, 2013); Qiu Jingjia 邱靖嘉, *Tiandi zhijian, Tianwen fenye de lishixue yanjiu* 天地之間：天文分野的歷史學研究 [Between Heaven and Earth: A Historical Study of Astral *fenye*] (Beijing: Zhonghua shuju, 2020).

[13] We translate *xiu* (宿) as "lodge" rather than "lunar lodge," as has persuasively recommended Christopher Cullen, "Translating 宿 *sukh/xiu and 舍 *lhah/she—'lunar lodges', or just plain 'lodges'?," *East Asian Science, Technology, and Medicine* 33, no. 1 (2011): 83-95.

[14] Qiu, *Tiandi zhijian*, 35ff.

[15] Pankenier, *Astrology and Cosmology*, 299-305.

administered provinces and counties, and when Chinese civilisation expanded into formerly barbarian regions that the authors of canonical texts had no knowledge of.

These systemic inconsistencies were aggravated further by the increasing demand for technical precision from state-sponsored astrology. Starting from the *Treatise on Astronomy of the Book of Jin* (*Jinshu tianwenzhi* 晉書天文志) by the Tang astronomer Li Chunfeng (李淳風, 602–670 CE)—an authority later gazetteers would continuously refer to, a precise number of *du* (度)[16] within a lodge were assigned to each specific prefecture: for instance, the Han dynasty Province of Jingzhou (荊州), formerly the Kingdom of Chu (楚), belongs to the lodges of Wing (*Yi* 翼) and Axletree (*Zhen* 軫), and that within the province, the prefecture of Nanyang (南陽) is 6 *du* into the lodge of Wing, or the prefecture of Guiyang (貴陽) is 10 *du* into that of Axletree.[17] This technical proposal would never reach consensus among later practitioners. The problem would grow more intractable as the imperial domain expanded, to include the vast swathes of territories not covered by authorities such as the *Book of Jin*. We will see later how it was precisely in gazetteers of the imperial peripheries where some of the most interesting discourses were made that appropriated Western learning to amend the existing *fenye* scheme.

The literati of the Late Imperial period were aware of the inner inconsistency and limitations of the *fenye* scheme. Starting from the Song dynasty, authors voiced their discontent, even rejecting the validity of the entire correlative system. They questioned the incoherence between the territorial units and their corresponding asterism. For instance, the fact that the ancient Kingdoms of Wu (吳) and Yue (越) in the South-East of China are allocated to the Northern Jupiter station of Star Chronicle (*xingji* 星紀), while the Kingdom of Lu (魯) in the East was allocated to the Western Jupiter station of Descending Harvester (*Jianglou* 降婁); or the fact that the tiny ancient kingdoms in the Central Plain were allocated more lodges than the vast regions of Yangzhou (揚州) in the South-East or Yongzhou (雍州) in the North-West.[18] Some also took issue with the Sinocentrism of the system, which excluded all foreign countries.[19] As the Southern Song author Zhou Mi (周密, 1232–1298) argued:

> People in the world match the 28 lodges to the 12 provinces: this is most careless and absurd. Just two lodges—Net and Mane—are made to govern all foreign countries. They are unaware that the 12 inner provinces from East to West and from North to South only stretch over 10 or 20 thousand *li*, while the foreign countries extend easily over several tens of thousands of *li*: they are immeasurably

[16] In traditional Chinese astronomy, a complete circuit of the heavens is 365 ¼ *du*, as the Sun was thought to move 1 *du* per day over a tropical year.

[17] This paper follows Schafer's English translation for the names of the lodges and the Jupiter stations. Schafer, *Pacing the Void*, 76.

[18] Qiu, *Tiandi zhijian*, 138–142. Traditional Chinese astronomy divided the twenty-eight lodges into four groups of seven, each corresponding to a cardinal direction.

[19] Qiu, *Tiandi zhijian*, 228ff.

> bigger than China. If we are to talk reason, China should only be allocated the two lodges of Dipper and Ox.
>
> 世以二十八宿配十二州分野，最為疎誕。中間僅以畢、昴二星管異域諸國，殊不知十二州之內，東西南北不過綿亘一二萬里，外國動是數萬里之外，不知幾中國之大，若以理言之，中國僅可配斗、牛二星而已。[20]

Remapping the "Jesuit impact"

In sum, literati had a multi-century tradition of critiquing the *fenye* system from the conceptual as well as the technical point of view, long before the Jesuits' arrival at the turn of the seventeenth century. In this respect, the Jesuits, with their new knowledge on the sphericity of the Earth and the size of the globe, did not initiate criticism of the *fenye* system, but only enhanced existing arguments. In fact, missionaries themselves very seldom engaged with *fenye* directly. As the province of a very small group of technical experts, *fenye* was hardly visible among the many forms of "superstitions,"[21] such as date-selecting, tomb-siting and other everyday prognostications, that the Jesuits set out to combat in China. One exception was Giulio Aleni's (1582-1649) imaginary dialogue with a Chinese literatus:

> Someone asks: "In our humble country, we theorise that all lodges correspond to particular lands which they govern, and we call this 'field allocation.' But I do not know whether this is also true in your honourable country?" I answer: "Your honourable country has already exhausted the lodges, allocating them all to govern China: it seems that nothing is left for the other countries. In truth, the ten thousand countries share one common sky. The Sun, the Moon, and the lodges move from East to West, shining first over the Eastern states and later over the Western land. They then move on from West to East again, without any repose. The Sun, the Moon, and the stars give no preferential treatment in the way they shine and glow. Why should a distinction be made between 'us' and 'them?' The theory of field allocation does exist in other countries; however, if we are to talk reason, this seems to regard the sky as one's private property, I see no basis for doing this."[22]

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[20] Zhou Mi 周密, *Xinyou zashi* 癸辛雜識 [Miscellaneous Notes from Guixin (Street)], quoted in Hsu, "*Shiqi shiji chuan Hua xixue*," 10. The work is available in its Jiguge 汲古閣 edition (Chongzhen period, 1628-1644), *houji* 26b/27a, Harvard College Library Harvard-Yenching Library, https://nrs.lib.harvard.edu/urn-3:fhcl:26292289, seq. 91-92.

[21] For the Jesuits' efforts against traditional Chinese practices of prognostication, see Chu Ping-yi 祝平一, "Piwang xingmi: Ming-Qing zhiji de tianzhujiao yu 'mixin' zhi jiangou 闢妄醒迷：明清之際的天主教與「迷信」之建構 [Enlightening the Deluded and Awakening the Bewildered: Christianity and the Term *mixin* in Seventeenth- and Eighteenth-century China]," *Zhongyang yanjiuyuan lishi yuyan yanjiusuo jikan* 中央研究院歷史語言研究所集刊 [Bulletin of the Institute of History and Philology, Academia Sinica] 84, no. 4 (2013): 695–752.

[22] Giulio Aleni, *Xifang dawen* 西方答問 [Questions and Answers on the Occident] (Wulin Tianzhutang, 1642) *juan* 2.8b/9a. Bibliothèque Nationale de France, https://gallica.bnf.fr/ark:/12148/btv1b90063481. See also a similar argument by Verbiest, discussed in Qiu, *Tiandi zhijian*, 250–251.

> 問：『敝邦論列宿各有所主之地，謂之分野，不知貴邦亦然否？』曰：『貴邦已盡分諸宿以主中國，則似他國無复可分者矣。其實萬國共戴一天，日月列宿，自東徂西，先照東邦，後照西土，繇西复轉東，原無停住。日月無私照，列星無私顧，何分彼此乎？分野之說，雖他邦亦有，以理論之，似乎自私其天，予未見其所據也。』

The new cosmographic knowledge introduced by missionaries was promptly echoed by a number of late Ming literati already discontented with the incoherence of *fenye*, most notably Xiong Mingyu (熊明遇, 1579–1649), Fang Yizhi (方以智, 1611–1671) and Jie Xuan (揭暄, 1613–1695) who formed between them a master-disciple network. Their arguments have been thoroughly studied.[23]

However, as we move away from these well-known literati to the more obscure authors of the *fenye* chapters in local gazetteers, the impact of Western learning seems far more complex. As stated earlier, after the introduction of Western learning, the number of gazetteers including a *fenye* chapter actually increased. And in fact, *fenye* forms the single most important gazetteer rubric under which information related to the Jesuits and Western learning can be found. Using the LoGaRT, 103 different gazetteers were located, from thirteen out of the fifteen provinces of China proper (except Gansu and Shaanxi) for the period up to 1820, which explicitly mentioned "Western methods" (*xifa* 西法), "Western system" (*xili* 西曆),[24] "Western Ocean" (*xiyang* 西洋), or the name of Matteo Ricci (Ch. Li Madou 利瑪竇, 1552-1610), the first Jesuit to reach Beijing and the initiator of Jesuits' scientific work in China.[25] The digitally-constructed dataset is certainly incomplete. For instance, it does not include the 1673 *Ningguo Prefecture Gazetteer* (*Ningguo fuzhi* 寧國府志, Anhui) with a *fenye* chapter by the mathematician Mei Wending (梅文鼎) which we will examine later, or the Kangxi era *Nanfeng County Gazetteer* (*Nanfeng xianzhi* 南豐縣志, Jiangxi), with a *fenye* chapter by the Christian literatus Liu Ning (劉凝).[26] Nevertheless, it does contain the source of some useful

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[23] Hsu, "Shiqi shiji chuan Hua xixue," 16–22; Qiu, *Tiandi zhijian,* 246–50.

[24] The word *li* (曆) can be rendered as "[astronomical] system" or "calendar" in different contexts. In this article, *li* is translated as "system," as it refers less to a calendar as a document than to a system with constants and algorithms that allow practitioners to perform calculations. On the translation of *li*, see Christopher Cullen, *The Foundations of Celestial Reckoning: Three Ancient Chinese Astronomical Systems* (New York: Routledge, 2016), 6-7.

