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Buddhism, Science and Technology

Challenges to Religions from a Digitalized World

Edited by
Jeffrey Kotyk and Ru Zhan

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Buddhism, Science and Technology: Challenges to Religions from a Digitalized World

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About the Editors

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Preface

The inspiration for this Special Issue stems from a major conference that was held in Hong Kong, from August 10th to August 11th, in 2023, at the University of Hong Kong, which was sponsored by the Glorisun Charity Foundation and organized by the Glorisun Global Network for Buddhist Studies and FROGBEAR, at the University of British Columbia. Following the conclusion of this conference, we welcomed submissions from scholars outside the conference. We wish to thank all the parties involved who made this Special Issue possible.

Jeffrey Kotyk and Ru Zhan

Guest Editors

Article

On Astronomical Materials in Buddhist Scriptures

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Abstract: There are many foreign astronomical materials that were preserved in the Chinese translation of Buddhist canons. From the content, these astronomical materials include cosmology theories, lunar mansion systems, calendrical data, etc. These astronomical materials are important evidence for the exchange and dissemination of astronomy between ancient civilizations. This paper aims to sort out and analyze the astronomical materials preserved in the Chinese translation of Buddhist canons, classifying and differentiating the content of astronomy, which was foreign to China, tracing the origins of these astronomical knowledge, discussing their impact on local astronomy in China, and evaluating the preservation form, characteristics, reliability, functionality, and limitations of these astronomical materials. Through the above discussion, this paper will demonstrate the core meaning of the historical view of transcultural transmission of sciences and technology, which is ‘knowledge progresses through dissemination and civilization thrives through communication’.

Keywords: Buddhist canons; astronomy; Chinese–foreign communications

1. Introduction

In the ancient history of Chinese astronomy, there were three major waves of significant foreign astronomical inputs: (1) Indian astronomy, along with Babylonian–Greek astronomy, brought to China with the spread of Buddhism from the late Eastern Han Dynasty to the early Northern Song Dynasty (c. 3–10); (2) Arabian astronomy introduced to China during the Yuan and early Ming Dynasties (c. 13–15) with the spread of Islam; (3) Western classical astronomy brought to China during the late Ming and early Qing Dynasties with the spread of Christianity (c. 16–17). Among these, the first wave of Buddhist astronomy lasted the longest and had the most extensive influence.

Although all three instances of foreign astronomical knowledge entering China were associated with religion, the latter two instances were not as closely tied to religion in terms of the content and form of transmission. However, the Buddhist canons, serving as religious scriptures, preserved a large amount of Indian astronomical data. Therefore, the Buddhist canons have become extremely important primary sources for studying the introduction of Indian astronomy to China.

In recent years, scholars have conducted research on astronomical materials in Chinese translated Buddhist scriptures from the following aspects.

Firstly, scholars have sorted out and interpreted the content of Indian astronomy accompanying the translation of Buddhist scriptures into Chinese. Makoto Zenba (Zenba 1952, pp. 171–213; 1956, 1957, 1968), Toru Aoyama (Aoyama 1982), Michio Yano (Yano 1986b, 1987), Chen Meidong (Chen 1998), Zhou Liqun (Zhou 2015), Akira Sadakata (Sadakata 1997), and others have interpreted and verified the specific content of Indian astronomy in the Chinese-translated Buddhist scriptures from the ephemerides to cosmological theories. Jeffrey Kotyk conducted extensive research on Buddhist astrology in the Tang Dynasty using various translated Buddhist scriptures as materials (Kotyk 2017a).

Secondly, research on the introduction and impacts of foreign astronomy and astrology in China using Buddhist scriptures has been conducted by many scholars. Michio Yano discussed the Japanese Sukuyoudou 宿曜道 which originated from the “Xiuyao Jing”

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and translated or compiled in the Tang Dynasty (Yano 1986a). Li Hui specifically discussed the *Xiuyao Shu* 宿曜術 introduced to China through the translation of Buddhist scriptures into Chinese (Li 2011). Niu Weixing takes Rāhu and Ketu, which accompanied the translation of Buddhist scriptures into Chinese, as the starting point to explore how foreign astronomical concepts were absorbed and melted into the process of becoming a part of the local culture (Niu 2010). Song Shenmi further paid attention to the inheritance, transformation, and integration of foreign astrology into the local culture (Song 2014). She also investigated the dissemination and sinicization process of the twelve zodiac signs in China based on the various literature records, including Buddhist scriptures (Song 2021). Jin Zhijia paid attention to the study of foreign astrology and its influence during the Tang and Song Dynasties using Buddhist and Daoist scriptures (Jin 2020).

Thirdly, scholars have examined factors such as dissemination intermediary and pathways in the exchange and dissemination of ancient Chinese and foreign astronomy. Niu Weixing discussed the issue of transmission intermediaries and pathways for Indian astronomy to China (Niu 2004b). Zhou Liqun analyzed an Indian astrological dissemination text in three languages: Sanskrit, Tibetan, and Chinese (Zhou 2013). Bill M. Mak explored the Central Asian factors that influenced the spread of Buddhist astronomy from India to East Asia (Mak 2015). Jeffrey Kotyk sorted out the Iranian elements in Tang Dynasty Buddhist astrology (Kotyk 2017b).

The above mentioned research centered on astronomical materials in Buddhist scriptures has achieved a large number of research results, but there are still many issues that need to be further explored. In this article, I attempt to provide a comprehensive classification, organization, and interpretation of astronomical materials in Chinese Buddhist scriptures, as well as an analysis and judgment of their preservation, reliability, limitations, etc., in order to provide a panoramic overview for a comprehensive understanding of astronomical materials in Chinese Buddhist scriptures.

2. The Distribution, Classification, and Interpretation of Astronomical Data in the Buddhist Canons

The astronomical data preserved in the Buddhist canons can be classified into eight categories based on their content: 1. Cosmology; 2. Lunar Mansions System; 3. Seasons, Calendars, and Divisions of Day and Night; 4. Length of Shadows; 5. Solar and Lunar Eclipses; 6. Five Planets (*wuxing* 五星) and the Seven Luminaries (*qiyao* 七曜); 7. *Rāhu* (Luohou 羅睺), *Ketu* (Jidu 計都), and *Navagraha* (Jiuzhi 九執); and 8. Planetary Tables.

Below, we will organize, analyze, and interpret the distribution of these astronomical contents in the Buddhist canons.

2.1. Cosmological Knowledge in the Buddhist Canons

Among various astronomical knowledge, cosmological knowledge is closely linked with other human thought domains such as religion and philosophy. The cosmological theories in Buddhist scriptures are intricately related to Buddhist philosophical systems and encompass three theoretical aspects: firstly, theories concerning the formation of the universe, describing the causes and processes of cosmic formation; secondly, descriptions of the structure of the heavens and earth in Buddhist scriptures; and thirdly, descriptions of the operation of the universe. Although these Buddhist cosmological theories are relatively ancient, they provide coherent explanations for basic astronomical phenomena such as diurnal variations, annual variations in day length and sunrise azimuth, and seasonal changes.

In Buddhist scriptures, the term *shijie* 世界 (world) is often used instead of *yuzhou* 宇宙 (universe). According to the explanation in the *Lengyan jing* 楞嚴經 [Skt. *Śūramgama-sūtra*], *shi* 世 refers to the passage and change in time in the past, present, and future; *jie* 界 means boundary, delineating space.¹ Buddhism divides the world into two dimensions: the world of sentient beings, also known as the ‘world of the sentient’ (*youqing shijie* 有情世界), and the world of objects, which is the land where all sentient beings dwell. The

world of objects has more materialistic implications and is therefore closer to the astronomical concept of the universe.

The *Abidamo jushe shilun* 阿毗達磨俱舍釋論 [Skt. *Abhidharmakośa-bhāṣya*] uses a verse-by-verse commentary format to interpret the theory of the world of objects. From this, we understand that the world was roughly formed as follows: At the beginning of a *kalpa*, there was a great wind that could shatter and disperse everything, making all things formless and invisible, without a trace of dust remaining. All the states and mountains in the world were blown apart. After undergoing an extremely long period of time, a great black cloud arose, covering the entire world, followed by heavy rain that poured continuously for millions of years. The water accumulated and formed the bottom sea, which was eleven *lakṣas*² and twenty thousand *yojanas* deep and twelve *lakṣas* and three thousand four hundred and fifty *yojanas* wide. The water from the bottom sea surged upward, coalescing into gold, like cream solidifying on the surface of boiled milk, forming the Golden Earth Wheel. The Golden Earth Wheel was three *lakṣas* and twenty thousand *yojanas* thick and had the same width as the water wheel (the bottom sea), which was diminished to eight thousand *yojanas* thick. The circumferences of the Golden Earth Wheel and the water wheel were three times their width,³ totaling thirty-six thousand *lakṣas* and ten thousand three hundred and fifty *yojanas*. Above the Earth Wheel, heavy rain poured down again, forming the Great Ocean. Under the agitation of the wind wheel, the essence gathered and formed Mount Sumeru, with superior essence forming seven golden mountains, middle essence forming seven silver mountains, inferior essence forming a mountain ring, and miscellaneous essence forming the four great continents.⁴

After the formation of the world, it acquired a certain internal structure. Descriptions of this world structure can be found in various Buddhist scriptures, among which the descriptions in several Abhidharma texts are more systematic and quantitative. In the *Abidamo jushe lun* 阿毗達磨俱舍論 [Skt. *Abhidharmakośa-bhāṣya*, hereafter *Jushe lun*], a combination of verses and commentary is used to depict the quantitative structure of the world.⁵ It is believed that all things in the universe exist on a vast and boundless wind wheel, with a water wheel above it. The surface of the water wheel solidified into the Golden Earth Wheel. At the top of the Golden Earth Wheel lies Mount Sumeru, surrounded by seven mountains including Yugamdhara (Ch. Yujiandaluo 踰健達羅). Mount Sumeru's water level and depth are both eighty thousand *yojanas*.⁶ The remaining seven mountains are all made of gold. Beyond the seven mountains are the continents, namely the four great continents: Jambudvīpa, Pūrva-videha, Avara-godānīya, and Uttara-kuru. The shapes of the four great continents are as follows: Jambudvīpa is shaped like a chariot, with two thousand *yojanas* on each of the east, west, and north sides, and only three and a half *yojanas* on the south side; Pūrva-videha is shaped like a half-moon, with a length of three hundred and fifty *yojanas* on the east side and two thousand *yojanas* on the other three sides; Avara-godānīya is shaped like a full moon, with a diameter of two thousand five hundred *yojanas* and a circumference three times the diameter, i.e., seven thousand five hundred *yojanas*; and Uttara-kuru is square, with each side being two thousand *yojanas*. Additionally, there are eight subcontinents attached to each of the four great continents. These continents and subcontinents are inhabited places.

The operation of the Buddhist universe is closely related to the dynamics of Buddhist cosmological evolution and the structure of the world of objects: the sun, moon, and stars revolve around Mount Sumeru under the support and propulsion of the wind wheel. The height of the sun and moon's orbit is half the height of Mount Sumeru, which is forty-two thousand *yojanas*. The sun revolves around Mount Sumeru, causing day and night alternations and seasonal changes on the four great continents.

Including the four great continents, the sun, moon, stars, Mount Sumeru, and the heavenly realms collectively are called one Small Thousand World. A thousand Small Thousand Worlds make up one Middle Thousand World. A thousand Middle Thousand Worlds constitute one Great Thousand World. Everything in the Great Thousand World

is generated and destroyed together in one great *kalpa* and regenerated at the beginning of a new great *kalpa*, reflecting a typical cyclical cosmological idea.

From the depiction of the Buddhist world structure in the *Jushe lun*, it can be seen that the structure of this world is quite refined. Whether it is the structure of the heavens and earth, the movement of the sun and moon, the shape of the four great continents, or the magnificent abodes of the heavenly beings atop Mount Sumeru, as well as the heights and lifespans of the gods, humans, and ghosts, all have a set of quantitative models, involving arithmetic and geometric progressions. At the same time, the world structure in Buddhist scriptures is not completely divorced from experience. For example, the description of the shape of Jambudvīpa roughly matches the north-wide and south-narrow shape of the Indian subcontinent. In summary, from the Buddhist scriptures, we can understand a quantified ancient Indian cosmological model.

2.2. Lunar Mansions System in the Buddhist Canons

Lunar mansions are a very common concept in Buddhist scriptures. However, a considerable portion of the discourse on lunar mansions is not directly related to astronomy and is sporadic and incomplete. Classical texts that provide relatively comprehensive descriptions of the lunar mansions system include the *Da fangdeng daji jing* 大方等大集經 [Skt. *Mahāvaiṣṭhīya-mahāsaṃnipāta-sūtra*, T no. 397], the *Wenshushili pusa ji zhuxian suoshuo jixiong shiri shan'e xiuyao jing* 文殊師利菩薩及諸仙所說吉凶時日善惡宿曜經 [Sūtra Spoken by Bodhisattva Mañjuśrī and Various Devas on Auspicious and Inauspicious Times and Days and Good and Evil Nakṣatras and Planets; T no. 1299; hereafter *Xiuyao jing*], the *Modengjia jing* 摩登伽經 [Skt. *Mātangī-sūtra*, T no. 399], the *Shetoujian taizi ershiba xiu jing* 舍頭諫太子二十八宿經 [Skt. *Śārdūlakarṇāvadāna*; T no. 1301; hereafter *Shetoujian jing*], and the *Qiyao rangzai jue* 七曜攘災訣 [Formulae for Averting Disaster by the Seven Luminaries; T no. 1308]. Most of these sutras belong to the Esoteric Buddhist tradition. The descriptions of the Indian lunar mansions system⁷ in these Buddhist scriptures generally include six aspects: the names of the lunar mansions, the number of lunar mansions, the width of lunar mansions, the number of stars in each lunar mansion, the shape of each lunar mansion, and the astrological significance of each mansion.

The *Fomu da Kongque Mingwang jing* 佛母大孔雀明王經 [Skt. *Mahāmāyūrī-vidyārājñī*; T no. 982], translated by Bukong 不空 (Amoghavajra, 705–774), is listed as the first text in the ‘Esoteric’ category of the Taishō canon. In this sutra, the names of the 28 lunar mansions are listed, and the Chinese names for the Indian lunar mansions are used for translation, which is a common practice in Buddhist scriptures. However, it is worth noting that the Chinese lunar mansions do not strictly correspond to the Indian lunar mansions in terms of specific stellar compositions. The *Foshuo da Kongque Zhouwang jing* 佛說大孔雀咒王經 [Skt. *Mahāmāyūrī-vidyārājñī*; T no. 985], translated by Yijing 義淨 (635–713), is an alternate version of the *Mahāmāyūrī-vidyārājñī*. Similarly, it lists the names of the 28 lunar mansions, but Yixing used phonetic translations for the names of the Indian lunar mansions.

The *Da fangguang pusa zang Wenshushili genben yigui jing* 大方廣菩薩藏文殊師利根本儀軌經 [Skt. *(Ārya)Mañjuśrīmūlakalpa*; Ritual Manual Sūtra on the Fundamentals of the Mañjuśrī in the Vaiṣṭhīya-bodhisattva-storehouse; T no. 1191; hereafter *Genben yigui*] translated by Tianxizai 天息災 (Skt. Devaśāntika, fl. 980–1000) during the Northern Song Dynasty (960–1127), lists the phonetic names of the twenty-seven lunar mansions excluding the Ox mansion. Influenced by Babylonian–Greek astronomy, Indian astronomy adjusted the number of lunar mansions to twenty-seven to match the imported zodiacal twelve houses. Additionally, considering the precession of the equinoxes, the first lunar mansion was changed from the older Krittikā to Rohini, also known as Aśvinī (Ch. Ashiweimi 阿濕尾儻). This sutra was translated by Tianxizai in the early years of the Northern Song Dynasty, relatively late in terms of translation date. Hence, the adjustment of the first lunar mansion to accommodate the precession of the equinoxes was necessary.

The *Genben yigui*, in *juan* 14, describes the fate of individuals born under the twelve zodiacal signs and establishes a correspondence between the twelve zodiacal signs and

the twenty-eight lunar mansions. After the concept of the twelve zodiacal signs entered India, it inevitably raised questions about how to match them with the twenty-eight lunar mansions. Here, we see an example of such coordination. In the *Nanmijishipaluo tian shuo zhilun jing* 難爾計濕囉囉天說支輪經 [*Nandikēśvara-deva Teaches the Zodiac Sūtra; T no. 1312, hereafter *Zhilun jing*], a similar correspondence between the twelve zodiacal signs and the twenty-eight lunar mansions is given. The correspondence between the twelve zodiacal signs and the twenty-eight lunar mansions provided in the *Zhilun jing* is more detailed than that given in *juan* 14 of the *Genben yigui*. Each lunar mansion is first divided into several sections and then matched with the twelve zodiacal signs, with some mansions divided into two parts, each matched with neighboring signs, and each zodiacal sign nominally paired with three mansions. Similar methods of matching zodiacal signs and lunar mansions can also be found in the *Xiuyao jing*.

The *Modengjia jing* and the *Shetoujian jing* are different translations of the same sutra, each with its own characteristics in translating the names of the twenty-eight lunar mansions. In the *Modengjia jing*, in the fifth chapter ‘Shuo xingtu pin’ 說星圖品 [Discourse on Star Charts], the names of the Indian lunar mansions are translated entirely according to the Chinese names of the lunar mansions, with the first mansion being Krittikā, which is evidently a relatively ancient system. The *Shetoujian jing*, on the other hand, uses a completely different translation method, translating the names of the Indian lunar mansions into Chinese using a method of paraphrasing. By examining the literal meanings of the Sanskrit names of the Indian lunar mansions, it can be seen that almost all of the paraphrased names correspond to the original Sanskrit meanings. This method of translating the names of lunar mansions is unique among all Buddhist scriptures.

The twenty-eight (or twenty-seven) lunar mansions encircle the heavens, with each mansion occupying a certain celestial area. In ancient China, the widths of the twenty-eight lunar mansions varied, with some being over thirty degrees wide, while others were only a few degrees wide or even just one degree wide. The width of the lunar mansions in ancient India differed. In the *Da fangdeng daji jing* it is said that Krittikā (Maoxiu 昴宿) ‘travels the four continents through thirty shi (時) in one day and one night’ (一日一夜, 歷四天下, 行三十時).⁸ The ancient Indian lunar mansions, also called *Nakṣatras* (Yuezhan 月站), were closely related to the movement of the moon, and the width of each mansion was expressed in terms of the time it took for the moon to stay in the mansion, from entering to leaving. Here, thirty shi is the width of Krittikā. The ‘Shuo xingtu pin diwu’ 說星圖品第五 [Fifth Discourse on Star Charts] in the *Modengjia jing* also provides the widths of the twenty-eight lunar mansions. The *Shetoujian jing* is a different version of the *Modengjia jing* and also lists the widths of the twenty-eight lunar mansions, but with slight variations compared with the *Modengjia jing*.

From the records of the three Buddhist scriptures mentioned above, it can be understood that the widths of the Indian lunar mansions are classified into three categories, large, medium, and small, based on the time the moon stays in each mansion. The width of the large mansion is three times that of the small mansion, while the medium mansion is twice the width of the small one. In ancient China, there was no consistent pattern for the widths of the lunar mansions. The widths of the lunar mansion given in the three scriptures are particularly narrow for the Ox mansion and do not fall into the categories of large, medium, or small widths. This further illustrates the uniqueness of the Ox mansion in the Indian lunar mansion system and helps to understand why the Ox mansion is excluded from the Indian system of twenty-seven mansions. For the same mansion, the values given by the three scriptures are mostly the same, with few differences. The time unit in the *Daji jing* is shi; in the *Shetoujian jing*, the time unit is a ‘moment’ (*xuyu* 須臾).⁹ The time unit in the *Modengjia jing* is not strictly defined, where ‘day’ (*ri* 日) refers to daytime, and one day and one night are equivalent to thirty shi.

2.3. The Division of Seasons, Calendar Days, and Day and Night Hours in the Buddhist Canon

The content related to calendars and seasons in the Buddhist canon is quite rich, mainly involving the division of seasons, the insertion of intercalary months, the arrangement of lunar months, the concepts of black and white months, day and night hours, and the determination of time segments.

In ancient India, the year was divided into 12 months, which were further divided into three or six seasons. These concepts are mentioned in many Buddhist scriptures. In ancient India, the name of the lunar mansion where the moon appeared on the night of the full moon determined the name of the month. The arrangement of days in a month and the division of hours in a day in ancient India also had their unique characteristics, as will be described below.

As the performance of rituals in Esoteric Buddhism requires precision in timing, Esoteric Buddhist scriptures often contain records related to calendar days and time segments. In the *Suxidi jieluo jing* 蘇悉地羯羅經 [Skt. *Susiddhikara-mahātantra-sādhnopāyika-pāṭala*], within the 'Apizhelujia pin di shiwu' 阿毘遮嚩迦品第十五 [Fifteenth Chapter of Ābhicāra], it is mentioned that a ritual called *abhiseka* (*apizhelujia* 阿毘遮嚩迦)¹⁰ should be performed at noon on the eighth or fifteenth day of the dark moon to more effectively subdue demons and monsters.¹¹ In the 'Gongyang cidi fa pin di shiba' 供養次第法品第十八 [Eighteenth Chapter on the Stages of Offering] of the same sutra, it is also mentioned that appropriate rituals should be performed at different times of the day. From this passage, we know that ancient India had a division of six time segments: three during the day and three during the night.¹²

In *juan* fourteen of the *Da fangguang pusa zang Wenshushili genben yigui jing* 大方廣菩薩藏文殊師利根本儀軌經 [Sūtra of the Fundamental Rites for the Great Bodhisattva Cundi's Treasury], there is also a discussion on seasons, calendar days, and day and night hours. It mentions that the first to fifteenth days belong to the white month, while the sixteenth to thirtieth days belong to the black month. Both white month and black month are Indian time units called a *paksa* (half-month); two *paksas* make up one month, twelve months make up one year, and one year is divided into six or three seasons.¹³ In *juan* four of the *Da Piluzhe'na chengfo jing shu* 大毘盧遮那成佛經疏 [Commentary on the Mahāvairocana Sūtra], it is also mentioned that the first, third, fifth, seventh, and thirteenth days of the white month are auspicious and suitable for *mandala* (*mandaluo* 漫荼羅) rituals. Among them, the eighth, fourteenth, and fifteenth days are particularly auspicious, and performing rituals on these days can have twice the effect with half the effort.¹⁴ The text further reminds that in the case of a short lunar month, there are only fourteen days in the white months, the fifteenth day is actually the first day of the black months, so it is no longer an auspicious day. Due to the variation in the moon's speed, the calendar typically uses the average speed of the moon. The actual occurrences of the new moon and full moon, known as 'true new moon' (*dingshuo* 定朔) and 'true full moon' (*dingwang* 定望), may differ by a day from the calculated new moon and full moon.¹⁵ From this, it can be seen that the rituals in Esoteric Buddhism should be determined based on the true new moon and true full moon, which is referred to as the 'fixed day' (*dingri* 定日).

The 'Mingshi fenbie pin diqi' 明時分別品第七 [Seventh Chapter on Understanding the Time Segments] in the *Modengjia jing* introduces the rules of the annual changes in the length of day and night recognized in ancient India, as well as the specific names of the 30 time segments of day and night. The same content is also mentioned in the variant translation of the *Shetoujian jing*, but the two texts have different methods of translating the names of the 30 time segments of day and night. Interestingly, both the *Modengjia jing* and the *Shetoujian jing* mention the use of human observation of the length of the shadow cast by their own body to determine the fifteen time segments of daylight, which is equivalent to using a person as a horizontal sundial.

2.4. The Length of Sunlight Shadow Data in Buddhist Texts

The *Modengjia jing* and the *Shetoujian jing* both mention the method of using ‘self-measurement’ to determine the fifteen time segments of daylight, which cleverly utilizes the sun’s projection. However, this involves the diurnal changes in the length of the shadow. Generally, astronomy focuses on the annual changes in the length of the noonday shadow. Such data are also mentioned in Buddhist scriptures, such as in the *Da fangdeng daji jing* and the *Shi feishi jing* 時非時經 [Sūtra of Timeliness and Untimeliness].

In the *Modengjia jing*, in the ‘Mingshi fenbie pin diqi’ section, the character Emperor Trisāṅku (Di Tengjia 帝勝伽) explains to the Brahmin ‘Lotus Fruit’ (Lianhua shi 蓮華實) the changes in the length of day and night and the variation in the length of the noonday shadow, which is measured using a noonday shadow chart with a height of 12 units.¹⁶ Based on the monthly records of the length of the noonday shadow in the scripture, it can be inferred that the location where the data were obtained was approximately near 39 degrees north latitude. From this, it can be further inferred that the astronomical knowledge reflected in the *Modengjia jing* was transmitted from India to Central Asian countries first and stayed there for a period. The noonday shadow data in the *Modengjia jing* were measured at that time and place, and then transmitted to the Central Plains.

The *Shi feishi jing* consists mainly of a data table with a few descriptive texts.¹⁷ Through analysis and interpretation of the scriptures and references to similar data in other Buddhist scriptures, it is not difficult to determine that these data are about the annual changes in the length of the shadow cast by the sun.

Regarding the concepts of ‘timeliness’ (*shi* 時) and ‘untimeliness’ (*feishi* 非時), although they occasionally have other meanings in Buddhist scriptures, in the vast majority of cases they are associated with ‘time for eating’ (*shishi* 時食) and ‘untime for eating’ (*feishi shi* 非時食). According to the ‘Shishi bu diwu’ 食時部第五 [Fifth of the Dining Time Sections] in *juan* 42 of *Fayuan zhulin* 法苑珠林 [Forest of Gems in the Garden of the Dharma] it is stated that ‘Noon is the time for the Dharma, that is, the time for eating. Beyond this time, when the shadow moves a hair’s width by a second, it is considered untimeliness’ (午時為法，即是食時。過此午時影一髮一瞬，即是非時).¹⁸ Thus, ‘timeliness’ and ‘untimeliness’ are strictly divided based on noon, which is very precise.

From a passage of the seventeenth *juan* of the *Mohe sengqi lü* 摩訶僧祇律 [Skt. *Mahāsaṅghika Vinaya*], we can roughly understand how the early Buddhists determined the time of noon. At that time, the mealtime for monks was not fixed and was ridiculed by the public. The Buddha then prescribed that meals should be taken in the first half of the day and taught the monks the method of ‘taking time’ (*qushi* 取時), which involved making a foot shadow and using a water clock (*kelou* 刻漏).¹⁹ In other words, on clear days, the exact moment of noon can be determined by observing the shadow of the sun, while on cloudy or rainy days, water clocks can be used to ascertain the time of noon. This term ‘foot shadow’ (*jiaoying* 腳影) corresponds exactly to the unit of shadow length ‘foot’ mentioned in the *Shi feishi jing*. Combining the narrative description at the beginning of the *Shi feishi jing*, it can be inferred that the Buddha obtained the length of the noonday shadow for twenty-four half-months in a year in advance and then informed the monks. As long as the monks observed the length of the shadow during the corresponding half-month, they could eat when the length of the shadow reached the ‘timeliness’ (*shi* 時) corresponding to that half-month. If it slightly exceeded the length corresponding to ‘un timeliness’ (*feishi* 非時), they could not eat that day. Therefore, the *Shi feishi jing* provides the ‘technical parameters’ for determining the time of noon. Buddhists had to rely on this ‘technical manual’ to determine the time for eating, ensuring that it was ‘timeliness for eating’ and not ‘untimeliness for eating.’

A complete set of shadow length data should include two important parameters: the height of gnomon measuring the length of shadow H , and the latitude of the measuring location φ . However, the *Shi feishi jing* does not provide these two parameters. Neverthe-

less, using certain spherical astronomy knowledge and necessary mathematical methods, it is not difficult to calculate these two parameters, shown as follows (Niu 2004a):

$$\varphi = 36.2^\circ \pm 2.42^\circ, H = 5.99 \text{ feet} \pm 0.57 \text{ feet}$$

According to the description at the beginning of the *Shi feishi jing*, the *Sūtra* was preached by the Buddha Śākyamuni when he resided in the Jeta Grove Monastery (Jialantuozhulin yuan jingshe 迦蘭陀竹林園精舍) in Śrāvastī (Wangshe cheng 王舍城)²⁰, so the data on the length of the noonday shadow should theoretically be applicable to the geographical latitude of Śrāvastī. Śrāvastī was the capital of the ancient Indian kingdom of Kosala (Mojiyetuo guo 摩揭陀國), located south of the Ganges River in the present-day Bihar state, at about 25 degrees north latitude. However, according to the calculation results, the applicable latitude for the length of the noonday shadow data in the *Shi feishi jing* is around 36 degrees north. Since the ‘untimeliness’ shadow length data were not measured in Śrāvastī, the ‘untimeliness’ shadow length data in the *Shi feishi jing* did not originate from the mouth of the Buddha. The latitude where these data are applicable belongs to the region of ancient Gandhāra, present-day eastern Afghanistan, northwestern Pakistan, and the Kashmir region controlled by Pakistan. This region was part of the ancient Gandhāra (Jibin guo 罽賓國) mentioned in Chinese historical records, a region where ancient Indian Buddhist culture flourished and the starting point for the spread of Buddhism to China via land routes. The translation of the *Shi feishi jing* was carried out in Khotan, which is also within the latitude range obtained. Therefore, the two sets of shadow length data provided by this sutra provide quite reliable technical support for Buddhists around 36 degrees north latitude to eat at the right time and avoid eating at the wrong time. At the same time, the *Shi feishi jing* is evidence of the spread of Buddhism from its place of origin to northwest India and the ancient western regions, and it is also important evidence of the transmission of Indian astronomical calendar knowledge along with Buddhism to China.

2.5. Sun, Moon, and Solar and Lunar Eclipses in the Buddhist Texts

The sun and the moon are undoubtedly the two most prominent celestial bodies, and Buddhist scriptures contain extensive descriptions of the sun, the moon, and related phenomena. These descriptions can generally be categorized as follows: (1) characteristics of the sun itself—sunlight, sun diameter, sun path, etc.; (2) characteristics of the moon itself—moon diameter, moon shape, moon substance, moon path, etc.; (3) phenomena of daily changes; (4) phenomena of annual changes; (5) changes in lunar phases; and (6) solar and lunar eclipses.

2.5.1. Origin, Material, Shape, and Size of the Sun and Moon

The sun and the moon are two essential celestial bodies, and how they are generated and what they are composed of is detailed in the ‘Shi benyuan pin’ 世本緣品 [Chapter on the Original Conditions of the World] of *juan 22* of the *Chang ahan jing* 長阿含經 [Skt. *Dirgha-agama*], which states that the sun and the moon are brought forth by a great storm from the original continent (golden land wheel 金地輪) located beneath the ocean, which is eighty-four thousand *yojanas* deep. The sun and the moon can move in the sky without falling, being supported by the so-called ‘five winds.’ Wind was a fundamental force in ancient Indian cosmology, and it played a role in the formation of the world and the generation of the sun and moon.

According to the *Chang ahan jing*, the sun and moon are composed of different materials. The sun is made of two parts ‘heavenly gold’ (*Tianjin* 天金) and one part glass (*poli* 頗梨)²¹, while the moon is made of two parts heavenly silver and one part crystal (*liuli* 琉璃). Both the sun and moon are square-shaped because they ‘appear round from a distance’ 遠見故圓.²² The length and width of the sun and moon are each fifty-one *yojanas*.²³

The ‘Riyuexing pin dijiu’ 日月行品第九 [The Ninth Chapter on Sun and Moon’s Path] in *juan 5* of the *Lishi apitan lun* 立世阿毗曇論 [Skt. *Sarvastivada Abhidharma*] offers similar views to the *Chang ahan jing* regarding the composition of the sun and moon. However, it

differs in its description of the shape and size, stating that the sun and moon are cylindrical. According to this text, the sun is fifty-one *yojanas* thick and wide, with a circumference of one hundred and fifty-three *yojanas*; the moon is fifty *yojanas* thick and wide, with a circumference of one hundred and fifty *yojanas*.²⁴ Clearly, the circumference is calculated using the formula ‘radius 1 diameter 3’ 徑一週三. Juan 10 of *Qishi jing* 起始經 [Sūtra on the Arising of Worlds] also mentions the sun being fifty-one *yojanas* long and wide,²⁵ and the moon being forty-nine *yojanas* long and wide. The *Yujia shidi lun* 瑜伽師地論 [Skt. *Yogācārabhūmi Śāstra*] states that the sun’s diameter is fifty-one *yojanas*, while the moon’s diameter is one *yojana* smaller than the sun’s.²⁶

Ancient Indians believed that the sun and moon emitted light themselves. According to the *Chang ahan jing*, the reason the sun and moon emit light is that the deities of the sun and moon themselves shine; their light first illuminates their golden and crystal palaces and then the solar and lunar abodes. The *Chang ahan jing* also explains ten reasons why sunlight becomes hot.²⁷

2.5.2. Path of the Sun and Moon

According to the *Chang ahan jing*, ancient Indians believed that the sun and moon revolved around Mount Sumeru at half its height. The ‘Riyuexing pin dishijiu’ in *juan 5* of *Lishi apitan lun* also mentions a similar view: the sun and moon travel at a height of forty thousand *yojanas* above Jambudvipa, which is half the height of Mount Sumeru.²⁸

The description of the movement of the sun and moon here is particularly noteworthy. Ancient Indians believed that the rotation of the sun and moon was a form of rotation around Mount Sumeru, which stands upright on the ground. In ancient Chinese cosmology, the *Huntian* 渾天 (chaotic heavens) theory advocated that the sun and moon revolve around the earth, but the *Gaitian* 蓋天 (covering heavens) theory in the *Zhoubi suanjing* 周髀算經 [Calculation Classic of the Zhou Gnomon] proposed a similar movement of the sun and moon to that of ancient India’s viewpoint.

The model of the sun orbiting Mount Sumeru can explain the alternating changes in seasons and day and night. In the ‘Riyuexing pin dishijiu’ in *juan 5* of *Lishi apitan lun*, there is a detailed description of the sun’s annual movement, stating that the sun’s path consists of 180 routes, while the moon’s path consists of 15 routes. Within half a year, the sun transitions consecutively from one daily path to the next, until it reaches the outermost path, then gradually returns to the innermost path. This annual variation in the azimuth of sunrise and the length of daylight can be fully explained in this manner. As for the moon’s movement, each lunar path is equivalent to 12 solar paths. Between the southernmost and northernmost routes of the 180 solar paths lies a distance of 290 *yojanas*, and the sun and moon travel back and forth within this range. The southernmost solar path is called the outer path (*wailu* 外路), with a diameter of 481,380 *yojanas* and a circumference of 1,444,140 *yojanas*. The northernmost solar path is called the inner path (*neilu* 內路), with a diameter of 488,000 *yojanas* and a circumference of 1,442,400 *yojanas*.²⁹ Here, the value of π is taken as 3, making it easy to calculate the difference of 290 *yojanas* in radius between the outer and inner paths.