[25] We used the search keyword Li Madou (利瑪竇) (and its variant 利馬竇) + *xifa* (西法) + *xili* (西曆) (and its variants西歷, 西曆, 西厤) + *xiyang* (西洋), in the section of *fenye* (分野) (and its variants 分埜 + 分墅) + *xingye* (星野) (and its variants星埜, 星墅) + *xingtu* (星土) for the period Shunzhi (順治) + Kangxi (康熙) + Yongzheng (雍正) + Qianlong (乾隆) + Jiaqing (嘉慶). The same search was done for the last half-century of the Ming dynasty (period Wanli 萬曆 + Tianqi 天啓 + Chongzhen 崇禎), but there was no hit.

[26] Catherine Jami, "La Carrière de Mei Wending (1633–1721) et le Statut des Sciences Mathématiques dans le Savoir Lettré," *Extrême-Orient Extrême-Occident* 36 (2013): 19–47, on 32; Chu Ping-yi 祝平一, "Liu Ning yu Liu Xun: Kaozhengxue yu tianxue guanxi xintan" 劉凝與劉壎：考證學與天學關係新探 [Liu Ning and Liu Xun: A New Research on the Relationship between Evidential Studies and

observations on the geographic distribution of Western learning, the social standing of such knowledge holders, and the variegated stances they took vis-à-vis such knowledge.

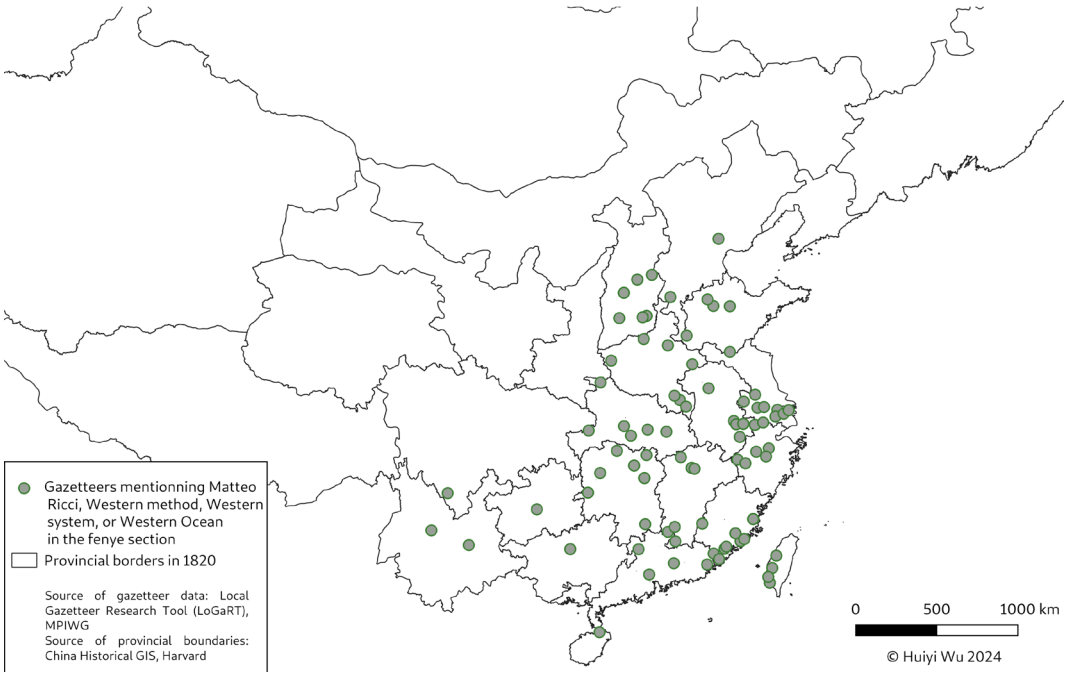

Figure 1: Geographical Distribution of Local Gazetteers with Western learning, 1660–1820.

The geographic distribution appears remarkably even and extensive. The province that tops the list, with both the largest number and largest percentage of gazetteers containing elements of Western learning, is Fujian. While Jiangsu ranks second on the list, it does not significantly outperform Hubei or Hunan, which enjoy a lesser visibility in the historiography of Western learning. Regions on the periphery of the empire such as Taiwan, Hainan, Guangxi, Guizhou and Yunnan all produced gazetteers with elements of Western learning. We will examine this geography of learning more closely later.

Heavenly Studies] *Xin Shixue* 新史學 [New History] 23, no. 1 (2012): 57-104, on 86.

Province (by descending order of percentage)	Gazetteers compiled	Gazetteers with WL	%
Fujian (+Taiwan)	90	18	20 %
Jiangsu (+Shanghai)	108	12	11 %
Anhui	91	9	10 %
Hubei	70	7	10 %
Hunan	104	9	9 %
Jiangxi	83	7	8 %
Shanxi	136	9	7 %
Zhejiang	128	7	6 %
Henan	152	8	5 %
Yunnan	66	3	5 %
Guizhou	20	1	5 %
Guangdong (+Hainan)	124	5	4 %
Shandong	133	5	4 %
Guangxi	36	1	3 %
Zhili (Hebei, Beijing, Tianjin)	179	2	1 %
Gansu	55	0	0 %
Shaanxi	128	0	0 %
Total	1703	103	6 %

Table 1. Percentage of Gazetteers with Western learning (WL), by Province.[27]

The data are also quite evenly spread across a chronological range of 160 years (1660–1820), with the number of relevant gazetteers per year peaking in 1796 (five gazetteers), and the number per decade peaking in the 1750s (eighteen gazetteers). The fluctuation does not seem significant in the context of the scale of the empire, with LoGaRT recording 1844 gazetteers in total over the same period. Interestingly, the data do not appear to align with the chronology of the top-down initiatives of empire-wide general gazetteers. The period between 1660–1820 saw the compilation of four editions of the *General Gazetteer of the Great Qing* (*Daqing yitong zhi* 大清一統志), with imperial edicts enjoining provincial governments to submit gazetteers in 1682, 1728, 1764 and 1811. Most gazetteers in our dataset seem to have been compiled following regional or local dynamics: initiative by enterprising officials to update gazetteers periodically, or more exceptionally, the suppression of a non-Han uprising that a new gazetteer would serve to celebrate, as was the case of the 1754 *Qingyuan Prefecture Gazetteer* (*Qingyuan fuzhi* 慶遠府志), which we will discuss later.

[27] The rounded percentages in the table were rounded in the table to ones so that they represent a meaningful precision. In the case of equality (for example, between Anhui and Hubei, both at 10%), a higher ranking was given to the province which produced a greater number of gazetteers with Western learning.

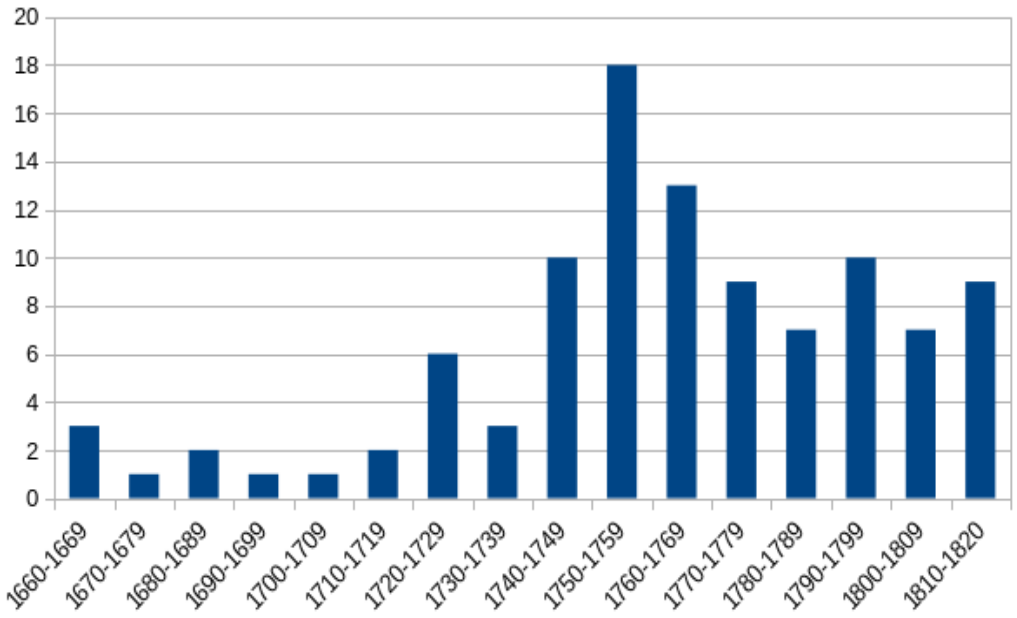

Figure 2: Temporal Evolution of Gazetteers with Western Learning in the *Fenye* Section.

Only in rare cases do we know the names of the authors of *fenye* chapters in local gazetteers. Apart from the handful of gazetteers which are known to have involved scholars versed in Western learning—the 1673 *Ningguo Prefecture Gazetteer* with Mei Wending, the 1702 *Shandong Provincial Gazetteer* (*Shandong tongzhi* 山東通志) with Xue Fengzuo (薛鳳祚, 1600–1680), and the Kangxi era *Nanfeng County Gazetteer* with Liu Ning—we only encountered two authors' names, both from the early decades of the Qing. The *fenye* chapter of the 1660 *Henan Provincial Gazetteer* (*Henan tongzhi* 河南通志) concludes with a discursive commentary signed "respectfully noted by Xiangui 獻圭謹識:" the editorial listed at the beginning of the gazetteer contains the name of a certain Tang Xiangui (唐獻圭), a Confucian student from Wujin, Jiangnan (江南常州府武進縣儒學生員).[28] The 1675 Fanchang County Gazetteer (*Fanchang xianzhi* 繁昌縣志, Anhui) has a *fenye*-and-omens chapter more conspicuously signed by Zhang Renfeng (章人鳳), who also signed five other chapters in the same gazetteer.[29] Similarly, he was listed in the editorial team as a tribute student by grace, and a county vice magistrate in waiting at the Ministry of Personnel (吏部候選縣丞恩貢生). This information is corroborated by the 1758 *Taiping Prefecture Gazetteer* (*Taiping fuzhi* 太平府志, Guangxi)—from where he likely hailed—specifying in one sentence that he had received the title in 1662.[30] The modest career

[28] *Henan tongzhi*, *juan* 4, 112–15, "修志姓氏," unnumbered *juan*. Unless otherwise indicated, all quotations from gazetteers, and any numbers following the *juan* number, are from LoGaRT.
[29] *Fanchang xianzhi*, *juan* 2.
[30] *Taiping fuzhi, juan* 21, 1088.

track of these authors, together with the general anonymity of the authors of the *fenye* chapters, coheres with what we know of the workforce in charge of editing local gazetteers. "Confucian school instructors, local people and yamen staff" working under resident administrators formed the backbone of the editorial personnel.[31]

While no top-down imperial command seems to have guided the gazetteers, the authors of the *fenye* chapters appear to agree on two fundamental points, lending a degree of coherence to the corpus. First, they spoke of Western learning either approvingly, as a contribution to the lore of astronomical knowledge available to literati, or matter-of-factly as the official system endorsed by the indisputable authority of the reigning dynasty (*guochao* 國朝). The 1660 *Henan Provincial Gazetteer* praised Qing astronomy as the acme of technical precision (*mi* 密) surpassing its Yuan and Ming predecessors, thanks to the adoption of "Western new method" (*xiyang xinfa* 西洋新法);[32] the same discourse, with the emphasis on progress towards greater precision, was repeated with remarkable consistency across gazetteers of different times and places, such as the 1727 *Chongming County Gazetteer* (*Chongming xianzhi* 崇明縣志, Southern Jiangsu),[33] the 1741 *Guizhou Provincial Gazetteer* (*Guizhou tongzhi* 貴州通志),[34] and the 1750 *Pizhou Subprefecture Gazetteer* (*Pizhou zhi* 邳州志, Northern Jiangsu).[35] The campaigns launched against Christianity and Western astronomy—the 1617 Nanjing persecution, the Calendar Case 1664–1669, and the 1724 prohibition of Christianity[36]—left no perceivable impact on *fenye* chapters.

The only explicitly negative comment on Western astronomy, which represents the exception to the rule, is the 1794 *Dangyang County Gazetteer* (*Dangyang xianzhi* 當陽縣志, Hubei). The author offered a twofold defence of *fenye* as a valid guiding principle, both against certain technical schemes he deemed untenable, and against the arguments for rejecting the entire *fenye* theory. The latter included

> [the Song dynasty scholar] Zheng Qiao 鄭樵 (1104–1162) [who] took the Indian theory [i.e., the Buddhist cosmology of four continents], according to which China only stands for the twelve countries under the jurisdiction of [the lodges of] Ox and Woman, and the field allocations abroad are not visible to China. Matteo Ricci [who] stated that the heavens are divided into nine spheres, with the Sun, the Moon and the Five Planets occupying one sphere each and the twenty-eight lodges occupying the second sphere; that the Earth was divided into five

[31] Joseph Dennis, *Writing, Publishing, and Reading Local Gazetteers in Imperial China, 1100–1700* (Cambridge, MA: Harvard University Asia Center, 2015), 132.
[32] *Henan tongzhi*, *juan* 4, 181:238.
[33] *Chongming xianzhi*, *juan* 2, 20:121.
[34] *Guizhou tongzhi*, *juan* 1, 7:54.
[35] *Pizhou zhi*, *juan* 1, 9:44.
[36] On these events, see Standaert, *Handbook*, 506-521.

> continents, on which China occupies one hundredth of the surface. This theory is ridiculous and unfathomable.
>
> 鄭樵取天竺説，華夏僅占牛女下十二國，而規外分埜華夏所不見；利瑪竇言天九重，日月五星各居一重，二十八宿在第二重，地五大洲，中國則五大洲中百分之一，其説又荒唐無所究竟旨。[37]

It is noteworthy that the author did not take issue with Ricci's status as a foreigner. He condemned Ricci on the same grounds he used to dismiss the arguments of earlier Chinese authors. The rest of the *fenye* authors in this study may have expressed some reservations about certain technical aspects of Western methods, but in general, once Western learning was officially adopted by the imperial authorities, it appears to have been widely recognised as an integral part of the Chinese astral science tradition.

Secondly, the authors of all these *fenye* chapters seem to share an awareness of the tension between, on one hand, the canonical status of *fenye* as a cosmographic framework and a standard gazetteer rubric, and on the other hand, the intractable lack of technical consensus amongst practitioners, particularly on a local level. This tension translated into different concrete problems for each locality. Authors picked out different aspects of Western learning to serve varying discursive functions, depending on their local standpoint and their individual inclination.

To deal with the heterogeneity of existing *fenye* schemes, authors typically employed the textual research techniques of the emerging *kaozheng* (考證) movement, collecting a wide range of historical documents and assessing their commonalities and divergences, usually without taking sides. An entry with new data based on the "Western system" or "Western methods," achieved with reformed methods and modified mathematical constants, usually appeared at the end of a list of data based on a long lineage of traditional methods, themselves highly heterogeneous, with no comment on their alien origin or cosmological implications. The novelty of Western methods therefore appeared either unimportant or underplayed, as it is simply incorporated into an open-ended repository of knowledge.

We may see this technique at work in the *fenye* chapter of the 1673 *Ningguo Prefecture Gazetteer*, written by Mei Wending, then a Confucian student at the prefectural school.[38] Mei started the chapter by observing that on the matter of *fenye* most textual authorities fall into two schools: one using twenty-eight lodges; and the other, twelve Jupiter stations. The prefecture of Ningguo, located in the ancient Kingdoms of Wu and Yue, was traditionally allocated to

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[37] *Dangyang xianzhi*, *juan* 1, 9:60.

[38] *Ningguo fuzhi* 寧國府志 (1673), repr. in *Zhongguo fangzhi congshu: Huazhong difang* 中國方志叢書: 華中地方 [Anthology of Chinese Gazetteers: East China] (Taipei, Chengwen chubanshe, 1985), 692:72.

either the lodges of Dipper (*dou* 斗), Ox (*niu* 牛), and Woman (*nü* 女), or the Jupiter station of Star Chronicle. However, this leads to a conflict. The total width of the three adjacent lodges of Dipper, Ox, and Woman exceeds 40 *du*, whereas a Jupiter station, defined by an equal twelvefold division of the heavens, was about 30 *du* wide.[39] Mei's twenty-page chapter then offers a series of tables that list the discordant opinions of relevant textual authorities on the correspondence between the Star Chronicle and the lodges of Dipper, Ox and Woman, followed by his own short commentary.[40]

For example, in the *Table of the Equatorial Extension of the Star Chronicle* (*xingji jidu biao* 星紀距度表, Figure 3, transcribed in Table 2), all pre-Qing texts agree that the Star Chronicle falls between the Dipper, the Ox, and the Woman, but they diverge widely regarding the precise starting point (variously situated between 12 *du* and 1 *du* of the lodge Dipper) and ending point (between 5 *du* of the Ox and 7 *du* of the Woman). The "Western calendar" displaced the start of the Star Chronicle to between the lodges of Winnower (the lodge preceding the Dipper) and Ox. Yet for Mei, the pre-Jesuit data was already so divergent that the novelty of using the Western methods did not stand out as singular. In his comment, Mei assessed all twelve authorities and their divergences on technical grounds, first emphasizing the "dramatic" divergence between two ancient systems and the consequences thereof on the *fenye* scheme:

> Hereinabove are twelve diverging authorities on the equatorial extension of Star Chronicle. If we follow the ancient system [i.e. the Triple Concordance System, 7 CE] which places the start of Star Chronicle at 12 *du* of Dipper, the defining star of Dipper [which marks the start of the lodge] would entirely fall into the field of the Kingdom of Yan, which is governed by the Jupiter station of Split Wood. If we follow the Orthodox Glory System (522 CE), according to which it starts at 1 *du* of Dipper and ends at 5 *du* Ox, then the part of Ox from 6 *du* onward, plus the entirety of the Woman, will fall into the field of the Kingdom of Qi. This is how dramatically different they are.
>
> 以上言星紀之度，不同者凡十二家，依古曆起斗十二度，則斗建星全入燕分爲析木之津。若正光曆起斗一度畢牛五度，則牛六度爲齊分而女宿全入齊，其相懸若此。

He then went on to point out another discontinuity underlying the discordant data within the Chinese tradition, that is, the knowledge of the precession of the equinoxes (referred to as *suicha* 歲差, annual difference)— the slow 26,000 year cycle of precession of the Earth's axis about perpendicular to the plane of its orbit round the Sun, which leads to a steady shifting of the observed position of the Sun at the solstices and equinoxes against the background of the fixed stars. Mei explained that Chinese calendrical systems had only began to take the precession of the equinoxes into account during the Tang dynasty (618-907 CE). This had led

[39] *Ningguo fuzhi*, 173.
[40] *Ningguo fuzhi*, 173–93.

to a decoupling between the 12 Jupiter stations and the 24 *qi* defined by the motion of the Sun.[41] The "Western system" was then described as introducing just one more change within this lineage of calendrical reforms that tackled the problem of precession:

> In addition, before the *Chimera Virtue System* (665 CE) of Li Chunfeng, the notion of precession of equinoxes was not applied. Therefore, all posited the start of Star Chronicle according to the motion of the Sun on the day of the [nodal *qi* of] Great Snow. Since the *Great Expansion System* (727 CE) dissociated the movement of the heavens with the motion of the Sun, the *Season Granting System* (1281 CE) redefined the start of the Star Chronicle to several days after the Winter Solstice. Today, the Western system defines the passage from one palace to another by a medial *qi*, and the motion of the Sun into Star Chronicle as Winter Solstice.[42] Thus the precession not only occurs at the solstices, but every year and to all the twelve Jupiter stations. This is entirely different from the ancient method.
>
> 又李淳風麟德曆以前不用歲差，故皆以大雪日躔爲星紀之初。大衍曆分天自爲天歲自爲歲，故授時歷以冬至後數日始躔星紀。而今西曆以中氣過宮，日躔星紀爲冬至，是不惟南北至有歲差，即十二次歲歲有差，全非古法矣。[43]

Western cosmology, or the challenge it posed to the *fenye* system, was never evoked. The novelty of Western methods was treated the same way as Mei treated the disagreement between two ancient systems. As Mei puts it at the start of the chapter, the aim of his work is to "preserve [diverging views] on an equal footing to await further investigation" (並存待考).[44] While few *fenye* gazetteer authors of the Qing period can match Mei in terms of scholarly rigor or mathematical insight, the form and content of his presentation is not uncommon. An erudite collation of conflicting claims on the subject of *fenye* is offered, including the new Western contributions, which recognises

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[41] Traditional Chinese calendar includes twenty-four seasonal markers, or solar terms, called the twenty-four *qi* (氣) (twelve "medial *qi*" *zhongqi* 中氣 alternated with twelve "nodal *qi*" *jieqi* 節氣). They are obtained by an equal division of the tropical year. The two equinoxes and two solstices are all medial *qi,* and the Great Snow is the nodal *qi* immediately preceding winter solstice. See Christopher Cullen, *Heavenly Numbers: Astronomy and Authority in Early Imperial China* (Oxford: Oxford University Press, 2017), 66–68.

[42] The late Ming calendrical reform that included the Jesuits' contribution adopted the elliptic coordinate system of European astronomy based on the twelve zodiac signs. In their translation, the zodiac signs, called "Palace" (*gong* 宮), were given the names of the twelve Jupiter stations. Therefore, "palace" and "Jupiter station" (*ci* 次) were used interchangeably. Each corresponded to an even twelvefold division of the elliptic, with the actual motion of the Sun on the winter solstice as the start of the Star Chronicle. The twenty-four *qi* were aligned with the twelve "palaces," with each medial *qi* corresponding to the passage from one palace to another (中氣過宮), and each nodal *qi* to the middle of a palace. See Wang Guangchao 王廣超, "Ming Qing richan shi'er gong (*ci*) jisuan zhi zhuanbian" 明清日躔十二宮(次)計算之轉變 [The Changes of the Calculation of the Sun's Motion Through the Twelve Palaces (Jupiter stations) During the Ming-Qing Period], *Wakumon* 或問 31, no. 37 (2020): 31–40.

[43] *Ningguo fuzhi,* 178-9.

[44] *Ningguo fuzhi*, 174.

both their historical authority and ambiguity, but no judgement or pronouncement is made.

Hanshu 漢書 (Book of Han): *santongli* 三統歷 (Triple Concordance System, 7CE)	Dipper 20 *du* – Woman 7 *du*
Fei Zhi 費直 (fl. Western Han dynasty): *Shuo Zhouyi* 說周易 (On the Classics of Change)	Dipper 10 *du* - Woman 5 *du*
Cai Yong蔡邕 (132-192 CE): *Yueling zhangju* 月令章句 (Commentary on the *Monthly Ordinances*)	Dipper 6 *du* - Woman 5 *du*
Weishu 魏書 (Book of Wei): *zhengguangli* 正光歷 (Orthodox Glory System, 522 CE)	Dipper 1 *du* – Ox 5 *du*
Yixing 一行: *dayanli* 大衍歷 (*Great Expansion System*, 727 CE)	Dipper 9 *du* 1042 *miao* 12 *tai* – Woman 4 *du*
Songshi 宋史 (History of the Song): *guantianli* 觀天歷 (Contemplation of Heaven System, 1094CE)	Dipper 9 *du* – Woman 6 *du*
Nan Song 南宋 (Southern Song dynasty): *tongtianli* 統天曆 (Concord with Heaven System, 1199 CE)	Dipper 4 *du* 35 *fen* 92 *miao* – Woman 2 *du* 95 *fen* 07 *miao*
Jin lizhi 金歷志 (Treatise of the Astronomical System of the *History of the Jin*)	Dipper 4 *du* 46 *fen* 62 *miao* – Woman 3 *du* 91 *fen* 91 *miao*
Yuanshi 元史 (History of the Yuan): *shoushili* 授時曆 (Season Granting System, 1281 CE)	Dipper 2 *du* – Woman 1 *du*
Ming 明 (Ming Dynasty): *Tianwen qinglei fenyeshu*天文清類分野書 (*Book of the Heavenly Inscriptions and the Clear Categories of Fenye*)	Dipper 3 *du* – Woman 1 *du*
Xili 西曆 (Western system)[45]	Winnower 3 *du* -Ox 1 *du*

Table 2. Equatorial Extension of Star Chronicle according to different textual authorities, as presented in Mei Wending's chapter in *Ningguo fuzhi* (1673).[46]

[45] In smaller font, Mei notes that by "Western system," he refers to "[work of] Li Zhizao, year Jia-Chen of the Emperor Wanli" (萬曆甲辰李之藻), that is, the *Illustrated Explanation of the Sphere and the Astrolabe* (*Hungai tongxian tushuo* 渾蓋通憲圖說, 1607), a partial translation of Christophorus Clavius's *Astrolabium* by Matteo Ricci and the convert literatus Li Zhizao (1565–1630). This paper follows the translation of *Hungai tongxian tushuo* in Jami, *Emperor's New Mathematics*, 25. On Mei Wending's source, see Jami, "La Carrière de Mei Wending," 28; Zhu Haohao, "The 'Intermediary Status' of *Fenye* 分野 in Local Gazetteers: Study on Mei Wending's 梅文鼎 *Ningguo fuzhi xingye* 宁国府志 • 星野 in early Qing China" (paper presentation, "Empire under the Night Sky: The Role of *Fenye* (Astrological Contents) in Late Imperial China Workshop, Max Planck Institute for History of Science, Berlin, May 25-26, 2023) (paper under review).

[46] This paper follows the translation of astronomical systems given by Nathan Sivin, *Granting the Seasons:*

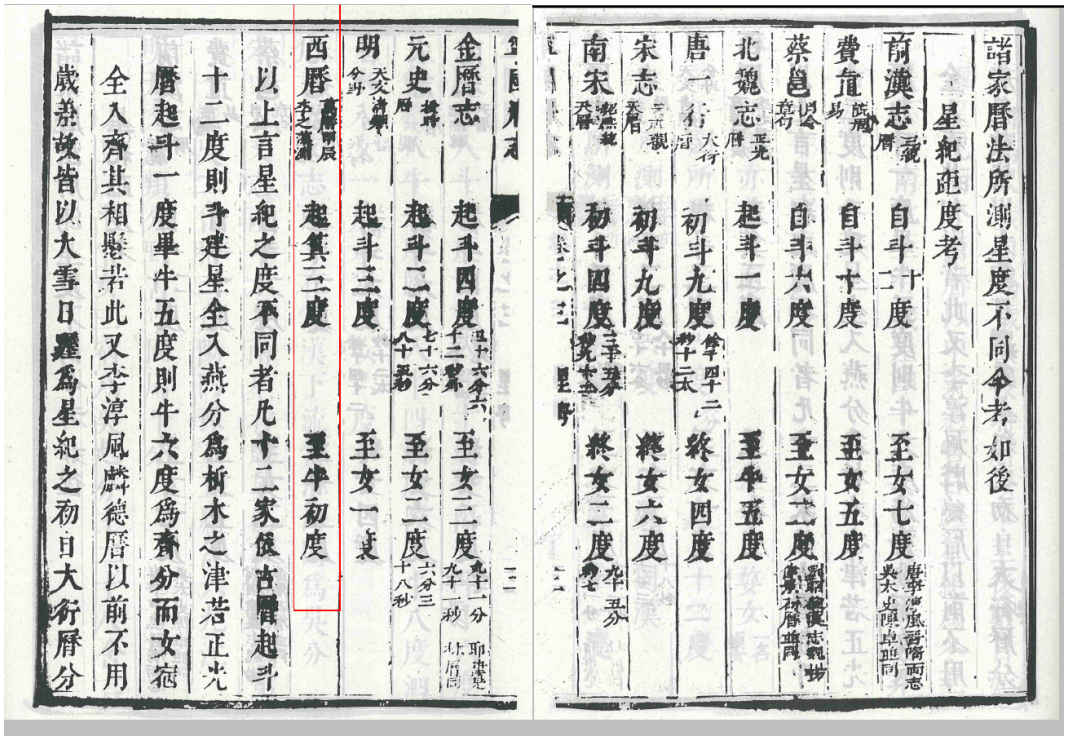

Figure 3. Equatorial Extension of Star Chronicle into the lodges according to different textual authorities, in Mei Wending's *fenye* chapter in *Ningguo fuzhi*.

The 1660 *Henan Provincial Gazetteer* similarly spent a dozen pages exhaustively enumerating different historical authorities, highlighting their convergences and disagreements. Yet the concluding note signed by the Confucian student Tang Xiangui posited the novelty of Western methods within a set of local *fenye* problems that Mei Wending in Anhui did not face: hence his expression of a stronger and more locally specific opinion. Situated in the Central Plain, Henan Province, as several prefaces of the gazetteer proudly stated, was the centre of the world according to the canonical *Tribute of Yu* (*Yugong* 禹貢); ten out of the twenty-eight lodges were allotted to localities inside this province alone, while lands stretching over thousands of *li* to the north and south had to share only one or two lodges.[47] This centrality, however, appeared to be both a blessing and a curse for *fenye* practitioners. The concentration of lodges makes Henan unusually sensitive to calendrical changes. As Mei Wending had also observed, the new Western system significantly redefined the Jupiter stations and their relationship to the 24 *qi*

The Chinese Astronomical Reform of 1280, with a Study of its Many Dimensions and a Translation of its Records (New York: Springer, 2008), 375-85.