Continuing in the ‘Riyuexing pin dishijiu’ in *juan 5* of *Lishi apitan lun*, the text further introduces the speed and direction of the sun and moon’s movements, their relative movements, and the changes in lunar phases.³⁰ Similar descriptions can also be found in *juan 22* of the *Chang ahan jing*³¹ and *juan 5* of *Qishi jing*³², which are essentially consistent with the records in the *Lishi apitan lun*. However, in *juan 11* of *Lishi apitan lun* there is a different explanation for the process and causes of the waxing and waning of the moon phases.³³ It can be seen that ancient Indians already recognized the relationship between lunar phase changes and the variations in sunlight and its position.

2.5.3. Sunlight Coverage

The ‘Riyuexing pin dishijiu’ in *juan 5* of *Lishi apitan lun* mentions that the diameter of sunlight coverage is 721,200 *yojanas*³⁴ with a circumference of 216,3600 *yojanas*. When the sun rises in the southern Jambudvīpa, it sets exactly in the northern Uttarakuru (Bei Yudanyue zhou 北鬱單越洲), reaches noon in the eastern Pubbavideha (Dong Fupoti zhou 東弗婆提洲), and midnight in the western Jambudvīpa. The different seasons throughout the day are formed by the sun’s movement.³⁵ Although the concept of sunlight having a certain coverage range is only found in one place in the Buddhist scriptures, it is highly significant. In the ancient Indian cosmological model, the sun’s path revolves around Mount Sumeru and is parallel to the earth’s surface. In this model, if the radius of sunlight were infinite, it would not be possible to have alternating changes between day and night. Therefore, the Buddhist scriptures explicitly state that the diameter of sunlight coverage is 721,200 *yojanas*, which means the radius is 360,600 *yojanas*. As such, within the spherical range centered on the sun with a radius of 360,600 *yojanas*, it is daytime, while beyond that is nighttime.

As the radius of sunlight coverage is smaller than the inner path diameter of the sun’s orbit around Mount Sumeru (480,800 *yojanas*), it is determined that when the sun travels along its ‘route’, it cannot shine on the opposite side of its position. For example, when sunlight shines on the southern Jambudvīpa, it cannot reach the northern Uttarakuru. The alternation of day and night on the four continents can be explained based on the two premises of ‘the sun revolves around Mount Sumeru’ and ‘the limited coverage range of sunlight’.

2.5.4. Solar and Lunar Eclipses

Regarding the cause of solar eclipses, ancient Indians also had unique understandings. In the form of the Buddha Śākyamuni preaching to the various celestial beings, such as in the fourteenth chapter, ‘Yinyang shan’ē zhengying pin’ 陰陽善惡征應品 [The Chapter on the Divine Signs of the Good and Evil and Yin and Yang] found within *juan 18* of *Da fangguang pusa zang Wenshushili genben yigui jing*, it explains the cause of solar eclipses, attributing them to Rāhu Asura, the king of the Asuras. Asura is the fifth class of the eight transmudane beings led by the *devas* (gods) and *nagas* (Dragons)³⁶ in Indian Buddhism, originally a kind of deity in the Indian Buddhist world, often at war with Indra, the king of the gods. Rāhu is the king of the Asuras. During a battle with Indra, Rāhu blocked the sun with one hand because it was too dazzling, causing a solar eclipse. Due to this relationship between Rāhu and eclipses, in ancient Indian astronomy, the ascending node of the ecliptic and the celestial equator, which is closely related to eclipses, was named Rāhu. In the *Qiyao rangzai jue*, detailed instructions and tables are given for Rāhu’s movements.

The fourteenth chapter, ‘Yinyang shan’ē zhengying pin’ found within *juan 18* of *Da fangguang pusa zang Wenshushili genben yigui jing*, also mentions a six-month period of eclipses. Modern astronomy tells us that eclipses must occur near the points where the ecliptic intersects the celestial equator, and the time it takes for the sun to move from the ascending node to the descending node is precisely six months. In fact, concerning lunar eclipses, including penumbral lunar eclipses, they occur at least twice a year, about every six months, and regarding solar eclipses, they also occur at least twice a year, about every six months.

In many more Esoteric Buddhist scriptures, solar and lunar eclipses appear more as signals of disasters or as special moments for conducting rituals. After explaining the cause of eclipses, as in the aforementioned *Da fangguang pusa zang Wenshushili genben yigui jing*, the text lists the constellations associated with solar eclipses and the disasters expected in various regions of ancient India, which is similar to the theory of divisions in ancient China.

From various descriptions in Esoteric Buddhist scriptures, it seems that ancient Indians believed that performing certain rituals during solar and lunar eclipses would have special positive effects. For example, the *Xukongzang pusa nengman zhuyuan zuishengxin tuoluoni qiu wenchi fa* 虛空藏菩薩能滿諸願最勝心陀羅尼求聞持法 [Vajrasattva Mantra for Fulfill-

ing All Wishes and Empowering the Most Excellent Mind] describes a method for preparing a divine medicine, which must be prepared during a solar or lunar eclipse.³⁷ The entire process described in the text is highly ritualistic, with detailed instructions. This divine medicine seems to primarily enhance people's understanding and memory. In the *Foshuo Da Molizhi pusa jing* 佛說大摩里支菩薩經 [Sūtra of the Great Maudgalyāyana], another process for preparing a divine medicine is described. This medicine is even more miraculous: it is refined during a solar or lunar eclipse, and when ingested, it can make a person invisible.³⁸ The *Shengjianni fenu jin'gang tongzi pusa chengjiu yigui jing* 聖迦柅忿怒金剛童子菩薩成就儀軌經 [Ritual Manual for the Holy Vajraketu Fierce Vajra Youth Bodhisattva] also describes a process for preparing a divine medicine that enables one to fly in the sky. The phrase 'waiting for the time of the lunar eclipse, fast for three days from the thirteenth to the fifteenth day' (候月蝕時，從十三日至十五日三日斷食)³⁹ reveals that one must have the ability to predict the day of the lunar eclipse in advance, otherwise fasting cannot begin on the thirteenth day. Indian astronomy, which was introduced to Tang Dynasty China, excelled in predicting eclipses, so this was probably not difficult during the flourishing period of Esoteric Buddhism in 7th and 8th century India.

Similar descriptions of conducting rituals during solar and lunar eclipses to enhance spiritual practice effectiveness are found in other Buddhist scriptures as well. All these descriptions illustrate that ancient Indians had a thorough understanding of solar and lunar eclipses, and their astronomical knowledge enabled them to accurately predict the occurrence of eclipses, thereby providing support for the religious practices of Esoteric Buddhism, allowing these rituals to be conducted smoothly.

2.6. The Five Planets and the Seven Luminaries in the Buddhist Canon

Without exception, various ancient civilizations recognized the existence of five major planets. In Buddhist scriptures, the names of these five major planets can generally be divided into two categories. First, the use of the common names of the five planets in ancient China: Suixing 歲星 (Saturn), Yinghuo 營惑 (Jupiter), Zhenxing 鎮星 (Mars), Taibai 太白 (Venus), and Chenxing 辰星 (Mercury), or alternatively, Muxing 木星 (Jupiter, Wood star), Huoxing 火星 (Mars, Fire star), Tuxing 土星 (Saturn, Earth star), Jinxing 金星 (Venus, Metal Star), and Shuixing 水星 (Mercury, Water star); second, the transliteration of the names of the five planets from India and western regions into Chinese.

The names Suixing, Yinghuo, Zhenxing, Taibai, and Chenxing were the formal designations for the five major planets in ancient Chinese astronomy. Later, these five planets were associated with the five elements, and they were arranged in the order of the Five Phases, which is the sequence of Wood generating Fire, Fire generating Earth, Earth generating Metal, and Metal generating Water.

In Buddhist scriptures, there are various arrangements for the sequence of the five planets. The *Renwang huguo bore boluomiduo jing* 仁王護國般若波羅蜜多經 [Perfection of Wisdom Sūtra for Humane Kings Protecting Their Countries] lists the names of the five planets in the order of Wood, Fire, Metal, Water, and Earth.⁴⁰ The *Sheng yaomu tuoluoni jing* 聖曜母陀羅尼經 [Sūtra of the Holy Mother of the Luminaries] also arranges them in the same order. The *Qiyao rangzai jue* gives the names and sequence of the five planets as Suixing, Yinghuo, Zhenxing, Taibai, and Chenxing.

In the *Da weide jinlun foding chisheng guang Rulai xiaochu yiqie zainan tuoluoni jing* 大威德金輪佛頂熾盛光如來消除一切災難陀羅尼經 [Sūtra of the Great Radiant Light of the Vajra Summit Buddha, the Extinguisher of All Calamities], the sequence of the five planets given is Metal, Wood, Water, Fire, and Earth. This sequence does not follow the Five Phases sequence, nor the sequence of the Five Phases generating and overcoming each other. However, it is the most commonly used sequence in colloquial speech for the five major planets, and it is actually arranged according to the average visual brightness of the five planets from brightest to darkest.⁴¹

In the *Xiuyao jing*, another different sequence for the five planets is given from fastest to slowest, namely Chenxing, Taibai, Yinghuo, Suixing, and Zhenxing, arranged in se-

quence. Here, the speed of the five planets refers to their apparent motion against the background of the fixed stars, for example, Jupiter orbits the sky once every 12 years, Mars orbits the sky once every 2 years, etc.⁴² Arranging the sequence of the five planets based on their speed of motion from fastest to slowest is essentially arranging them according to their distance from the sun, from nearest to farthest. In Esoteric Buddhist scriptures, various other arrangements of the sequence of the five planets are also found, but it is not necessary to elaborate on them here.

There are many details about the orbits and sizes of the five planets in the *Qiyao rangzai jue*. The astronomical table of the five planets in this Buddhist scripture is the most detailed description of the orbits of the five planets among many Buddhist scriptures. Before each section of the planetary tables, there is a general description of the names, sizes, and orbits of the respective planets. The *Modengjia jing* also provides a simple description of the orbital periods of the five planets. Except for the claim that Venus orbits the sky once every one and a half years, which is questionable—usually ancient beliefs consider Venus and Mercury to orbit the sky once a year—the orbital periods of the other four planets are consistent with those given in the *Qiyao rangzai jue*.

Regarding the diameters of the five planets, the *Xiuyao jing* provides the following: Taibai is ten *yojanas* in diameter, Suixing is nine *yojanas*, Chenxing is eight *yojanas*, Yinghuo is seven *yojanas*, and Zhenxing is six *yojanas*.⁴³ Although the numerical values of the planetary diameters given in the *Qiyao rangzai jue* are different, they correspond to the sequence of the visual brightness of the planets in terms of Metal, Wood, Water, Fire, and Earth. The *Fantian huoluo jiuyao* 梵天火羅九曜 [*Skt. *Brahmā Hora Navagraha*; The Nine Luminaries of Indian Heaven] provides that the circumference of Saturn is ninety *li*, Mercury one hundred *li*, Venus one hundred *li*, the sun one thousand five hundred *li*, Mars seventy *li*, the moon one thousand five hundred *li*, and Jupiter one hundred *li*,⁴⁴ which differs from the *Qiyao rangzai jue*, and provides the circumference values instead of the diameter values.

The diameter values of the five planets given in the Buddhist scriptures do not reflect the actual size of the planets but rather to some extent reflect their apparent brightness. In the *Xiuyao jing*, the five planets are arranged from 'large' to 'small', which corresponds to the usual verbal sequence of the five planets: Metal, Wood, Water, Fire, and Earth. These statements about the size of the planets indicate that ancient India noticed the different brightness of different planets and believed that the difference in brightness was due to the different sizes of the stars themselves. However, it is worth noting that in the *Fantian huoluo jiuyao*, the circumference of Saturn is greater than that of Mars, which seems to imply that size is not simply judged according to brightness.

The five major planets plus the sun and the moon are the most prominent seven celestial bodies in the sky, collectively referred to as the 'seven luminaries' (*qiyao* 七曜). The term 'seven luminaries' within Buddhist sūtras first appeared in 'Shuo xingtu pin' contained within *juan* 1 of *Modengjia jing*, translated by Zhu Lüyan 竺律炎 (d.u.) and Zhi Qian 支謙 (fl. 223–253) during the Wu 吳 Dynasty of the Three Kingdoms 三國 (222–280).⁴⁵ It also mentioned the seven luminaries in the section 'Mingshi fenbie pin' within the second *juan* of the same scripture.⁴⁶ In addition, the meaning of the seven luminaries was explicitly stated in the *Da fangdeng daji jing* (T no. 397), translated by the Indian *trepitāka* Naliantiyeshe 那連提耶舍 (Narēndrayaśas; 517–589) during the Northern Qi Dynasty 高齊 (550–577): 'The so-called luminaries, there are seven kinds, namely the sun, the moon, Venus, Jupiter, Mercury, Mars, and Saturn' (言曜者, 有於七種, 一者日、二者月、三者營惑星、四者歲星、五星鎮星、六者辰星、七者太白星).⁴⁷

In the *Xiuyao jing*, it is mentioned that the stars of the sun, moon, and five planets take turns in presiding over good and bad events, which is the origin of the still prevailing system of the week.⁴⁸ During the Tang Dynasty, due to the developed communication between China and the West, the Western system of a seven-day week had already been introduced to China. In Chang'an, there were also areas where Persians, Indians, and Central Asians lived together, and it was common to hear them referring to the days of the week by the names of the seven luminaries.

Additionally, the *Fantian huoluo jiuyao* also provides alternative names for the seven luminaries, namely: Tuxing 土星, Jihuan 雞緩; Shuixing 水星, Dixing 滴星; Jinxing 金星, Najie 那頤; Taiyang 太陽, Mi 密; Huoxing 火星, Xuhan 虛漢; Taiyin 太陰, Mu 暮; and Muxing 木星, Womosi 喞沒斯. These are the names for the seven luminaries used by the Central Asian peoples during the Tang Dynasty.

As a collective term for the sun, moon, and five planets, the seven luminaries also frequently appear as a whole recitation name in Esoteric Buddhist scriptures. In most ritual and mantra scriptures, there are mantras related to the seven luminaries, and reciting such mantras can achieve specific purposes of salvation or supplication.

2.7. *Rāhu, Ketu, and the Nine Luminaries in the Buddhist Canon*

In addition to the sun, moon, and five planets, *Rāhu* and *Ketu* together constitute the so-called nine ‘grabbing’ (Jiuzhi 九執) (or nine luminaries [Jiuyao 九曜]). *Juan 4 of Da piluzhe’na chengfo jing shu* 大毗盧遮那成佛經疏 [Commentary on the *Mahāvairocana Sūtra*], describes them as follows: the nine luminaries consist of the seven planets, namely, the sun, moon, Mars, Mercury, Jupiter, Venus, Saturn, and also *Rāhu* and *Ketu*, totaling nine luminaries.⁴⁹ The same text in *juan 17* also mentions that in Sanskrit, it is called *Bālīka* (Bolihe 燮哩何), translated as ‘nine grabbing’.⁵⁰ In Sanskrit, nine grabbing is known as *Navagraha*, referring to the nine deities that influence celestial phenomena.

In fact, the ‘Shuo xingtu pin’ section of *juan 5 of Modengjia jing*, translated as early as the Eastern Wu period, had already defined the nine luminaries: ‘Now, I will explain to you the seven celestial bodies: the sun, moon, Mars, Jupiter, Venus, Saturn, and Mercury are called the seven, and *Rāhu* and the comet, together, are called the nine’ (今當為汝復說七曜: 日、月、熒惑、歲星、鎮星、太白、辰星、是名為七, 羅睺、彗星, 通則為九) (see Note 45). The ninth celestial body among the nine luminaries was referred to as the ‘comet’ (*hui* 彗). The commentary on the *Mahāvairocana Sūtra* in *juan 4* also lists *Rāhu* and the comet together.⁵¹ In the *Beidou qixing humo fa* 北斗七星護摩法 [Procedures for the Fire Ritual for the Seven Stars of the Big Dipper], the monk Yixing 一行 (683–727) explained it as follows: ‘*Ketu*, translated as a banner. A banner refers to a comet. *Rāhu* refers to the deity of conjunction and eclipse’ (計都者, 翻為旗也。旗者, 彗星也。羅睺者, 交會蝕神也).⁵² *Ketu* is Sanskrit for ‘banner’ (*qi* 旗) and its original meaning in Sanskrit includes both ‘banner’ and ‘comet.’ Therefore, ‘*Ketu*’ is a transliteration, and ‘comet’ is a translation. The *Qiyao rangzai jue* mentions that *Ketu* is also known as ‘moon boli’ (*Yue boli* 月孛力), with ‘bo’ 孛 being a type of comet mentioned in ancient Chinese texts. In many Esoteric Buddhist scriptures, *Ketu* is translated as *huixing* 彗星 (comet), *huibo* 彗孛 (*bo* comet), or *changwei xing* 長尾星 (long tailed star), but they all refer to *Ketu* when listed as one of the nine luminaries.

Apart from descriptions of *Rāhu* and *Ketu* in texts such as the *Qiyao rangzai jue* that closely align with their astronomical meanings, in many other Esoteric Buddhist scriptures, when *Rāhu*, *Ketu*, or the nine luminaries are mentioned, they are mostly treated as one group of important celestial deities for chanting.

The Buddhist scriptures mentioned above that discuss *Rāhu*, *Ketu*, or the nine luminaries belong to the Esoteric Buddhist canon. Texts outside the Esoteric Buddhist canon rarely mention *Rāhu*, *Ketu*, and the nine luminaries. This indicates that the concept of the nine luminaries was introduced into China with the spread of Esoteric Buddhism, and in many cases, it was treated only as a symbol of astrology. The aforementioned Buddhist scriptures were translated during the middle to late Tang Dynasty and early Song Dynasty, suggesting that the concept of the nine luminaries was introduced on a large scale during the middle to late Tang Dynasty.

2.8. *Planetary Ephemerides in the Buddhist Canon*

Planetary ephemerides in Esoteric Buddhist scriptures primarily appear in the *Qiyao rangzai jue*. This scripture directly presents the tables of the five major planets (*wuda xingxing* 五大行星), *Rāhu*, and *Ketu* in numerical form. Each table provides the celestial coordinates for a heavenly body in a certain constellation and degree for each month. The tables

also mark the dates and positions on the ecliptic for the planets’ invisibility, visibility, direct motion, and retrograde motion. The ephemerides for Jupiter span 83 years, for Mars 79 years, for Saturn 59 years, for Venus 8 years, for Mercury 33 years, for *Rāhu* 93 years, and for *Ketu* 62 years.⁵³ Here, the length in years of a certain planetary ephemerides is equal to the sum of the planet’s sidereal periods and synodic periods. For Jupiter, as an example, there are 7 sidereal periods and 76 synodic periods in 83 years. This quantitative relationship can be traced back to Indian and Babylonian astronomy (Pingree 1981).

By utilizing modern accurate astronomical tables, an analysis of the precision in both position and time of the planetary tables and *Rāhu* and *Ketu* tables in the *Qiyao rangzai jue* yields the following results (Tables 1 and 2):

Table 1. The precision of the positions of the Five Star Calendar in *Qiyao rangzai jue*.

Planet	Mean Error of Stationary Point	Mean Square Error of Stationary Point	Mean Error of Concealing and Appearing Position	Mean Square Error of Concealing and Appearing Position
Jupiter	−0.41°	1.29°	−0.47°	1.89°
Mars	1.00°	6.34°	−2.45°	15.11°
Saturn	−0.39°	1.72°	−0.38°	1.70°
Venus	−0.98°	5.65°	0.23°	11.68°
Mercury	—	—	−1.13°	6.95°

Table 2. The precision of the times of the Five Star Calendar in *Qiyao rangzai jue*.

Planet	Mean Error of Stationary Point	Mean Square Error of Stationary Point	Mean Error of Concealing and Appearing Time	Mean Square Error of Concealing and Appearing Time
Jupiter	−3.14 days	6.25 days	−3.57 days	2.38 days
Mars	−1.61 days	6.71 days	−5.20 days	15.58 days
Saturn	−3.89 days	3.32 days	−2.93 days	1.94 days
Venus	−0.80 days	7.05 days	−3.85 days	6.72 days
Mercury	—	—	−1.04 days	7.50 days

Additionally, the mean positional error for *Rāhu* in the table is -3.4° with a mean square error of 1.2° , while for *Ketu*, the mean positional error is -5.7° with a mean square error of 1.3° .

The precision mentioned above generally aligns with the accuracy of planetary tables during the era of visual observation, supporting the functionality of the *Qiyao rangzai jue* as a practical astrological handbook.

3. The Preservation Characteristics of Astronomical Data in the Buddhist Canon

A prominent feature of the preservation of astronomical data in Buddhist scriptures is its integration with astrology. Astronomy and astrology have inherently intricate connections. Although early Buddhism generally prohibited the study of astrology among its followers, by the time Buddhism reached the stage of Esoteric Buddhism, this barrier had been completely eliminated. Some Buddhist scriptures, especially those classified as ritual texts and Esoteric scriptures in the Esoteric Buddhist tradition, serve the purpose of facilitating rituals for disaster relief, which essentially serves the broader objectives of astrology.

Some Esoteric Buddhist scriptures appear entirely as astrological documents based on their titles. For instance, the *Qiyao rangzai jue* conveys its purpose as utilizing the movements of the sun, moon, and the five planets to forecast and mitigate disasters. Regardless of its astrological purpose, the descriptions of the movements of the five planets and the

tables provided for their positions, as well as the positions of *Rāhu* and *Ketu*, are invaluable to ancient Indian astronomical data. Similarly, the *Xiuyao jing* contains rich astronomical data, including information on the Indian constellation system, the twelve houses of the zodiac, and knowledge about the sun, moon, and five planets. However, the title of this scripture, 'Wenshushili pusa ji zhuxian suoshuo jixiong shiri shan'e xiuyao jing' 文殊師利菩薩及諸仙所說吉凶時日善惡宿曜經 [Sūtra Spoken by Bodhisattva Mañjuśrī and Various Devas on Auspicious and Inauspicious Times and Days and Good and Evil Nakṣatras and Planets], indicates its purpose of elucidating the auspiciousness and inauspiciousness of specific days and planets for human activities, undoubtedly making it a work of the astrological literature.

Under the overarching characteristic of serving astrology, the preservation of different astronomical content in Esoteric Buddhist scriptures also exhibits distinct features. Some scriptures directly preserve ancient astronomical data, while astronomical knowledge in certain Buddhist scriptures is embedded in the narrative more indirectly and subtly.

Astronomical knowledge in Buddhist scriptures often gets disseminated in a way that integrates with Buddhist principles. After all, the ultimate goal of Buddhist scriptures is to propagate the Dharma. Therefore, even when astronomical content is mentioned in Buddhist scriptures, it is often used to elucidate Buddhist principles more explicitly. For example, in *juan* five of *Foshuo da bonihuan jing* 佛說大般泥洹經 [Sutra on the Great Nirvana], a lunar eclipse is used to illustrate the unchanging nature of the Tathāgata's Dharma.⁵⁴ Similarly, in the *Xiangtou jingshe jing* 象頭精舍經 [Sutra of the Elephant's Head Hermitage], the lunar phases from the first to the fifteenth day are metaphorically used to describe the process of spiritual cultivation and the states attained.⁵⁵

Of course, in the above examples, astronomical concepts are only used metaphorically for explanatory purposes. In some cases, astronomical content itself becomes part of Buddhist theoretical discussions, particularly in the integration of Buddhist cosmology with cosmological theories. For instance, in *juan* 16 of *Abidamo zang xianzong lun* 阿毗達磨藏顯宗論 [Skt. **Abhidharma-samayapradīpikā*, **Abhidharma-pitaka-prakarana-sāsana-śāstra* or **Abhidharmakośa-śāstra-kārikā-vibhāṣya*; Treatise Clarifying the Tenets of the Abhidharma Treasury], a Buddhist cosmological diagram is described, starting from the movements of the sun and moon, discussing the alternation of day and night, the changes in the length of day and night, and extending to the abodes of celestial beings, accompanied by extensive descriptions of Buddhist cosmology.⁵⁶ It presents a vividly Buddhist worldview, with astronomical content being an integral component. In Esoteric Buddhist scriptures, Buddhist theories are intricately combined with astrology and astronomy. From the distribution of astronomical data in Buddhist scriptures, it is evident that a substantial amount of data appears in Esoteric Buddhist scriptures.

4. The Reliability of Astronomical Data in the Buddhist Canon

We believe that the astronomical data in the Buddhist scriptures are reliable, and this reliability can be explained from two perspectives.

Firstly, from the perspective of textual preservation, the Chinese Buddhist canon has been well preserved. Although there may have been some transcription errors due to copying, the act of transcribing Buddhist scriptures was considered a meritorious deed by Buddhists, especially when they transcribed scriptures with devout faith, as the possibility of errors was minimized. Therefore, we can essentially affirm that the Chinese-translated Buddhist scriptures we see today are essentially the same as they were when they were originally translated.

Secondly, from the perspective of Buddhist scripture translation, many of the translators involved in the translation of Buddhist scriptures into Chinese had a good grasp of astronomical knowledge at that time. This can be inferred from some biographical materials about these translators. For example, from the *Gaoseng zhuan* 高僧傳 [Biographies of Eminent Monks], we see that An Qing 安清 (i.e., An Shigao 安世高, active during the 140s–160s)

was proficient in knowledge of the ‘Seven Luminaries and Five Elements’ (Qiyao wuxing 七曜五行)⁵⁷; Tankejaluo (Tankāra 曇柯迦羅; active in the 220s–250s) had a command of the study of ‘star maps and their changes’ (星宿圖讖運變)⁵⁸; Kāng Senghui 康僧會 (?–280) was knowledgeable about ‘astronomical charts and diagrams’ (天文圖緯)⁵⁹; Tanwuchen 曇無讖 (Dharmakṣema; 385–433) had a clear understanding of ‘mantras and incantations’ (明解咒術)⁶⁰; Jiumoluoshi (Kumārajīva 鳩摩羅什; 344–413) was highly skilled in ‘yinyang astrology’ (陰陽星算)⁶¹; Qiunabatuoluo 求那跋陀羅 (Guṇabhadra; 394–468) had learned various treatises of *Wuming* 五明 (Five clarities) since childhood and was proficient in astronomy, arithmetic, medicine and incantations, etc.⁶²; Qiunapidi 求那毗地 (Guṇavṛddhi; ?–502) had a clear understanding of ‘yinyang’ and was skilled in divination⁶³; Junaluotuo 拘那羅陀 (Paramārtha or Zhendi 真諦, 499–569) was extremely knowledgeable and renowned for his expertise⁶⁴; and Putiliuzhi 菩提流志 (Bodhiruci; 572–727) was well versed in ‘calendars, numerology, yinyang, and divination’ (曆數咒術, 陰陽讖緯).⁶⁵

The likes of Kumārajīva, Guṇabhadra, Paramārtha, etc., were renowned translators. The *Gaoseng zhuan* was written during the Southern Liang Dynasty, recording the early translation situation. Translation reached its peak during the Tang Dynasty. The famous monk Yi xing was proficient in both astronomy and calendar calculation, and the ‘Dayan Calendar’ (*Dayan li* 大衍曆) he constructed was one of the best calendars in the history of calendars, and he translated a large number of Buddhist scriptures.

Due to the work of these translators who were knowledgeable in astronomy, it can be inferred that the astronomical data in the existing Chinese-translated Buddhist scriptures were accurately translated from the original texts.

5. Limitations of Astronomical Data in the Buddhist Canon

It is undeniable that the astronomical data in the Buddhist canon have their limitations. Astronomy in the Buddhist canon is either intertwined with Buddhist philosophy or associated with astrology. For example, the cosmological content in the Buddhist canon closely aligns with the propagation of Buddhist worldview. The astronomical content appearing in the Buddhist canon sometimes serves as a means to elucidate Buddhist doctrine, sometimes as a tool to determine the precise timing of religious rituals, and sometimes even as a subject of criticism. Therefore, the astronomical content in Buddhist scriptures is subject to certain restrictions. Serving astrology and elucidating doctrine is both the reason why astronomy can be preserved in the Buddhist canon and the reason why it is limited.

The limitations of astronomical data in the Buddhist canon are also related to the religious views of certain Buddhist sects. For example, in the *Da boniepan jing* 大般涅槃經 [Skt. *Mahāparinirvāṇa-sūtra*; *Nirvāṇa Sūtra*], it is mentioned that some Buddhist monks at the time were knowledgeable in astronomy and astrology.⁶⁶ However, some Buddhist sects believe that for Buddhist monks, practices such as astrology, crafts, and skillful activities are as sinful as eating fish and meat. Only by abstaining from these sinful activities can one be considered a true disciple of the Buddha.

Buddhism refers to other religious sects such as Brahmanism as ‘outsiders’. From the records in the Buddhist canon, it is known that most Brahmanic outsiders were knowledgeable in astronomy and calendrical calculation. For example, in the *Lianhua mian jing* 蓮花面經 [*Sūtra of the Monk Lotus Face*], it is mentioned that a Brahmanic disciple named Lotus Face 蓮花面 was intelligent and knowledgeable, mastering the knowledge of the twenty-eight constellations and the degrees of the five planets.⁶⁷ Juan 2 of *Genben shuoyiqieyoubu pinaiye zashi* 根本說一切有部毗奈耶雜事 [Skt. *Mūlasarvāstivāda-vinayakṣudrakavastu*] mentions the outsiders being ‘good at calendar calculating’ 善明曆數 at that time.⁶⁸ The Buddha did not allow his disciples to engage with other disciplines such as astronomy and astrology in order to focus on Buddhism. This is explicitly stipulated in the *Vinayas*; for example, it is stated in the *Da Aidao biqiuni jing* 大愛道比丘尼經 [*Sūtra of the Bhikṣuṇī Mahāprajāpatī*] ‘throughout his life, he must not say whether the day is good or bad, and divining the auspiciousness and inauspiciousness, observing the sky, calculating the calendar and eclipse, fortunetelling through celestial phenomena,all of these are pro-

hibited.’ (盡形壽，不得說道日好日不好，占視吉凶，仰觀曆數、推布盈虛、日月薄蝕、星宿變殞……一不得知).⁶⁹ This regulation extensively prohibits bhikṣuṇīs engaging in astronomical and astrological activities, thus prohibiting the learning and dissemination of astronomical knowledge. This prohibition had a negative effect at the time. According to the first volume of *Genben shuoyiqieyoubu nituona* 根本說一切有部尼陀那 [Skt. *Mūlasarvāstivāda Vinaya*], the prohibition on studying astronomy and calendrical calculation resulted in Buddhist disciples not knowing the current date. When the Buddha allowed them to study these subjects, it caused a disturbance and diverted them from their practice of good deeds. Later, the Buddha came up with a compromise solution, specifying that only the chief monk should learn about the stars and calendar days, and others should not learn.⁷⁰

In the *Mohe sengqi lü da biqiu jieben* 摩訶僧祇律大比丘戒本 [Skt. **Mahāsāṃghika-pratimokṣa-sūtra*], the so-called ‘six memorization methods’ (*liunian fa* 六念法) are stipulated, among which the first method is ‘knowing the dates of the sun and moon, the first day, the second day, up to the fourteenth and fifteenth days, big month or small month, one should know them all’ (當知日數月，一日、二日及至十四日、十五日，月大月小悉應知).⁷¹ Although this somewhat relaxed the prohibition on studying astronomy, it was limited to learning the arrangement of calendars.

In the later period of Buddhism, as it gradually merged with Brahmanism to form Esoteric Buddhism, what was originally considered the study of outsiders by Buddhism was also accepted. The *Da boniepan jing* mentions books about ‘solar and lunar eclipses, and the changes in celestial phenomena’ (日月薄蝕、星宿運變) that were previously unseen but are now available.⁷²

The introduction of Esoteric Buddhism into China can be said to have occurred almost simultaneously with the arrival of Buddhism in China. Many of the early translators who came to China were Brahmins or converted from Brahmanism to Buddhism. By the middle of the Tang Dynasty, Esoteric Buddhism had reached its peak in China. Esoteric Buddhist scriptures contain more astronomical content, which is fortunate for the preservation of Indian astronomical data.

6. Conclusions

Ancient civilizations around the world have developed distinct astronomy systems which served as important components in their respective cultures and facilitated exchanges and dissemination between different ancient civilizations. American historian of astronomy David Pingree (1933–2005) once likened ancient astronomy–astrology to a great tree, with its main roots deeply buried in the deserts of Mesopotamia, its secondary roots extending deeply into Egypt and China, and its branches branching out from Babylon to Egypt, Greece, Syria, Iran, India, and China. They were grafted onto the cultural trunks of different civilizations, growing different leaves, shoots, and flowers (Pingree 1992, p. 563). The astronomical data in the Buddhist canon discussed in this article aligns with Pingree’s depiction of the cultural exchange between eastern and western astronomy–astrology, confirming each other’s perspectives.

The astronomical knowledge in the Buddhist canon originates directly from Indian civilization, but some knowledge can be traced back to Babylonian and Greek civilizations. They spread to China through the Silk Road and interacted with indigenous Chinese astronomy. The study of astronomical data in the Buddhist canon helps us understand the position of ancient Chinese civilizations in the history of world civilization. It also provides concrete examples to illustrate that human civilization has never developed in isolation or in a closed state, revealing the core meaning of the historical view of technological and cultural exchange: knowledge advances through dissemination, and civilization flourishes through communication.

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Abbreviation: *T* = *Taishō shinshū daizōkyō* 大正新脩大藏經. See References, Secondary Sources, Takakusu and Watanabe (Takakusu and Watanabe) eds.

Notes

- ¹ *Da foding rulai miyin xiuzheng liaoyi zhu pusa wanxing shou lengyan jing*, *T* no. 945, 19: 4.122c13–15.
- ² *Luocha* 洛叉, the Chinese transliteration of the Sanskrit term *lakṣa* was also rendered as *luosha* 洛沙. It is equivalent to 100,000. In Chinese translations of Buddhist scriptures, *lakṣa* is sometimes translated as *yi* 億, which meant 100,000 instead of 100,000,000.
- ³ It is considered that the value of π equals 3. In many instances in Chinese translations of Buddhist scriptures, π is taken to be 3. The ancient Chinese mathematical text *Zhoubi suanjing* 周髀算經 [Calculation Classic of the Zhou Gnomon] also adopts the same value for π .
- ⁴ *Abidamo jushe shi lun*, *T* no. 1559, 29: 8.214a14–215b7.
- ⁵ *Ibid.*, 11.57a7–60c20.
- ⁶ Eighty thousand *yojanas* is an approximate figure; more precisely, it is eighty-four thousand *yojanas*.
- ⁷ As for the relevant parameters of the Indian *nakṣatras*, please refer to the following literature: (Pingree and Morrissey 1989).
- ⁸ *Da fangdeng daji jing*, *T* no. 397, 13: 41.274c16.
- ⁹ In ancient India, one day was divided into 30 *muhūrtas*, also translated as *shi* 時, or *xūyū* 須臾.
- ¹⁰ A Chinese transliteration of the Sanskrit *abhicāra*, referring to the act of subduing or controlling.
- ¹¹ *Suxidi jieluo jing*, *T* no. 893, 18: 2.613b4–7.
- ¹² *Ibid.*, 618b23–b27.
- ¹³ *Da fanguang pusa zang Wenshushili genben yigui jing*, *T* no. 1191, 20: 14.885c3–14.886c8.
- ¹⁴ *Da Piluzhe'na chengfo jingshu*, *T* no. 1796, 39: 4.617c23–27.
- ¹⁵ *Ibid.*, 617c23–618a8.
- ¹⁶ *Modengjia jing*, *T* no. 1300, 21: 3.408c18–3.409a15.
- ¹⁷ *Foshuo Shi feishi jing*, *T* no. 794b, 17: 1.739a8–c22.
- ¹⁸ *Fayuan zhulin*, *T* no. 2122, 53: 42.611c26–29.
- ¹⁹ *Mohe sengqi lü*, *T* no. 1425, 22: 17.359b26–c4.
- ²⁰ Rajagrha, known as Wangshe cheng 王舍城 in Chinese, is transliterated from Sanskrit, meaning ‘the abode of the king’. It was one of the important sites of early Buddhism in ancient India and served as a center for the early propagation of Buddhism by Gautama Buddha. It is transliterated as ‘Luoyuejielixi 羅閱揭梨醯’, ‘Luoyuezhi 羅閱祇’, or ‘Luoyue 羅閱’ in Chinese. Xuanzang’s *Da Tang Xiyu ji* 大唐西域記 [The Great Tang Dynasty Records of the Western Regions] (*T* no. 2087, 51: 9.923a16) translates it as ‘Heluoshejilixi cheng’ 曷羅闍婁利呬城.
- ²¹ *Boli* 玻璃 translates the Sanskrit *sphatika*. In Chinese translations of Buddhist scriptures, it is also rendered as *poli* 頗黎, *podijia* 頗胝迦, *pizhijia* 頗置迦, *shapozhijia* 娑波致迦, *saipozhijia* 塞頗致迦, *subozhijia* 窣坡致迦, and others.
- ²² In ancient China, there was a similar interpretation attributing the round shape of the sun and moon to the distance of the viewer. The ‘Tianwen zhi’ 天文志 [Treatise on Astronomy] in *Suishu* 隋書 [Sui History] quotes Wang Chong as saying, ‘The sun and moon are not actually round; they appear round due to their distance from observers. The sun is the essence of fire, and the moon is the essence of water. Why are they round in the sky when they are not round on the earth? 日月不圓也, 望視之所以圓者, 去人遠也. 夫日, 火之精也; 月, 水之精也. 水火在地不圓, 在天何故圓 (Suishu 19.509)?’
- ²³ *Chang ahan jing*, *T* no. 0001, 1: 22.145b15–18.
- ²⁴ *Lishi apitan lun*, *T* no. 1644, 32: 5.195a11–c4.
- ²⁵ *Qishi jing*, *T* no. 24, 1: 10.358c21–22.
- ²⁶ *Yujia shidi lun*, *T* no. 1579, 30: 2.287c23–24.
- ²⁷ *Chang ahan jing*, *T* no. 0001, 1: 22.146b11–12.
- ²⁸ *Lishi apitan lun*, *T* no. 1644, 32: 5.195a10–11.
- ²⁹ *Lishi apitan lun*, *T* no. 1644, 32: 5.195a10–c4.
- ³⁰ *Ibid.*, 195c4–15.

- 31 *Chang ahan jing*, T no. 0001, 1: 22.146a11–12. Here, the ancient Chinese length unit *li* is used instead of *yojana*. Based on the aforementioned walking speed, it can be calculated that one *yojana* is approximately 18.6 *li*. According to *the Da Tang Xiyu ji*, there are three variations for one *yojana* being 40 *li*, 20 *li*, and 16 *li*, which are generally consistent.
- 32 *Qishi jing*, T no. 24, 1: 9.359b24–27.
- 33 *Apidamo jushe lun*, T no. 1558, 29: 11.59b13–17.
- 34 In the ancient Chinese book *Zhoubi Suanjing* 周髀算經, it is stated that the radius of sunlight is 167,000 *li*, which is a remarkable similarity with the Indian one. However, it is currently difficult to say whether the two have independently emerged in their respective cultures or have a mutually influential relationship.
- 35 *Lishi apitan lun*, T no. 1644, 32: 5.197b3–7.
- 36 Others of the eight classes are *yakas*, *ganharvas*, *gaudas*, *kinaras*, *mahoragas*.
- 37 *Xukong zang pusa nengman zhuyuan zuishengxin tuoluoni qiu wenchi fa*, T no. 1145, 20: 1.602c15–25.
- 38 *Foshuo Da Molizhi pusa jing*, T no. 1257, 21: 2.268c4–9.
- 39 *Shengjia'ni fennu jin'gang tongzi pusa chengjiu yigui jing*, T no. 1222, 21: 2.113a21–22.
- 40 *Renwang huguo bore boluomiduo jing*, T no. 246, 8: 3.843a21–23.
- 41 *Da weide jinlun foding chishengguang rulai xiaochu yiqie zainan tuolononi jing*, T no. 964, 19: 1.338c16–19.
- 42 *Wenshushili pusa ji zhuxian suoshuo jixiong shiri shan'e xiuyao jing*, T no. 1299, 21: 1.387a27–28.
- 43 *Wenshushili pusa ji zhuxian suoshuo jixiong shiri shan'e xiuyao jing*, T no. 1299, 21: 1.387b5–7.
- 44 *Fantian huoluo jiuyao*, T no. 1311, 21: 1.459c27–461c5.
- 45 *Modengjia jing*, T no. 1300, 21: 1.404b13–15.
- 46 *Ibid.*, 3.410a14–15.
- 47 *Da fangdeng daji jing*, T no. 0397, 13: 56.373a21–23.
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- 49 *Da Piluzhe'na chengfo jingshu*, T no. 1796, 39: 4.617c14–15.
- 50 *Ibid.*, 7.653b24–25.
- 51 *Da Piluzhe'na chengfo jingshu*, T no. 1796, 39: 4.618c27.
- 52 *Beidou qixing humo fa*, T no. 1310, 21: 1.457c23–24.
- 53 *Qiyao rangzai jue*, T no. 1308, 21: 1–2.429b1–448a24.
- 54 *Foshuo da nihuan jing*, T no. 376, 12: 5.890c6–15.
- 55 *Foshuo xiangtou jingshe jing*, T no. 466, 14: 1.488a8–11.
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- 57 *Gaoseng zhuan*, T no. 2059, 50: 1. 323a25–27.
- 58 *Ibid.*, 324a17–18.
- 59 *Ibid.*, 325a16–17.
- 60 *Ibid.*, 336a5–6.
- 61 *Ibid.*, 330a7–11.
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- 63 *Ibid.*, 345a6–7.
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Article

From Nescience to Science: Buddhist Reflections on Human/Nature

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Abstract: A Buddhist system of two truths provides a descriptive framework with criteria for what counts as real in contrast to what does not. This paper looks at the relationship between these two truths in the works of two seventh-century Indian philosophers, Dharmakīrti and Candrakīrti, and draws implications for comparison and contrast with modern scientific understandings of the world. It highlights important features of Dharmakīrti's epistemology that aim to circumvent cultural conventions in a way that resonates with scientific representations of knowledge. It also contrasts this approach with one inspired by Candrakīrti in order to argue for the place of ethics and persons in a hybrid Buddhist–scientific picture of the world.

Keywords: anti-realism; Madhyamaka; Yogācāra; epistemology; Candrakīrti; Dharmakīrti

1. Introduction

A Buddhist system of two truths provides a descriptive framework with criteria for what counts as real, or true, in contrast to what does not. This paper looks at the relationship between these two truths in the works of two seventh-century Indian philosophers, Dharmakīrti and Candrakīrti, and draws implications for comparison and contrast with modern scientific understandings of the world. It highlights important features of Dharmakīrti's epistemology that aim to circumvent cultural conventions in a way that resonates with scientific representations of knowledge. It also contrasts this approach with one inspired by Candrakīrti in order to argue for the place of ethics and persons in a hybrid Buddhist–scientific picture of the world.

2. Frameworks of Reality

At the heart of Dharmakīrti's epistemology is a distinction between that which is more fundamental and that which is less so. Specifically, a distinction is made between (1) the “real” entities that underwrite the cultural artifacts we conventionally designate within language, and (2) the “unreal” cultural artifacts that are nothing more than cultural constructions. For Dharmakīrti, what is real has a unique and determinate time (*kāla*), place (*deśa*), and form (*ākāra*) (Dreyfus 1997, p. 70); in contrast, linguistic universals distributed across time and space are deemed unreal. He thus contrasts a surface level of linguistic superimposition with a deeper causal process. Dharmakīrti defines the real, or ultimate truth, as that which is causally efficacious, in contrast to that which is ineffective (Dharmakīrti n.d.).¹ In a significant way, he presents a pragmatic account of truth.

Dharmakīrti's epistemology creates a wedge between two levels of reality—the ultimate truth of causally efficacious particulars and the conventional truth of that which lacks causal power, like linguistic universals. Creating a wedge between two domains enables him to make a distinction between what is real and what is unreal (or rather, what is efficacious and what is ineffective) within a particular framework of explanation. The dichotomous contrast between the potent and impotent elements of a framework is at the heart of Dharmakīrti's system and is a powerful tool that enables pragmatic distinctions to be made between what is real and what is unreal, *even in a virtual world*.² That is, an

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important facet of Dharmakīrti's distinction between two truths is that it gives him a means to account for causal processes without reference to a *metaphysically* real external world.

The distinction between more and less real need not presume a metaphysical reality, since these distinctions can be made in virtual worlds, as in the difference between, for instance, a good and bad movie, a comedy movie and a horror movie, or simply the difference between a movie and disjointed flashes of light appearing on a screen. There need not be anything that is *most* real, or a final truth, to ground these kinds of distinctions; a pragmatic distinction is enough. In other words, with a purely pragmatic criterion there is a way to account for "better" explanations without necessarily presuming there to be a "best" or "most real" explanation.

The pragmatic distinction between two truths is a powerful one, but when Dharmakīrti is confronted with the question of whether causal efficacy, the basis of this distinction between what is real (ultimate) and unreal (conventional), pertains to the ultimate or simply to what is conventional, he replies "so be it" (*astu yathā tathā*) (Dharmakīrti n.d.), suggesting that the reality of what is ultimate and efficacious—the mark of the real—is itself just conventional. A generous reading of this response suggests that the dichotomy he introduces between the real and unreal is not based on an ultimate foundation, but is simply a conventional description, and thus a tool that is useful even while the tool is contingent and falls apart under a reflexive gaze or when pushed to its limit, as in Thomas Kuhn's notion of a "paradigm". (Kuhn 1962).

Yet a critical reading of Dharmakīrti suggests a deep incoherence that runs through his distinction between two levels of reality (the real and the unreal): the distinction embeds a commitment not only to an intractable dualism, but to an incoherent realism. This is because the conceptual problems introduced on one level of reality tend to be unresolved on that level, and only resolvable through an appeal to another level. For instance, the problem of accounting for the efficacy of conventional truth is resolved by appealing to ultimate particulars that are the ineffable truth(s) that ground reality, yet these "ineffable" truths are also described in linguistic terms. Ineffable things, however, cannot logically be appealed to in a description of how things work because, by definition, they are ineffable. We cannot meaningfully talk about what is nonconceptual (at least in a referential way), so we cannot extract any normative or descriptive power from what is ineffable. Furthermore, the distinction between nonconceptual nature and conceptual culture is in the first place a *conceptual* distinction, so what is nonconceptual is arguably only meaningful as a relational concept—a concept distinguished from its inverse, that which is conceptual.

To address these kinds of problems, interpreters of Dharmakīrti, like Shakyā Chokden, have offered what has been called a "sliding scale" or "ascending scale" of analysis to account for the inconsistency between levels of description (Dunne 2004, pp. 53–59; Dreyfus 1997, pp. 98–99). That is, what might be deemed "real" on one level of analysis is considered "unreal" within another framework of analysis. For instance, the designation of a "pot" is distinct from the actual object—the thing we call "pot" that holds water. That is, the linguistic *sign* is unreal in contrast to the *object* that it designates. Yet the object that holds water, and that we call "pot", is designated in dependence upon its parts—its qualities that constitute it, such as earth (in the case of a clay pot), as well as its sensory qualities (like color and shape). These sensory qualities, or *dharmas*, on another level of analysis, are more real than the cultural product that we call a "pot", given that a pot is a conceptual superimposition of something extended in time and space, a linguistic construction imputed upon a flux of events, whereas no such entity really endures in time and space. This is because for Buddhists like Dharmakīrti, it is only in language that we find permanent, spatially extended, singular things; we do not find them in reality.

Yet when pressed further, even the sensory qualities of color and shape that constitute the pot are linguistic entities, and so on another level of analysis, these too are simply cultural products on a different scale—nothing but labels superimposed upon an ineffable and indeterminate manifold; they are "convenient fictions" at best, but fictions nonetheless. Upon further analysis, even the ineffable processes that appear "out there" are subjectively

constituted; that is, what is perceived is intertwined with a perceptual apparatus, and is primed and inflected by the interests of a person. Thus, these seemingly external things are culturally intertwined, too; they are not known to exist independently, outside of perception. Thus, in the end, at his final level of analysis, Dharmakīrti deconstructs not only any and every linguistic representation, but also the entire framework of dualistically-structured reality—the subjective along with objective representations. In the deepest level or reality, what is left is only nonduality, the luminous nature of mind.

It can be instructive to consider these competing frameworks in light of the natural sciences. For instance, when we are engaged with biology, we can talk about organisms as the basic unit of ontology—a world of dogs, spiders, or bats. When we move to another framework, chemistry for instance, the entities that are most relevant are no longer organisms, but the chemicals, like hydrogen, oxygen, and carbon, that compose them. In a chemist’s framework, chemicals are the units of description that account for the causal processes of the world, including the processes of organisms. Another descriptive framework we might employ is physics, wherein chemicals, too, are composed of other units, like molecules and atoms, and we can continue this descriptive reduction by “zooming in” further to molecules, atoms, and subatomic particles (quarks, and so on).

When evaluating competing frameworks, we need not presume that the lower levels of analysis give us the “right” description, any more than we need to presume that a higher (or highest) level (e.g., that of a transcendent self or God) is one that is the most accurate. In fact, without pragmatic criteria, presuming a reductionist position in which the final truth is at the bottom layer, in the *dharmas* or atoms, or that the final truth lies at the highest level, in the buddha-mind or God, is nothing more than a metaphysical presumption. In fact, we need not presume that the *real* truth lies in any one level of analysis. Rather than collapsing everything into a singularity in a final level, in a final physics or a buddha-mind, there is another way of thinking about the relation between frameworks.

The criterion for what is real needs only to apply *within a particular framework*, and need not entail a framework-independent appeal to a metaphysical reality—either at the bottom level, or holistically, at the top, or anywhere in-between. Instead of a final, or ultimate, truth we can appeal to contextual, or framework-dependent truth, which is nothing more and nothing less than a way to distinguish between that which counts as real and that which does not, *within a framework*.

3. Rethinking the Human/Nature Divide

Two different accounts of the relationship between frameworks correspond to two interpretations of the two truths, which I want to represent here through the figures of Dharmakīrti and Candrakīrti: whereas a Dharmakīrtian offers a final layer of true reality (i.e., the ultimate, ineffable luminosity that is the nature of the nondual mind), a Candrakīrtian denies the coherency of any final or most fundamental layer of the world (i.e., the ultimate truth is emptiness).³ While a Dharmakīrtian develops an account of reality by drawing conventional distinctions, a Candrakīrtian highlights the ultimate truth: the fact that that which counts as real is inextricably tied to a conceptual framework, and any description of reality always takes place within a framework. In more general terms, these two interpretations represent the difference between the perspectives of Yogācāra and Madhyamaka.

To illustrate the difference between these Dharmakīrtian and Candrakīrtian accounts, consider two explanations of what makes a car move: pressing down the gas pedal *versus* the movement of gears, cylinders, and a combustion engine. A Dharmakīrtian would say that the common description, “pressing down the gas pedal”, is underwritten by an engineer’s account of the causal process.⁴ Yet a Candrakīrtian would point out the fact that both of these levels of description are simply linguistic accounts, so neither brings us beyond or behind the wall of cultural fabrication; they are both equally conventional truths. While both Dharmakīrti and Candrakīrti may agree on the fact that both of these descriptions are conventional and that both serve distinctive purposes, there is a difference

in how these claims are situated in relation to each other, respectively, in a hierarchical or symmetrical way.

In a Dharmakīrtian analysis of an ascending scale, an underlying account—a *dharmic* or scientific description—takes priority over a folk account; a deeper level of description grounds a surface description. In contrast, the priority of natural language resonates with a Candrakīrtian explanation. That is to say, in a Candrakīrtian analysis, we can see that a scientific account, represented by the language of the mechanical engineer, is necessarily dependent on mundane language usage. Thus, scientific language is grounded in natural usage, rather than *vice versa*. For this reason, a scientific account cannot fully replace or completely explain away the mundane usages of natural language.⁵ In either case, in a Dharmakīrtian or Candrakīrtian interpretation, while one account can be said to undergird the other, and even while one account may be accepted as the condition for the possibility of the other, neither account need be completely reducible to the other (and in fact one account can be seen to compliment the other).

On an ascending scales interpretation, represented here by Dharmakīrti, one can argue that to embrace human constructions all the way down, and to give up the quest for an immediate encounter with nature—giving up what Sellars described as the “myth of the given”—is to replace nature with culture and do nothing more than colonize nature with our conceptual constructs. Is the collapse of nature (or the buddha) into the human really better than collapsing the human into nature (or the buddha)? On the sliding-scale interpretation, represented here by Candrakīrti, there is no way to escape the fact that nature is embedded within the orbit of human values, and recognizing this itself is liberative. That is, the quest to escape the orbit of this hermeneutic circle itself is fueled by ignorance that binds one to suffering, and liberation is nothing more than dropping this misguided quest for transcendence to focus on the immanent, living world, which is always already for us humans on a human scale.

In contrast to a Dharmakīrtian interpretation of ascending scales that leads to the final reality of the nondual buddha-mind, in a Candrakīrtian interpretation, there is an important sense in which frameworks are not arranged hierarchically, but rather, symmetrically. In other words, whereas a Dharmakīrtian analysis can be seen as an ascending scale, a Candrakīrtian analysis can be seen as a sliding scale. Dharmakīrti’s scale is oriented toward to unitive insight of the buddha’s meditative absorption on the other side of nirvana, while Candrakīrti’s sliding scales, without prioritizing a highest (or lowest) level, enables equity among the levels of analysis and thus can keep the human scale in view.

Yet when we embrace, with a Candrakīrtian interpretation, a thoroughgoing embeddedness of scientific truths with human interests and values, if we fail to make a distinction between what is more or less real within a conceptual framework, we slide into a pernicious relativism in which anything goes, one which Tom Tillemans called “the dismal slough”. (The Cowherds 2011). That is to say, without evaluative or truth-tracking criteria, one person’s opinion is as truthful as any other’s. This is because it is impossible to reform one’s view, and needless to mention, get science off the ground, without the ability to make distinctions between useful fictions and useless fabrications. Even when all distinctions are nothing but conceptual superimpositions, some superimpositions can be more useful than others. To avoid the dismal slough of relativism, a sliding scale must not ignore framework-dependent, qualitative distinctions, and therefore must embed a hierarchy of conventional values (as is the case with a Dharmakīrtian model).

A Candrakīrtian sliding scale can also be said to maintain an ascending structure in terms of ultimate value given that it is oriented toward liberation, the culminating realization of a buddha. Also, a Dharmakīrtian ascending scale can be said to share the symmetrical structure of a sliding scale when abstracted from the Buddhist soteriological context within which it is embedded. There need not be much space between these two interpretations, but I make this contrast to highlight a point about how we can understand the interface between Buddhist values and science. I do so while acknowledging that a certain amount of decontextualization of traditional Buddhist doctrine is necessary in order

to put these Buddhist traditions into conversation with the philosophy of science. In any case, what I wish to highlight here is that a sliding scale, as opposed to an ascending scale, conveys the contingent and relational status of any conceptual frame. As long as it avoids the pernicious relativism of the “dismal slough”, a sliding scale can function to keep the focus on human meaning and personal values; since these are not completely replaced at a deeper level of an analysis with an impersonal truth, one need not lose sight of the conventional while seeing (or seeking) the ultimate truth.

When we completely reduce the personal to the impersonal, even while there may be something gained, as in a scientific explanation, there will necessarily be something lost, too. One implication of this is that a concern for the welfare of persons calls for taking seriously the level of analysis populated by persons and human values. By emphasizing that meanings and values on the human level cannot be completely reduced to non-human values, ethics are foregrounded on *this* side of nirvana—in the present, living world. Ethics are not sacrificed or instrumentalized as merely a means to an end when the immanent world of humanity is not reduced to a transcendent world of a buddha (or to an underworld of physics or some other future techno-utopia).

While qualitative distinctions between better and worse can be made within a framework, we also have to answer the following question: what makes one framework better than another (and under which meta-framework)? It is important to recognize that that which matters or counts as real within a framework depends on the purpose one has for using that framework. A Buddhist framework provides a goal, or *telos*, and the pragmatic function of promoting well-being and alleviating suffering, which is the determining factor used to ascertain what really matters.⁶ A monistic framework might be useful when the goal is to see the commonality of things, while a pluralistic framework is useful for drawing distinctions and charting relationships between things and events. As scientists use biology, physics, etc. for different purposes, Buddhists are not limited to a single framework to serve human purposes and the ultimate goal of nirvana. Yet problems can arise when setting up relations between frameworks, and in particular when one framework is completely colonized and reduced to another, when there is a totalizing meta-framework, particularly when personal (e.g., human) values are excluded.

Delimiting the framework-dependent boundaries of a claim gives explanatory power to claims within that framework, but does so at the expense of alternative frameworks. For instance, scientific accounts, in being partial and limited, are useful, albeit for limited purposes. Problems creep in when a single framework is conceived to provide *the* single and complete account of the world. This is the case with the dogma of scientism, as it is with the case of the dogma of a religion. Science, however, as a methodological stance rather than a reductionist metaphysical position, is pluralistic and open-ended. In this way, it permits multiple, competing frameworks and need not be held to be a totalizing dogma.

Like a scientific methodology, Buddhist epistemology also allows for fluidity among multiple frameworks, since a Buddhist criterion of truth, like one of science, can be rendered pragmatically. A Buddhist can make use of frameworks, like those of Abhidharma or the modern sciences, but a distinctively Buddhist claim to truth is not guided by only a reductionist ideal that excludes personal interests and values. Persons (sentient beings) and freedom (nirvana) are arguably the first and final resting place of Buddhist values, so in light of the priority of these values, a Buddhist orientation toward truth can be said to be fundamentally opposed to that of science.

In Buddhist epistemology, the factor that determines what counts as real in a given framework, as well what guides the choice of framework, is interest. Interests motivate goal-directed behavior and guide the construction and maintenance of a given framework (Dunne 2011, pp. 91–93). Interests are rooted in personal values, a subjective dimension. The place of interest is explicit for Buddhists—nirvana; interest is rarely explicit (or is explicitly shunned) in the case of scientific goals. Since scientific methods are structured impartially to exclude personal interests, which is a feature that gives a scientific model its explanatory power, science on its own lacks the ability to distinguish values among

frameworks; thus, science alone cannot offer a totalizing account of the world. Buddhism, in contrast, for better and for worse, offers a totalizing meta-framework grounded in interests and an orientation toward nirvana.

4. Conclusions

To conclude, inspired by a contrast between Dharmakīrti and Candrakīrti, I want to put forward a way of thinking about the relation between science and Buddhism in the modern world. Dharmakīrti's epistemology, like scientific knowledge, purports to move us from conceptual ignorance (nescience) to perceptual knowledge (science), even while it is rooted in the Buddhist project of liberation. Yet since this system is explicitly grounded in interests, and is embedded in a Buddhist purpose and *telos*, in a significant way it is also at odds with the modern ideal of scientific objectivity. This is not, however, necessarily a problem; rather, it is simply a fact, a fact that—like other scientific facts—I contend, are rooted in human values. It is in articulating the place of human values in a scientific world, and the contingency of all truths, that we find insight from Candrakīrti.

While we might presume that the ultimate truth is a scientific truth or natural law and that the conventional truth is a human truth or cultural norm, in fact, both of these truths can be said to be embedded in cultural values. Ethical matters, in particular, involve personal values, and these are not completely reducible to non-human things. While persons may be composed of things like chemicals or molecules, or the five aggregates, including feeling and consciousness, persons are not completely reducible to them. These are different levels of description that track different things and thus enable different worlds to come into view. These worlds are shaped and guided by interest. While scientific frameworks of the world, like physics and chemistry, are certainly useful, we need not presume that they are completely value-free, nor should we presume that scientific images are sufficiently complete for Buddhist interests and personal values to be outsourced to the sciences.

There is a clear difference between scientific and humanistic models of truth, and I have tried to explore the implications of this difference in light of a relationship between a (Dharmakīrtian) ascending scale of reality and a (Candrakīrtian) sliding scale of truth. As opposed to a reductionist approach that totally collapses human values into impersonal descriptions, or *vice versa*, I want to propose a hybrid approach as a way forward, one in which the first- and third-person perspectives both supplement each other. Neither a first-person phenomenology that “brackets” the world nor a third-person attempt to extract the subject out of the world is an actual possibility, and neither can provide a complete account of the lived world. Cultural and natural worlds can certainly be differentiated, but they are arguably never completely separable. This intertwined relation is important to acknowledge, particularly as we are confronted with the question of how to articulate, without reducing one to the other, the place of Buddhism in a scientific world and the place of science in a Buddhist world.

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Notes

¹ Dharmakīrti, *Commentary on Epistemology (Pramāṇavārttika)* 3.3: “That which performs an ultimate function here is an ultimate existent. The others exist as conventional; these are said to be particulars and universals”.

² In other words, a pragmatic causal account can function both in an external realist ontology and in an idealist framework in which an external world is virtual.

- ³ I use “Dharmakīrtian” and “Candrakīrtian” to illustrate two philosophical stances that are inspired by the works of these two figures. These labels are *not* meant to represent the authorial intent of these figures, but are rather used as a heuristic to illustrate two philosophical trajectories. A Dharmakīrtian view can be understood as relating to the meaning of the Sanskrit term *sat* as *reality* whereas a Candrakīrtian view presents its meaning as *truth*. On the complex and intertwined relation between these two philosophical trajectories, see (The Yakherds 2021).
- ⁴ This example of “causal framing” is from James Woodward, cited in (Gold 2015, p. 111). Gold brings up this issue in an excellent discussion of the “three natures” in Yogācāra.
- ⁵ A similar point is made by Wilfrid Sellars in his “Philosophy and the Scientific Image of Man” (Sellars 1962, pp. 8–9).
- ⁶ This feature of Buddhist truth reflects the twofold meaning of the Sanskrit term *artha*, which is at once an “object” and a “goal”. This bivolality also reflects Quine’s famous slogans: “To be is to be the value of a variable” and “No entity without identity”. In his classic essay on ontological relativity, Quine stated that “Specifying the universe of a theory makes sense only relative to some background theory, and only relative to some choice of a manual of translation of the one theory into the other. (...) We cannot know what something is without knowing how it is marked off from other things. Identity is thus a piece with ontology”. (Quine 1969, pp. 54–55).

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Article

The Use of Large Language Models for Translating Buddhist Texts from Classical Chinese to Modern English: An Analysis and Evaluation with ChatGPT 4, ERNIE Bot 4, and Gemini Advanced

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Abstract: This study conducts a comprehensive evaluation of large language models (LLMs), including ChatGPT 4, ERNIE Bot 4, and Gemini Advanced, in the context of translating Buddhist texts from classical Chinese to modern English. Focusing on three distinct Buddhist texts encompassing various literary forms and complexities, the analysis examines the models' capabilities in handling specialized Buddhist terminology, classical Chinese grammar, and the translation of complex, lengthy sentences. The study employs a methodology where selected excerpts from these texts are translated by the LLMs, followed by an in-depth analysis comparing these machine-generated translations to human translations. The evaluation criteria include word translation accuracy, the ability to recognize and correctly interpret specific meanings within both classical and modern contexts, and the completeness of phrases without omitting or unnecessarily adding words. The findings reveal significant variations in the performance of these LLMs, with detailed observations on their strengths and weaknesses in translating specialized terms, managing grammatical structures unique to classical Chinese, and maintaining the integrity of the original texts' meanings. This paper aims to shed light on the potential and limitations of using LLMs for translating complex literary works from ancient to modern languages, contributing valuable insights into the field of computational linguistics and the ongoing development of translation technologies.

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Keywords: large language models (LLMs); Buddhist texts; translation evaluation

1. Introduction

In this paper, I evaluate the translation capabilities of large language models, with specific emphasis on classical Chinese. My methodology involves translating selected excerpts ranging from 400 to 500 words. The corpus for this study consists of three Buddhist texts chosen to encompass a range of classical Chinese literature. This includes one text of Indian–Chinese origin, identified as 相續解脫地波羅蜜義經 (T0678), and two texts of Chinese origin, written by Buddhist monks. The Chinese texts consist of 合訂天台三聖二和詩集 (B0087), noted for its literary quality, and 現果隨錄 (X1642), recognized for its narrative strength. The cited textual sources have been accessed through the Chinese Buddhist Electronic Text Association database (CBETA).

Moreover, the selection of these three texts for translation by large language models and human evaluation was not random. First, text T0678 is an early translated Buddhist sutra by Guṇabhadra (394–468). This text was chosen because it discusses a series of Buddhist philosophical concepts, such as the stages of liberation practice as well as the relationship between mental consciousness and liberation, and touches upon the tathagatagarbha doctrine. These contents can be used to test how large language models perform when translating Buddhist philosophical terms and concepts. Therefore, my evaluation of the Indian–Chinese text, T0678, focuses on whether the machine translations recognize certain special Buddhist terms and the correct spelling of the Romanized Sanskrit words.

Furthermore, it considers the Buddhist sutras' unique linguistic features and grammatical structures, distinct from those of classical Chinese.

The second text comes from the preface of B0087, written by Ming Dynasty monk 淨戒 (d,1418). This text was selected because, although it is a Buddhist text, it contains many traditional Chinese literary terms and is highly literary in nature, featuring beautiful phrasing and parallel prose structure. This text can be used to test how large language models perform when handling specialized Chinese classical literary works. The assessment of the second text, B0087, characterized by its more pronounced literary nature, will primarily focus on the ability of large language models to discern and interpret the literary devices and methods employed in classical Chinese literature. Additionally, the evaluation will explore the models' ability to correctly identify and translate quotes from other literary works incorporated into the text.

The last text is a story from X1642, written by the late Ming-early Qing Dynasty monk Jiexian 戒顯 (1610–1672). This is a strongly narrative text that tells a complete story. Therefore, this text can be used to test large language models' performance in translating narrative texts and their ability to understand the logic within the story. The evaluation of the third text, X1642, will assess the machine translation's capability to convey the structural aspects of narrative in classical Chinese texts. Narrative texts exhibit a robust logical structure. Consequently, the evaluation of narrative texts will focus on the ability of large language models to translate the stories comprehensively.

I will utilize three commercial large language models—ChatGPT 4 (OpenAI 2022), ERNIE Bot 4 (Baidu 2023), and Gemini Advanced (Google 2023)—to handle the translation of these Buddhist texts, thereby assessing their capability in processing complex classical Chinese literature. The main goal of this assessment is to determine the accuracy of three large commercial language models in translating classical Chinese texts into modern English.

The evaluation criteria are as follows: 1. The machine translation's ability to translate each word; 2. The machine translation's ability to interpret the specific meanings of words in both classical and modern Chinese, ensuring translations accurately reflect the original meanings from the classical context rather than their modern interpretations; 3. The completeness of machine-translated phrases, with attention to errors involving omitted or added words. Additionally, I use human-translated texts as a standard to assess the machine translations.

To evaluate the large language models' ability to process extensive classical Chinese texts, I plan to input a complete paragraph in a single instance instead of translating merely one or two sentences at a time. Each text evaluation will present the following:

1. The original text in its classical form;
2. My translation from classical Chinese into modern English;
3. The three machine-generated translations from classical Chinese to modern English;
4. Analysis and evaluation.

The prompt "Please translate <text> into modern English" was given to each large language model. I also used additional prompts, such as "Please translate <text> directly into modern English without summarizing the text and making comments".

In analyzing texts translated by machines, I used various colors to identify errors made by the language models. **Red** marks are used to point out semantic errors, indicating instances where the translation failed to accurately capture the intended meaning of a word or phrase. This includes the following: 1. Words with multiple meanings, where the chosen translation did not align with the context intended in the text; 2. Words whose meanings differ between classical and modern Chinese, with large language models incorrectly using the modern interpretation in a classical context; 3. Cases where the translated word or phrase diverged completely from its original meaning, resulting in a translation that did not reflect the original intent. **Blue** marks are assigned to instances where large language models could not correctly identify the names, courtesy names, or posthumous titles of historical figures mentioned in the text. **Green** marks highlight instances where

large language models either omitted parts of the content, leading to missing information, or inserted content that was not present in the original, thus causing a mismatch between the translation and the original text.

Additionally, in translating the texts T0678, B0087, and X1642 from classical Chinese to modern English, as well as in analyzing the accuracy of large language models' translations, I consulted the following dictionaries:

1. Paul W. Kroll and William G. Boltz, *A Student's Dictionary of Classical and Medieval Chinese*;
2. *The Dictionary of Classical Chinese (古代漢語詞典)* by the Dictionary Research Center of The Commercial Press (商務印書館辭書研究中心);
3. *The Dictionary of Classical Chinese Function Words (古代漢語虛詞詞典)* published by the Institute of Linguistics, Chinese Academy of Social Sciences (中國社會科學院語言研究所古代漢語研究室);
4. Nakamura Hajime 中村元, *Bukkyogo daijiten shukusatsuban (佛教語大辭典 縮刷版)*
5. Ding Fubao (丁福保), *Buddhist Dictionary (佛學大辭典)*.