[47] Preface to *Henan tongzhi*, 2:68. The preface was signed by Li Mu [?], from Shangqiu (Henan), the Expositor-in-Waiting of the Hanlin Hongwen Academy (翰林弘文院侍講，商丘李目 □。).

of the year. However, the disruption this caused to the *fenye* in Henan was far more dramatic than in Ningguo. According to Tang,

> the lodge Roof [*wei* 危] only reaches [the chronogram of] *hai* (亥)[48] at 13 *du*; the latter corresponds to the lodges of House [*shi* 室] and Wall *bi* 壁, and to the field division of [the ancient state of] Wei 衛 or [the Han Province of] Bingzhou [并州]. And according to the methods of the [older] Season Granting [System], the Sun only reaches the field division of Wei five days after the solar term of Rain Water [*yushui* 雨水]. However, according to today's Western methods, the Sun should have already reached *hai* on the day of Rain Water. At that time, it only extends 8 *du* into the lodge of Roof, which corresponds to the field division of Qingzhou [青州, or state of Qi 齊, in Shandong]. In the event that a solar or lunar eclipse or a planetary conjunction occurs during these five days, should it be attributed to the land of Wei, or the land of Qi?[49]
>
> 但以中州論之，危十三度始入亥官，其星室壁，衛分，并州，授時法，雨水後五日，太陽始過衛分。今西洋法，雨水日卽過亥宮。是太陽尚在危八度，固青州分也。設此五日之內，有日月之薄蝕，五星之淩犯，將屬之衛乎？抑屬之齊乎？

He went on to enumerate similar problems posed by the realignment between the Jupiter stations and the solar terms, and the ways these problems would be amplified as time goes by.[50] In the end, he fell back on a posture of intellectual modesty: "we enumerate the diverging discourses, while awaiting a more enlightened solution by later generations."[51] For a serious practitioner of *fenye*, the new Western method was at once an imperial authority to reckon with, and a disruptive force for the specific region he was based in.

The 1675 *Fanchang County Gazetteer*, with a *fenye* chapter signed by Zhang Renfeng, the county magistrate in waiting, seems to proceed from yet another stance vis-à-vis the *fenye* theory itself. After dutifully enumerating the relevant passages from seven major dynastic histories,[52] the chapter continued with seven pages of "auspicious and inauspicious omens" (*xiangyi* 祥

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[48] In traditional Chinese astronomy, there is a fixed correspondence between the 12 Jupiter stations and the 12 chronograms (*chen* 辰). The chronogram of *hai* corresponds to the Jupiter station of Loggerhead Turtle (*Juzi* 娵訾), and to the lodges of House and Wall. See Schafer, *Pacing the Void*, 5.

[49] *Henan tongzhi*, *juan* 4, 181:238–89.

[50] *Henan tongzhi*, *juan* 4, 181:239: "Yet [we are speaking here only of a discrepancy of] five days. Once we move into the Jupiter station of Quail Fire, there will be a discrepancy of nine days. Moving further ahead into [the stations of] Longevity Star and Great Fire, there will be a discrepancy of twelve days. And this is not the end of the issue. The motion of the Sun is subject to the precession of the equinoxes every year. A few hundred years later, [the chronogram of] *hai* will be supplanted by that of *zi*, *wu* by the *wei,* and so forth, until all twelve chronograms lose their original position." (然此不過五日耳。進而鶉火，則差九日，更進。而壽星大火則差十二日，又不獨此也。太陽之行，歲歲有差，更數百年則亥官皆子度，午官皆未度，辰卯漸移，亦復如之，十二辰盡失其故。)

[51] *Henan tongzhi*, *juan* 4, 181:238–89 (故論列于此，以俟高明者再訂焉).

[52] *Fanchang xianzhi*, *juan* 2, 10:112–18.

異), mostly historical events happening in the aftermath of astral anomalies in the region of the third star of Southern Dipper, under which the county should be placed according to the *Book of Jin*. Intriguingly, the list ends with two very recent natural disasters under the Qing rule—a devastating flood in 1656, and a great drought in 1671—without citing related astral anomalies.[53]

The note at the end of the chapter seems to be an attempt to justify the editorial choice with a humanist discourse that emphasises good governance over prognostication. It opens with two Ming authors' arguments against *fenye*. The academician Gao Gong (高拱, 1513–1578) criticised the "rigidity" (*ju* 拘) of Han dynasty Confucian Zheng Xuan's (鄭玄, 127–200) *fenye* scheme, which too neatly "attached the twelve ancient states to the twelve Jupiter stations."[54] The author Wang Shizhen (王世貞, 1526–1590) wholly rejected *fenye* as irrational and inconsistent with the geographic and demographic configuration of China, in particular the wealthy lower Yangzi regions, which by the sixteenth century had largely outgrown the marginal place they had in traditional *fenye* system.[55] The two Ming author's arguments are followed by a reference to Matteo Ricci, who disqualified certain celestial phenomena as omens:

> Matteo Ricci further said: the Sun, the Moon, the Five Planets and the asterisms all have a constant position, while the motions of Sun and Moon, the conjunctions and the eclipses all have constant measurements. What is fixed cannot cause calamity, as calamities only come from what is inconstant. When a dense and sharp upsurge of earthly air exceeds its original sphere to reach the fiery region, its flames will congeal and be preserved as a comet. Its fuzziness can be as long as a tail or as short as a moustache. Its colour may be silvery, bloody, or smoky, depending on the quality of the air that made it.
>
> 利瑪竇又云，七政列宿有常位，[躔]離交食有常度，夫定者非能爲災，惟不定乃爲災。若地氣濃銳冲騰，踰域直臻火疆，凝熘而存，是為彗星，芒長似尾，短似鬚，銀色血色烟色者各如其氣之質也。[56]

In other words, astronomical phenomena such as eclipses and conjunctions only count as omens when they diverge from prediction; comets are natural atmospheric phenomena rather than astral anomalies, resulting from the upsurge of "earthly air" to the "fiery region." This was a correct paraphrasing of the Aristotelian theory of comets as presented in Ricci's *The Structure of Heaven and Earth* (*Qiankun tiyi* 乾坤體義, 1605).[57] Zhang Renfeng, who recommended an

[53] *Fanchang xianzhi* (1675), *juan* 2, 10:120.
[54] *Fanchang xianzhi* (1675), *juan* 2, 10:120.
[55] Ibid., 10:121.
[56] Ibid. On the implicit challenges Ricci posed to the *fenye* theory and its underlying cosmology, see Hsu, "Shiqi shiji chuan Hua xixue," 10.
[57] Matteo Ricci, *Qiankun tiyi*, *shangjuan*, 12a/13a. Bibliothèque Nationale de France, https://gallica.bnf.fr/ark:/12148/btv1b90062834.image#

agnostic attitude towards prognostication, follows with the conclusion that human actions can divert the course of good or evil happenings that have been foretold by omens:

> Perhaps astral anomalies cited by various *fenye* authors were not reliable? … Confucius [in his historical works] only recorded the calamities and anomalies without the corresponding event, that is because it is was not known whether or not an event is the fulfilling of an omen or not. It is said that "evil spirits do not prevail over virtue."[58] Therefore there are cases in which mistakes were repaired by good words, an auspicious mulberry tree withered to death, or an ill-boding star moved away from its ominous course.[59]
>
> 諸說則分野所現星變，舉不足憑乎？……孔子紀災異而不著其事應，蓋驗不驗未可知之辭也。語云，妖不勝德，故有善言補過，而祥桑枯死，災星徙度者矣。

Thus Ricci's name and thoughts, representing new cosmological knowledge and ideas, are recruited by Zhang Renfeng to debunk the importance of *fenye,* in continuation with a century-long tradition of Confucian anti-*fenye* criticism.

The *Fanchang County Gazetteer* is not the only case of an author who invoked Western cosmology to buttress his discontent with the current *fenye* scheme. Interestingly, a greater number of gazetteers with similar chapters can be found in the empire's borderland. This was, however, a rather different kind of discontent to that of authors discussed up to now. Instead of a general dismissal of the *fenye* theory and the practice of astrological prognostication, these gazetteer chapters were specifically dissatisfied with the peripheral place to which the traditional scheme had relegated their localities, and invoked the Jesuit's name and Western cosmographic ideas to advocate a reformed and fairer way of practicing *fenye*.

This can be seen in the 1717 *Zhuluo County Gazetteer* (*Zhuluo xianzhi* 諸羅縣志) in Taiwan, the first gazetteer compiled after the Qing seizure of the rebel island in 1683, and in several gazetteers in Guangxi, Yunnan, and Guizhou. These regions were either newly conquered or recently brought under the governance of the centrally-controlled civil bureaucracy. All contained large proportions of non-Han population. Compiling a gazetteer for these regions, as Joseph Dennis reminds us, is an act of cultural politics that "marks a locale's membership in the civilised Chinese world."[60] The tension inherent in such an undertaking is perhaps nowhere stronger than in the *fenye* section: the section is as important to the gazetteer genre as the Sinocentrism of the *fenye* scheme is inhospitable to these peripheral localities. This is where the European elements in Qing imperial astronomy came in handy for gazetteer writers in peripheral regions.

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[58] This is an aphorism from the *Shiji* by Sima Qian (145–86? BCE).
[59] *Fanchang xianzhi* (1675), *juan* 2, 10:121.
[60] Dennis, *Writing, Publishing, and Reading*, 52.

One particularly striking example is the 1754 *Qingyuan Prefecture Gazetteer* (*Qingyuan fuzhi* 慶遠府志, Guangxi). The gazetteer was compiled in the aftermath of an indigenous uprising in 1741.[61] Its preface described the region as "situated on the remote borderland, populated by a mixture of Yao and Zhuang people" (地處邊徼，猺獞雜處) who were "not of our kind, not submitting as subjects, and not presenting tributary gifts" (非我族類，不臣其人，不納其贄).[62] An earlier and now-lost edition of the gazetteer seems to have allotted Qingyuan to the "Seven Stars of the Throat, an asterism of the Barbarians" (七星員官，蠻夷星也).[63] The writer of the *fenye* chapter in the 1754 edition protested that this was unacceptable. He contended that Qingyuan should instead be placed under the lodges of Wing (*yi* 翼) and Axletree (*zhen* 軫), asterisms governing the ancient Kingdom of Chu (centred in the region known today as Hubei-Hunan).

He justified his position with the new European notion of the terrestrial globe on which, unlike the traditional Chinese conception of a flat Earth, no absolute centre can be found and no particular spot can claim a privileged relation with the Heavens:

> The Heavens surround the earth from outside as impartially as the white of an egg enveloping its yolk…[64] The two Treatises in the *Book of Jin* [i.e., *Treatise on Astronomy* and *Treatise on Geography* with prescriptions on *fenye*] established correspondence only [between the heavenly regions and] the fiefs and prefectures within the inner part of China, sparing nothing for the [faraway lands both inside and outside of the empire] south to the Meiling Mountains, north to the Gobi Desert, in Magellanica[65] and in Europe.[66]
>
> 夫天包於外，如卵白裹黃，無私覆也……二晉志止配內地郡國……而嶺南、漠北、墨瓦[臘泥加]、歐羅[巴]之域，槩無與焉。

[61] *Qing Gaozong shilu* 清高宗實錄 [Veritable records of the Qianlong emperor], 26 June 1741 (清高宗六年五月丁丑), https://www.zhonghuadiancang.com/lishizhuanji/daqinggaozongchunhuangdishilu/97123.html.

[62] Preface to *Qingyuan fuzhi*, 3:41, 3:43.

[63] *Qingyuan fuzhi, juan* 1, 12:135. This allocation can be found in the *Treatise on Astronomy of the Book of Jin* (青丘七星，在軫東南，蠻夷之國號也.) For the various schemes of field allocation regarding the Barbarian people, see Qiu, *Tiandi zhijian*, 59–62.

[64] The "egg" metaphor was originally advanced by the astronomer Zhang Heng 張衡 (78–139 CE) to indicate the centrality of the (flat) Earth in the Cosmos. Its reinterpretation since the sixteenth century by Jesuits and their Chinese interlocutors to endorse the notion of the spherical Earth constitutes a complex case of cultural translation. By the eighteenth century, the new interpretation has been generally accepted in learned circles in China. See Zhang Qiong, *Making the New World Their Own*, 57–64.

[65] Magellanica (Ch. *Mowalanijia* 墨瓦臘泥加) was the hypothetical landmass which European cosmographers from Antiquity to the early modern period posited in the south polar region, with the assumption that the continental landmasses of the Northern hemisphere should be balanced by lands in the Southern hemisphere. On the introduction of the concept of Magellanica in China, see Zhang, *Making the New World*, 159, 305ff.

[66] *Qingyuan fuzhi*, *juan* 1, 12:136.

The traditional *fenye* scheme was fundamentally limited. Nevertheless, instead of rejecting the system altogether, the author advocated for its extension in light of the grandeur of the global Earth:

> Contemplate the map [of the imperial territory]: it starts from Korea in the East and reaches the Jiayu Pass in the West, bordered by the sea in the South and connects with the desert in the North. It only covers 10,000 *li*. According to [ ] [ ]-jiang[67]: as one degree on the spherical Earth equals 250 *li*, one knows that the Earth, with 360 degrees, is 90,000 *li* in circumference. Therefore, even [foreign lands] beyond the 10,000 *li* should be in the *fenye* system, let alone Qingyuan, which is still within the 10,000 *li*?[68]
>
> 且度輿圖，東起朝鮮，西至嘉峪，南濱海，北連沙漠，不過萬餘里止耳。□□江云：地球既每度二百五十里，則知三百六十度為地一周九萬里，是萬里之外皆可以分野。况慶遠尚在萬里內乎？

By de-centring the position of China in the world and introducing the newfound continents farther away, European cosmography allowed gazetteer writers to relativise the hierarchy between the centre and periphery within the empire, thus serving the astrological interests of peripheral localities.[69]

The sources we accessed do not offer any insights to the backstage of the editorial processes in the gazetteers examined in this article. It is difficult to offer a fine-grained reconstruction of the undergirding political, social and intellectual stakes that necessarily varied not only from one place to another, but also between gazetteers at the provincial, prefecture and county levels. However, in order to achieve a more nuanced understanding of Western learning in China, it is important to appreciate the sheer diversity of the published discourses. While all saw the new Western knowledge in terms of its disagreement with traditional views, the four texts considered in this section offer contrasting approaches to that disagreement: an erudite neutrality that saw the impartial collecting and preserving of all conflicting knowledge as an end in itself; an expression of the unease caused by the disruptive force of the confrontation of the new and traditional methods; or *a priori* discontent with tradition, either with regards to its theoretical validity or its local practicality, that was given fresh impetus by the new knowledge. The diversity of these approaches was informed by both the personal inclination of each author and the specific position of each locale within the empire and its cosmographic vision. The

[67] The name of the quoted author is illegible apart from the last character. I have not been able to identify him.

[68] *Qingyuan fuzhi*, *juan* 1, 12:136.

[69] Daniel Patrick Morgan has provided an analysis of the astronomical data in the *Qingyuan Prefecture Gazetteer*. Daniel P. Morgan, "Popular science: Astronomical Data in Chinese Local Gazetteers using LOGART" (paper presented at the workshop "Empire under the Night Sky: The Role of *Fenye* (Astrological Contents) in Late Imperial China," May 25–26, 2023, MPIWG), paper under review.

story of Western learning was not merely one of a clash between Europe and China, but of complex interactions between global, imperial, and local scales.

Webs of citations and geography of learning

The broad spatial and temporal range of gazetteers with elements of Western learning raises the question of the sources authors relied on for their knowledge. To what extent did knowledge circulate through personal acquaintance with missionaries, or was it transmitted textually? If the latter, which texts were the most instrumental in this circulation?

It appears that direct encounter with missionaries mattered little. In fact, there is a striking discrepancy between the geography of the gazetteers that cite the Jesuits and the latter's known itineraries. Matteo Ricci is a case in point: while there is no mention of him in any of the eight cities he dwelt in, except Beijing, his name appears in the gazetteers of no less than sixty-eight locales where he never set foot, most significantly in the *fenye* chapters (Figure 4). Neither is there any observable overlap between this geography of learning and the Catholic communities in China. The regions where Catholicism found a foothold among the local population, such as Southern Shanxi and Eastern Fujian, show no greater inclination to engage with Western learning in the *fenye* chapters of their gazetteers. Those who did so utilised the same type of secular sources as their counterparts in regions without Catholic presence—such as the 1770 *Lu'an Prefecture Gazetteer* (*Lu'an fuzhi* 潞安府志, Shanxi) where Catholicism had an enduring presence since the late Ming:[70] Its *fenye* chapter credited the *Shanxi Provincial Gazetteer* for knowledge about Jesuit-mediated European cosmology. This confirms what scholars have widely noted: after the Ming-Qing transition, Western science and Catholic faith increasingly parted ways, to follow distinct routes of transmission both geographically and socially.

[70] On Catholicism in Lu'an, see Henrietta Harrison, *The Perils of Interpreting: The Extraordinary Lives of Two Translators Between Qing China and the British Empire* (New Haven: Princeton University Press, 2021), 143–46.

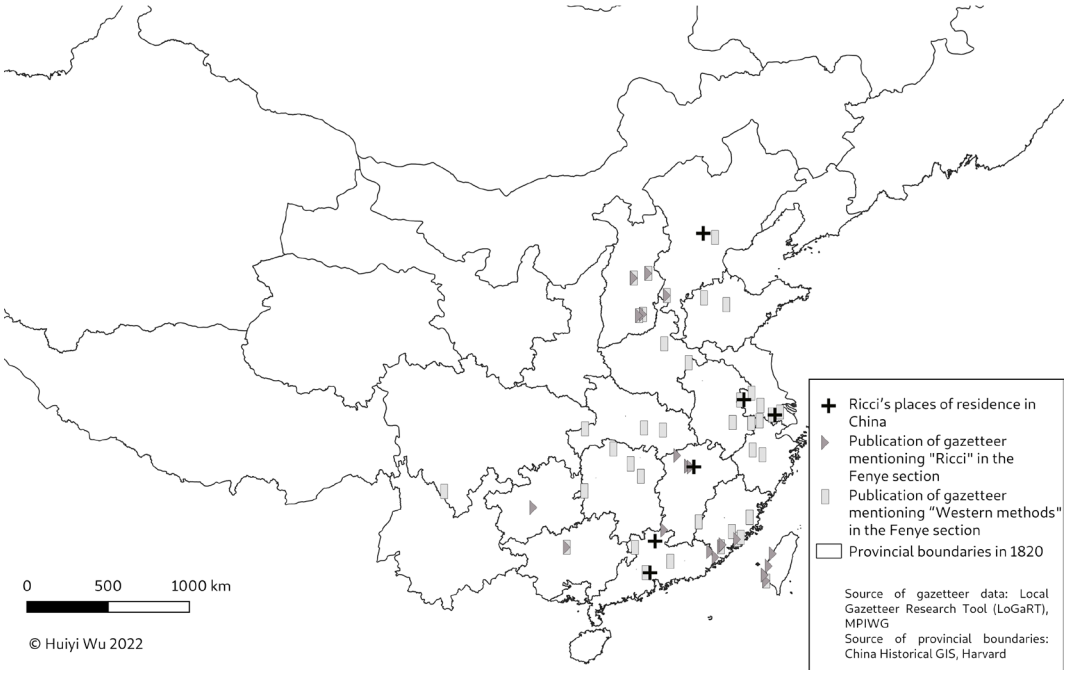

Figure 4: Geographic distribution of gazetteers citing Matteo Ricci and Western method, compared to Ricci's actual whereabout in China.