Text 1: 《相續解脫地波羅蜜義經》：「觀世音菩薩白佛言：「世尊！菩薩有十地，所謂歡喜地、離垢地、明地、焰地、難勝地、現前地、遠行地、不動地、善慧地、法雲地。佛地第十一，此諸地幾種清淨攝，為有幾分？」佛告觀世音菩薩：「有十四種清淨十一分，攝此諸地。觀世音！悵望清淨攝初地、增上戒淨攝第二地、增上心清淨攝第三地、增上慧淨，增上上上妙淨，攝第四地乃至佛地，是四種淨攝彼諸地。」「云何十一分？觀世音！解行地菩薩有十法行：善修習菩薩解脫忍，度此地已，菩薩超昇離生彼分滿足，而未能於微細犯戒行正知住，此則分不滿足，為滿足故，方便進求到已滿足；而未能具足世俗三昧正受，及滿足聞持陀羅尼，此則分不滿足，為滿足故方便進求到已滿足；而未能如所得菩提分法數數修習，亦未能捨正受法愛心，此則分不滿足，為滿足故方便進求到已滿足；而未能觀察真諦，不能捨一向背生死向涅槃意，行方便攝修菩提分法，此則分不滿足，為滿足故方便進求到已滿足；而未能現前觀諸行生，多住厭離多住無相，此則分不滿足，為滿足故方便進求到已滿足；而未能多住不斷無間無相思惟，此則分不滿足，為滿足故方便進求到已滿足；而未能捨離無相有行及得相力，此則分不滿足，為滿足故方便進求到已滿足；而未能究竟分別眾相分別諸名，一切種說法得自在，此則分不滿足，為滿足故方便進求到已滿足；而未能受得滿足法身，此則分不滿足，為滿足故方便進求到已滿足；而未能得一切爾焰無礙無障知見，此則分不滿足，為滿足故方便進求到已滿足。彼分滿足故，一切分滿足。觀世音！是名十四種清淨十一分攝一切諸地。」」 (CBETA 2023.Q4, T16, no. 678, pp. 714c18–715a21)

Human Translation: Avalokiteśvara Bodhisattva said to the Buddha, “World-Honored One! The Bodhisattva has ten grounds, named the Ground of Very Joyful, the Ground of Stainless, the Ground of Lightened, the Ground of Radiant Wisdom, the Ground of Difficult to Overcome, the Ground of Manifest, the Ground of Far-reaching, the Ground of Irreversible, the Ground of Perfect Wisdom, and the Ground of Clouds of Dharma. The Buddha Ground is the eleventh and highest level. Within these stages, how many types of purity exist, and into how many aspects can they be categorized?” The Buddha replied to Avalokiteśvara Bodhisattva, “There are four types of purity, divided into eleven aspects, contained within these grounds. Avalokiteśvara! The first ground is included in the purity of aspiration, while the second ground is included in the purity of higher precepts. The purity of the higher mind encompasses the third ground. Starting from the fourth ground and extending up to the Buddha ground, the purity of higher wisdom and the supreme and highest incomparable purity are contained within these grounds. These four types of purity encompass those grounds”.

“Why are there eleven categories? Avalokiteśvara! The Bodhisattva in the stage of practicing through understanding will follow ten aspects in their practice. The Bodhisattva diligently cultivates the forbearance of liberation, having already

passed the current stage, transcending and leaving the cycle of birth and death and reaching the perfection of that ground. However, if the Bodhisattva is still unable to maintain proper awareness of subtle transgressions of the precepts, it is not yet satisfactory. To achieve perfection, one must apply skillful means, strive diligently, and persist until complete satisfaction is attained. If a Bodhisattva has not yet been able to fully possess the practice *samādhi* in the world and hear and remember the *dhāraṇī* perfectly, it is not yet adequate. To reach perfection, one must utilize expedient techniques, strive diligently, and continue until complete satisfaction is achieved. If a Bodhisattva has not yet repeatedly practiced the obtained Bodhyaṅga Dharma and also cannot yet abandon the attachment to the *samaya* and Dharma, it is not yet fulfilling. To attain perfection, one must employ skillful and expedient methods, strive diligently, and persevere until complete satisfaction is reached. If a Bodhisattva is still unable to observe the essence of truth, cannot abandon the idea of merely seeking *nirvāṇa* to escape from the cycle of birth and death, and does not skillfully and expeditiously cultivate the Bodhyaṅga Dharma, it is not yet sufficient. To achieve perfection, one must apply skillful means, strive diligently, and continue until complete satisfaction is attained. If a Bodhisattva is unable to directly observe the arising of all Dharmas in the present moment, only inclined to abide in an aversion towards living in this impure world, and only abiding in the absence of characteristics, it is not yet satisfactory. To achieve perfection, one must employ skillful and expedient methods, strive diligently, and continue until complete satisfaction is attained. If a Bodhisattva is incapable of maintaining unbroken and unceasing contemplation on the absence of characteristics, it is not yet satisfactory. To achieve perfection, one must apply skillful means, strive diligently, and continue until complete satisfaction is attained. If a Bodhisattva still cannot abandon the attachment to the absence of characteristics, thereby manifesting actions in reality and gaining the power from forms, it is not yet satisfactory. To achieve perfection, one must utilize expedient techniques, strive diligently, and continue until complete satisfaction is attained. If a Bodhisattva cannot thoroughly discern all the forms and names and cannot freely explain Dharmas in all its various aspects, it is not yet satisfactory. To achieve perfection, one must apply skillful means, strive diligently, and continue until complete satisfaction is attained. If the perfection of the truth body cannot be obtained, it is not yet satisfactory. To achieve perfection, one must employ skillful and expedient methods, strive diligently, and continue until complete satisfaction is attained. If unable to attain all the capabilities that can be known and reach the clear, unobstructed, and affliction-free real knowledge and insight, it is not yet satisfactory. To achieve perfection, one must apply skillful means, strive diligently, and continue until complete satisfaction is attained. When this part is satisfied, all parts are then completed. Avalokiteśvara! These are the four purities that encompass all levels across the ten Bodhisattva grounds and the Buddha ground”.

ChatGPT 4: Avalokiteshvara Bodhisattva said to the Buddha: “World-Honored One! The Bodhisattva has ten grounds, namely the Ground of Joy, the Ground of Freedom from Defilement, the Ground of Radiance, the Ground of Brilliance, the Ground of Difficulty Overcome, the Ground of Manifestation, the Ground of Far-reaching, the Ground of Immutability, the Ground of Good Wisdom, and the Ground of Dharma Cloud. The Buddha ground is the eleventh. **How many types of purity encompass these grounds, and to what extent?**” The Buddha replied to Avalokiteshvara Bodhisattva: “There are four types of purity that encompass these grounds in eleven aspects. Avalokiteshvara! The first ground is encompassed by the purity of aspiration, the second ground by the purity of superior precepts, the third ground by the purity of superior mind, and the fourth to the Buddha ground by the purity of superior wisdom, the utmost supreme

and wondrous purity. These four types of purity encompass all those grounds. “How are these eleven aspects defined? Avalokiteshvara! A Bodhisattva on the path of understanding has ten practices: diligently cultivating the Bodhisattva’s patience of liberation. Having transcended this ground, the Bodhisattva ascends beyond birth, fulfilling that aspect, yet unable to maintain precise conduct without minor transgressions, this aspect is unfulfilled. For its fulfillment, one skillfully seeks to achieve satisfaction; unable to fully embody the worldly samadhi or master the recitation of dharanis, this aspect remains unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to practice repeatedly the dharma of the Bodhi aspect as obtained, and unable to abandon the attachment to the lawful, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to and unwilling to renounce the inclination from life to Nirvana, practicing skillfully the dharma of the Bodhi aspect, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to witness the arising of phenomena directly, often dwelling in dispassion and formlessness, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to remain in the uninterrupted contemplation of formlessness, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to abandon the formless actions and attain the power of form, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to ultimately discern all phenomena and names, and to speak dharma freely in all manners, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to receive the fulfilled Dharma body, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction; unable to attain the unobstructed knowledge and vision in all dharmas, this aspect is unfulfilled. For its fulfillment, one skillfully seeks satisfaction. With this aspect fulfilled, all aspects are fulfilled. Avalokiteshvara! This is called the four types of purity encompassing eleven aspects of all grounds”.

ERNIE bot 4: Avalokiteshvara Bodhisattva said to the Buddha, “World-honored One! There are ten stages for Bodhisattvas, known as the Joyful, the Stainless, the Luminous, the Flaming, the Difficult to Conquer, the Manifest, the Far-going, the Immovable, the Good Wisdom, and the Dharma Cloud stages. The Buddha stage is the eleventh. How many types of purity encompass these stages, and how many aspects are there?” The Buddha replied to Avalokiteshvara Bodhisattva, “There are four types of purity encompassing eleven aspects that embrace these stages. Avalokiteshvara! The purity of aspiration encompasses the first stage, the purity of enhanced precepts encompasses the second stage, the purity of enhanced mindfulness encompasses the third stage, and the purity of enhanced wisdom, together with the purity of supreme and exquisite wisdom, encompasses the fourth stage up to the Buddha stage. These four types of purity embrace all those stages. “And what are the eleven aspects? Avalokiteshvara! Bodhisattvas on the stage of understanding and practice have ten dharmas to cultivate: They skillfully cultivate the patience of Bodhisattva liberation. After transcending this stage, Bodhisattvas rise above birth and death and fulfill that aspect. However, they are not yet able to abide in right knowledge of subtle offenses against the precepts. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. Yet they are not able to fully attain mundane samadhi and the retention of dharanis. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. But they are not able to repeatedly cultivate the Bodhi factors they have attained, nor can they abandon their attachment to samadhi. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. And they are not able to observe the true nature, nor can they abandon their one-sided intention of turning away from birth and death towards Nirvana. They cultivate the Bodhi factors through skillful means. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment.

And they are not able to observe the arising of all dharmas in the present moment, often dwelling in aversion and the absence of form. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. They are not able to abide predominantly in uninterrupted and formless contemplation. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. They are not able to abandon formless existence and attain the power of form. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. And they are not able to ultimately distinguish all phenomena and names, nor can they freely explain all dharmas. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. They are not able to fully receive the Dharma body. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. And they are not able to attain unobstructed knowledge and vision of all dharmas. This aspect is not yet fulfilled. To fulfill it, they diligently strive and attain fulfillment. When that aspect is fulfilled, all aspects are fulfilled. Avalokitesvara! These are the four types of purity encompassing eleven aspects that embrace all the stages”.

Gemini Advanced: Avalokitesvara Bodhisattva addressed the Buddha, saying: “World Honored One! Bodhisattvas have ten stages, namely the Joyous Stage, the Stainless Stage, the Illuminating Stage, the Radiant Stage, the Hard to Conquer Stage, the Manifest Stage, the Far-Reaching Stage, the Immovable Stage, the Excellent Intelligence Stage, and the Cloud of Dharma Stage. The Buddha Stage is the eleventh. How many kinds of purity encompass these stages, and how many parts are there?” The Buddha replied to Avalokitesvara Bodhisattva: “There are four kinds of purity and eleven parts that encompass all these stages. Avalokitesvara! The purity of aspiration encompasses the first stage; the purity of precepts encompasses the second stage; the purity of mind encompasses the third stage; the purity of wisdom, the purity of the highest and finest, encompasses the fourth stage and up to the Buddha stage. These four kinds of purity encompass those stages. What are the eleven parts? Avalokitesvara! A bodhisattva on the path of understanding and practice has ten dharmas: Good cultivation of the bodhisattva’s endurance, having passed this stage, the bodhisattva transcends and is free from birth, and that part is fulfilled, but he is not yet able to dwell in right knowledge of subtle transgressions of precepts. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to fully receive the worldly samadhi and to fulfill the retention of dharani. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to repeatedly cultivate the divisions of Dharma related to his attained enlightenment, nor is he able to release attachment to received teachings. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to observe the true principle, and cannot discard intentions always leading away from samsara towards nirvana, practice the skillful gathering of the divisions of enlightenment Dharma. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to directly witness the arising of all actions, mostly dwelling in detachment and mostly dwelling in formlessness. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to dwell extensively in continuous, uninterrupted, formless contemplation. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to release formless practices with form and attain the power of manifestation. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to definitively discern all forms and names, achieving freedom in all forms of

Dharma exposition. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to receive the complete Dharma body. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. He is not yet able to obtain the unimpeded, unobstructed knowledge and vision encompassing all flames. Therefore, this part is not fulfilled. In order to be fulfilled, he conveniently advances and seeks until he is fulfilled. When that part is fulfilled, all parts are fulfilled. Avalokitesvara! This is called the four kinds of purity and eleven parts that encompass all stages”.

	ChatGPT 4	ERNIE Bot 4	Gemini Advanced
Red	18	38	43
Green	2	1	5
Blue	0	0	0
Totals	20	39	48

This text includes several distinctive Buddhist terms, such as “佛” (Buddha), “觀世音菩薩” (Avalokiteśvara), and “陀羅尼” (dhāraṇī). Given that these terms were initially translated from Sanskrit into classical Chinese, an appropriate approach for translation would be to present the Romanized Sanskrit forms of these terms in the translated text rather than providing their Chinese Pinyin transcriptions. The three large language models have generally succeeded in writing the Romanized Sanskrit terms. However, there are still some shortcomings in specific details.

In Sanskrit transliteration, all three models exhibit a significant shortcoming: the omission of diacritical marks. These marks are crucial in Sanskrit phonology, delineating precise phonemic distinctions and intonation patterns intrinsic to the language. Diacritical marks, defined as supplementary signs or symbols appended to letters, denote specific pronunciations or stress patterns, thereby preserving the nuanced phonetic characteristics of the original Sanskrit (Biltoo 2021, p. 20). A salient example of this deficiency is the translation of “Avalokitesvara”. All three models—ChatGPT 4, ERNIE Bot 4, and Gemini Advanced—uniformly rendered this as “Avalokiteshvara”. This transliteration notably lacks the diacritical mark on the “s” character, a crucial phonetic indicator distinguishing this sound from the standard “s” phoneme in Sanskrit (Biltoo 2021, p. 23). Such an omission compromises phonetic accuracy and potentially obscures the deeper etymological and semantic nuances associated with correctly pronouncing this significant bodhisattva’s name in the Buddhist tradition.

Further analysis reveals additional nuances in the translation of Buddhist terminology. The Chinese term “陀羅尼” should be properly rendered as “dhāraṇī” in Sanskrit transliteration. While ChatGPT 4’s translation of “dharanis” is not inherently incorrect, it fails to adhere strictly to the International Alphabet of Sanskrit Transliteration (IAST) standards (Biltoo 2021, pp. 21–25). ERNIE Bot 4 mirrors ChatGPT 4’s approach, whereas Gemini Advanced opts for “dharani”, all lacking the diacritical marks.

Another salient example is the complex Buddhist term “菩提分法”. This compound consists of two elements: “菩提分” and “法”. In Romanized Sanskrit, these components correspond to “bodhyaṅga” and “dharma”, respectively, culminating in the composite term “bodhyaṅga-dharma”. ChatGPT 4’s rendition of “Dharma of Bodhi” represents a partial translation, accurately rendering “dharma”, while leaving “bodhyaṅga” untranslated. ERNIE Bot 4’s interpretation is more problematic, oversimplifying “菩提分” to merely “Bodhi” and omitting “法” (dharma) entirely. While capturing a general sense, Gemini Advanced’s translation, “The divisions of Dharma”, lacks precision in conveying certain Buddhist concepts.

Moreover, the term “涅槃” necessitates translation as “nirvāṇa” in Sanskrit. Notably, all three models consistently omitted the essential diacritical marks in their translations,

a shortcoming that permeates their handling of Sanskrit terms. These discrepancies underscore the complexities inherent in translating specialized Buddhist terminology and highlight the current limitations of artificial intelligence in accurately rendering such nuanced philosophical and religious concepts. The consistent omission of diacritical marks across all models points to a systemic deficiency in their ability to fully capture Sanskrit's phonological and semantic intricacies within Buddhist textual translation.

Buddhist term translations require balancing literal and conceptual accuracy. “十地”, for example, refers to the ten stages of practice in Buddhism, which are crucial for practitioners following the bodhisattva path. While ERNIE Bot 4 and Gemini Advanced both translate it as “stage”, which is not incorrect in conveying the meaning, ChatGPT 4's translation of “ground” is more appropriate when considering the literal sense of the Chinese term. This translation accurately reflects the word-for-word correlation between the Chinese “地” and its Sanskrit equivalent, “bhumi”, which means “ground” or “earth”.

Additionally, large language models exhibit varying degrees of accuracy in translating nuanced Buddhist terminology and philosophical concepts from classical Chinese, often struggling with contextual meanings and idiomatic expressions. In the sentence “此諸地幾種清淨攝，為有幾分”，the intended inquiry is twofold: “How many kinds of purity do these grounds encompass, and into how many aspects can they be divided?” ChatGPT 4's translation did not convey the latter part of the sentence, which states “into how many parts can they be divided”, and instead translated it as “to what extent”.

The term “增上戒” in the subsequent sentence can be translated as “higher precepts”. In this rendering, “增上” corresponds to “higher”, conveying a sense of elevation or superiority, while “戒” equates to “precepts”, referring to the moral guidelines that Buddhist practitioners are expected to follow. ERNIE Bot 4's “enhanced precepts” translation fails to capture the nuanced meaning of “增上”. On the other hand, Gemini Advanced's translation remains incomplete, as it only renders “戒” as “precepts” without addressing the translation of “增上”.

Moving on to the sentence “增上心清淨攝第三地，增上慧淨，增上上上妙淨”，we can find that the relationship between the latter sentence and the former sentence is a progressive one. “增上” represents “higher”, and “增上上上” means the highest meaning. However, Gemini Advanced does not reflect this progressive relationship in its translation, and the sense of higher and highest is not conveyed.

ERNIE Bot 4's treatment of the text presents several noteworthy issues that warrant closer examination. The model consistently translates “增上” as “enhanced”, a choice that, as previously elucidated, falls short of conveying the full semantic range of the original term. This consistent misinterpretation suggests a systematic limitation in the model's understanding of Buddhist terminological nuances.

Of particular interest is ERNIE Bot 4's rendering of “增上上妙淨” as “exquisite wisdom”. The selection of “exquisite” to translate “妙” is problematic in this context. While “exquisite” typically denotes delicacy and esthetic beauty in English, it fails to capture the profound philosophical implications of “妙” in Buddhist thought. In this context, “妙” should signify incomparable, transcendent, or superlative.

ChatGPT 4's translation of “妙” as “wondrous”, while marginally more appropriate than ERNIE Bot 4's interpretation, still does not encapsulate the term's intended meaning within the Buddhist philosophical framework. The choice of “wondrous” leans towards conveying a sense of awe or marvel, which, while not entirely misplaced, does not adequately express the concept of superiority or incomparability inherent in the original term.

In contrast, Gemini Advanced's “highest and finest” translation demonstrates a more nuanced understanding of the term's contextual significance. This rendering accurately reflects the superlative nature of “妙” in Buddhism, conveying its elevated status and exceptional quality. Among the three large language models, Gemini Advanced's interpretation most closely aligns with the intended meaning of the original text in this instance.

In classical Chinese, “云何” is used to pose a question, commonly translated as “why” or “how”. ChatGPT 4 captured this nuance, whereas ERNIE Bot 4 and Gemini Advanced

rendered it as “what are”. Although this still conveys a question, it does not reflect the meaning of “云何” in its classical context.

Another aspect to consider is that translating intricate Buddhist philosophical concepts poses challenges for large language models, often resulting in a loss of nuance and contextual depth. The term “解行地菩薩” is a unique Buddhist term referring to the stage of a Bodhisattva who practices through their understanding, which is the stage of the Bodhisattva before attaining the realization of Suchness. Thus, ChatGPT 4’s rendition of “Bodhisattva on the Path of Understanding” has some limitations. It suggests “path” rather than highlighting “解行地” as a distinct stage of Bodhisattva. Furthermore, it translates “解” merely to “understanding”, omitting the crucial aspect of “行”, which signifies “practice”. While ERNIE Bot 4 translated both “understanding” and “practice” and recognized “解行地” as a stage of Bodhisattva, it did not reflect the relationship between “understanding” and “practice”. The text depicts this stage as one where practice is guided by understanding, necessitating a translation that emphasizes “practicing through understanding” rather than presenting “understanding and practice” as parallel concepts, as ERNIE Bot 4 did. Similarly, Gemini Advanced did not convey “stage” and misrepresented the relationship between “understanding” and “practice” as parallel.

The term “十法行” in this context refers to ten ways of practice. ChatGPT 4’s “ten practices” translation aligns more closely with the intended meaning than ERNIE Bot 4 and Gemini Advanced, which rendered it “ten dharmas”. While “dharmas” can indeed be translated as “法” in Chinese, generally signifying the Buddha’s teachings, such as Buddhist truths and principles, the “十法行” mentioned here pertains directly to the specific practices Bodhisattvas are expected to cultivate, as evidenced by the subsequent content.

Large language models demonstrate varying proficiency in translating complex Buddhist concepts and practices, often struggling with context-dependent terminology and specialized doctrinal nuances. This is evident in their translations of a text describing the practices a Bodhisattva needs to cultivate, particularly in the sentence “善修習菩薩解脫忍，度此地已，菩薩超昇離生彼分滿足，而未能於微細犯戒行正知住，此則分不滿足，為滿足故，方便進求到已滿足”. All three large language models exhibit some limitations in their translations of this sentence.

When translating “而未能於微細犯戒行正知住”, ChatGPT 4 did not provide a literal, word-for-word rendering. It refrained from directly translating “犯戒” as “transgressions of the precepts” and did not convey “正知住” as “proper awareness”. Instead, it summarized the phrase as “yet unable to maintain precise conduct without minor transgressions”. While ChatGPT 4’s interpretation captures the overall meaning somewhat, it does not accurately translate each term.

In “善修習菩薩解脫忍”, ChatGPT 4 did not capture the Buddhist term “解脫忍” and instead oversimplified it as “bodhisattva’s endurance”. This simplification does not reflect that “解脫忍” (the forbearance of liberation) refers to a certain cultivation method within the Bodhisattva path of Mahāyāna Buddhism and, therefore, should be translated as “the forbearance of liberation”. Furthermore, its translation of “善” is also not precise. While “善” in classical Chinese can indeed mean “good”, in the context of this passage, it should be translated as “skillful” or “diligently”.

The following sentence “而未能於微細犯戒行正知住”, Gemini Advanced translated “住” as “dwell”, resulting in a translation that does not capture the sentence’s intended meaning. This sentence conveys that the Bodhisattva should maintain proper awareness of even subtle transgressions of the precepts, rather than Gemini Advanced’s interpretation of “to dwell in the right knowledge of subtle transgressions of precepts”.

The accurate translation of context-dependent Buddhist terminology poses a challenge for large language models, particularly when dealing with terms with multiple meanings or specialized usage in Buddhist literature. “此則分不滿足，為滿足故，方便進求到已滿足” appears several times in the subsequent text, highlighting this challenge. Among the three large language models, only ChatGPT 4 accurately translates the term “方便” as “skillful”. In classical Chinese, “方便” has different meanings depending on the context.

Specifically, in Buddhist literature, “方便” refers to skillful means or methods, making “skillful” the most appropriate translation. ERNIE Bot 4, however, translates “方便” as “diligently”, which does not capture the nuanced meaning of the term in this context. On the other hand, Gemini Advanced translates “方便” as “conveniently”, which, while correct in other contexts, is unsuitable for this particular Buddhist text. Therefore, ERNIE Bot 4 and Gemini Advanced do not provide the most accurate translation of “方便”.

Furthermore, Gemini Advanced’s “求進” translation is also inaccurate. In the context of this text, the term should be rendered as “seek”, conveying the act of searching or seeking. The translation “advances” does not capture the text’s intended meaning.

Translating complex Buddhist terminology poses substantial difficulties for large language models, frequently resulting in misinterpretation of compound concepts and loss of essential nuances. In the text “而未能具足世俗三昧正受，及滿足聞持陀羅尼” all three large language models—ChatGPT 4, ERNIE bot 4, and Gemini Advanced—had some difficulties translating the Buddhist term “正受三昧”. Instead of treating “正受三昧” as a single term, the models split it into two separate words: “三昧” and “正受”. This led to some inconsistencies in the translations, with ChatGPT 4 rendering “三昧” to “samadhi” and “正受” to “embody”, resulting in the translation “embody the worldly samadhi”. Likewise, ERNIE bot 4 divided the term and translated “正受” as “attain”, recognizing only the meaning of “受”, while not capturing the meaning of “正” as “correct” or “right” in a word-for-word translation. As a result, it produced the translation “attain mundane samadhi”. Gemini Advanced had a similar challenge as the other two models, splitting “正受三昧” into two terms and translating “正受” as “receive”. Moreover, all three large language models did not include the proper diacritical marks when translating “samādhi”.

Moreover, the translations did not convey the meaning of “聞持” in this sentence. This term signifies “hearing (Buddhist teachings) and memorizing them”, and thus, the translation should precisely capture both aspects: “聞” (hearing) and “持” (memorizing). ChatGPT 4 did not capture the term’s meaning and translated it as “recitation”. Similarly, ERNIE Bot 4 and Gemini Advanced interpreted “持” as meaning to retain or keep, leading them to translate it as “retention”. Consequently, all three machine translations did not include the crucial aspect of “hearing” in their renderings of “聞持”.

Large language models face challenges when translating Buddhist philosophical concepts, particularly terms with specific doctrinal meanings. This difficulty is exemplified by ChatGPT 4’s translation of the phrase “捨正受法愛心”. While the model correctly rendered “捨” as “abandon” and “愛心” as “attachment”, it failed to recognize the Buddhist terms “正受” (samaya) and “法” (dharma in this context). Instead, ChatGPT 4 interpreted “法” as being related to law, resulting in the translation “lawful”, and omitted the translation of “正受” altogether. Although mainly accurate, ERNIE Bot 4’s translation has two minor issues: the spelling of “samadhi” lacks diacritical marks, and “dharma” is not translated. Gemini Advanced, on the other hand, did not provide a literal, word-for-word translation of the sentence. Instead, it summarized the content as “nor can he release attachment to received teachings”, interpreting “正受法” as “received teachings”. This suggests that Gemini Advanced only considered the literal meaning of “受” (received) without accounting for the specialized translation of “正受” within the Buddhist context.

The challenges faced by large language models in capturing the nuanced relationships between Buddhist concepts are further demonstrated by ChatGPT 4’s translation of the sentence “而未能觀察真諦，不能捨一向背生死向涅槃意，行方便攝修菩提分法”. While the model accurately rendered “而未能觀察真諦” as “discern the truth”, it failed to capture the latter part of the sentence, which conveys the inability to abandon the idea of merely seeking nirvāṇa as a means to escape from the cycle of birth and death. Instead, ChatGPT 4 interpreted this as “the inclination from life to Nirvana”, suggesting a progression from life to nirvāṇa. However, this interpretation does not align with the relationship between the cycle of birth and death and nirvāṇa in the given context, where the practitioner seeks nirvāṇa to break free from the cycle of birth and death.

The ensuing discussion will center around the fact that the accurate translation of Buddhist terms necessitates a profound comprehension of their specific meanings within the framework of Buddhist philosophy, posing a challenge for existing large language models. ChatGPT 4's translation of the subsequent text “而未能現前觀諸行生，多住厭離多住無相” has some limitations. ChatGPT 4's translation of the term “厭離” does not capture its meaning. In Buddhism, “厭離” is a specific term that refers to a strong aversion towards the impurities of the present world, accompanied by the desire to distance oneself from them. Therefore, the term should be translated as “aversion” to accurately reflect this sense of intense dislike and the wish to avoid or shun something. ChatGPT 4's choice of “dispassion” does not convey this nuance, as it suggests a state of being unfeeling or cool, rather than a state of deliberately distancing oneself due to an aversion towards the impurities of the world. Rendering “住” as “dwelling” is not the most suitable choice in this context. While “住厭離” can mean “dwelling” in classical Chinese, this word means a state of residence associated with houses and people. However, in the present text, the “住” in “住” conveys the notion of maintaining or remaining in a particular state. Consequently, it would be more fitting to translate “住” here as “maintaining” or “abiding in”.

All three large language models did not capture the meaning of “多”. ChatGPT 4 and ERNIE Bot 4 translated it to “often”, while Gemini Advanced rendered it to “mostly”. Although these meanings are correct for “多” in classical Chinese, they do not align well with the context of the text. The sentence aims to convey that practitioners on the Bodhisattva path should not merely maintain and abide in the states of aversion and absence of characteristics. Using the word “often”, which denotes frequency, does not capture the intended meaning because it implies that Bodhisattva path practitioners might frequently abide in this state, while in other situations, they may transcend it. Therefore, if practitioners on the Bodhisattva path only “often” maintain the states of aversion and absence of characteristics, then there would be no need for the following text to point out that this aspect is unsatisfactory and that one should break through this state to seek perfection. Likewise, “mostly” is also not the most suitable choice for the context of the text. Therefore, in this sentence, “多” should be translated as “only” or “merely” to reflect the intended meaning more accurately.

In the subsequent sentence “而未能多住不斷無間無相思惟，此則分不滿足”，the context of the text suggests that it is more fitting to translate “多住” as “mostly”, “mainly”, or “always”. This is because the preceding sentence aimed to convey that practitioners on the Bodhisattva path should not merely abide in the states of aversion and absence of characteristics. As such, the translation of “多” in the previous sentence must express a sense of limitation or stagnation.

In contrast, this sentence seeks to communicate that practitioners on the Bodhisattva path need to focus more, or primarily, on uninterrupted contemplation of the absence of characteristics. If they cannot achieve this, they cannot attain perfection in this regard. Therefore, the translation of “多住” here should not employ “only” to express a sense of limitation. Instead, it is essential to use words like “mainly” to offer guidance and advice to the practitioners on the Bodhisattva path, encouraging them to invest more energy in contemplation.

When translating this sentence, ChatGPT 4 neglected to translate “多”, but its rendering of “住” to “remain” is accurate. The limitation in ERNIE Bot's translation, “They are not able to abide predominantly in uninterrupted and formless contemplation”, stems from its translation of “無相思惟” as “formless contemplation” rather than “meditation on the absence of characteristics”.

In this sentence, Gemini Advanced still did not accurately translate “多住”, making the same error as before, with “住” still being translated to “dwelling”. Furthermore, its translation of “無相思惟” is the same as ERNIE Bot 4's translation.

In summary, context-dependent translation of seemingly simple terms poses a challenge for large language models, particularly in texts with subtle philosophical distinctions.

Large language models often encounter difficulties when translating complex sentence structures in Buddhist texts, particularly when these sentences convey multiple layers of meaning. The sentence “而未能捨離無相有行及得相力”, despite lacking punctuation, illustrates this challenge by conveying three distinct layers of meaning: the inability to abandon the attachment to the absence of characteristics, the manifestation of concrete actions in reality, and the attainment of power from forms. ChatGPT 4’s translation fails to capture these three layers, instead combining the first two and resulting in the inaccurate translation of “有行” as “formless actions”. Similarly, ERNIE Bot 4 does not translate “有行” as having concrete actions, while Gemini Advanced only accurately translates the aspect of gaining power from form, omitting the first two layers of meaning.

The accurate translation of Buddhist terms requires a deep understanding of their specific usage within the context of Buddhist literature, a nuance that current large language models often struggle to grasp. This is exemplified by ChatGPT 4 and ERNIE Bot 4’s translations of the word “究竟” in the sentence “究竟分別眾相分別諸名，一切種說法得自在”. In Buddhist literature, “究竟” typically denotes a thorough and complete understanding, making “completely” or “thoroughly” more suitable translations than the chosen “ultimately”, which conveys a sense of finality rather than the intended meaning. Moreover, their rendering of “說法” as “to speak dharma” does not capture the intended meaning of explaining or interpreting the teachings. These limitations arise from the models’ reliance on the meaning of “究竟” in non-Buddhist classical Chinese texts, which differs from its usage in Buddhist literature. Gemini Advanced’s translation of “究竟” as “definitively” and its inaccurate translation of “一切種說法得自在” further highlight the challenges faced by large language models in capturing the essence of Buddhist terminology.

The difficulty in accurately translating Buddhist terms extends to the sentence “受得滿足法身”, where the models struggle to capture the meaning of “滿足法身” as the perfect Dharma body or truth body. ChatGPT 4’s translation of “fulfilled” suggests satisfaction without reaching perfection, while ERNIE Bot 4’s “fully receive the Dharma body” interprets it as completely accepting the Dharma body. Gemini Advanced’s “complete” translation also fails to capture the state of perfection in this context.

The subsequent sentence “而未能得一切爾焰無礙無障知見”, further underscores the challenges large language models face when dealing with highly specialized Buddhist terms. “爾焰”, a Buddhist term referring to the ability to know, determine, or understand, is omitted in ChatGPT 4’s translation and misinterpreted by Gemini Advanced as “all flames”. The term “無障”, which refers to the absence of afflictions in Buddhism, is translated by ChatGPT 4 as “unobstructed”, failing to convey the intended meaning. Furthermore, the models struggle to accurately translate “知見” as true knowledge and insight, with ChatGPT 4 rendering it “dharma”. These misinterpretations and omissions of crucial philosophical concepts highlight the challenge that highly specialized Buddhist terms pose for large language translation models.

In conclusion, through comparative analysis of the English translations of Buddhist literature by ChatGPT 4, ERNIE Bot 4, and Gemini Advanced, we can see that all three large language models have certain limitations in handling Buddhist terminology and classical Chinese grammar. The three models have several shortcomings. First, their transliteration of Romanized Sanskrit generally lacks the necessary diacritical marks. Second, the translation of key Buddhist concepts, such as “菩提分法”, “解行地”, and “聞持”, is not precise enough. Third, there is an insufficient grasp of the special meanings of words like “方便”, “多”, and “究竟” in the Buddhist context. Finally, when dealing with complex, long sentences, they often fail to convey the multi-layered meanings of the original text. However, overall, the translation quality of ChatGPT 4 is noticeably superior to the other two models. It translates terms like “十地”, “增上戒”, and “善” closer to the meaning and better understands the unique connotation of the term “方便” in the Buddhist context. Although there are deficiencies in certain areas of ChatGPT 4’s translations, it comparatively grasps the overall intent of the text better. The performance of ERNIE Bot 4 and Gemini Advanced is relatively not good enough. For instance, ERNIE Bot 4 recognized “解行地” as a Bod-

hisattva stage but did not accurately reflect the relationship between “understanding” and “practice”, implying a parallel relationship rather than one where the practice is guided by understanding. Gemini Advanced generalizes “善” as “good”, failing to reflect its nuance of “skillfulness”. Therefore, when considering the overall translation quality, ChatGPT 4 outperforms both ERNIE Bot 4 and Gemini Advanced. While all three models demonstrate areas that could be enhanced, ChatGPT 4 exhibits a notably higher level of competence in comprehending and accurately translating Buddhist literature.