Meanwhile, in the gazetteers that did record Jesuits' presence and their intellectual interaction with local literati in other sections, there is not necessarily any reference to Western learning in the *fenye* section. For example, the 1651 *Xiangfu County Gazetteer* (*Xiangfu xianzhi* 祥符縣志, Henan) in the "Sojourner" (*youyu* 遊寓) section included a mini-biography of Francesco Sambiasi (Ch. Bi Fangji 畢方濟, 1582–1649), who was described as "possessing extraordinary skills and versed in astronomical and numerological arts" (有異術，兼通曆數),[71] and the 1719 *Nanping County Gazetteer* (*Nanping xianzhi* 南平縣志, Fujian) in its "Temples and Shrines" (*siguan* 寺觀) section took note of a Catholic church, where "the Western scholar Simao da Cunha [Ch. Qu Ximan 瞿西滿, 1589–1660] preached his religion and made observations."[72] In the 1717 *Chenggu County Gazetteer* (*Chenggu xianzhi* 城固縣志 Shaanxi), the local magistrate and editor Wang Mu (王穆), inserted in the poetry (*shige* 詩歌) section a long poem that he himself wrote to the resident Jesuit Gabriel Baborier (Ch. Bu Jia 卜嘉 1663–1727), recording their conversation about the wonders of the world overseas—the fantastic animals of Africa, the colossus of Rhodes, and the newfound continent of America

[71] *Xiangfu xianzhi*, *juan* 5, 58:552.
[72] *Nanping xianzhi*, *juan* 8, 35:255 (西土瞿西滿設教測候).

(*Yamolijia* 亞墨利加) and the hypothetical Southern landmass of Magellanica.[73] None of these gazetteers include any reference to Western learning in the *fenye* section. The geographical distribution of Western learning in the gazetteer *fenye* sections does not coincide with the geography of missionary presence in China, and the *fenye* sections seem to have their own sources of Western knowledge that they did not necessarily share with other sections in their gazetteer.

The *fenye* sections we have surveyed all attribute their knowledge of Western learning to a rather limited range of textual sources. The most frequently cited source was the *Treatise on Astronomy of the Dynastic History of the Ming* (*Mingshi tianwenzhi* 明史天文志), promulgated in 1739 (eighteen explicit citations). In addition to investing Western astronomy with imperial authority, it offered gazetteer authors: a standard narrative about the historical origin of Western astronomy in China; the geodesic surveys carried out by Westerners; concepts of the spherical Earth, latitude and longitude, precession of the equinoxes; not to mention guidelines on *fenye* for each province. To a lesser extent, the *Timely Modelling System* (時憲曆, fourteen explicit citations) also served as an authoritative source of statements about Western astronomy.

Few private authors were explicitly cited in the *fenye* chapters. One of the rare cases is *Comprehensive Refined-ness* (*Tongya* 通雅) by Fang Yizhi (方以智, five citations), which famously rejects *fenye* theory based on European cosmological knowledge introduced by Ricci, particularly the knowledge of stars of the Southern celestial hemisphere invisible in China.[74] The aforementioned 1675 *Fanchang County Gazetteer* could have drawn the knowledge about Aristotelian theory of comets directly from Ricci's *Explication of the Structure of Heaven and Earth*, which was not available through imperial scholarship at that time. The 1754 *Qingyuan Prefecture Gazetteer* editors had access to a wider range of possible sources of knowledge about the hypothetical austral landmass of Magellanica, including Ricci and other missionaries' world maps and geographical treatises, but also the imperial Compendium *The Complete Collection of Ancient and Modern Illustrations and Texts* (*Gujin tushu jicheng* 古今圖書集成). Western learning travelled across the empire, although we are not sure of the intermediaries that carried the knowledge to each gazetteer author.

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[73] *Chenggu xianzhi*, *juan* 8, 64:342–45.

[74] *Xijiang zhi* 西江志 (1720), *juan* 1, 39:48: "*Comprehensive Refined-ness* said: [The scheme of] astral-territorial *fenye* was defined with the greatest detail in the Treatises of the Dynastic histories of the Sui and Tang. Yet since the completion of the [celestial] maps according to the Western methods, the theory of the Two Boundaries [by the Tang astronomer Yixing] becomes ridiculous. Matteo Ricci made two maps, one for the stars commonly visible in China and the other for the stars unseen in China... They truly can settle doubts that have lingered since antiquity." (通雅云，星土分野，隋唐之志爲詳，然自西法圖成，則兩戒之說荒唐矣。利瑪竇爲兩圖，一載中國嘗見之星，一載中國所未見者……真可決從古之疑。).

This begs the question of whether we can detect any regional patterns of circulation. Do gazetteers from neighbouring regions share similar features, or cite the same sources? Can we speak of local or regional knowledge, regarding Western learning in China?

We can answer the question with a measured affirmative, by looking at the way gazetteers cited knowledge about Western learning from other gazetteers at a higher regional level or from neighbouring localities. For instance, the 1803 *Shangcheng County Gazetteer* (*Shangcheng xianzhi* 商城縣志, Henan) referred to the *Henan Provincial Gazetteer* for the notion of the precession of equinoxes, in order to justify its modification of the field division of the locale over time.[75] The 1796 *Shimen County Gazetteer* (*Shimen xianzhi* 石門縣志, Jiaxing 嘉興 prefecture, Zhejiang) cited a plethora of gazetteers, from the earliest 1288 Gazetteer of Jiahe (*Jiahe zhi*嘉禾志) of the Jiaxing Circuit during the Yuan dynasty to the Ming general gazetteer for recommendations on the field allocation of the local region. The author also evoked the notion of precession, playing down the impact this had on the field allocation of his locale. His acknowledged source of quotation was the neighbouring *Changxing County Gazetteer* (*Changxing xianzhi* 長興縣志, Huzhou, Zhejiang) edited by the official scholar Xing Shu 邢澍 (1759–1823), which was still unpublished at this point (it would first be printed in 1805).[76]

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[75] *Shangcheng xianzhi* (1803), *juan* 1, 15:90–91, "The [Henan] Provincial Gazetteer: The Western methods posits the passage between palaces on the day of the medial *qi*, therefore the fixed stars became subject to an annual precession, the palaces are no longer correlated to fixed lunar lodges, and lodges can move to dwell in different palaces. Since the beginning of the Ming dynasty there has been more than 400 years. If one counts the precession of one *du* every 70 years, there should be a difference of 6 *du*. The lodge Gullet (*kang*) has [an equatorial extension of] 9 *du*. At the beginning of the Ming dynasty, Guangzhou, Gushi and Shangcheng extended 5 *du* into the lodge of Gullet. Today they should retreat to 2 *du* of the lodge Base (*di*)." ([河南]通志：西洋之法以中氣過宮，而恒星遂有歲進之差，宮無定宿，而宿可以遞居各宮，從明初至今四百餘年，以七十歲差一度之法較之，當差六度，亢九度，明初光州固始商城入亢五度，今當退入氐二度。).

[76] *Changxing xianzhi* (1805), *juan* 1, 8:96–98, "Chongde [historical name of Shimen] is situated between [the ancient kingdoms of] Wu and Yue, thus precisely at the junction between the lodges of Dipper and Ox. (Jiahe Gazetteer of the Zhiyuan era) 15 du of the Dipper [corresponds to] the prefecture of Jiaxing. [The counties of] Jiaxing, Xiushui and Jiashan extend 6/7 into it, and the counties of Haiyan, Pinghu, Shimen, Tongxiang extend 4/8 into it. (Secret Words of the Inner Augury Books) Various books and the older gazetteer all maintain that Jiaxing belongs to [the Han dynasty province of] Yang, and the three lodges of Dipper, Ox and Woman are its field. Yet the General Gazetteer of the Ming stated that the prefecture of Jiaxing belongs to the celestial field of the Dipper, while the Clear Categories of *Fenye* by Liu Ji (official *fenye* manual of the Ming dynasty) stated that Dipper extends into the prefecture of Jiaxing of [the ancient kingdom of] Wu at 2 du, and [the different counties of the prefecture?] are distributed across 11 du of the Dipper. In the 11th month of the 19th year of Kangxi (21 Dec 1680 – 19 Jan 1681) a comet appears in the Dipper, and the Astronomical Bureau memorialised that it belonged to Wu and Yue. Therefore, concerning the *fenye* of the prefecture, one can speak solely of the Dipper and never of the Ox and the Woman. (Jiaxing Prefecture Gazetteer by Yuan Guozi, 1681). The Western methods posits the passage between palaces on the day of the nodal qi [sic.]. Thus the extension of palaces moves every year. In two thousand years, the lodges of Tail and Winnower will extend entirely into the palace of the Star Chronicle. Shall we then take the Tail and the Winnower as the *fenye* of Wu and Yue? This must not be so. In my humble opinion, although the Winter Solstice may move from one palace to another, the affiliation of Wu and Yue to the Dipper and the Ox shall never be changed.