Text 2: 《合訂天台三聖二和詩集》：「宣情達事。世教有取於詩。吾宗聖賢高蹈遠視邈然矣。亦仿人情近習琢為文句。蓋憫物之心不可遏也。抑將激誘於道。奚啻宣情達事。流翫百世珠玉之擬哉。觀夫豐干寒拾三聖所唱。楚石琦公之和。韻皆痛快激烈斥妄警迷。山中天靈義首座。服膺有素。願繡梓以傳焉。且簪舊本諸名公序帖。及三隱集記系之。又以佛國白禪師所作文殊指南贊。詞勝理詣。永明壽禪師。布衲雍。鏡中圓。前後山居唱和之什。暨古德十牛頌。并諸歌偈。切於風礪。有裨益於世者。比次成帙。勸率善信陳智寶。賈福常。俾諸眾緣。併與刊行。謁言為弁。因謂醫方萬品。求對治而休。海寶千般。得如意而足。披此集者。驀然逗著一言半句。撲落眼眉。粲發心華。方信聖賢憫物之心。誠有在也。是則助揚激誘。微天靈之勳。吾誰與歸。永樂丙申夏。結制前一日。僧錄司右闡教。兼住鍾山靈谷。幻居比丘淨戒。」 (CBETA 2023.Q4, B14, no. 87, p. 737a8–b2)

Human Translation: Expressing emotions affairs of the world, the prevailing orthodox teachings are selected from poems. The esteemed predecessors of our school traveled to distant places and gained a broad and far-reaching view. They also closely imitated human emotions and, through review and practice, encapsulated them in the words and sentences of their literary works because they could not suppress empathy for everything in the world. Perhaps it will serve to inspire and guide others onto the right path. This goes beyond merely expressing emotions and comprehending world affairs; it is akin to cherished pearls and jewels that have been circulated and appreciated across many generations. Reading the poems written by the three masters Feng Gan, Han Shan, and Shi De, the venerable elder Chushi Qi follows their literary rhythm in his writings, which are straightforward, spirited, and eschew ignorance, alerting people to not fall into delusion. The chef monk Yi at the Tianling Temple in the mountain has always kept these works in mind and is willing to print and publish them in an elegantly bound volume for future generations. Additionally, compilations have been made of forewords by various esteemed masters from previous editions, and the Compilation of Records on the Three Hermits (Sanyin jiji 三隱集記) has been attached. Furthermore, the In Praise of Mañjuśrī's Guidelines (Wenshu zhi-nan zan 文殊指南讚) composed by Chan Master Foguo Bai has been included, known for its wonderfully written and profound principles. A series of literary works about mountain-dwelling life were successively written and responded to by Chan Master Yongming Shou, Bu Na Yong, and Jing Zhong Yuan, and the Hymn of Ten Oxen (Shiniu song 十牛頌) by various elderly monks and other poems and Buddhist verses. Selecting works that have been carefully polished by the authors, like stones weathered by years of wind, and which have numerous benefits for future generations, they have been compiled into volumes in sequence. Under the leadership of devout followers such as Chen Zhibao and Jia Fuchang, many others have also participated, jointly publishing, and distributing these works. This text is respectfully presented as the preface. Just as people stop searching for treatments once they find one that works or feel satisfied when they obtain a desired treasure from the sea, some readers may find a phrase in this book that captures their attention, as if shaking off the dust in their eyes. This can instantly enlighten them and cause the flower of wisdom in their heart to bloom in an instant. Only then do they believe in the compassionate heart of the sages towards all beings that truly exist. This book serves to inspire and guide

us as if it is a gift of power bestowed upon us by the heavens. Who are the like-minded individuals walking the same path together with me? In the summer of the Yongle Bingchen Year, on the day before the monastic retreat, I, Bhikkhu Huanju Jingjie, serving as the Right Supervisor Monk for Buddhist Practices (you chanjiao 右闡教) of the Central Buddhist Registry (senglu si 僧錄司) and the abbot in the Linggu Temple in Zhong Mountain, wrote this preface.

ChatGPT 4: Expressing emotions and **achieving enlightenment**, the teachings of the world have **much** to gain from poetry. **Our ancestral sages, with their lofty and far-sighted ideals, seem almost beyond reach.** Yet, they too crafted sentences and phrases, closely imitating human emotions and practices, for their compassion for all beings could not be restrained. Or perhaps to inspire and guide towards the path. This is not merely about expressing emotions and **achieving enlightenment**; it's like the eternal beauty of gems and pearls, admired across centuries. **Consider the rousing and forceful verses sung by the three saints in the cold, the harmonious responses of the esteemed Chu and Shi, all brimming with intense emotion, denouncing falsehoods and awakening the lost.** **The celestial spirit of the mountains, revered and deeply embraced, wishes to embroider these teachings for posterity.** And so, gathering ancient texts, prefaces by renowned **officials, and records of the three hermits,** along with the **Manjushri Guide** by **the Zen master from the Buddha land, whose words surpass logical understanding.** **The works of Zen master Yongming Yanshou, along with the songs and verses of ancient virtues, like the Ten Ox Herding Pictures, contribute to the sharpening of the mind, benefiting the world.** Thus, **this collection is formed, encouraging the faithful to cherish these jewels of wisdom, allowing everyone to share in their publication.** **In offering these words,** it's like seeking a cure in the myriad prescriptions of medicine or satisfaction in the thousand treasures of the sea; **encountering just a word or phrase within these pages can enlighten, opening the eyes and blossoming the heart.** **Only then can one truly appreciate the compassionate heart of the sages.** This is to aid in promoting inspiration and guidance, a testament to **the celestial spirit's subtle influence.** **To whom do I dedicate this work?** On the eve of **completing this compilation in the summer of the Yangle year, as the Deputy Director of the Monk Registry and resident of the Zhongshan Linggu, the monk Jingjie of the Phantom.**

ERNIE bot 4: Expressing emotions and conveying events. Poetry has a role to play in educating the world. Our ancestors, the saints and sages, had lofty aspirations and far-reaching visions. They also imitated human emotions and were familiar with polishing their verses. Their compassion for all things could not be restrained. Perhaps they **wanted to** inspire people to follow the right path. It was not merely about expressing emotions and conveying events, but also about creating timeless pearls and jade-like masterpieces. Consider the songs sung by the three saints Fenggan, **Hanshi,** and the harmonies of **Chushi Qigong.** Their rhymes are all painful and intense, denouncing falsehood and warning the deluded. **The chief monk of righteousness in the mountain, Tianling,** has long admired and practiced these teachings. He wishes to compile and print them for posterity. He has also compiled various prefaces and postscripts by renowned scholars from previous editions, as well as the "Records of the Three Hermits". In addition, he has included the "Guide to Manjusri" composed by **the Buddhist monk Bai Chanshi,** which is rich in both language and reason. The chants and responses of Yongming Shou Chan Master, Buna Yong, and Jingzhong Yuan from their mountain retreats, as well as the "Ten Ox Hymns" of the ancient masters and various songs and verses, are all **relevant to the times and beneficial to society.** **They have been compiled into a volume, and with the encouragement of devout believers such as Chen Zhibao and Jia Fuchang, they have been published for the benefit of all.** It is said that there are thousands of medical remedies, but

one seeks the right treatment to rest. There are countless treasures in the sea, but one is content with obtaining what one wishes. Those who read this collection may suddenly stumble upon a word or phrase that will open their eyes and illuminate their hearts. Then, they will believe that the saints and sages truly had compassion for all beings. This is how they help to promote and inspire, and without the achievements of Tianling, who would we turn to? In the summer of the **Yongle era**, the day before the end of the monastic retreat, the Right Elucidator of the Monastic Bureau, and the abbot of Zhongshan Linggu Temple, **the illusory monk Jingjie**, wrote this.

Gemini Advanced: To express feelings and convey matters; worldly teachings do draw from poetry. **Our ancestral sages were lofty and far-sighted, profound indeed.** Yet they also followed human sentiments and customs, honing **[wisdom]** into written verses. This was **surely** because a compassionate heart for all beings could not be restrained. Moreover, they **aimed** to inspire and guide towards the **Way**. How could this be merely about expressing feelings and **conveying matters**? It surpasses this, flowing **playfully** for a hundred generations like a semblance of pearls and jade. **Consider** Fenggan and **Hanshi—those chanted by the Three Sages**. See how the rhymes of **Duke Qi of Chu** resonate as well. All are vigorous and spirited, sharply denouncing falsehood and rousing those deluded. **Yishou, Spiritual Leader of the Mountain [Temple], has always upheld these with devotion.** He wishes to **carve them in woodblock** for their transmission. Further, **I** shall attach prefaces and postscripts by renowned figures, along with records from the **‘Three Recluses Collection**. Additionally, included is the **‘Guide to Manjushri’** composed by **Master Bai Chan of the Buddhist realm**. The words excel, the principle profound. From Yongming Shou Zen Master, **the poems ‘Cloth Robe’ and ‘Mirror Circle’, along with those from his mountain dwelling exchanges**. There are also the ancient worthies’ **‘Ten Oxherding Verses’,** as well as various **songs** and verses. **All incisive and refining,** beneficial to the world, they will be compiled in due order. **I urge the virtuous patrons Chen Zhibao and Jia Fuchang, that along with all contributing benefactors,** let this be published. Respectfully offering these words as a preface: **Just as with the myriad medicinal formulas, one seeks remedy according to ailment; or how the ocean’s countless treasures exist to fulfill desires.** those who open this collection may suddenly grasp a single word or half a phrase. **Their inner vision cleared,** the heart-flower will blossom. Only then will belief arise that the sages’ compassionate heart for all things truly exists. This indeed is furthering inspiration and guidance—slightly attributed to **Tianling’s merits.** **With whom else does this credit lie?** Summer of the Yongle Bingchen Year [1446], the day before the monastic retreat. By the **Bhikshu Jingjie, Right Dharma Propagator of the Sangha Registry,** also **residing at Zhongshan Linggu.**

	ChatGPT 4	ERNIE Bot 4	Gemini Advanced
Red	22	23	22
Green	10	5	5
Blue	6	5	7
Totals	38	33	34

In B0087, all three large language models—ChatGPT 4, ERNIE Bot 4, and Gemini Advanced—demonstrate the ability to translate most of the classical Chinese text into modern English. However, these models encounter difficulties in identifying and differentiating words with multiple meanings, particularly in the context of Buddhist terminology and literary practices.

In the translation of the phrase “宣情達事”, the characters “宣” and “達” should be considered a pair of near-synonyms, both carrying the meaning of expressing or conveying ideas or emotions. Furthermore, given that the context of the B0087 text is related to classical Chinese poetry, the translation of “達” should be sought in past classical texts, particularly those concerning the function or evaluation of traditional poetry. In the *Shiji* 史記, there is a passage stating: “詩以達意” (Poetry is used to express ideas) (Sima 2014, p. 3885). Therefore, the “達” in B0087 should be translated as “express” or “convey”, similar to its usage in the *Shiji*. However, this character is often translated in different contexts as “achieving”. This discrepancy led ChatGPT 4 to incorrectly translate this term as “achieving”, highlighting its challenges in comprehending the subtleties of classical Chinese literature. In this context, ChatGPT 4 demonstrated inferior performance compared to the other two models in interpreting “事”. It erroneously opted for “enlightenment” as the translation. This choice stems from ChatGPT 4’s recognition of the text’s Buddhist associations, leading it to favor terms with specific Buddhist connotations. However, this interpretation resulted in a translation that potentially misrepresents the intended message. A more accurate rendering of “事” in this context would be “matters” or “affairs”, which better preserves the original meaning without introducing unwarranted religious overtones.

The models’ performance varied in translating the phrase “世教有取於詩”. ChatGPT 4 and Gemini Advanced successfully captured the core meaning, while ERNIE Bot 4 fell short. The term “世教” functions as a noun, denoting contemporary mainstream thought or the prevailing teachings of the era. Although ChatGPT 4 provided a largely accurate translation, it introduced an extraneous element by including the word “much”.

A closer examination of the original classical Chinese text reveals that while the character “有” might superficially seem to correspond to “much”, given its potential to imply quantity in specific contexts, it serves here merely as a grammatical particle. In this instance, “有” lacks inherent semantic content and does not function to modify verbs, nouns, or adjectives.

Rendering Buddhist terminology into English proved challenging for all three models, as seen in their interpretations of “高蹈” and “吾宗”. Given the author’s affiliation with the Linji school (臨濟宗) of Chan Buddhism, “吾宗” should be translated as “the predecessors” rather than the broader “our ancestors”. Similarly, “高蹈邈然”, which in classical Chinese implies “traveling far”,¹ was only partially captured by the models, which emphasized “lofty” but missed the notion of distant travel (Xiao 1986, p. 1990).

The models’ interpretation of literary practices revealed varying degrees of success. In translating “習琢為文句”, only ChatGPT 4 correctly rendered “習” as “practice”, while ERNIE Bot 4 and Gemini Advanced misinterpreted it as “familiar” and “customs”, respectively. These errors stem from misunderstanding the sentence’s intent to describe the refinement of emotions into literary expressions.

Complex sentence structures highlighted both strengths and weaknesses in the models’ translations. ChatGPT 4 excelled in capturing the overall essence of the sentence “蓋憫物之心不可遏也。抑將激誘於道。奚啻宣情達事。流翫百世珠玉之擬哉” but stumbled on “宣情達事”. ERNIE Bot 4 misinterpreted critical terms like “抑將” and “誘”, while its translation of “流翫百世珠玉之擬哉” lacked precision. Gemini Advanced performed slightly better than ERNIE Bot 4 in conveying the basic meaning but still included inaccuracies, such as inappropriately adding “surely” and mistranslating “翫” as “playfully”.

In sections discussing historical figures, geographical locations, and monk titles, all three machine translations demonstrated limitations in handling specialized terms. The models struggled to accurately recognize and translate the names of prominent Buddhist figures, such as Fenggan, Hanshan, Shide (Zanning 1987, p. 483), and Chushi Qi (CBETA 2024.R2, X77, no. 1524, pp. 469a21–470a8), in the phrase “觀夫豐干寒拾三聖所唱。楚石琦公之和。快激烈斥妄警迷”. ChatGPT 4 mistranslated Hanshan and Shide’s names as “the three saints in the cold”, while ERNIE Bot 4 and Gemini Advanced only partially identified the names. Furthermore, the models failed to interpret the respectful title “公” correctly,

with ERNIE Bot 4 incorporating it into Chushi Qi's name and Gemini Advanced misinterpreting it as "Duke".

The term "痛快", which typically denotes a brisk and straightforward literary style, was mistranslated by ERNIE Bot 4 as "painful". This error highlights the difficulty in accurately rendering context-specific literary terms from classical Chinese into modern English.

The phrase "山中天靈義首座" illustrates this interpretive difficulty. In this context, "天靈" can be understood as a temple "Tianling Temple" while "義首座" may be rendered as "chief monk Yi" (Xu, *Zhizheng ji*, juan 71, p. 1256)². However, ChatGPT 4 misinterpreted "首座" as "The celestial spirit of the mountains", while ERNIE Bot 4 and Gemini Advanced failed to accurately identify the personal name and monastic position.

The following sentence "服膺有素" further illustrates the models' limitations in capturing the intended meaning of specialized Buddhist terminology. "服膺" means "to firmly memorize or sincerely believe in (a text)", while "有素" is understood as "always" or "consistently". ChatGPT 4 did not provide an accurate translation, ERNIE Bot 4's translation was closer but still incomplete, and Gemini Advanced correctly translated "有素" but made an error in translating "服膺".

In addition, "且纂舊本諸名公序帖。及三隱集記系之。又以佛國白禪師所作文殊指南讚。詞勝理詣" contains both classical titles and names of historical figures; yet, the translations provided by the three large language models are inadequate.

Firstly, personal names and specialized terminology further exemplified the models' limitations. In the text, "佛國白禪師" refers to the historical figure "Foguo bai", (CBETA 2024.R1, T51, no. 2077, p. 591c4) but ChatGPT 4 failed to recognize this, and incorrectly translated it as "the Zen master from the Buddha land". It correctly translated as "禪師" (Zen/Chan master), but "佛國白", which should be the monk's name, was mistakenly translated as "the Buddha land".

"諸名公" in the text signifies "various renowned masters", but ChatGPT 4 incorrectly translated it as "renowned officials". ERNIE Bot 4 incorrectly interpreted "公" as "scholars".

The translation of book titles and Sanskrit terms posed significant challenges for the language models, often resulting in inaccurate or incomplete renderings. "三隱集記" is the title of the book, with "三隱" referring to the hermits Han Shan, Shi De, and Feng Gan. Therefore, while ChatGPT 4's translation of "hermits" is correct, "集記" should be translated separately, with "集" as "Compilation" and "記" as "Record". However, ChatGPT 4 merely translated it as "collections". Similarly, ERNIE Bot 4 did not accurately translate "records" in "Collection of Records of the Three Hermits".

"文殊指南讚" also fails to accurately convey the title, which should encompass both "指南" (guidelines) and "讚" (in praise of); translating it as "In Praise of Mañjuśrī's Guidelines" ChatGPT 4 only rendered "指南" as "guide" and omitted "讚". Additionally, the Romanized Sanskrit term "Mañjuśrī" provided by ChatGPT 4 is inaccurate, lacking diacritical marks to represent sounds correctly. ERNIE Bot 4 also omitted diacritical marks in the Romanization of Sanskrit for "Manjushri".

Accurate translation of classical Chinese terms proved a formidable task, particularly in capturing the subtle meanings of words with multiple interpretations. This complexity is exemplified in the translation of the phrase "詞勝理詣", where the nuanced meanings of "勝" and "詣" proved problematic for large language models.

In classical Chinese, "勝" has various meanings. Given the context, "勝" should be interpreted as the adjective "wonderful", while "詣" should be translated as "profound" or "of high quality". ChatGPT 4 struggled with these terms, rendering the phrase as "whose words surpass logical understanding". While "surpass" can indeed be one interpretation of "勝", it is inappropriate in this context.

ERNIE Bot 4's translation of "勝" as "rich" was misplaced, and it also failed to convey the meaning of "詣".

Gemini Advanced made a different error in translating the sentence "且纂舊本諸名公序帖". The original text indicates that Chief Monk Yi compiled the prefaces of famous

masters, but Gemini Advanced used the first person, incorrectly attributing this action to the author of text 2: “I shall attach prefaces and postscripts by renowned figures”. In subsequent translations, it also inaccurately rendered the titles of two books and the name Fuguobai. However, Gemini Advanced’s translations of “勝” and “詣” in the following sentence were accurate.

The translation of classical Chinese Buddhist texts by large language models reveals varying levels of accuracy in recognizing historical figures and interpreting complex literary references. In “永明壽禪師。布衲雍。鏡中圓，前後山居唱和之什。暨古德十牛頌。并諸歌偈。切於風礪。有裨益於世者。比次成帙”，ChatGPT 4 was able to realize that “永明壽” referred to the abbreviated name of the Chan master Yongming Yanshou (CBETA 2023.Q4, T51, no. 2078, p. 763b18–19), a detail that the other two large language models missed. However, ChatGPT 4 omitted significant content in its following translation; it left out the names “Bu Na Yong” (CBETA 2024.R2, X80, no. 1566, p. 507b8–16) and “Jing Zhong Yuan”, which did not appear in the translated text, and it also overlooked the phrase “切於風礪”, failing to translate it. Overall, ChatGPT 4 seemed to only roughly summarize the intended message of the sentence without providing a detailed, word-for-word translation.

ERNIE Bot 4 recognized and translated the names “Yongming Shou”, “Bu Na Yong”, and “Jing Zhong Yuan”. However, like ChatGPT 4, it did not translate the phrase “切於風礪”, skipping it to proceed to the following sentence.

Gemini Advanced had the weakest performance in translating this sentence; it translated only the name “Yongming Shou” and failed to recognize “Bu Na Yong” and “Jing Zhong Yuan” as names of monks, instead translating them directly as “the poems ‘Cloth Robe’ and ‘Mirror Circle’”.

The intended meaning of “前後山居唱和之什”, which is “these three individuals successively wrote and responded to each other’s poems about life in the mountains”, was also inaccurately translated to “along with those from his mountain dwelling exchanges”. Like the previous two machine translations, Gemini Advanced also overlooked “切於風礪”.

Translating personal names and publishing-related terminology from classical Chinese poses a significant challenge for language models, as evidenced by their handling of the sentence “勸率善信陳智寶。賈福常。俾諸眾緣。併與刊行。謁言為弁”.

ChatGPT 4 made several errors in translating this sentence. Firstly, it omitted the names of historical figures Chen Zhibao and Jia Fuchang. Secondly, it summarized the sentence: “Thus, this collection is formed, encouraging the faithful to cherish these jewels of wisdom, allowing everyone to share in their publication”, which does not accurately reflect the original content. The original text describes the publication process of this anthology or literary works, emphasizing that it was accomplished under the leadership of Chen Zhibao and Jia Fuchang in cooperation with other faithful individuals rather than encouraging appreciation of wisdom’s treasures as understood by ChatGPT 4. Furthermore, ChatGPT 4 omitted the translation of “謁言為弁”. In classical Chinese, “弁” can mean “preface” or “introduction”, so the sentence should imply “This passage that the reader sees serves as the introduction”.

In comparison, ERNIE Bot 4 performed better in translating this sentence. It identified and translated the names of the historical figures mentioned within and broadly understood the core content of the sentence without significant errors. However, ERNIE Bot 4 also missed translating “謁言為弁”.

Gemini Advanced was the only one among the three machine translations to translate “謁言為弁” but its interpretation of the sentence’s meaning was slightly off. It used a sentence structure starting with “I urge ...”, which inaccurately suggests that the author pleads with Chen Zhibao, Jia Fuchang, and others to contribute to the book’s publication. The original text commends their contributions to the publishing of this anthology rather than soliciting their support.

Large language models demonstrate varying proficiency in translating classical Chinese parallelism, often recognizing the structure but struggling with nuanced interpretations of metaphorical content. The sentence “因謂醫方萬品。求對治而休。海寶千般。得如

意而足” exemplifies the use of parallelism, a technique from traditional Chinese literature that ensures the first and subsequent sentences are matched in logic, parts of speech, and metaphor. All three large language models accurately identified this literary device. In their translations, “如意” was not interpreted as a specific treasure. Instead, mirroring the concept of “對治” (the correct remedy), they rendered “如意” as “fulfilling one’s desired wish”, aligning with the narrative of seeking the proper treatment and then being satisfied.

However, ChatGPT 4 incorrectly translated “因謂” as “In offering these words”, missing its intended meaning. In classical Chinese, “因謂” should be more precisely translated as “it is said that there are”.

ERNIE Bot 4 made a mathematical error in its translation. The term “萬種” should be translated as “ten thousand kinds”, but it inaccurately rendered it as “thousands of”.

In its interpretation of the sentence, Gemini Advanced strayed from the intended meaning. The references to ten thousand remedies and a thousand treasures are metaphors the author employs to lay the groundwork for what follows and to emphasize the anthology’s worth. However, Gemini Advanced misinterpreted this as “Just as with the myriad medicinal formulas, one seeks remedy according to ailment; or how the ocean’s countless treasures exist to fulfill desires”. This reading does not adequately highlight the anthology’s significance. The author aims to convey that, much like one seeks the singular effective remedy among ten thousand or the one fulfilling treasure among thousands, this anthology stands out as the singularly most precious and insightful book available.

Language models’ interpretations of the sentence “披此集者。驀然逗著一言半句。撲落眼屑。粲發心華。方信聖賢憫物之心。誠有在也” reveal the complexities in translating classical Chinese literary devices.

ChatGPT 4 omitted the translation of “披此集者” in the sentence. It fails to convey that this sentence was addressed to readers of the anthology. “驀然逗著一言半句” should indicate that readers are suddenly captivated by a phrase or a few words in the book. However, ChatGPT 4 translated it as “within these pages can enlighten”, an unrelated addition to the original text. While the entire sentence includes a metaphor of “enlightening the reader”, this metaphor is related to “粲發心華” and should not appear in the first part of the sentence.

Moreover, the translation of “撲落眼屑” was incorrect across multiple models. ChatGPT 4 rendered “撲落” as “opening”, whereas, in classical Chinese, it does not mean to open but rather implies “to cause to fall” or “to shake off, to scatter”, generally carrying the sense of “falling” rather than “opening”. “眼屑” refers not to the eyes themselves but to the dust within them. The metaphor of “shaking off the dust from one’s eyes” used by the author signifies the clarity and enlightenment gained from reading the book, akin to clearing one’s vision of obstructions, thereby offering new insights and wisdom to the reader.

ERNIE Bot 4 made a similar mistake by rendering the phrase “open their eyes”. At the same time, Gemini Advanced’s translation of “Their inner vision cleared” grasped the intended meaning but failed to express the original metaphor accurately.

Classical Chinese allusions pose unique translation difficulties for large language models, often requiring deep cultural and historical knowledge to interpret correctly. The phrase “吾誰與歸”³ resented another challenge, being an allusion to *Guoyu* 國語 (Zuo, *Guoyu*, juan 14, p. 331). It asks, “Who are the like-minded individuals walking the same path with me?” In this context, “歸” should be understood as “together”. However, all three models struggled with this allusion. ChatGPT 4 incorrectly translated it as “To whom do I dedicate this work?”

ERNIE Bot 4 mistakenly rendered “歸” as “return”, Gemini Advanced also failed to grasp that the sentence expresses the author’s search for like-minded individuals, leading to inaccurate translations across the board.

The translation of classical Chinese Buddhist texts by large language models shows inconsistent levels of precision, especially when dealing with specialized Buddhist terms, historical allusions, and Ming Dynasty-era institutional nomenclature. The sentence “永樂丙申夏。結制前一日” indicates that the author wrote the text in the summer of the Bing Shen

year during the Yongle era of the Ming Dynasty, which corresponds to the summer of 1446 AD. “結制” refers to the traditional annual retreat in Buddhist monastic communities. When translating this sentence, ChatGPT 4 incorrectly wrote “永樂” as “Yangle year”, whereas the correct pinyin spelling should be “Yongle”. Moreover, “結制” should be translated as “retreat” rather than “completing this compilation”. Overall, ChatGPT 4 made significant errors in handling the traditional Chinese lunisolar calendar and failed to accurately translate a conventional Buddhist custom.

In contrast, ERNIE Bot 4 correctly translated the pinyin spelling of “Yongle” and the Buddhist custom “retreat”, but it omitted the translation of “Bing Shen”.

Gemini Advanced accurately translated this sentence and even identified “永樂丙申” as the year 1446 in the modern calendar.

The “僧錄司” was an institution responsible for managing Buddhist monks. The *Chinese-English Dictionary of Ming Government Official Titles* translates it as “The Central Buddhist Registry” (Zhang et al. 2017, p. 166). While ChatGPT 4’s translation “Monk Registry” captures the basic function of registration and management, it omits the term “Central” and replaces “Buddhist” with “Monk”. This simplification, though conveying the general purpose of the institution, does not fully reflect its status as a centralized, national-level organization as indicated in the authoritative translation.

ERNIE Bot 4 rendered this government institution as a “Monastic Bureau”. While “Bureau” implies a governmental agency, “錄” in classical Chinese signifies “to register” or “to enroll”. Therefore, given the necessity for an exact word-for-word translation of “僧錄司”, ERNIE Bot 4’s rendition does not fully capture the institution’s function related to the registration of monks.

Gemini Advanced’s translation of “僧錄司” into “Sangha Registry” is also acceptable, considering that “Sangha” is a Romanized Sanskrit term associated with the meaning of “Buddhist community”.

In the text, “右闡教” refers to a religious official position during the Ming Dynasty in China, serving as a branch of the “闡教”. The role entailed researching Buddhist teachings and guiding monks in the teachings and practices of Buddhism. Thus, this position could be accurately translated as “Right Supervisor Monk for Buddhist Practices”. ChatGPT 4’s rendition of it as “Deputy Director” captures the leading responsibilities of the role; yet, it lacks precision in the description. ERNIE Bot 4’s translation, “Right Elucidator”, successfully conveys the essence of “闡” but fails to explicitly communicate the position’s educational and guiding duties towards monks in studying and practicing Buddhist doctrines, rendering this translation imprecise. Meanwhile, Gemini Advanced’s “Right Dharma Propagator” translation significantly strays from the original meaning.

In “兼住鍾山靈谷”, the term “住” signifies the monastic role of “abbot”, not the verb “reside”. This implies that the text’s author not only serves as the Right Supervisor Monk for Buddhist Practices but also holds the position of the abbot in the Linggu Temple in Mountain Zhong. ERNIE Bot 4 alone accurately interpreted this context, whereas the other two large language models misconstrued “abbot” as living or residing.

The last line of the text, “幻居比丘淨戒” denotes the author’s name. “Jingjie” is the author’s Dharma name, and “Huanju” is an alternative name (CBETA 2024.R2, X82, no. 1571, p. 216c16–22; CBETA 2024.R2, X64, no. 1262, p. 467a15). Therefore, the correct translation would be “Bhikkhu Huanju Jingjie”. ChatGPT 4 correctly identified “Jingjie” as a name and rendered it in its pinyin form. Still, it did not recognize “Huanju” as the author’s alternative name, incorrectly translating it as “the Phantom”. Similarly, ERNIE Bot 4 erroneously translated “Huanju” as “the illusory”. Gemini Advanced only focused on translating “Jingjie” and omitted “Huanju”, leaving no reference to “Huanju” in its translation.

In conclusion, the performance of large language models in translating classical Chinese texts reveals both their capabilities and limitations, particularly in handling context-dependent meanings, specialized terminology, and literary devices. This analysis of their

translations highlights several key areas of challenge and varying degrees of success among different models.

Large language models faced significant difficulties in accurately interpreting words with multiple meanings based on their context. A prime example is the mistranslation of “達” as “achieving” instead of the intended “expressing” within the phrase “宣情達事”. This challenge was evident across all models, with Gemini Advanced performing slightly better in capturing the overall meaning of phrases like “奚啻宣情達事”, despite not being perfectly precise in details.

The models also struggled considerably with specialized terms, particularly failing to recognize and translate the names of historical figures, monks, geographical places, and book titles. For instance, none of the models correctly identified the names Fenggan, Han-shan, Shide, and Chushi Qi in the text “觀夫豐干寒拾三聖所唱。楚石琦公之和”. However, ERNIE Bot 4 showed some improvement in this area, successfully recognizing “Fenggan” and “Chushi Qi” and accurately translating names like Yongming Shou, Bu Na Yong, and Jing Zhong Yuan in certain instances.

A common issue across the models was the frequent oversight or misinterpretation of essential phrases critical to the overall meaning. ChatGPT 4, in particular, omitted the most content among the three models. For example, it neglected to translate “切於風礪” in the context of “切於風礪。有裨益於世者。比次成帙”. While the models generally grasped the main ideas of sentences, they often made mistakes in specifics—either by leaving out information, introducing unrelated interpretations, or failing to convey the intended meaning of specific terms and phrases accurately.

The translation of cultural concepts posed challenges for all models. For instance, “僧錄司” (a body responsible for overseeing Buddhist monks) was variously translated as “Monastic Bureau” or “Sangha Registry” rather than the more accurate “Buddhist Registry”. Similarly, the translation of Buddhist customs like “結制” (annual retreat) was often misunderstood, with ChatGPT 4 incorrectly rendering it as “completing this compilation”.

Based on the analysis, Gemini Advanced and ERNIE Bot 4 demonstrated superior translation performance compared to ChatGPT 4 for the given texts. ERNIE Bot 4, in particular, showed strengths in recognizing certain names and understanding context-dependent meanings, such as correctly interpreting “住” as “abbot” in “兼住鍾山靈谷”. However, all models still made errors in various aspects of translation.

While large language models have made significant strides in translating classical Chinese texts, they face challenges in accurately conveying nuanced meanings, specialized terminology, and cultural concepts. The varying performance across different aspects of translation highlights the need for continued improvement in these models’ understanding of context, specialized knowledge, and literary devices in classical Chinese texts. Future developments in language models should focus on enhancing their ability to handle context-dependent interpretations, recognize and accurately translate specialized terms and named entities, and maintain the integrity of complex literary structures and cultural references in classical Chinese texts.

Text 3: 《現果隨錄》：「蘇州劉錫玄。字玉受。號心城。庚戌進士。初為廬陵教授。應滇聘。道過黔中。回泊舟郵亭。夢一長面偉人告曰。某朱將曹翰也。⁴予在唐朝為商。過一寺。見一法師登高座。講佛門四十二章經。余發心設齋一堂。隨聽經一座。以此善因世為小吏。從不脫官。至宋初升為偏將軍。名曹翰。征江州久不下。怒屠其城。自此以來世世為猪受人屠戮。今公泊舟處。乃吾死所。少頃第一受宰者即我也。有緣相遇。願垂哀救。劉公蹶起。呼僕視船頭。果屠門也。少頃門啟。擡一猪出。號聲動地。劉倡買載回放之閩門西園內。呼曹翰即應。公刊因緣遍布。兼載黔枝偶存集中。罷翁曰。猪業重。性蠢。何能現夢。其能現夢者仍是聽經餘惠也。余辛未時同公聽講台教於即中堂。公口述其事。余至西園。猶及見此猪身好潔。呼曹翰即應。與人無異也。然曹翰與曹彬從兄弟也。武惠行軍不妄殺一人。勳樂冠世。曹翰乃恣意屠城。致墮畜類。累生酬債。慈忍分途。苦樂異報如此。嗚呼。能撥無因果也哉。又王丹麓居士遂生集載劉公夢中問曹翰。平日見汝等受殺時。何法可救。曰。每當屠割時。苦不堪忍。惟聞念佛音聲遂解其苦。望公凡見屠殺割裂經湯鑊熟

食時。乞念阿彌陀佛。或準提呪。不獨解苦。且有脫苦之益。言訖悲涕謝去。」 (CBETA 2023.Q4, X88, no. 1642, p. 43a21–b19//R149, pp. 518b15–519b01//Z 2B:22, pp. 259d15–260b01)

Human Translation: Liu Xixuan from Suzhou, with the courtesy name Yushou and the alternative name Xincheng, was a Presented Scholar (jinshi 進士) in the year of Gengxu 庚戌. In his early career, he served in an official capacity in Luling, where he held the title of Instructor (jiaoshou 教授). Subsequently, he was called to serve in Yunnan. On the way back, passing through Guizhou, his boat anchored at a post house. In his dream, a tall, long-faced man appeared and said to him: “I am a general from the Song Dynasty named Cao Han. During the Tang dynasty, I was a merchant. Once, while passing by a temple, I encountered a Buddhist master sitting on the higher seats to lecture on Buddhism’s Sutra of Forty-two Chapters. At that time, I was moved to sponsor a pure vegetarian meal and listened to a lecture on sutras. Due to this meritorious act, I have been able to hold minor official positions in several lifetimes and never left an official position. In the early Song dynasty, I was promoted to the rank of Lieutenant General (pian jiangjun 偏將軍), known as Cao Han. I led troops to attack Jiangzhou and, infuriated by our prolonged inability to conquer it, ordered a massacre of the civilians upon breaching the city. Since that time, I have been reborn as a pig in each subsequent life, destined to be killed by people. The very spot where your boat is currently anchored is where I am scheduled to be slaughtered. Soon, the first pig to be led out for slaughter will be me. Our encounter is destined, and I hope you can show compassion and save my life”. Upon waking from the dream suddenly, Mr. Liu (Xixuan) called his servant to the front of the boat to take a look, and indeed, there was an entrance to a slaughterhouse. Shortly after, the gate of the slaughterhouse opened, and a pig was brought out. The pig’s cries were so loud that they could shake the earth. Liu initiated the purchase of the pig, brought it back, and set it free in the Xiyuan Temple nearby the Chang Gate (the northwest city gate in Suzhou). Whenever someone called out the name “Cao Han”, the pig would respond immediately. He wrote and published an article about this event and its cause, which was widely circulated and also recorded in Collection of Occasional Works in Guizhou. (Qianzhioucun ji 黔枝偶存集)

Ba Weng commented: “Pigs are burdened by heavy karma and are naturally ignorant; how then could one communicate in a dream? This pig’s ability to communicate through a dream was likely the result of good karma, accumulated in a previous life by listening to Buddhist sutras: In the Xinwei year, I and Liu Xixuan listened to the teachings of the Tiantai school together at Jizhong Hall. He personally shared this remarkable story with me. Later, when I visited the Xiyuan Temple, I saw that pig, which was very clean. Whenever someone called out the name ‘Cao Han,’ it would immediately respond, indistinguishable from a human”.