These two examples bring us to the observation that knowledge circulation in gazetteers did not always follow a top-down model, that is, new knowledge did not always first appear in a provincial gazetteer and later filter down to the prefecture and county level. In the case of Henan province, the provincial gazetteer did take the lead in engaging with Western learning. However, most provinces did not follow this pattern. In Shanxi, the first gazetteer to reckon with Western learning was the 1721 *Fenyang County Gazetteer* (*Fenyang xianzhi* 汾陽縣志), followed by the 1723 *Pingyang Prefecture Gazetteer* (*Pingyang fuzhi* 平陽府志), both citing the *Disputation on Fenye* (*Fenye bian* 分野辯) by the scholar-official Zhu Zhijun (朱之俊, 1596–1671), a native of Fenyang. The first *Shanxi Provincial Gazetteer* (*Shanxi tongzhi* 山西通志) to include elements of Western learning appeared in 1734, and the knowledge later trickled down again to a number of prefecture- and county-level gazetteers.[77] Meanwhile, in Hunan province, six prefecture- and county-level gazetteers between 1746 and 1820 had already taken on board elements of Western learning, before the provincial gazetteer finally made the move in 1820.[78]

Can any cross-regional circulation of Western learning in the gazetteers be traced? Here we meet the limit of our sources. Apart from references to the imperial authorities, Fang Yizhi's *Comprehensive Refined-ness* was the sole title of private scholarship to enjoy citations in the gazetteers of more than one province: the quotation in which Fang rejected *fenye* first appears in two consecutive editions of the *Jiangxi Provincial Gazetteer* (that of 1720 *Xijiang zhi* 西江志, and its revised and expanded 1732 edition *Jiangxi tongzhi* 江西通志), before being transmitted to the Shanxi province, appearing in the 1734 *Shanxi Provincial Gazetteer*, the 1770 *Lu'an Prefecture Gazetteer* (which explicitly presented the quote as a second-hand citation from the provincial gazetteer (通志), and the 1778 *Changzi County Gazetteer* (*Changzi xianzhi* 長子縣志), subordinate to Lu'an. The quote remained identical throughout these different gazetteers. However, in the absence of explicit citation or shared editorial personnel, there is no evidence of any borrowing between the two provincial gazetteers. More generally, the lack of a personal authorial signature in the *fenye* chapters makes it impossible to assess the extent of

(Changxing County Gazetteer by Xing Shu, 1805)." (崇德處吳越之間，獨在斗牛躔度之交。[至元嘉禾志] 斗十五度，嘉興府：嘉興、秀水、嘉善入七分之六，海鹽、平湖、石門、桐鄉入八分之四。[內緯祕言]羣書及舊志所載，皆謂嘉興屬揚州，以斗牛女三舍爲其分，而明一統志謂嘉興府天文斗分，又劉伯温清類分野謂斗二度入吳嘉興府，分屬斗十一度。卽今康熙十九年十一月彗星見斗，欽天監奏屬吳越，則郡分可專言斗，不必及牛女也。[袁國梓嘉興府志] 西法以節氣過宫，宫度歲有遷移，閱二千年後，尾箕之宿盡入於星紀宫，則將以箕尾爲吳越分乎？必不然矣。愚謂冬至雖有移宫，而吳越之屬斗牛終右不易。[邢澍長興縣志]).

[77] 1763 *Changzhi County Gazetteer* (長治縣志), the 1770 *Lu'an Prefecture Gazetteer*, the 1771 *Fenzhou Prefecture Gazetteer* (汾州府志), the 1778 *Changzi County Gazetteer* (長子縣志), the 1783 *Taiyuan Prefecture Gazetteer* (太原府志), and the 1784 *Yuxian County Gazetteer* (盂縣志).

[78] 1746 *Yuezhou Prefecture Gazetteer* (岳州府志); 1757 *Yuanzhou Prefecture Gazetteer* (沅州府志); *1760 Zhijiang County Gazetteer* (芷江縣志); 1765 *Chenzhou Prefecture Gazetteer* (辰州府志); 1772 *General Gazetteer of Chenzhou (*郴州總志); 1810 *Yuanjiang County Gazetteer* (沅江縣志); 1820 *General Gazetteer of Chenzhou* (郴州總志); *Hunan Provincial Gazetteer* (湖南通志) 1820. The 1757 *Provincial Gazetteer* did not make any reference to Western learning.

knowledge circulation based on the individual journeys or transfer and relocation of individual scholar officials. Of the handful of identifiable authors, we know that Mei Wending took part in drafting the gazetteer of his native prefecture after having encountered Western learning in locally available books. The more obscure Tang Xiangui and Zhang Renfeng travelled far from their home towns (one from Jiangsu to Henan and the other from Guangxi to Anhui) in the course of their official careers, but the location of their encounter with Western learning has not yet been determined.

Conclusion

Ultimately, the question remains whether the gazetteers examined in the course of this study can be considered as evidence of knowledge circulation. Western learning occupies only a marginal place in these *fenye* texts, and the information on it appears fragmentary and piecemeal. Most importantly, although some authors advocated for a reformed scheme of *fenye*, none ultimately came up with any operable solution. There is no clear indication of how a new *fenye* scheme based on the notion of a spherical Earth might have looked, or how it would have concretely extended the heaven-earth correlation to Europe and Magellanica. This is a notable contrast to two other well-studied cases of cultural appropriation: the appropriation of Western cartographic knowledge during the making of the Kangxi Atlas, which gave rise to a hybrid new imperial standard in which "Chinese" and "Jesuit" input were no longer distinguishable,[79] or the formation of Chinese Christian funeral rituals from an interweaving of Confucian and Catholic practices.[80]

However, we might also contend that knowledge circulation is always selective and incomplete.[81] The Tang dynasty *Nine Seizer System* (*Jiuzhili* 九執歷) was made using Indian methods of computation without adopting Buddhist cosmology.[82] Later, during the Ming dynasty, Islamicate astronomical calculations were partially adopted without addressing the question of cosmology.[83] For historians, what did circulate, and the new meanings that knowledge gained

[79] Mario Cams, *Companions in Geography: East-West Collaboration in the Mapping of Qing China (c. 1685–1735)* (Leiden: Brill, 2017).

[80] Nicolas Standaert, *The Interweaving of Rituals: Funerals in the Cultural Exchange between China and Europe* (Seattle: University of Washington Press, 2008).

[81] Francesca Bray, "Some Problems Concerning the Transfer of Scientific and Technical Knowledge," in *China and Europe: Images and Influences in Sixteenth to Eighteenth Centuries*, ed. Hongqi Li and Thomas H. C. Lee, 203-220 (Hongkong: Chinese University Press, 1991).

[82] Bill Mak's translation for *Jiuhzhi* is followed. Bill Mak, "Greek Astral Sciences in China," in *Overlapping Cosmologies In Asia: Transcultural and Interdisciplinary Approaches*, eds. Bill M. Mak and Eric Huntington, 45-74 (Leiden: Brill, 2022).

[83] We find in Mak and Huntington's recent edited volume many examples of selective adaptation and co-existence of competing cosmologies across Asia. Bill Mak and Eric Huntington, ed., *Overlapping Cosmologies in Asia: Transcultural and Interdisciplinary Approaches* (Leiden: Brill, 2022). I thank Yang

by virtue of its circulation, is just as important to note as what got lost on the way. It is undeniable that some interaction did occur. Authors in the four corners of the empire engaged seriously with select elements of Western learning, assessing its commonalities and ruptures with traditional methods, and weighing its implications for specifically local *fenye* problems. They did not merely pay lip service to a form of knowledge sanctioned by imperial authority, but demonstrated their understanding of the cosmology behind the "Western method." This is different from the case presented recently by Zhang Xue concerning the reception of longitude and latitude in Qing China. Longitude-latitude coordinates and related mapping conventions were adopted in a number of private scholarly works, primarily as "a token of imperial authority," testifying to "their ties to the centre of political power," rather than to a genuine understanding of the cosmology behind the new data and conventions.[84] Moreover, we may still argue that the very act of mentioning "Western method" in the *fenye* chapter was a deliberate choice testifying to the presence of relevant scholarly resources in the locale and a degree of awareness of it among the educated, even if not every one of the more than a hundred gazetteers offered as elaborate a discourse as the examples given in this paper.

It remains somewhat surprising that gazetteer *fenye* chapters became an important locus for the reception of Western learning. As historical actors themselves indicated, and modern scholars have often emphasised, European cosmology was fundamentally at odds with and liable to undermine the theoretical basis of *fenye.* Yet the encounter of incommensurables from faraway cultures did not necessarily lead to a clash or the superseding of one by another, but rather to coexistence and negotiated compromise. Perhaps one facilitating factor that allowed the *fenye* tradition to accommodate Western learning was its own heterogeneity. With the intractable plurality of traditional schemes and the lack of consensus between literati, rather than facing a cultural monolith, the newly arrived Western learning met an arena of conflicting views where an alien newcomer could fit in, or even offer a welcome fresh vision. This, to a certain extent, is comparable to the reception of Neo-Confucian cosmology in Enlightenment Europe. As we have argued elsewhere, in that case the Jesuits' presentation was successful and enthusiastically received, owing to the fact that European cosmological tradition itself was heterogeneous and conflicted. While the Aristotelian and Neo-Confucian cosmological languages were arguably incommensurable and untranslatable into one another's system, translators and readers had at their disposal an array of non-Aristotelian traditions and terminologies—Epicurean, Neoplatonic, Cartesian, or Spinozist—to aid in rendering and comprehending the Chinese ideas.[85]

Qiao for bringing to my attention the diachronic comparison.

[84] Zhang Xue, "The Plurality of Reception: Latitude and Longitude in Early Modern China, 1700–1900," *Isis* 113, no. 3 (2022): 537–58.

[85] Wu Huiyi, *Traduire la Chine au XVIIIe siècle: Les Jésuites Traducteurs de Textes Chinois et le Renouvellement des Connaissances Européennes sur la Chine (1685–ca. 1740)* (Paris: Éditions Honoré Champion, 2017),

Highlighting this plurality was one of the aims of this study. In the case presented in this article, the plurality was not only conceptual, but also geographical. The geography of learning extended well beyond the cultural core areas into places where no missionary ever set foot and not usually included in the narrative of Western learning, thus making visible unfamiliar forms of interaction between Chinese literati and the new Western input. This local scale, and the heterogeneous stakeholders who mobilised Western learning to serve on this level, have often been invisible in a historiography of Sino-Western contact that has focused on China's cultural core areas and made civilisation its primary unit of analysis. More investigation needs to be conducted to further pluralise the history of Western learning with regards to Qing China's variegated local contexts.

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