Cao Han and Cao Bin were cousins. Cao Bin, posthumously known as Wu Hui, never killed the innocent indiscriminately when leading troops, earning unparalleled merits and honors. In contrast, diacritical mark. The nature of compassion and cruelty varies among individuals, resulting in vastly different retributions of suffering and joy. Ah! Who can deny the existence of karma in this world?

Furthermore, according to the Collection of Joyful Life (Suisheng ji 遂生集) authored by the lay Buddhist Wang Danlu, Liu Xixuan once asked of Cao Han in a dream, “When I see you being slaughtered, how might I save you?” Cao Han replied, “Every time I am slaughtered, the pain is truly unbearable. At those moments, only the sound of reciting the Buddha’s name can alleviate the pain. I beseech you, whenever you see slaughtering and the cutting of bones and flesh, or meat being cooked in a boiling pot and about to be eaten, to recite the name

of Amitabha Buddha or the *Cundī* Mantra. Not only will it relieve the pain, but you will also receive good rewards for helping sentient beings escape suffering". After saying, Cao Han wept sorrowfully, expressed his gratitude to Liu Xixuan, and then departed.

ChatGPT 4: Liu Xixuan from Suzhou, styled Yushou and known by the pseudonym Xincheng, was a distinguished scholar of the Gengxu year. Initially an educator in Luling, he was later invited to Yunnan. On his journey, passing through central Guizhou, he anchored his boat at You Pavilion. There, he dreamt of a tall, imposing figure who introduced himself as Cao Han, a former general named Zhu during the Tang dynasty who became a merchant. This figure recounted visiting a temple, listening to a monk preach the Forty-Two Chapter Sutra, and sponsoring a meal and a sermon session, which led to a life of unending minor officialdom, never freed from office, until the early Song dynasty when he rose to be a junior general. Due to his failure to capture Jiangzhou and subsequent massacre of its inhabitants, he was condemned to be reborn as a pig, slaughtered generation after generation. In the dream, this figure revealed that the place where Liu's boat was anchored was his place of death and that he would be the first pig to be slaughtered soon. He pleaded for Liu's compassion. Awoken by the dream, Liu hurriedly checked the front of the boat and found a slaughterhouse. Soon, a pig was brought out, its cries earth-shattering. Moved by the dream and the coincidence, Liu bought the pig and released it in the western garden of the gate, calling it Cao Han, to which it responded. Liu published the story widely, including it in the collection of occasional works from Guizhou, indicating that even a creature as unintelligent and heavily burdened with karma as a pig could manifest in a dream due to the residual merits of past good deeds. Years later, during a lecture, Liu recounted this story, and I had the chance to see the pig, remarkably clean and responsive to the name Cao Han, indistinguishable from humans. This story serves as a stark contrast between Cao Han and his relative Cao Bin, who was known for his humane military conduct, highlighting the divergent outcomes of their actions.

Additionally, lay Buddhist Wang Danlu included an account in his collection where Liu, in the dream, asked Cao Han how he could be saved during slaughter. Cao Han replied that the sound of Buddha's name alleviated his suffering during slaughter. Wang thus urged that upon witnessing any act of slaughter, one should chant the name of Amitabha Buddha or the Cundi Mantra, not only to ease the suffering but also to aid in liberation. With these words, he departed in tears of gratitude.

ERNIE Bot 4: Liu Jinxuan of Suzhou, styled Yushou and nicknamed Xincheng, was a Jinshi (successful candidate in the highest imperial examination) in the Gengxu year of the sexagenary cycle. He first served as a professor in Luling and was later invited to Yunnan, passing through Guizhou on his way. While moored at a post station, he had a dream in which a tall and impressive man appeared to him and said, "I am Cao Han, a general under the Zhu dynasty. In the Tang Dynasty, I was a merchant who passed by a temple and saw a Buddhist master seated on a high platform expounding the Sutra of Forty-two Chapters. Inspired by this, I made up my mind to offer a vegetarian feast and listen to the sutra. As a result of this good deed, I have been reborn as a minor official in later generations and never lost my position. However, in the early Song Dynasty, I was promoted to a general and given the name Cao Han. When I was conquering Jiangzhou and could not capture it for a long time, I angrily slaughtered its inhabitants. Since then, I have been reborn as a pig in every generation and slaughtered by people. The place where you have moored your boat is where I died. Soon, the first pig to be slaughtered will be me. Fate has brought us together, and I beg you to have

mercy on me and save me". Liu Jinxuan woke up in a start and called his servant to look at the bow of the boat, where he saw a slaughterhouse. Moments later, the door opened, and a pig was carried out, its cries shaking the earth. Liu advocated for the pig's purchase and had it released in the West Garden of Changmen. When he called out "Cao Han", the pig responded immediately. Liu widely published the story, including it in his collection of anecdotes from Guizhou. An old man commented, "The karma of being a pig is heavy, and pigs are stupid by nature. How could they appear in dreams? The fact that this pig could appear in a dream is due to the residual blessings from listening to the sutra". I was with Liu Jinxuan listening to a lecture in Zhongtang during the Xinwei year of the sexagenary cycle when he related this story to me. When I went to the West Garden, I saw this pig, which was clean and responded immediately when called "Cao Han", just like a person. However, Cao Han and Cao Bin were cousins. Cao Bin, known for his martial prowess and benevolence, did not kill a single person unnecessarily and achieved great honor. Cao Han, on the other hand, indulged in slaughtering the inhabitants of cities and was reborn as an animal as a result. He had to endure the suffering of being slaughtered over and over again to repay his karmic debts. Compassion and cruelty lead to different outcomes, and the rewards and punishments are correspondingly different. Alas, who can deny the existence of karma? Furthermore, in Wang Danlu's collection of anecdotes, it is recorded that Liu Jinxuan asked Cao Han in his dream, "When you see your kind being slaughtered, what method can save them?" Cao Han replied, "When we are being slaughtered, the pain is unbearable. But when we hear the sound of Buddha's name being chanted or mantras being recited, it relieves our suffering. I beg you, whenever you see animals being slaughtered, cut up, boiled, or cooked, please chant 'Amitabha Buddha' or other mantras. This will not only relieve their suffering but also help them escape from it". After saying this, Cao Han wept with gratitude and departed.

Gemini Advanced: Liu Xixuan, courtesy name Yushou, sobriquet Xinchun, was a jinshi of the Gengxu year. He initially served as a professor in Luling. Upon accepting an invitation to Yunnan, he passed through Qiongzong. Returning, he docked his boat at a post station. Here, he dreamt of a tall, imposing figure who introduced himself: "I am Zhu Jiang Cao Han. In the Tang Dynasty, I was a merchant. Passing a temple, I saw a dharma master lecturing on the Forty-two Chapters of the Buddha. I vowed to establish a vegetarian hall and listened to the entire lecture. Due to this good deed, I became a minor official in every life, never losing my position. In the early Song Dynasty, I was promoted to general. My name was Cao Han. Besieging Jiangzhou without success, I angrily slaughtered the city. Since then, I've been reborn as a pig each lifetime, slaughtered by humans. Where you've docked your boat is where I died. Soon, I'll be the first slaughtered. As fate connects us, please show mercy and save me".

Liu Gong awoke, calling his servant to check the ship's bow. Indeed, it was a slaughterhouse gate. Soon after, the gate opened, and a pig was carried out, its cries shaking the ground. Liu offered to buy and release it in the garden west of the Chang Gate. He called out "Cao Han", and it responded. Liu Gong publicized this karmic connection and included it in his collection "Occasional Writings". Ba Weng commented, "A pig's karma is heavy, its nature dull. How could it manifest a dream? The ability to do so is a remnant blessing from hearing the sutras".

Later, I attended a Dharma lecture with Liu Gong at the Jizhong Hall. He recounted this incident to me. When I visited the West Garden, I saw the pig. Its body was clean, and when I called "Cao Han", it responded—no different from a human. Interestingly, Cao Han was a cousin of Cao Bin. Cao Bin was a mili-

tary commander who never needlessly killed. His honors were unmatched. Cao Han, however, recklessly slaughtered a city, leading to his animal rebirths. He repaid debts over lifetimes, with paths of compassion and cruelty diverging, rewards and suffering distinct. Alas! Who can deny cause and effect? Wang Danlu, a Buddhist lay practitioner, compiled Liu Gong’s dream. In it, Liu asked Cao Han, “On weekdays when you see your kind killed, how can you be saved?” He replied, “During the slaughter, the suffering is unbearable. Only hearing the sound of Buddha chanting relieves it. I hope whenever you witness butchering, whether by splitting, boiling, or eating, you’ll recite Amitabha Buddha or the Zhunti mantra. This will not only ease the suffering but also offer a path to liberation”. With that, he wept bitterly and departed.

	ChatGPT 4	ERNIE Bot 4	Gemini Advanced
Red	17	18	19
Green	15	6	9
Blue	3	8	6
Totals	35	32	34

In the translation of “蘇州劉錫玄。字玉受。號心城。庚戌進士。初為廬陵教授。應滇聘。道過黔中”, large language models show inconsistent results when tasked with identifying and translating the various appellations found in Chinese personal names. While all three large language models successfully identified “玉受” and “心城” as additional names for Liu Xixuan, they differed in their chosen terms when translating “字” and “號”. Considering the context of Chinese naming traditions present in this text, I consulted Chinese History: A New Manual and opted for a “courtesy name” to translate “字” and an “alternative name” to translate “號” (Wilkinson 2015, pp. 136, 138). It is worth noting that ERNIE Bot 4 incorrectly identified the pinyin spelling of Liu Xixuan’s full name, where the pronunciation of “錫” should be “xi”. However, it recognized it as “jin”.

When tasked with translating classical Chinese Buddhist texts, large language models exhibit inconsistent levels of precision. This variability is especially pronounced when dealing with specialized vocabulary, historical allusions, and official titles specific to the Ming Dynasty period. This inconsistency is exemplified in their handling of the term “jinshi”, which is the highest degree in Imperial China’s examination system. ChatGPT 4 avoided a direct translation, describing it as a “distinguished scholar”.

ERNIE Bot 4 took a more comprehensive approach, retaining the pinyin “jinshi” while also explaining it as “a successful candidate in the highest imperial examination”. Gemini Advanced similarly kept the pinyin but did not provide its meaning and notably failed to mention Liu Xixuan’s Suzhou origins. These disparities highlight large language models’ challenges in accurately conveying specific historical terms and contextual details in translation tasks. Within the hierarchy of traditional Chinese bureaucracy, the title “教授” was associated with local administration at the prefectural level. This position held a comparatively modest status in the overall ranking of official posts. ChatGPT 4 translated it as “educator”, while ERNIE Bot 4 and Gemini Advanced translated it as “professor”, both terms associated with academic institutions or schools rather than official positions. Therefore, after referring to the *Chinese–English Dictionary of Ming Government Official Titles* and considering that this position was responsible for teaching Confucian students, we translated this term as “instructor” (Zhang et al. 2017, p. 243). These disparities in translating personal names and appellations are not limited to individuals; they also extend to the interpretation of official titles and specialized terminology, as evidenced by the varying translations of “進士” and “教授”.

The varying interpretations of “黔中” and “郵亭” by different large language models, along with punctuation errors in the source text, illustrate the complexities involved in accurately translating and contextualizing classical Chinese texts. The term “黔中” should

be spelled as “Qianzhong” in pinyin, but it was erroneously translated to “Qiongzong”. Conversely, the remaining two large language models accurately recognized it as an alternative name for Guizhou, correctly translating it to “Guizhou” in their interpretations. The punctuation in this text, according to the CBETA version, has an issue where the editor mistakenly punctuated “道過黔中回。泊舟郵亭” as “道過黔中。回泊舟郵亭”. This punctuation is incorrect. In addition to referencing earlier versions, a comprehensive analysis of the contextual framework and logical structure of the discourse enables the identification of punctuation errors. This level of nuanced textual scrutiny remains beyond the current capabilities of large language models. From the overall content of the text, it is evident that Liu Xixuan encountered Cao Han, who had reincarnated as a pig, on his way back from Yunnan to Suzhou. He purchased the pig and brought it back to Suzhou. Hence, this story must have occurred during Liu’s return journey from Yunnan to Suzhou. Moreover, the text notes that Liu included this story in his collection of writings, titled *Collection of Occasional Works in Guizhou 黔枝偶存集*, which indicates that the stories in this collection all took place in Guizhou. Thus, piecing together these clues, we can deduce that Liu’s journey from Yunnan to Suzhou included a passage through Guizhou, where he rescued Cao, who had reincarnated as a pig. Therefore, the sentence should be correctly punctuated as “道過黔中回。泊舟郵亭”, meaning “On the way back, after passing through Guizhou, he anchored his boat at a post house”.

Furthermore, there was a misinterpretation of “郵亭” by ChatGPT 4. Historically, a “郵亭” was a stopover for officials and military personnel and accurately translates to “post house”. ChatGPT 4 incorrectly interpreted it as a pavilion named “You”, while ERNIE Bot 4 and Gemini Advanced more accurately described it as a “post station”.

The challenges in accurately translating classical Chinese texts extend beyond personal names and appellations, as large language models also struggle with capturing nuanced descriptions, translating historical terms, and conveying the original text’s perspective consistently. In the following sentence, another protagonist, Cao Han, appears in Liu Xixuan’s dream and tells his own story:

夢一長面偉人告曰。某朱將曹翰也。予在唐朝為商。過一寺。見一法師登高座。講佛門四十二章經。余發心設齋一堂。隨聽經一座。以此善因世為小吏。從不脫官。至宋初升為偏將軍。名曹翰。征江州久不下。怒屠其城。自此以來世世為猪受人屠戮。今公泊舟處。乃吾死所。少頃第一受宰者即我也。有緣相遇。願垂哀救。

In this part, Cao Han shares his experience using the first-person perspective. However, ChatGPT 4 mistakenly described it in the third person, whereas the other two machine translations correctly retained the original first-person viewpoint. Moreover, all the large language models failed to translate “長面偉人”. ChatGPT 4 interpreted it as “a tall, imposing figure”, ERNIE Bot 4 had it as “a tall and impressive man”, and Gemini Advanced similarly translated it as “a tall, imposing figure”. The term “長面” actually describes having a long face or elongated facial features, which was not accurately captured in the translations. Additionally, “偉人” refers to a tall man rather than a sense of being imposing or impressive.

Moreover, all three large language models incorrectly translated the phrase “某朱將曹翰也”. These translation errors do not stem from limitations in the models’ linguistic capabilities but originate from an erroneous source text provided by CBETA. As a human translator cognizant of the historical context, I would recognize the anachronism in associating Cao Han, a Song dynasty figure, with “某朱將曹翰”. The absence of corroborating historical evidence linking Cao Han to the Song dynasty’s Zhu lineage necessitates a critical reevaluation of the CBETA text’s authenticity. This historiographical discrepancy would compel scholars to conduct a comprehensive textual analysis, potentially leading to the identification and collation of earlier, more authoritative versions. This process of critical analysis and historical cross-referencing demonstrates cognitive flexibility and contextual understanding that currently exceeds the capabilities of large language models, despite their considerable advancements in text processing and generation. ChatGPT 4 mistakenly

translated it as a general with the surname Zhu. ERNIE Bot 4 misinterpreted it as “Zhu dynasty”. Finally, Gemini Advanced rendered it into its pinyin transcription as “Zhu Jiang Cao Han” and failed to recognize that “某” signifies a form of self-introduction.

When translating “見一法師登高座。講佛門四十二章經。余發心設齋一堂。隨聽經一座”, ERNIE Bot 4 alone captured the entire passage, in contrast to ChatGPT 4 and Gemini Advanced, which both omitted “登高座” in their translations. Nevertheless, ERNIE Bot 4’s rendition of “高座” fell short of precision. This term denotes the modestly raised seating for Buddhist monks during sermon delivery; thus, “higher seats” would be a more fitting translation than ERNIE Bot 4’s “high platform”. In the subsequent sentence, “設齋” should be translated as offering pure vegetarian meals to monks, whereas Gemini Advanced incorrectly rendered it as “establish a vegetarian hall”. Additionally, ChatGPT 4 did not accurately translate “設齋” as “pure vegetarian meal”; instead, it merely translated the phrase as “meal”. Furthermore, “聽經” should be translated as “listening to the lecture on sutras”. ChatGPT 4 failed to translate “經” precisely as “sutra” in its rendition, opting instead for “a sermon session”. Similarly, Gemini Advanced did not accurately capture the essence of “sutra”, translating it as “lecture” instead.

“偏將軍” denotes a specific rank in the Chinese military hierarchy that should be translated as “Lieutenant General” (Zhang et al. 2017, p. 262). ChatGPT 4 rendered it as “junior general”, which, though not entirely accurate, indicates an attempt to convey the rank’s relative position, unlike the other two large language models that translated it as “general”.

In the context of X1642, the term “世” is linked with reincarnation and should be translated as “life” to accurately reflect that Cao Han was reincarnated as a minor official in each of his lives. However, ERNIE Bot 4 incorrectly translated “世” as “generation”, which conveys the idea of family lineage rather than the series of reincarnations uniquely experienced by Cao Han. This error was propagated in subsequent translations that followed ERNIE Bot 4’s output. Additionally, ChatGPT 4 omitted the translation of “名曹翰”, failing to indicate that Cao Han was the general’s name in the early Song dynasty. At the same time, Gemini Advanced mistakenly interpreted the general’s title as “Cao Han”.

Another challenge is maintaining the original text’s perspective and capturing nuanced details. ChatGPT 4 encountered further difficulties in translating the passage “征江州久不下。怒屠其城。自此以來世世為豬受人屠戮。今公泊舟處。乃吾死所。少頃第一受宰者即我也。有緣相遇。願垂哀救。” Although it captured the overall message, it struggled with several key details. Firstly, it deviated from the original text’s first-person perspective, narrating the events from a third-person viewpoint. Secondly, it overlooked the translation of “怒” in “征江州久不下。怒屠其城。” which indicates Cao Han’s anger stemming from his failure to seize Jiangzhou, leading to the city’s massacre. ChatGPT 4 simplified this aspect to a mere siege-induced massacre, missing the nuance of “anger”. Furthermore, it incorrectly rendered “世” as “generation” instead of “life”, distorting the intended meaning of reincarnation. Lastly, it omitted the translation of “有緣相遇”, moving directly to Cao Han’s appeal to Liu Xixuan for salvation. In contrast, the other two large language models provided more complete and accurate translations of this passage.

Large language models also struggle with the translation of honorifics and actions. The sentence “劉公蹶起。呼僕視船頭。果屠門也。” posed challenges for all three models. In classical Chinese, “公” is a term of respect for a male, and “Liu Gong” can be translated as “Mr. Liu”. However, ChatGPT 4 omitted “公” in its translation, rendering it merely as “Liu”. ERNIE Bot 4 provided the full pinyin of Liu Xixuan but incorrectly spelled “xi” as “jin”, while Gemini Advanced directly translated “劉公” to its pinyin form, “Liu Gong”.

Furthermore, the sentence “呼僕視船頭” was misinterpreted by all three models, as they failed to capture the meaning of sending a servant to the front of the boat to assess the situation, instead simply translating it as checking the bow. ChatGPT 4 omitted the translation of “呼僕” and incorrectly translated the action as Liu hurriedly checked the front of the boat himself. ERNIE Bot 4 and Gemini Advanced both misunderstood the action, interpreting it as the servant being called to check the boat’s bow rather than being sent to the front of the boat to take a look.

Large language models often struggle with accurately translating ancient Chinese texts, particularly when dealing with specific terms and place names. This issue is demonstrated in the translations of the phrase “劉倡買載回放之閩門西園內” by three models. Firstly, in terms of vocabulary comprehension, all three models failed to capture the meaning of the word “倡 accurately”. In this context, “倡” should be understood as “initiatively”, indicating that Liu took the initiative to buy the pig. However, ChatGPT 4 completely ignored the translation of this term and even added irrelevant content. ERNIE Bot 4 translated it as “advocated for”, while Gemini Advanced rendered it as “offered to”, both of which are unsuitable for the context.

Secondly, the models performed poorly in translating place names. “閩門” refers to a city gate in the northwest of Suzhou (Huang, *Yitong lucheng tuji*, n.d., juan 8, p. 232)⁵, and “西園” refers to the Xiyuan Temple in Suzhou. ChatGPT 4, while recognizing “閩門” as a gate, failed to specify its location and mistranslated “西園” as “western garden of the gate”. ERNIE Bot 4 and Gemini Advanced also struggled with these terms, failing to identify “西園” as Xiyuan Temple correctly (Cao 1933, *Wu xian zhi*, juan 38, pp. 6–7).

Furthermore, the models had difficulties with modal particles and honorifics. For instance, in the phrase “呼曹翰即應”, only ERNIE Bot 4 correctly translated “即” as “immediately”. When translating the honorific “公”, all three models failed to accurately convey its usage as a respectful form of address.

In “公刊因緣遍布。兼載黔枝偶存集中”,⁶ ChatGPT 4 incorrectly translated “公” to “Liu”. While “公” does refer to Liu Xixuan from a content understanding perspective, “公” should be translated as “He” for a more accurate word-for-word translation, being an honorific for Liu Xixuan. Additionally, it failed to translate “兼”, which should be rendered as “and also”. Its translation of “黔枝偶存集” as “Collection of Occasional Works from Guizhou” is, however, correct. ERNIE Bot 4 similarly erred in translating “公” as “Liu”, and its rendition of “黔枝偶存集” was off the mark. “偶存” signifies works written sporadically and preserved, not “anecdotes”. Gemini Advanced inaccurately translated “公” as “Liu Gong” and misinterpreted “因緣” as a “karmic connection” instead of the story and its origins. Nonetheless, it correctly translated “兼” as “and”. Gemini Advanced’s translation of “黔枝偶存集” was incomplete because it failed to include “黔”, omitting the crucial detail that Liu’s book was completed in Guizhou.

The whole story ends in the preceding section, followed by comments from another commentator. The subsequent commentary is credited to Ba Weng, the courtesy name of Jie Xian, the author of X1642 in this paper. Therefore, this section functions as the author’s own commentary on the story.

罷翁曰。猪業重。性蠢。何能現夢。其能現夢者仍是聽經餘。余辛未時同公聽講台教於即中堂。公口述其事。余至西園。猶及見此猪身好潔。呼曹翰即應。與人無異也。然曹翰與曹彬從兄弟也。武惠行軍不妄殺一人。勳榮冠世。曹翰乃恣意屠城。致墮畜類。累生酬債。慈忍分途。苦樂異報如此。嗚呼。能撥無因果也哉。

The challenges of accurately translating ancient Chinese texts are further exemplified in the commentary section of the story, where nuanced interpretations and historical references become even more critical.

ChatGPT 4, for instance, failed to recognize that this segment was separate from the main story, erroneously attributing Ba Weng’s comments to Liu’s collection. This misattribution led to a significant misrepresentation of the text’s structure and authorship.

Moving on to the content of the commentary, we see varying degrees of accuracy in translating specific terms and concepts. For example, the phrase “猪業重。性蠢何能現夢。其能現夢者仍是聽經餘”. ChatGPT 4 was generally well translated, capturing the idea that the pig’s ability to appear in dreams was due to past good deeds. However, nuances such as the specific reference to “listening to sutras” were often lost in translation. ERNIE Bot 4 recognized that this text segment differs from the main story but inaccurately translated the name Ba Weng as “an old man”. Among the translations, Gemini Advanced provided the most accurate rendition.

The translation of temporal and location-specific terms presented another set of challenges—the phrase. The sentence “余辛未時同公聽講台教於即中堂” was not accurately translated by any of the three large language models. Firstly, “辛未” refers to a year in the traditional Chinese sexagenary cycle. ChatGPT 4 and Gemini Advanced, however, failed to translate it accurately, with only ERNIE Bot 4 correctly identifying this term. “台教” should be associated with the teachings of the Tiantai school in Chinese Buddhism and translated as “I and Liu Xixuan listened to the teachings of the Tiantai school together”. ChatGPT 4 significantly reduced the content by simply translating “台教” as “lecture” and omitting “I and Liu Xixuan” in its translation. ERNIE Bot 4 translated the sentence fully but also inaccurately rendered “台教” as “lecture”, not associating it with the Tiantai school. While Gemini Advanced incorrectly referred to it as “Dharma lecture”, it accurately identified “即中堂” as the name of a hall, “Jizhong”, which should be translated as “Jizhong Hall”. ChatGPT 4 and ERNIE Bot 4 did not correctly translate this architectural name. ChatGPT 4 also omitted translating “余至西園”, while the other two models did translate this phrase but misinterpreted “西園” as “western garden” rather than the correct “Xiyuan Temple”.

Additionally, ChatGPT 4 and Gemini Advanced failed to translate “即” as “immediately” in the phrase “呼曹翰即應”.

The complex interplay of historical narrative and moral philosophy in classical Chinese texts often poses difficulties for machine translation. This is particularly evident in the passage comparing the actions and fates of Cao Han and Cao Bin.

The original text contrasts two historical figures, cousins Cao Han and Cao Bin, emphasizing their divergent paths and the karmic consequences of their actions. It begins by describing Cao Bin, posthumously known as Wu Hui, whose compassionate military leadership earned him great honor. The passage states, “When leading troops, Wu Hui never killed the innocent indiscriminately, earning unparalleled merits and honors”⁷ (Tuotuo 1739, *Song Shi*, juan 258: 13170).

In stark contrast, the text then depicts Cao Han’s brutal conduct: “Cao Han’s reckless massacre of civilians led to his downfall, reincarnating as an animal to suffer and repay his karmic debts over several lifetimes”. This juxtaposition illustrates the author’s belief in karmic retribution, concluding with a rhetorical question that underscores the inevitability of cause and effect in the moral universe. However, the nuances of this passage proved challenging for large language models.

ChatGPT 4 did not translate this sentence word-for-word, missing many details and only providing a summary: “This story serves as a stark contrast between Cao Han and his relative Cao Bin, who was known for his humane military conduct, highlighting the divergent outcomes of their actions”. Moreover, it incorrectly translated Wu Hui as “humane military” instead of recognizing it as Cao Bin’s posthumous title.

ERNIE Bot 4’s translation missed fewer details than ChatGPT 4 but still overlooked some translations. For instance, “勳榮冠世”, which means unparalleled honors, was merely summarized as “achieved great honor”. It also failed to recognize Wu Hui as Cao Bin’s posthumous title, translating it as “martial prowess and benevolence”. The phrase “行軍” was not reflected in its translation.

Furthermore, in “苦樂異報如此”, “苦” and “樂” should be translated as “suffering” and “joy”, but ERNIE Bot 4 rendered them as “rewards” and “punishments”. The translation by Gemini Advanced was somewhat better than the previous two machine translations, but it also contained errors. The word “然” in the sentence indicates a transition, which should be translated as “however”, but it was incorrectly translated as “interestingly”. It also failed to translate Cao Bin’s posthumous title accurately, “Wu Hui”, instead rendering it as “Cao Bin was a military commander”. The phrase “leading troops” was also overlooked and not included in the translation.

The intricate nature of classical Chinese texts often extends beyond the main narrative, incorporating supplementary content that adds depth and nuance to the original story. This complexity is exemplified in the third part of our text, which features Wang Danlu’s

supplement to the tale of Liu Xixuan and Cao Han. The supplementary section begins with the phrase “又王丹麓居士遂生集載劉公夢中間曹翰”, signaling an additional layer to the narrative.

The word “又” in classical Chinese can be interpreted as “moreover”; thus, its presence here indicates that this section of the text is an additional part beyond the main narrative and Ba Weng’s commentary. Gemini Advanced overlooked the translation of this adverb.

“居士” is defined as “lay Buddhist”, denoting a lay follower of Buddhism. ChatGPT 4 and Gemini Advanced translated this term, whereas ERNIE Bot 4 failed to include this translation.

Furthermore, none of the three large language models succeeded in providing an accurate translation for the title of Wang Danlu’s book. Wang titled his work “遂生集”, which translates to “Collection of Joyful Life”, where “遂” implies “joyful” and “生” signifies “life”⁸ (Ji. 1789, *Siku quanshu zongmu*, juan 133: 10159). ChatGPT 4 omitted the book’s title in its translation, merely describing Wang’s work as a “collection”. ERNIE Bot 4 mistakenly referred to it as a “collection of anecdotes”, Gemini Advanced’s translation did not mention the collection’s title or offer any translation.

The supplement also includes additional dialog between Liu Xixuan and Cao Han: “平日見汝等受殺時。何法可救”. This sentence can be translated as: “When I see you being slaughtered, how might I save you?” ChatGPT 4, ERNIE Bot 4, and Gemini Advanced struggled to translate this sentence. ChatGPT 4 did not translate this sentence but merely summarized its intended content: “How he could be saved during slaughter”. ERNIE Bot 4 mistranslated the sentence. The text also conveys Liu asking Cao how Liu should save animals when he sees them being slaughtered. ERNIE Bot 4 misunderstood it as how Cao should save them when witnessing the animals being killed. Gemini Advanced made the same mistake as ERNIE Bot 4, and it translated “平日” as “On weekdays”. Traditional Chinese calendars had no concept of “weekends” and “weekdays”.

In the subsequent sentence “曰。每當屠割時。苦不堪忍。惟聞念佛音聲遂解其苦。望公凡見屠殺割裂經湯鑊熟食時。乞念阿彌陀佛。或準提呪。不獨解苦。且有脫苦之益”, ChatGPT 4 was unable to provide a correct and complete translation. Cao answered Liu’s question in the text and provided a detailed solution: “Only the sound of reciting the Buddha’s name can alleviate the pain. I beseech you, whenever you see slaughtering, and the division of bones and flesh, or meat is cooked in a boiling pot and will be eaten, to recite the name of Amitabha Buddha or the Cundī Mantra”.

Furthermore, Cao described the pain experienced during slaughter. However, these details were overlooked by ChatGPT 4, similar to its handling of previous translations where it merely summarized the content: “Cao Han replied that the sound of Buddha’s name alleviated his suffering during slaughter”. Moreover, in the original text, Cao requests Liu to recite the Buddha’s name when witnessing the slaughter of animals to lessen their suffering. Still, ChatGPT 4 misunderstood this part, translating this sentence as Wang’s request to people: “Wang thus urged that upon witnessing any act of slaughter, one should chant the name of Amitabha Buddha or the Cundi Mantra, not only to ease the suffering but also to aid in liberation”. Moreover, the Romanized Sanskrit spelling of “Cundi Mantra” is incorrect in this sentence. “Cundi” lacks a diacritical mark, and the accurate spelling should be “Cundī”.

ChatGPT 4’s translation of “且有脫苦之益” was inaccurate. This phrase means “but you will also receive benefits for helping sentient beings escape suffering”. ChatGPT 4 failed to specify who would receive these benefits, translating it directly as “to aid in liberation”. ERNIE Bot 4 did not correctly translate the Zhunti mantra, rendering it as “or mantras being”. Moreover, it incorrectly translated “receive benefits for helping sentient beings escape suffering” as “help them escape from it”. Gemini Advanced was unable to translate the term “準提” into its Romanized Sanskrit, rendering the term in its Chinese pinyin “zhunti”, while correctly translating “mantra”. Additionally, Gemini Advanced inaccurately translated the final sentence “言訖悲涕謝去”. The intended meaning is that,

after Cao had spoken these words to Liu, he wept bitterly, expressed his gratitude, and then departed. However, Gemini Advanced failed to capture Cao's expression of gratitude towards Liu, only conveying that Cao cried sorrowfully.

In conclusion, ChatGPT 4, ERNIE Bot 4, and Gemini Advanced have difficulty translating the names of people, places, and book titles mentioned in the text. This is evident in their inconsistent translations of names like "Wu Hui" and "Ba Weng", as well as their inability to identify and translate the titles of books such as "Collection of Occasional Works in Guizhou" and "Collection of Joyful Life". Furthermore, the models occasionally omit or misinterpret important Buddhist terminology and concepts. For example, they struggle to accurately translate terms like "台教", which refers to the teachings of the Tiantai school in Chinese Buddhism, and fail to provide the correct Romanized Sanskrit spellings for mantras such as the "Cundi Mantra". These errors highlight the need for the models to be trained on more extensive datasets related to Buddhist scriptures and terminology. Each model exhibits its strengths and weaknesses in handling the complexities of classical Chinese literature, which frequently employs metaphors, allusions, and specialized vocabulary. Moreover, they encounter challenges in identifying geographical information, such as failing to recognize the Xiyuan Temple in Suzhou accurately and providing inconsistent translations for the name of the city gate, "Chang".

Considering the statistical data in this article that quantifies the translation errors made by the three large language models and the analysis presented above, it can be concluded that when it comes to performance in translating X1642, ERNIE Bot 4 outperforms Gemini Advanced, which in turn outperforms ChatGPT 4. For instance, in translating the phrase "登高座", ERNIE Bot 4 successfully included it in the translation, while both ChatGPT 4 and Gemini Advanced omitted this detail. Additionally, ERNIE Bot 4 accurately translated the Chinese year "辛未" in the sexagenary cycle, a task the other two models failed to accomplish. Moreover, when translating a sentence containing the term "台教", ERNIE Bot 4 was the only model that did not omit any content, despite not explicitly linking the term to the Tiantai school. This demonstrates its superior ability to capture and include relevant information.

These findings underscore the need for further refinement in large language models, particularly in specialized terminology, cultural references, and complex literary structures typical of classical Chinese literature.

2. Conclusions

In an analysis of the use of large language models for translating Buddhist texts from classical Chinese to modern English, it is clear that while ChatGPT 4, ERNIE Bot 4, and Gemini Advanced each have their strengths, they also exhibit limitations. ChatGPT 4 has a significant advantage in translating Indian–Chinese Buddhist texts. It makes the least number of errors in its translations and better understands some specialized Buddhist terminology compared to ERNIE Bot 4 and Gemini Advanced. However, ChatGPT 4's performance is poor in translating literary and narrative texts that follow these Buddhist works. The main reason is that ChatGPT4 omits more of the original text and adds more irrelevant translations compared to ERNIE Bot 4 and Gemini Advanced. Among the three large language models examined in this study, ERNIE Bot 4 produces the most complete translations, although it also omits some original content. It strives to translate each text as literally as possible, rendering the translation word by word. Moreover, ERNIE Bot 4 performs best in translating narrative texts, but there is still significant room for improvement in translating the names of historical figures and dates using the traditional Chinese sexagenary cycle. Gemini Advanced has a slight edge in translating literary texts and can not only correctly translate dates using the Chinese sexagenary cycle but also convert them to corresponding years in the Gregorian calendar. In summary, each large language model demonstrates varying degrees of proficiency in handling the complex syntax, semantic depth, and specialized vocabulary of ancient Chinese Buddhist classics. Although they can generally produce a translation of a 400–500-word passage of Buddhist classical Chi-

nese, accurately translating classical Chinese remains a daunting task, especially in the subtle context of Buddhist literature. From the analysis in this paper, we can see that large language models are unfamiliar with the metaphors, allusions, traditional Chinese cultural background, and historical figures found in ancient Chinese literary works. This lack of knowledge is reflected in their limitations in accurately translating the names of historical figures, geographical locations, and book titles. In addition, large language models have limitations in translating Romanized Sanskrit. They all fail to annotate Romanized Sanskrit words with the correct diacritical marks.

While large language models have exhibited a high degree of proficiency in translating classical Chinese texts, their output generally features a clear logical structure and smooth articulation. However, their insufficient background knowledge of Chinese religion and history prevents them from fully replacing the work of human scholars in translation at present. To put it another way, instead of relying solely on large language models to handle the entire translation process of classical Chinese texts and having humans revise the generated output subsequently, at the present time, employing large language models as an assistive tool for humans in the translation endeavor may produce more favorable outcomes. As technology advances in the future, it is crucial to recognize that enhancing large language model's comprehension of historical, religious, and geographical information from various regions could be an avenue for further improvement. Additionally, increasing their familiarity with the names, posthumous titles, official ranks, and imperial examination degrees of prominent Chinese historical figures may also contribute to the advancement of these models. Ultimately, the goal is to bridge the gap between the rich heritage of classical literature and the broader accessibility afforded by modern language, enabling a deeper appreciation and understanding of Chinese Buddhist texts across linguistic and cultural boundaries.

Moreover, given the constraints of this paper's scope, the analysis could only include three distinct representative classical Chinese Buddhist texts, with only excerpts chosen from each text. As a result, the absence of contextual information may have led to some of the inaccuracies produced by the large language models when rendering classical Chinese into modern English. Therefore, in future analyses, if more comprehensive texts were to be input into the large language models, their translation outputs might vary.

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List of Abbreviations

B (*Dazangjing bubian xuanlu* 大藏經補編選錄)

CBETA (Chinese Buddhist Electronic Text Association database)

IAST (International Alphabet of Sanskrit Transliteration)

T (*Taishō shinshū daizōkyō* 大正新脩大藏經)

X (*Shinsan dai Nippon zokuzōkyō* 卍新纂大日本續藏經)

Notes

- ¹ The term “邈然高蹈” in the text is derived from “邈然高蹈” in Zhong Hui's 鐘會 “Xi shu wen” 檄蜀文. This is a writing method of “borrowing allusions” (用典) in classical Chinese writing, which means quoting allusions from others' works in one's own writing. In Zhong Hui's essay, this word means “traveling far, to go to a very distant place”.
- ² Chief Monk Yi, who styled himself Renfeng, inscribed calligraphy works and wrote a postscript for them, saying: “When Han Zi bade farewell to Master Wenchang, he mentioned that the master had come to visit and seek teachings from our disciples, indicating his admiration for us. Now, Chief Monk Yi of Tianling Temple, whose name is Yi and who calls himself Renfeng, has also

come to visit and seek teachings from our disciples. This clearly shows his deep admiration for us. Have our disciples imparted any teachings to him? Did they speak of benevolence or righteousness? Does he merely admire these titles while neglecting sincerity? Should we nurture him gently, like tender shoots being cultivated? I shall encourage and promote his growth. I will guide you to look beyond these titles and delve into deeper truths. (義首座，自號仁峯，題誦連軸，為之跋曰：“韓子送文暢師，言其謁吾徒來請，其心有慕焉。天盜首座義公，既名義，又號仁峯，而又謁吾徒來請，則其有慕也審矣。吾徒亦有以告之乎？仁乎？義乎？其亦慕其名而遺其誠乎？而亦煦煦予子同其育乎？揮之進之，予將究子於名號之外矣”。)

- 3 While touring Jiuyuan, the burial grounds of the Jin state, Zhao Wenzhi posed a question to Shu Xiang: “If the deceased were to rise again, to whom would we pledge our allegiance?” (趙文子與叔向遊於九原，曰：“死者若可作也，吾誰與歸”?)
- 4 The content in this CBETA version is incorrect. In earlier versions of this book, the character “朱” (zhu) in this sentence should be “宋” (song). See, Jie Xian 戒顯, *Xiangguo suilu* 現果隨錄, 1671 edition. Naikaku Bunko collection, National Archives of Japan.
- 5 The Gate Chang of Suzhou. (蘇州府閭門。)
- 6 In *Qianqingtang shumu* 千頃堂書目, the title of the book is recorded as *Qiandu oucun* 黔牘偶存 rather than *Qianzhi oucun* 黔枝偶存: “錫玄玉受集十又黔牘偶存”。
- 7 Cao Bin, courtesy name was Guohua, from Lingzhou in Zhengding ... posthumously honored as Wuhui. (曹彬，字國華，真定靈壽人 諡武惠。)
- 8 In this book that I have compiled, the effects of karmic retribution of good and evil come swiftly. The purpose is to encourage people in the world to maintain a passion for life, allowing all things to enjoy a joyful existence naturally. Therefore, I titled this book “Joyful Life” (*suisheng* 遂生). (予所纂輯中，善惡果報，捷於影響，无非欲使天下之人不失好生之意，天下之物得遂樂生之情，故以遂生為名。)

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Article

Monks, Blogs and Three Media Cases: Russian-Speaking Buddhist Communities in the Era of Social Media

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Abstract: This paper focuses on the problem of how Buddhism was reinstitutionalized in Russia in the frame of the meta process of mediatization. The empirical part of this study included two stages and was conducted during 2020–2024. In this paper, the authors focused mainly on the peculiarities of constructing strategies in the Internet and new media via traditional Gelug ethnic offline organizations, the Russian branches of the International Karma Kagyu Community, International Dzogchen Community and Russian-speaking community of Theravada converts. The methodological framework of the research included the institutional perspective developed by the Danish media scholar Stig Hjarvard for studying the mediatization of religion and the concept of “mediatized public religion” by Mia Lövhem and Marta Axner, as well as the concept of “digital religious innovators” by Heidi Campbell. The authors revealed that the processes of digitalization and mediatization have resulted in the emergence of Russian mediatized Buddhism. Various trends in modern Russian Buddhism are disproportionately represented in the public sphere of media; representation directly correlates with the strategies that Digital Buddhist creatives of different streams—Gelugpa traditional, Dzogchen, Theravada or Karma Kagyu—have chosen in relation to the Internet and new media.

Keywords: digital Buddhism; Gelug; International Dzogchen Community; International Karma Kagyu Organization

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1. Introduction

In recent decades, sociologists have exhibited a heightened interest in studying mediatization and digitalization trends impacting religions. This interest has been reinforced by the fact that digitalization, though initially restricted to transference of analog data and work routine into a digital format, over the years has developed to become a considerable milestone in the process of global social transformations. In modern sociology, this meta-process is commonly referred to as mediatization. The media literally stitch through the entire canvas of communication practices, acting as significant drivers for cultural change in various institutions. In modern societies, the media form a public sphere linking different social institutions to each other. The public sphere of media brings to the very surface the institutional concepts of society. It forms a reality of shared experience in which the cultural foundations of various institutions become transparent and representative (Hjarvard 2013, p. 68). Owing to the media, institutional concepts become the object of public scrutiny and discussion, which, in turn, encourages the relevant institutions to generate discourse concerning their own regulatory frameworks (Hjarvard 2014, pp. 215–17). One of the key changes introduced by mediatization has been the influence of digital media on so-called “life horizons” and social interaction in all spheres of society, among which is religion (Lundby 2013, p. 197). In the case of religion, mediatization has resulted in mediatized religion with various forms of self-presentation and representation of religion in the cultural public media sphere.

Religions enter the cultural public sphere of media as hybrid mediatized institutions represented by religious mass media and other media outlets and journalism on religion, as well as films, various talk shows, TV series, etc. (Hjarvard 2012). Digital discourses of religious blogs, public sites, podcasts and the like also contribute to the development of the mediatized public sphere of religion (Lövheim and Axner 2015). Diverse media are becoming interfaces of religion in the cultural public sphere. It is in this mediatized mode that religions come into contact with new, unprecedented formats of modern reality.

The Internet and new media technologies have catered to an upsurge in translocal interactions between religiously involved users. This communication transcends conventional associations with sacred loci, such as offline temples, churches, datsans, monasteries, etc. (Hepp and Krönert 2009). This interaction leads to shaping new meanings and reinterpreting religious practices and religious authorities, while unsupervised by institutions or congregations. Through the digitalization of religious sacred texts, media accessibility of sacred knowledge devalues traditional religious education and calls into question the epistemic authority of religious professionals (Cheong 2021; Campbell and Bellar 2023). New digital media challenge traditional religious values, as they make space for new religious authorities to emerge and for new ways of influence on a certain religious group to develop. In fact, mediatization has brought about shifting authority, which was previously assigned to religious professionals with conventional training, institutional status and authority (Campbell and Bellar 2023, pp. 83–86). Since the 2015s, sociologists have been extensively reporting the complete eradication of the difference between online and offline communications and religious activities. Research focus has shifted onto studying the traditions, authorities and identities being transformed in the mediatization of religions (Radde-Antweiler 2019).

As reported previously (Ostrovskaya et al. 2021), sociological studies on religion and digital media usually underline that Buddhism is a developing area on the Internet that needs to develop adequate tools for its online and offline correlations. Sociological studies of online American Buddhism have shown that the majority of users classified as “cybersangha” are actually looking for information about offline communities via the Internet or try to find something for bedtime reading (Tweed 2002). Criticizing the current state of affairs, the researchers propose revising the concepts of “cybersangha” and “online religion and religion online” by comparing Buddhist digital activity (websites, apps and blogs) with offline belonging to the Buddhist communities (Ostrowski 2015, pp. 191–203; Connelly 2015, pp. 59–60).

The past decade saw articles reviewing Russian Buddhist sites and electronic resources (Aktamov et al. 2015), providing online cartography and analysis of Buddhist communities on the social network *Vk.com*¹ featuring the general characteristics of the Russian-speaking Buddhist Internet segment (Dondukov 2019), navigating Buddhist pilgrimage and cyber pilgrimage (Lamazhaa et al. 2020) and observing digital strategies of Russian-speaking Buddhist communities (Ostrovskaya et al. 2021).

The research papers cited above usually include a general review of Buddhist sites, some social media accounts and a case study of Russian Buddhist digital strategies which have been favored by the Russian audience over the past thirty years. They tend to either describe somewhat all-Russian Buddhism or talk about the feud between traditional Buddhists and convert Buddhists. However, they do not research into how leaders of different streams of Buddhism use the Internet and digital media in their media strategies to advance their authority in the competitive field of Russian Buddhism.

Our previous study has shown that Russian-speaking digital Buddhism is a heterogeneous reality in which online communities, sites, webcasts and public pages in social media developed or used by offline Buddhist organizations coexist with online communities of so-called online Buddhists (Ostrovskaya et al. 2021). We argued that the digital mapping of this reality should be carried out not analytically, as foreign colleagues suggest, but by means of a quantitative benchmark survey. The mathematical-model approach allowed us to create a digital map of the Buddhist online communities on the *Vk.com* social network.

We found that the “Buddhist niche” of the popular Russian social media Vk.com is represented by online communities of the followers of offline Russophone Buddhism, and by various quasi-Buddhist communities that have no offline alternatives. The Buryat, Kalmyk and Tuvan online communities of the Gelugpa school and the online group of the Russian Association of Communities as part of the Karma Kagyu International Organization prevail in terms of quantity and their online activity. The number of online communities of the Russian-speaking part of the International Dzogchen Community and the Theravada is considerably less. In addition, there are precious few Dzogchen communities on the Vk.com network, and they are predominantly private. The Russian-speaking Theravada groups are not consolidated. Comparison of the results obtained for Vk.com with data on online communities, public pages and groups on the Fb.com showed that the digital activity of the Russian-speaking Buddhist organizations in these social media outlets is different. In the Buddhist niche of the Fb.com platform, personal blogging accounts of members of the Dzogchen Community and the Russian-speaking Theravada prevail. We supposed that digital mapping of Buddhist online communities, public pages and blogs on Fb.com, combined with a qualitative study of this environment, can shed light on the peculiarities of building relationships with the Internet and new media by traditional Gelug ethnic offline organizations and the Russian branch of the International Karma Kagyu Community.

Digital mapping of the Buddhist niche in Vk.com has revealed a significant gap in knowledge about the online profiles of the Russian-speaking part of the International Dzogchen Community and Theravada. The next study phase made it possible to identify the media used and the types of Buddhist digital creatives, whose efforts worked towards shaping of media technologies. Our analysis of strategies employed by the Russian-speaking part of the International Dzogchen Community and Russian Theravada communities has revealed fundamentally different strategies for online activity. They are conditioned by differences in communal Buddhist identity. Representatives of Russian-speaking Dzogchen communities view themselves as part of the inner translocal space of Buddhist practice distanced from the uninitiated, in accordance with Chögyal Namkhai Norbu’s method. The strategy of the Russian-speaking Theravada was developed in a completely different way. In this case, a positive attitude towards the Internet and new media technologies is associated with the desire to popularize Theravada Buddhism in Russia (Ostrovskaya et al. 2021).

In this paper, we would like to study the mediatization stages of Russian Buddhism between 1990 and 2024. We will focus mainly on the peculiarities of building relationships with the Internet and new media by traditional Gelug ethnic offline organizations and the Russian branch of the International Karma Kagyu Community. The two Tibetan Buddhist streams, each in their own right, claim to represent “traditional Buddhism” of Russia in the public sphere of media. This research could clarify how Buddhism was reinstitutionalized in Russia after the persecution of monks and sangha and the destruction of monasteries in Soviet times. This research will focus on learning how their positioning as Russia’s traditional Buddhism within the Russian Buddhist framework has affected their strategies in relation to the Internet and new media technologies.

2. Materials and Methods

The methodological framework of our research includes the institutional perspective developed by the Danish media scholar Stig Hjarvard for studying the mediatization of religion, the concept of “mediatized public religion” by Mia Lövhelm and Marta Aksner and the concept of “digital religious creatives” by Heidi Campbell.

For this study, the concept of the “public sphere of media” should be elaborated on as it is crucial for the institutional approach to the mediatization of religion. According to Hjarvard, the “public sphere of media” is a reality of shared experience in which the cultural foundations of various institutions become transparent and representative (Hjarvard 2013, p. 68). The media reality of institutions includes the political public sphere and the cultural public sphere. Owing to the media, the institutional contents of various social domains of

society become the object of public scrutiny and discussion, which, in turn, encourages the relevant institutions to generate discourse concerning their own regulatory frameworks (Hjarvard 2014, pp. 215–17). At the microlevel of media communication, the reality of extended and shared experience arises, which constitutes an indispensable component to new identities and communities. The public sphere of shared experience created by the media involves interaction and communication in new cultural contexts (Hjarvard 2013, pp. 37–38). Thus, the microlevel of reality concept added to the methodology means that the research focuses on identifying cultural meanings that enter the public sphere of media through individual and group media practices. At the macro level, the media form a public sphere that links the cultural meanings of different social institutions in a completely new way. In the public sphere of media, various institutions undergo a structural intersection of their modes of action. According to Hjarvard, “media create a public space for society to reflect on itself, that is, the very forum that makes various institutions visible to everyone and initiates a discussion about what resources and rules should be available and applicable to almost every aspect of public life” (Hjarvard 2014, p. 216).

The concept of “mediatized public religion” by Lövheim and Axner is based on selected theses from the theory of mediatized religion by Hjarvard and the concept of public spheres of discourse by Jürgen Habermas. For research in this view, the most applicable methodological thesis of Lövheim and Axner is that religion in public spheres of media should be analyzed against several criteria: types of actors (religious and non-religious), types of media spheres that provide a public format for discussions and the context of discourse about religion (secular or religious). Thus, “mediatized public religion” involves public discourses about religion propagated by the media spheres of journalism, religion, popular culture and digital spaces. The definitions of each of the spheres almost fully align with the definitions proposed by Hjarvard for the spheres of mediatized religion. Lövheim and Axner introduce the fourth media sphere to the typology of decrees, labelling it the religious digital spaces of blogs, websites, podcasts, etc. They argue that religious blogs are eligible for research as they present a mediatized public discourse that can transform intrinsic cultural perspectives on religions (Lövheim and Axner 2015, pp. 47–48).

We have applied the concept of “religious digital creatives” proposed by Campbell to our differentiating research design previously. This study investigates the strategies created by Buddhist communities when relying on digital technologies to build their own identity, authority and boundaries. Campbell offers three types of “religious digital creatives” whose activities shape digital religious discourses. These are digital professionals, digital speakers and digital strategists (Campbell 2021, pp. 48–54).

The design of the given paper relies on the aspects of Lövheim and Axner’s concept that concern types of actors, media spheres and discourses in order to establish the formats of mediatized discourse about traditional Buddhism in the public media sphere of Russian society. Campbell’s typology helps to construct a sample of respondents for expert interviews and serves as an analytical framework for interpreting the interviews. Further, the responses of the interviewees are to be reviewed for semantic blocks indicating the respondents’ motivation to use the Internet and digital technologies for religious purposes.

The empirical part of our study included two stages and was conducted from January 2020 to October 2022. In the first stage, we used quantitative software methods for collecting social network data with customized software—a data crawler. As a result, a graph model was built; clusters of Buddhist online communities in the Vk.com social network were identified and described. The analysis of the clusters resulted in a somewhat online map of Russian Buddhism with major players being the Buryat, Kalmyk and Tuvan branches of the Tibetan Géluk school, the Russian Association of Communities that are part of the International Karma Kagyu Organization, the Russian department of the International Dzogchen Community and the Russian-speaking Theravāda. It should be emphasized that the “Buddhist” niche of Vk.com accommodates both digital representatives of offline Russian Buddhism and a variety of quasi-Buddhist communities which have no offline counterparties (Ostrovskaya et al. 2021).

The findings helped to draw a map for the Buddhist online communities of the Vk.com platform and to analyze the structural relations between them. The findings also helped formulate objectives for the second stage of our research, which was a random study of selected Buddhist online communities on the Vk.com platform with qualitative methods of sociological research.

At the second stage, we conducted a case study of Internet and media strategies favored by Buryat, Kalmyk and Tuvan Buddhism, the Russian association of the International Dzogchen Community, representatives of the Russian-speaking Theravāda and the Russian Diamond Way Karma-Kagyū Association. The digital infrastructure and media communications of these contemporary Russian Buddhist schools are hardly studied at all. Therefore, it was decided to combine biographical narrative and expert interviews. Sampling was executed with the following criteria: involvement with the community's development; productive digital activity of at least 5 years; a clear profile of online activity, the account being written on behalf of an organization or community, a website or blog. A total of 30 interviews were conducted. All respondents were offered to answer the same set of questions, which fell into two topical categories: biographical and the repertoire and targeted use of media by the Buddhist community of a particular lineage.

3. Socio-Cultural Context of Re-Institutionalization of Buddhism in the 1990–2000s

3.1. Mediatization of Russian Buddhism: From the Underground to Various Identities

Specifics of traditional Russian Buddhists' involvement with media are immediately related to the unique history of Russian Buddhism as a whole. The problem is that Buddhism labeled "traditional for Russia" was institutionalized during the imperial period of Russian history mainly in Buryatia and Kalmykia. Each of these Russian regions has its own local characteristics. However, the socio-cultural model for reproduction was similar to monasteries and religious and educational centers supported by laypeople. This model was borrowed from the Tibetan–Mongolian Gelugpa model, known for its monastic education system, which trained experts in canonical texts and its rigid division into monks, novices and laypeople. The Russian adaptation was developed relatively autonomously under the patronage of imperial confessional policy.

The history of Tuvan Buddhism is somewhat different since the region became part of the Russian state as late as in 1914. The institutionalization of Buddhism in Tuva was a unique case as Buddhism had started spreading across this region in the XVII century, when numerous Tuvan tribal nomads were part of the Qing Empire. Socio-cultural consolidation of Tuvan Buddhism largely coincided with the reception of written heritage initiated by local nobility, who sought to create islands of Buddhist scholarship and practice in a short time, sending their children to study in Mongolian Buddhist centers. Commoners' Buddhist consciousness and practice was formed in symbiosis with autochthonous shamanism and animistic beliefs (Mongush 2001, p. 5; Khomushku 2005, p. 116). The end result was similar to the Buryat and Kalmyk socio-cultural patterns, which meant reproduction of Tibetan–Mongolian Gelugpa Buddhism within a framework of monasteries (khure), collectives of Buddhist professionals (monks and novices) and laypeople, with a focus on written heritage and the development of traditional Buddhist education. However, the unique feature defining Tuvan Buddhism was incorporation of local cults and rituals into both the belief system and practice.

In Soviet times, the imperial socio-cultural model of Buddhism was cancelled in the regions: the clergy were repressed, monasteries were destroyed and potential laypeople were socialized under atheistic ideology. The Buddhist traditions of Kalmykia and Tuva suffered an irreparable damage. In 1943, the Kalmyk ASSR was legally liquidated, and Kalmyks were forcibly deported to the regions of Siberia (Holland 2015, p. 953). During deportation and exile to the eastern regions of the country, the rituals of Kalmyk Buddhist tradition were practiced underground by monks who held prayer services at homes and by families of lay followers Buddhists who preserved Buddhist texts and ritual objects (Bakaeva 2012, pp. 41–42). The 1930s' repressions of the supreme Tuvan lamas and

the destruction of monasteries discontinued the monastic tradition of Buddhist clergy reproduction and started a pattern of illegal practice in prayer houses in remote areas of Tuva (Tenzin 2018, p. 87).

It was not until the end of World War II in the late 1940s that state authorities started to relax their grip on Buddhism. In 1946, the Central Spiritual Board of Buddhists (TsDUB), a new structural body on the territory of Buryatia headed by Pandito Khambo Lama, was founded for the centralized management of Buddhism in the USSR (Bakaeva 2012, p. 38). In the aftermath of this event, it was allowed to rebuild and reopen Aginsky and Ivolginsky Buddhist datsans, though with a 20-monk limit requirement.

By contrast, in many regions of Buryatia, lamas had been illegally practicing on their return from prisons and exile (Vanchikova 2012, p. 130). For many decades, the Ivolginsky Datsan remained a spiritual outpost for all those who wished to practice Buddhism, notwithstanding atheistic propaganda and high ideological risks. Kalmyk Buddhist laity would come to Datsan for the sake of rites, conducting rituals after the funeral of relatives, and so on (Bakaeva 2015, p. 8). In the late 1950s, Tuvan lamas and novices established contact with the Ivolginsky Datsan.

In the 1950s–1970s, a model of practicing Buddhism under ideological pressure was developed. The major innovation to this model was the inclusion of laity, both lay ethnic Buddhists and those of a different descent. There were three autonomous branches of underground Buddhism. One was constituted by ethnic lay Buddhists (Buryats, Tuvans and Kalmyks) initiated by monks who never broke their vows and communicated the tradition to the laity. The other two branches represented the underground Buddhism of non-ethnic conversion.

In the 1960s and 1970s, the so-called underground Buddhism originated and took over university departments of Oriental studies and philosophy, as well as research institutes. The founders and leaders of underground Buddhist groups came from different Soviet republics. They would take risk and go to Buryatia in search of a Buddhist mentor; they would take refuge with him; they would stay at datsans for a long time, studying the doctrine and practice of Buddhism. Their spiritual mission meant such educational activities as translating Tibetan texts into Russian and establishing contacts with Western Buddhists and the Tibetan diaspora in India. Interestingly, this non-ethnic Buddhist community was heterogeneous. It involved groups that established contacts with The Library of Tibetan Works and Archives in Dharamshala and held secret meetings in Moscow and St. Petersburg. They aimed to create first paper and later digital media about Tibetan Buddhism. They engaged in translating Tibetan Lamrim into Russian, as well as publishing its paper and digitized volumes; they wrote for the journal Buddhism of Russia and managed its website; they cooperated with the like-minded creators of the website and the YouTube channel Save Tibet.

Another group united followers of the Buryat Buddhist mentor Bidiya Dandaron, whose teaching tradition was closer to Dzogchen than to Gelug, characteristic of Buddhist regions in Buryatia, Kalmykia and Tuva. In the early 1990s, they initiated the publication of the paper historical Buddhist magazine *Garuda*, a new medium for Russian Buddhism. This illustrated religious medium was issued between 1992 and 1998 featuring translations of Sutra passages, teaching texts and famous mentors' biographies.

In the early 1990s, marked by ideological mainstream revival of Russia's religions heritage and the new federal law "On Freedom of Conscience and Religious Associations", attempts were made to revive traditional Buddhism of the Imperial Russia and the Soviet TsDUB. Both attempts revealed the existing differences between Gelug followers in Buryatia, Kalmykia and Tuva. In 1997, the Buddhist Traditional Sangha of Russia (BTSR), the successor of the Central Buddhist Board, was established (Bernstein 2013, pp. 99–100). The confrontational nature of the BTSR for the regions and the country itself resulted in the emergence of alternative centralized organizations in Buryatia and Kalmykia. Each of them claimed to represent all Buddhists in Russia and strived to act as a single governing body (Bakaeva 2012). Decentralization was not the only way of diversifying religious institutions

in Buddhist regions. Buddhists of Buryatia, Kalmykia and Tuva chose their own Buddhist heads that sought to maintain contact with Gelugpa monasteries of the Tibetan diaspora in India. Traditional Buddhism in Buryatia, Kalmykia and Tuva would spend the following decades developing their own sangha of professional monks and novices, establishing communication of rituals to lay people and building monastic education systems.

The apparent difference in interpretations of Gelug Buddhist tradition by the regions resulted in a different attitude towards the Tibetan mentors sent from India to help restore monastic life. Datsans led by Pandito Khambo Lama sought to reinforce the Buryat ethnic oriented version of the Gelug. Consequently, Tibetan mentors either left Russia or founded their own autonomous centers. Tibetan Buddhist centers built in Ulan-Ude in the first decades of the 2000s abandoned the idea of unification, pursuing their own interpretation of traditional teachings and practices (Bernstein 2013, pp. 102–3; Garri 2014, p. 162).

In the 2000s, the majority of newly rebuilt datsans and Buddhist centers of Buryatia, Kalmykia and Tuva had their own websites. However, it took them a long time to build their identities prior to that. Their qualms were well articulated by one of our interviewees. He was on the panel developing the first website for the Ivolginsky Datsan and the website for the first Russian media, *Buddhism in Russia*, in 2001–2002. His biographical narrative describes in detail the realities of those years when information about Buddhism, Russian institutions and centers and any interaction concerning Buddhism were mediated by electronic bulletin boards and the Russian branch of echo conferences on the FidoNet². At that time, it was still widely believed that one could learn about the true Gelug tradition only in monasteries of Buryatia:

I had a Fidonet network node. It was much more popular than the Internet in our country until the early-mid 2000s. There was a large Buddhist echo conference ru.dharma. The first Buddhist I talked to in ru.dharma told me to check the Ivolginsky datsan. I ended up there, in Ulan-Ude. I took a bus and arrived at the Ivolginsky datsan, there is no one there. It was empty. I went through the gate, at random. I looked around: still no one to see. I tried some house and found Buryat huvaraks there. They told me to join them. 'Sit down. We'll pour you some tea, tell us what you want', said they. I told them that "I came from St. Petersburg. I was interested in Buddhism. I wanted to know how everything worked there. 'What are you doing?' they asked. I was like, "Well, I'm doing websites in St. Petersburg in a web studio'. They go: "Sites! Great! And we just need to launch the Ivolginsky Datsan website the day after tomorrow, but we have none, we have nothing, we are in complete panic. I was taken to Dasha Choykhorlin Institute, where a Russian guy is trying to put up the site and fails. There is a portrait of the Dalai Lama hanging l. . .] In two days we made the website of the Ivolginsky datsan and posted it on my personal server. We launched it. Then, the photos. I photographed the datsans myself, scanned the photos. The first photos that appeared on the site were also my photos. Now, of course, it has already been changed many times.

The narrative in question also describes the dilemma faced by a non-ethnic Buddhist who wanted to convert to Buddhism in the early 2000s, which was the need to choose between the Buryat and Tibetan versions of the Gelug tradition:

Me and two Russian guys, with whom we made a website, took refuge with Yeshe Lodoy Rinpoche. We talked about it there for a long time, with this lama. They were in fierce opposition; the Buryats were very jealous of the Tibetans. This confrontation between the Buryats and Tibetans was very clearly felt. I remember when I told them that I wanted to go to the center that is being built by Yeshe Lodoy Rinpoche, I caused a whole storm. Then the abbot of the Ivolginsky datsan said: "You, Europeans, all go there—you come and all you think of is Tibetans. What did they do for this place? We came when everything had already been done. We have been in these terrible conditions for decades. Our morality may have degraded, our knowledge may have degraded, but we have been here all these difficult years, and the Tibetans came all in white coats. And you do not recognize our achievements, but go to them instead of supporting those akin." This was very much contrary to my ideas about Buddhism—why arrange some kind of inter-clan showdown

and competition when we needed to unite. Therefore, when the choice was where to take refuge, with the Buryats or with Yeshe Lodoy Rinpoche, I went to him. Moreover, they did not have a procedure there. He was just starting to build the center, there was a pile of bricks and two sheds. He lived in one shed, and there was a reception room in the other. So, I arrived there out of curiosity and left as real Buddhist. And then I came to St. Petersburg, met A., offered him help. Then I began to make up all sorts of texts from the magazine “Buddhism of Russia”. I made the sites of “Buddhism of Russia” and Narthang too.

The dilemma of choosing between mentors mentioned in the quote seems to be typical of Russian Buddhism during its re-institutionalization in the post-Soviet period. Initiated in the early 1990s, the revival of Buddhism traditional for Russia was understood mainly as a recreation of the traditions of Buddhism in Buryatia, Kalmykia and Tuva. Thus, two very contradictory trends became evident. One was the desire of each region to construct its own communicative patterns of Buddhism focused on historical, ethnically oriented versions of Buryat, Kalmyk and Tuvan Buddhism of the Tibetan–Mongolian root. This trend revealed itself in confrontations between Buddhist institutions of Buryatia and Kalmykia over creating a single centralized governing body for all Buddhist organizations in Russia. In addition, for a long time, representatives of traditional Buddhism in the regions took a very skeptical approach to Buddhist communities and organizations created by Buddhist teachers from Europe and Asia and representing other streams of Buddhism (Zen, Theravada, Karma Kagyu, Dzogchen, etc.).

The second trend was for Russian Buddhist movements of the 1990s–2000s to seek cooperation with one another. In our opinion, this trend stemmed from the Soviet period when Buddhism was professed by groups associated with the underground.

3.2. Digitalization of Russian-Speaking Buddhism in Stages: From Paper Media to Forums and Websites

Interviewees who converted to Buddhism in the 1990s would usually voice hopes and aspirations for an all-Russian Buddhist communicational platform. The main media claiming to represent the entire Russian Buddhism of the 1990s–2000s were the magazines “Buddhism of Russia”, “Garuda” and the Buddhist Forum on the website “Association of Buddhism on the Internet”.

For the research into the history and tradition of media involvement, it is fundamentally important that the first Russian Buddhist magazine was created by a convert (non-ethnic) follower of Géluk-Andrey T. He associated with the “Buddhist underground” of the late 1970s and represented a secluded group of professional Buddhologists and Buddhists from different parts of the USSR. In a series of interviews with the YouTube channel Save Tibet with Andrey T. there is a section dedicated to this topic:

As atheism prevailed back in the 70s, it was very difficult to find any literature or even any information about Buddhism. So, I got in touch with the Library of Tibetan Works and Archives in Dharamshala. Its director Gyatso Tsering would send me some books, and I would send him our publications about Buddhism in return. My name was familiar to them and they helped us with some things. Then, around 1985 or so an American Buddhist monk Alan Wallace came to St. Petersburg by chance. He was still a monk at that time. The team working on Lamrim gathered in my apartment, [...] someone brought him as well. He got into our Lamrim seminar. He was impressed. He realized that we had no contacts with the Buddhist community and we were in dire need of teaching and he advised us to invite Alexander Berzin who was then one of the Dalai Lama’s translators. The next year he came. We arranged secret, conspiratorial lectures here. We invited only the most reliable Buddhists. Lectures were in Moscow and St. Petersburg. People came here from Estonia, Lithuania. The best people of underground Buddhism and Buddhology gathered here. Alex was impressed. Berzin, he was a close person to His Holiness the Dalai Lama. Upon his return from Russia, Berzin told him in detail about everything that happened here. When perestroika began, we managed to take over a Buddhist temple

which was under the state. We registered ourselves as a Buddhist association and received a Buddhist temple as such. Then we wrote a letter to the Dalai Lama. We asked him to give us advice on how to organize Buddhist life here, to give us rules to follow, and we asked him to send spiritual mentors. As a result, a delegation came to us in November 1990. They observed what was happening in the temple and came to some conclusions. Soon, in December of the same year, I went to India, to Dharamshala. When we were negotiating the Buddhist temple there, they called a Kashag meeting and decided to help us. Then I met the Dalai Lama personally. When the Dalai Lama³ later went to Russia, they wrote to me that I would accompany him as an interpreter. (Terentyev 2015)

The given quote grasps the essence of the 1990s, when, along with the restoration of the Géluk tradition in the regions of its origin, converted Buddhist communities were organized by representatives of the former Soviet Buddhist underground. They also created the first Buddhist media of those years—the magazines *Narthang Bulletin* (later renamed “*Buddhism of Russia*”) and *Garuda*.

From 1992 to 1998, the *Nartang Bulletin* was an electronic magazine which was sent out to subscribers or worked as Bulletin-board systems. In the self-description, the *Nartang Bulletin* was defined as “the only monthly issue reviewing Buddhism in the former USSR published by the Russian affiliate of the Narthang Publications publishing house under the Department of Information and International Relations of His Holiness the Dalai Lama.”⁴ The analysis of the earlier publications revealed that this magazine positioned itself as the one associated with the Tibetan Géluk tradition and its spiritual leader, His Holiness the Dalai Lama XIV. At the same time, the magazine chose to focus on the Buddhist environment in Russia—events in Buddhist regions, chronicles of registered Buddhist associations and the emergence of Buddhist media. In 1995, the magazine assumed the new name “*Buddhism of Russia*”, expanding its repertoire beyond short digests and chronicles on Buddhist communities. It published excerpts of Russian translations of Lamrim, the fundamental text for the Géluk School. In the 1990s–2000s, a number of convert lay Buddhists from different cities on the former Soviet territory gravitated towards the magazine to translate Lamrim. The group focused on preparing both hard and digitized copies of Lamrim volumes in the Russian translation, creating content and maintaining the website of the *Buddhism of Russia*, as well as collaborating with an associate website and the YouTube channel of the same name “Save Tibet”.

The *Garuda* magazine was established by Russian followers of the Buryat teacher Bidiya Dandaron and was positioned as a journal of Buddhist history. From 1992 to 1998, this illustrated religious edition published excerpts from sutra texts, teacher texts and biographies of famous mentors in Russian translation. It was positioned as representing Russian Dzogchen, and, therefore, associated with the teachings of Chögyal Namkhai Norbu Rinpoche. However, the very first visit of Namkhai Norbu Rinpoche to St. Petersburg and Moscow made it evident that a joint community was out of the question.

The peculiar environment of the 1990s defined by the revival of Buddhism as a religion of Russian historical heritage also meant that the Géluk tradition lost its unique status on Russia Buddhist landscape. In a short time, Russia saw a raise of communities following not only Tibetan teaching, but also the teaching of other Far Eastern and Southeast Asian countries. Meanwhile, Buryatia, Kalmykia and Tuva were focused on finding their own authentic versions of the Géluk tradition, while building strict managerial boundaries, establishing a system of training Buddhist clergy involving lay followers. For a while, ethnic Buddhists were reluctant to accept the new socio-cultural realities, such as the emergence of other Buddhist communities established by Tibetan mentors from abroad and communities initiated by Buddhist converts (Ostrovskaya 2015).

Foreign influential Buddhist mentors and centers with the Dalai Lama XIV and the Tibetan diaspora at the helm enjoy a high religious authority and act as a significant source of religious charisma, while being virtually independent of Russian communities (Badmatsyrenov and Rodionov 2020, p. 65). Groups of “non-ethnic” Buddhist converts positioned in large cities tend to view the “traditional” Buddhist clergy of Buryatia, Tuva

and Kalmykia as limited to their ethnical identity and, therefore, not as a sufficiently legitimate source of religious Buddhist wisdom and certainty (Agadzhanian 2009, p. 228).

When analyzing the collected interviews, we noticed that respondents would consistently refer to their involvement with the Buddhist Forum created in 1998 as an interactive unit of the website Buddhism on the Internet Association. Up until the Russian-language versions of social media on Vk.com, Facebook and Instagram emerged, The Buddhist Forum served as a discussion media platform for various schools of Russian Buddhism.

The very emergence of the public media platform to discuss the doctrine and traditions of Buddhism was in tune with the socio-cultural situation of the late 1990s–early 2000s. Russia witnessed the introduction of new socio-cultural models for various Buddhist traditions. Their followers were in close interaction with each other: they practiced together under the guidance of various mentors, exchanged literature and translations and attended lectures and retreats of major Buddhist teachers who came with short-term visits from different countries. Moreover, the early 2000s saw comprehensive organizational and communicative profiles for Buddhist movements taking shape. This was consolidated in the new media reality of the Internet. Since the second half of the 1990s, websites of particular Buddhist organizations, communities, magazines and publishing houses have been introduced on a regular basis.

The website of the Association Buddhism on the Internet became the first and only media resource of its kind. It provided everything that was previously accessible only through electronic bulletin boards, community mailings or the Fidonet network. The content of the site included both general information on the history and doctrine of Buddhism and up-to-date information about Russian Buddhism, specific communities in various cities and countries and new publications of Buddhist books, visits and lectures of teachers and mentors. In his biographical narrative, the creator of the site stressed that he had deep knowledge of practices and discourses of various Buddhist communities. His experience as well as his expertise in media technologies encouraged him to build a platform representing Russian Buddhism on the Internet. The major innovation of this website as opposed to all the Russian sites of Buddhist communities, *datsans*, *khure*, *khuruls* and various associations of convert Buddhists that operated at that time was the interactive platform called the “Buddhist Forum”:

In 1996–1997, the first Buddhist websites began to emerge. By that time, I had made a website for the local Buddhist community Lotus. We exchanged information with other providers of Internet resources. And at some point, I had the idea to create a website that would link information sources on the Buddhist Internet. So, in 1998, the project “Association of Buddhism on the Internet” was launched to consolidate the Buddhist digital landscape. We discussed this project with Andrey T., M, and A*. The Internet was only beginning to reach out to the public, and I had the opportunity, by virtue of my work, to create a resource accessible to those who had the Internet. As a result, the site became a news resource. I accumulated information from other Buddhist sites there, published news about different schools. The site maintained a catalog of Buddhist resources. And a little later, a news subscription News of Buddhism was created. Again, some time later, a Buddhist forum was launched on the site. It was meant as a communication tool for Russian Buddhists. It used to be on such a simple text engine. I still have the first web-branches. They are so funny compared to what it grew into. Its structure finalized in the first few years, and it has remained unchanged so far. People discussed Buddhist traditions, compared ideas, schools, texts. According to data, the majority was representatives of Tibetan Buddhism, and the pattern remains the same to this day. They were followed by Zen adherents as a more well-known movement and Theravada as the path of those who are genuinely interested.*

Further digitalization of Russian Buddhism, which started with the spread of the Internet, resulted not only in the creation of community websites, but also in the introduction of community boundaries and conceptual foundations of doctrinal discourses. The Buddhist Forum became the one and only digital platform for self-assertion reinforced through

the “inter-Buddhist” virtual discussion. Gradually, the forum’s discourse diversified into separate branches with moderators who regulated the discussions of Tibetan Buddhists of Géluk, Karma Kagyu and Dzogchen followers, as well as representatives of Zen, Chan and Theravada Buddhism:

There were fluctuations in interaction between representatives of different traditions, who behind the closed doors were resentful to each other. We worked out the principles of coexistence in the same information space in order to avoid escalation. A single media platform—it was a wonderful experience of sharing one space. Something was created; we discussed translations, terms, etc. Now that everything has spread over the Internet and become isolated, well, I don’t know if it’s wrong or just a stage of development. The Forum has served as a single media platform for many years. Its engine has changed several times. The Forum has very strict rules, which is why people have begun to leave. In my opinion, the forum is a platform which offers some useful information for people. This was my vision. Not everyone liked it, and some people began to slip away in order to create their own platforms. Anyone can enroll in the forum even non-Buddhists, but you need to fill out an online questionnaire where you’ll be asked about it. There were followers of Ole Nydahl on the Forum, they also stayed, but they did their own thing as well. In 2000, Karma Kagyu created their own media resource and went into their own space at buddhism.ru. In 2005 I had a conflict with the administrator of the karma kagyu website buddhism.ru. He registered my domain buddhism.org.ru which hosted the website of the Association and the Buddhist Forum to his name. We did some correspondence and reached an agreement that buddhism.org.ru will link to my new website buddhist.ru. But after some time the agreement was terminated. This is an old story, of course, now it is not so important.

The interviews with the creator of the website and the Buddhist Forum have revealed that as community discourses diversified, representatives of various Russian Buddhist movements showed an increasing need to distance themselves and create their own media platforms. In our interviews of 2021–2024, many respondents noted that in the late 1990s they had engaged with Buddhist forums but then lost interest in them. The majority of interviewees reiterated that “later” they returned to the media communications of websites, forums, public social networks and streaming services that were created by representatives of various Russian-speaking Buddhist schools. Our 2022–2023 questionnaire was updated with a question about Buddhist media that the respondents used themselves and would recommend to others. Interestingly, none of the respondents referred to the Buddhist Forum. In fact, no one mentioned a single media resource popular with all Russian-speaking Buddhists. Respondents usually named either their own website/blog, or the website or account of their community, datsan and organization. The similar answers to this question emphasized the exclusive importance of online activities and media repertoires associated with the community/organization or branch of Buddhism to which the respondent belonged.

4. Discussion

4.1. Mediatized Public Traditional Buddhism: Online Discourse on Russian Buddhism of the Gelug Tradition

From 2019 to 2024, we were monitoring Russian Buddhist presence of the traditional Gelugpa stream on the social network VK.com. The largest cluster of online maps for Russian Buddhism in social media constitute Vk communities that gravitate towards the well-received-in-Russia Tibetan–Mongolian Gelugpa tradition. The subscribers of these communities predominantly come from the “Buddhist regions of Russia”—Buryatia, Tuva and Kalmykia. This cluster includes accounts about the Dalai Lama, including his “verified” profile⁵, as well as a network of groups under the spiritual leadership of Geshe Jampa Tinley, which have their offline communities registered in Russia and the neighboring countries. The other part of this cluster comprises communities from datsans of Buryatia

and the Trans-Baikal region, Novosibirsk and the Irkutsk region, Khuruls of Kalmykia, Khure of Tuva and Kure of the Altai Republic.

The cluster of Gelugpa Buddhist communities is dominated by accounts and groups representing Buryat and Kalmyk monasteries, as well as lay followers' Buddhist organizations. Tuvan Buddhist VK communities make up a small fraction of this large cluster of online maps for Russian Buddhism. Most of the Tuvan Buddhist communities do not interact with offline temples or communities. The survey of these communities has revealed that they are short-lived and are used as nametags or posts generated for a special event, such as a Buddhist mentor's visit to Tuva. Those which represent physical offline khure and Buddhist centers are few in number. It is also noteworthy that they exclusively appeal to Tuvan Buddhists as they communicate in Tuvan (Badmatsyrenov et al. 2020, p. 127). The interviews with various community media creators of 2022–2024 have shown that when asked about regional Buddhist media the interviewees never mention Tuvan bloggers, Tuvan religious media or Tuvan social media accounts.

Having considered the followship, frequency of updates and the repertoire of posts typical of large Gelugpa VK communities, we conducted a series of expert interviews with the creators and leaders of these communities. In the interview session, we learnt that the creators and administrators of most major Buddhist Gelug VK accounts were monks with Geshe degrees who led the datsans or khuruls of Buryatia and Kalmykia. The biographical narratives of these respondents demonstrated similar segments: the interviewees belonged to the mid-1970s or early 1980s generations. At an early age, they decided to embark on the path of Buddhist obedience, receive a traditional Buddhist education, and take monastic vows. Most of the respondents studied at the Buddhist University "Dashi Choinkhorlin named after Damba Darzha Zayaev" at the Ivolginsky Datsan. Some have interned at the St. Petersburg Datsan Gunzechoyne and had training experience at Drepung Goman in India. When asked about their attitude to the Internet and new media technologies, respondents invariably replied that both were an important component of modern life, since digital media were embedded in the communicative practices of everyday life and, therefore, were applicable to Buddhist enlightenment.

A separate question block in the interview concerned the permissibility of using Buddhist practices in online communication. The Gelugpa monks emphasized that they did not see a fundamental difference between online and offline discussion of the doctrine, when applied to prayer services, sermons or educational lectures on the Dharma. Hereafter, we state a passage from an interview (2022) with one of the most popular blogger monks, the rector of the Buddhist University "Dashi Choinkhorlin named after Damba Darzha Zayaev" at the Ivolginsky Datsan. He manages a large VK account, as well as a YouTube blog. In the interview, the rector made clear that for the Gelugpa tradition, the issue of transmitting religious practices online is treated differently. According to the respondent, their approach directly correlated with the Gelug discourse about the Internet and new media in religious practice:

We stand apart from other streams of Buddhism. The Gelug tradition is more focused on the study of philosophy. Other Buddhist traditions, especially Tantric ones, are limited in terms of bringing their practices online. Previously, when those who wanted to study Tantra gathered, they would retreat as a group, receive personal initiation and practice. This is not possible online. It's easier for us under the Gelug: we deliver prayer services and lectures on Teaching online. As for Tantra, We hold different opinions on the practice: it is one thing if the teacher is ready himself and he personally knows people who are sitting somewhere in other places. But there are also opponents of taking such practices online –the idea is that there is no personal transfer. Technically, there is no difference whether a person listens to a live online or to the record. It is especially true for lectures on Buddhist philosophy. They are not comprehensive any way and require listening on repeat. It is the same with personal training, which, in fact, we received at the University: many times we revised the same topic with different teachers. Buddhist philosophy is multifaceted; one should reread and revise it.

Both in this interview and in other expert interviews, the respondent monks emphasized that the repertoire of Gelugpa media has by far reached out beyond the sites of datsans, khuruls, accounts and communities in VK.com over the last five years. This was significantly facilitated by lockdowns during the COVID-19 pandemic. Thus, commenting on the reasons for creating his own blog on YouTube, the rector of the Buddhist University noted that it was during the lockdown that it became evident that new media provided an opportunity for translocal interaction for students from the separated regions of Buryatia, Kalmykia and Tuva:

During the pandemic, many teachers relocated to the Internet space. Now they conduct online training sessions in Zoom, YouTube. Before the pandemic, everything was moving slowly. If they wanted to teach online, they would shoot short 5–7 minute videos and upload them to YouTube. In the spring of 2020, we set up a schedule. Before the winter, we had tried to teach offline, and in March, with the start of the new school year, we introduced the online format. First, we tried Zoom, but there were listeners who didn't have access to it or who found it difficult to tune in. We switched to YouTube that was easier to use, which was good for older people. For nonresidents who usually could not attend offline classes, the transition to online was a win. They now had the opportunity to log into classes and watch the recorded version. In addition, it was beneficial for those who would previously miss 2–3 weeks due to personal issues, and then, of course, would forget what had been said previously. Now they could watch the recording and sort out the missing material. Switching to online format facilitated our interaction with students in a certain way: offline studying meant a lot of time wasted on logistics, discussions after the lecture, traffic jams on their way back. Online lectures were read at one thirty and that was it. Trips to Moscow were an even bigger problem, for example, since you had to leave all your business here. And now we introduced weekly online meetings on Zoom and YouTube. There were Q and A's in Zoom after the lecture, answers were written in other places, I am responsible for answering them.

As follows from this interview and other interviews with Buddhist mentors from Buryatia, their lockdown media communications have shown that YouTube was a convenient platform for growing followership and drawing attention to traditional Buddhism.

The analysis of answers to the block of questions about the preferred media repertoire suggests that private chats in Viber and WhatsApp messengers are prevalent for the interaction of mentors with students and laity. VK public accounts and social network communities serve for educational purposes and appeal to laity and all those who would like to embark on the path of Buddhist teaching. The creator and manager of “Buddhism | Mahayana | Gelug”, one of the largest Buryat Buddhist public sites in Vk.com, stressed that he had chosen this social network because of its great popularity and accessibility to people. At first, the group was created to discuss Mahayana Buddhism, but over time, lay followers from different cities of Russia began to subscribe and enquire about the doctrine, requirements and practices. Gradually, the public had assumed the clear-cut role of the “Buddhist Teaching transmitter”:

Why did I tie Buddhism, Mahayana and Gelug? It is Buddhism, Mahayana and Gelug that is our tradition. At first, there was a public server for communication. Since Mahayana was extensive, they wanted to communicate with the Tuwan brothers, with Kalmyks. We did communicate. Then, people would start to join, those who got interested. Now we did not only communication, but also the transmission of Teaching. I try to write in small patches. People don't read much, like in the news, they need short texts. I'm putting out Lamrim, extracts from the lectures of great Buryat teachers. I try to write four lines, at least two lines every day. There's no point in writing more, well, it's important to be consistent, every day like this. Well, one thought as it goes.

According to all the interviews of 2012–2024, with no exception, the YouTube digital platform became the leading media for educational communication practices, reaching the widest possible audience. In the interview, we asked respondents to name YouTube

channels that were popular with the Russian-speaking Buddhist sphere. Our further analysis of these channels and expert interviews with their creators revealed the following. On the YouTube digital platform, branded (collective) channels of individual Buddhist datsans and khuruls and personal vlogs (video blogs) of reputable teachers, mentors and rectors of datsans have been predominantly authored in Buryatia. By far, a smaller number of those have been made in Kalmykia. In addition, there are journalistic podcasts about Buddhism in Buryatia, Kalmykia and Tuva, presenting original programs about Buddhism on the relevant regional digital TV. Their number is small, and they were mainly uploaded in 2012–2024.

Regarding our study of mediatized Russian traditional Buddhism, it is noteworthy that branded channels of datsans or khuruls entered YouTube earlier than personal vlogs and journalistic podcasts. The emergence of Buddhist branded YouTube channels as an independent type of communicative media practice about Buddhism appeared within 2012–2016. In terms of the mediatization of Russian Buddhism, these years are associated with the separation of various Russian Buddhist streams from each other in hope of creating their own interfaces in the public media sphere of Russian society. Thus, this period coincided with major datsans of Buryatia and Kalmykia updating the contents of their websites, tagging them to their public accounts on the social network VK.com and creating branded YouTube channels. The next step was their outreach to regional media or engagement with journalistic programs about Buddhism on digital TV channels, which resulted in topical podcasts on YouTube.

One of the digitalization pioneers in Buryat Buddhism was the Traditional Buddhist Sangha of Russia (BTSR) under the leadership of Pandito Khambo Lama D. Ayusheev. According to the expert interviews, back in the 1990s, at the dawn of digitalization, the Khambo Lama decided to use the Internet and new media technologies for Buddhist enlightenment and spreading Buddhist awareness. Many of the respondents, creators of communities and public sites of Buryat datsans in Buryatia, mentioned that it was Pandito Khambo Lama D. Ayusheev who inspired them to rely on the media to appeal to novices and laity. As we mentioned earlier, the Ivolginsky Datsan website was launched back in the early 1990s and was subsequently changed a number of times to accommodate the ever-expanding repertoire of Internet technologies.

In 2015, the BTSR public page for VK.com was created. In 2016–2018, communities and public accounts of other Buryat datsans were added. Pandito Khambo Lama fostered media cooperation with digital channels of Buryat television. Meanwhile, in 2016, BTSR became the founder of the digital “Public information and journalism TV channel Selenga-TV”. Starting from 2017, the podcast on this YouTube channel has been broadcasting live performances of prayer services from Buryat datsans, interviews and lectures of reputable lamas, as well as reporting on Buddhist events and calendar holidays. Another milestone in BTSR communication practices was the weekly program Buddhist Environment (2018) on the municipal digital television and the radio channel Tivikom. The podcast “Buddhist Environment” has its own platform on the website of the Ivolginsky Datsan, as well as on the YouTube channel of the TV channel “Tivikom”. The interview with the press secretary of the Ivolginsky Datsan and the creator of the program Buddhist Environment explains the nuances of Buddhism mediatization by means of journalism on religion:

The very idea of tapping into the Internet belongs to the Khambo Lama. All the episodes of Buddhist Environment have been fully dedicated to Buddhism. I invite experts from museums, the rector or vice-rector of the Buddhist University to a conversation. There are some things that they instruct me to say since a lama can't speak publicly about certain things. Wherever I go, I need to spread the teaching. When quarantine began in 2020, people began to leave requests for prayer services on the website, on Fb, on Instagram. Now, the website allows you to apply for prayer service, to send names in. And then I suggested that I would regularly talk on television about the meaning of various khuruls so that people would know which prayer service to send an application for. I was doing so for three months. Later, people from television sent me a video, and I posted it in social

media. Since then, every 3 days I have posted interpretations of khurals on Fb. I wanted to stop it when the lockdown ended. But subscribers began to write to me in person and asked me to continue. So that's the kind of enlightenment that went on.

The quote and the interview itself illustrate how mediatized Buddhism relies on cooperation between journalism and Buddhist professionals. Striving for its public media brand, the Buddhist organization has hired professional journalists and audio and video production people. The journalist can bring forward topics that are inaccessible to a monk due to religious vows. The journalist creates an agenda and a repertoire of topics with the digital audience in mind. Buddhist professionals, in turn, can verify whether the content complies with the doctrinal and ethical provisions of Buddhism.

Alongside this interaction with secular media, journalism on religion started to develop interest in traditional Russian Buddhism in their due course. A striking example of such interest was one of the first documentaries about Buryat Buddhism and the phenomenon of the “incorruptible body” of Khambo Lama Ethigelov, which was produced by a secular director and secular producers in 2020 with the support of the Presidential Grants Fund⁶. Among other vivid examples of journalists featuring Buddhism in the regions of the traditional Gelug were YouTube podcasts of the Bumba Media Holding and the TV program *The Buddhist Way* by Tuva 24 TV Channel.

The launch of the Bumba Media Holding podcast in 2012 is directly related to the media tradition of Kalmyk traditional Buddhism. The Central Khurul of Kalmykia has its own website that was registered in 2013 and was consistently updated in 2008–2023, as well as a large VK public account and a branded YouTube channel (13.1 thousand subscribers). Cooperation with public media has become a separate area of business. Therefore, the podcast case on the YouTube channel Bumba Media Holding (39.2 thousand subscribers) is very interesting.

This podcast was created by a lay follower Kalmyk man who had supported monks from the Central Khurul of Elista for decades. He knew the struggles of the Kalmyk Khuruls, the fate of those who, at the dawn of the revival of Buddhism, embarked on the path of monasticism. In an interview, the creator of the Bumba Media Holding stressed that, having by the will of fate witnessed the modern history of Russian Buddhism and the revival of the Buddhist educational monastic tradition in Kalmykia, he decided to record it in chronicles. The blog started as a series of his films about young people killed in Chechnya, about the fate of deported Kalmyk families who returned to their homeland and about young Kalmyk novices who studied at Drepun Gomang in India. The success of these topics and letters from subscribers led to other stories about the life of the Central Khurul and interviews with Buddhist mentors on various aspects of Buddhist Teaching:

In my past life I worked in television and did well for myself. Then, I began to understand that state controlled television, both good and bad, would have its own agenda. There was a youth organization there that began to promote the Kalmyk language, traditions, and Buddhism. But my first acquaintance with Buddhism was with our monks when they were still studying at Gomang in India. And I got a dream. They told me about their studies in India, celebrations of our national holidays. I thought to myself they were monks and they also celebrated our national holidays. I gradually realized that I was going to leave television. I wanted to make my own content. I started with a project called Radioboomba, a successful project, but I understood that people were watching YouTube. <...> And I made our first film in 2015. It was called “When will I come back?”. Then were “They could, and we can” and “I’m a monk”. I began to realize that we Kalmyks have a great history. These are the old Buddhists of Siberia who prayed in secrecy, that’s how they hid Buddhist symbols. People would need them later. They would be interested. I understood that what I was shooting now: holidays, some events related to khuruls, could be watched later. That’s how it was, that what monks were like. We make astrological forecasts every year. We’ve been shooting Astrological forecasts (it’s only once a year) for 7 years. Then again, Buddhist lessons, Kalmyk language lessons.

Tuvan Buddhism is represented on the digital YouTube platform by the podcast of the weekly TV program The Buddhist Path broadcast by the digital TV channel Tuva 24 (created in 2013). The program is presented by its creator, a well-known Tuvan scholar of Tuvan Buddhism and a sociologist. The podcast is broken down in topics related to the history of Tuvan Buddhism and features interviews with Tuvan Buddhist mentors, novices, monks and nuns. In addition, the podcast gives a regular weekly review of news about modern Tuvan Buddhism, such as lectures by visiting Buddhist mentors and interviews with researchers of Buddhism and Tuva.

Personal blogs of Buddhist teachers and mentors appeared mainly during the lockdown period due to the 2020 pandemic. The exception was the blog Lama Oleg, one of the most popular Russian-language vlogs on YouTube.

Most expert interviews rendered the Buryat blog Lama Oleg (12.4 thousand subscribers) by the rector of the Kurumkan datsan the most popular Russian YouTube blog. In the interview, the author of the blog stressed that he came up with the idea of creating his own blog channel in 2013. He had received many letters of people from different regions of Russia asking him to become a mentor for them. They would learn about the Buddhist mentor residing in the Kurumkan district of Buryatia from their friends who had attended yoga tours organized for laity by the datsan's rector. In the early years, the blog mainly provided monthly then weekly astrological forecasts. To write those, Lama Oleg had to study the literature on Buddhist astrology in Tibetan and Mongolian and adapt it to the realities of modern society. Later, at the request of a rapidly growing Russian-speaking audience, he introduced lectures on the basics of teaching and meditation and began to shoot and upload short documentaries about his Buddhist pilgrimages with groups of subscribers, his interviews, mountain climbing, etc.:

Through the blog I am appealing to not only the Buryats, but everyone. We are Buryats now, and then we will die and will be reborn in another state, in the guise of another person. The first regular update was "Zurkhai" which created thanks to my wife. She asked if I could make a prediction that would be useful for people. As I started making Zurkhai posts, there was a sharp increase in subscribers. Many people wrote to me and said they were checking the blog. I have tried to make everything accessible and logical. All Buddhists work with astrology in Buryat and Mongolian. They were written for cattle breeders. I expanded it as now there were few cattle breeders. People order personal forecasts from me; they contact me via Telegram, Vk, Viber. The Internet boosts opportunities. We can do a lot even with the Internet we have in the region. <...> In recent years, a lot of people have asked to become their teacher. As soon as I started arranging yoga tours, people who did them began to reach out. I explain to them that I don't have such capacity yet. I can't be a teacher to them, but I can be an assistant, an adviser. Huge armies of people received initiations not only from the Dalai Lama, from various teachers, they wanted to study further, but there was nowhere to go. Teachers came for a short time, communicated information to us, gave us initiations, and what do we do about it, what do we do next? I've been thinking about it a lot. Maybe this is one of my missions—to help implement what we got. Yoga tours are about this. When we go into the shutter.

The quote highlights implications to mediatized Buddhist communication: blog subscribers, attracted to the digital discourse about Buddhism through the media activity of a Buddhist blogger, become involved in the offline interaction of laity with Buddhist mentors and gain the desired opportunity for personal discipleship and interaction with a chosen Buddhist mentor.

4.2. Traditional Russian Mediatized Buddhism in the Format of the Russian Association of the Karma Kagyu International Organization

Against the new landscape of Russian Buddhism, the Dzogchen communities of Namkhai Norbu Rinpoche as well as the Karma Kagyu communities created throughout Russia and the CIS by the Danish Buddhist mentor Ole Nydahl stand out. They did not

associate in any way with the traditional Buddhist organizations of Buryatia, Kalmykia and Tuva, since they represented other schools of Tibetan Buddhism and other structural models, whereas communities of Namkhai Norbu Rinpoche did not seek to be registered as religious associations and did not oppose themselves in any way to Buddhism of historical heritage (in detail: Ostrovskaya et al. 2021). Communities of the Karma Kagyu lineage took a different path (Ostrovskaya 2015).

Since 1989, Ole Nydahl has visited Russia and CIS countries on a regular basis, helping his followers to build local branches of the international Karma Kagyu organization. All of them operated on a single model of dharma centers where lectures would be read by traveling Karma Kagyu teachers and regular collective meditations and ritual practices would be conducted. They would have a library with books of the community publishing house. Karma Kagyu communities sought to obtain official status of a religious association and gain a public image of a Russian Buddhist Traditional confession. As early as in 1994, the Buddhist center Karma Lekshey Ling in St. Petersburg began publishing the Russian magazine *The World of Kagyu* and founded its own publishing house Diamond Way to publish translations of books by Lama Ole and those Tibetan teachers whose texts were recommended to followers (Ostrovskaya 2016, pp. 79–85).

As soon as the first Lama Ole's communities were established in Russia and the CIS, they embarked on a mission to popularize Karma Kagyu Buddhism and expand the community. Over time, this attitude led to them dropping their confrontation with the "conservative Géluk monastic tradition" prevailing in Buryatia, Kalmykia and Tuva, which karma kagyu started in the 1990s. In the 2000s, Ole Nidal's followers began to promote a different self-presentation in public media—the idea of the Tibetan Karma Kagyu movement as one of the Russian traditional confessions. The digital activity of the community with the introduction of its own media brand buddhism.ru testifies in favor of this hypothesis. In this context, digitization resulted in the community magazine *Kagyu World* receiving a new name "Buddhism.ru". The websites of local Karma Kagyu communities which used to be filled with various designs and content in 1996–1998 were updated in accordance with a media unification principle—an international logo and a uniformed visual presentation were introduced.

In an expert interview, a Board member of the Russian Diamond Way Karma Kagyu Buddhist Association interpreted the undertaken unification of all Ole Nydala's Karma Kagyu community sites as the delineation of the digital boundaries for their own media niche, separating the doctrines and practices adopted by the International Association of Karma Kagyu Communities from those on other Russian-language Internet resources about Buddhism:

As early as large desktop computers were introduced, we began to make websites of our centers. The first Russian websites were launched in 1996. I remember working on texts for the first websites in 1998. Then, of course, it all started to come together, because we have centralized and local organizations. For a while, we enjoyed a lot of freedom: local organizations were free to do what they wanted to on their websites—both writing and posting pictures. Then, we began to put it all in order. We worked on a visual style, an international logo. And we all took up this style, the general vision. The vision is to present it so that people better understand who we are and what we do. And for this, we need to publish something that explains our approach. Other approaches are fine too. We used to publish a lot of them, maybe to prove it to ourselves and others that we were not in-troverts. Now that's not the thing. So, we've downsized the range of topics. On our official website there is Buddhism in general, Kagyu School, teachers, teachings, contacts, etc. Official sites are standardized all over the world, centers and local organizations are connected to this big cap. Each center has its own subpage, but all are made in the same key. Basically, it's a white background with a red-fire wheel as a logo. Inside it, there is the letter "K" which stands for the first letter of our name and the name "Karmapa". The red stripe is our universal logo. Our logo is red, white with a touch of yellow. It is well

known everywhere. And the overall style is simple; something in-between eastern and western designs, but more of the West to it.

In an interview with board members of Russian Karma Kagyu communities, the editors of the “Buddhism.ru” website and mobile application emphasized that the Karma Kagyu community has an “analog” strategy. That is, they teach the doctrine, transfer initiations to practices and discuss the Buddhism of the Karma Kagyu school only offline. According to respondents, this strategy was passed down by Ole Nydahl himself who forbade his followers to create any accounts or blogs about Buddhism on the Internet. Moreover, he strongly recommended refraining from participating in any discussions on spiritual topics on forums or social networks at all. Here is a quote from an interview with the chairman of the Moscow Karma Kagyu community regarding their main media strategy:

We have an established line of behavior in the network. Disputes and discussions in open and closed groups, as well as in Telegram chats, for example, are not encouraged. It is better to clarify issues face to face. The ban on blogging and social media activities comes from Lama Ole. Now and then, he sends emails over our internal network dwbn.org on topics that he considers relevant. These letters come to the centers, where we translate them and pass them onto our newsletter. Ole himself does not write anything on social networks. It's all about people not getting dragged into discussions and not giving their own teachings. The volume of information is immense, and there is more confusion. In the live analog format, we continue to be very open.

This attitude of Lama Ole was interpreted in the interview as the one stemming from the very essence of Karma Kagyu doctrines, which is to treat oral transmission of sacred knowledge “from mouth to ears”, from teacher to student, as the only possible way of teaching. In the interview with the board member, he says the following:

You see, our school has the word “kagyu” in its name, which means oral succession. Oral transmission implies a personal meeting of the teacher and the student. We know a story of Mar-pa who would cross the Himalayas to reach his teacher. And now, when the covid began, Lama Ole received a lot of letters asking if they could give lectures online and the like. He replied that we would never change our basic approach: in order to get practice, you need to meet a person in person. In a personal meeting, not only information is transmitted, but also a certain blessing and the experience of a particular person in practice. Lama Ole said that he would regularly give us lectures on streaming, broadcasting via the Internet, even about Mahamudra, about the Supreme. We have our international network specially made for this. There is a local one, there is a centralized one in Russia, and there is an international one. There are servers for streaming. Streaming is free. There is a button “make a donation”. Before covid, streaming was secondary; it was in-troduced in 2001–2002 for people who wanted to watch from afar. It used to be a bonus, but now it has become the only way to listen to Ole. He would allow it for only as long as the pandemic lasts, when there is no opportunity to meet with him personally. Ole also conducts meditations online. Generally speaking, we are aiming for this to stop completely. That is, streaming will remain but practices and everything that requires presence will only be taking place in person. We are conservatives! As long as we are alive, there will be no transition of practices online.

As the interview suggests, translocal religious media practices in streaming date back to the period of 2019–2021 and are considered contradictory to the strategy of limiting religious communications to the offline format of face-to-face interaction. Media communication about the Buddhist doctrine and practice of Ole Nydahl’s followers is limited to a closed streaming site dwbn.org. This requires registration and presenting evidence of personal initiation received from Lama Ole.

5. Conclusions

In the recap, we would like to list the key findings of this study. The processes of digitalization and mediatization have resulted in the emergence of Russian mediatized

Buddhism. Various trends in modern Russian Buddhism are disproportionately represented in the public sphere of media; representation directly correlates with the strategies that digital Buddhist creatives of different streams—Gelugpa traditional, Dzogchen or Karma Kagyu—have chosen in relation to the Internet and new media.

Digitalization of Russian Buddhism fell into three main stages: the creation of media in the fashion of those that had already been made by foreign communities of a similar school (newspapers, magazines and Internet connections); the emergence of common discussion platforms (Buddhist Forum) and the creation of community websites and the introduction of their own intra-community streaming sites, social media accounts and media branding of particular schools.

The emergence of community discourses about the Internet and new media technologies was directly related to the introduction of offline boundaries for Russian Buddhist communities. Newly acquired freedom of religion as well as opening of the borders in the 1990s meant that those who wanted to practice Buddhism no longer had to go to Buryatia or find a mentor from the former Buddhist underground. Russia welcomed mentors of other Tibetan schools, as well as Buddhist mentors from other Asian countries. They opened centers throughout the country and did not require their followers to accept monastic lifestyle or to live at a monastery. They offered an accessible path to the Dharma to people of the European mindset. The most popular mentors of the time were Chögyal Namkhai Norbu Rinpoche and Ole Nydahl.

It would be wrong to believe that community strategies were first introduced with the advent of the Internet or new media. We assume that new media technologies have made it possible for each of the schools to consolidate the ideas about interactions within the community and with external society. Thus, the Buddhist Forum which was meant as a digital platform for Russian-speaking Buddhists contributed to the differentiation of schools in terms of their views on the doctrine and practices of Buddhism. The procedure for building the Internet and new media strategies relied on regulations of communications about doctrine and practices adopted by a community. For example, the International Dzogchen Community and the Ole Nydahl Karma Kagyu communities regulate teaching and practice transmissions by limiting them to internal closed media. Either of these schools grants free access to their Russian-language website and digital media. This is the only similar feature in both strategies. The digital strategy of the International Dzogchen Community is characterized by acceptance of modernity and high sensitivity to a changing environment. This meant the introduction of communities' innovative digital media which would facilitate translocal communications of its members in different parts of the world and synchronize the religious practice of local communities.

The strategy of the Russian-speaking Theravada was developed in a completely different way. In this case, a positive attitude towards the Internet and new media technologies is associated with the desire to popularize Theravada Buddhism in Russia. In the early 1990s, there were only a small number of active Theravadins among the Russian convert Buddhists. Significant shifts towards the development of communities began only in the 2000s as a result of two circumstances. Firstly, some followers traveled to the countries of Southeast Asia to train and ordain as bhikkhu/bhikkhuni or to receive experience in Buddhist communities or meditation centers. Upon returning to Russia, some of them established new communities of the Theravada tradition that they learned in Asian monasteries. Secondly, the spread of the Internet and social media created a truly unprecedented opportunity to study dharma online. The Russian-speaking Theravadins opened a separate niche within the Buddhist Forum website developed in 1998 to hold their discussions and then created their own websites. They prefer blogging activity on the Facebook public page and on the VK group for popularizing the tradition, aimed at attracting a wide audience. Russian Theravadins see their mission as transmitting teachers' reflections on doctrine and the distribution of Russian translations of the canon texts and commentaries. Actually, acting as theo-bloggers, they choose topics for coverage and teachers for online promotion and write their own educational articles. The dominant activity of the Russian Theravada

groups is independent translations of the Pa’li Canon. The respondents emphasized that Theravada Buddhism is a fundamentally new tradition for the Russian socio-cultural context, previously known to a narrow circle of professional Buddhist scholars. They do not set themselves the goal of opposing themselves to the Mahayana historically established in Russia. In view of this, they consider the digitalization of translations, online publication of materials about Russian-speaking Theravadins and discussion of doctrine and practice on forums as means to popularize Theravada Buddhism in Russia.

The strategy of the International Association of Karma Kagyu Communities and its Russian department was built in accordance with community’s discourse on technological advances of our time as a threat to the tradition of oral transmission of sacred knowledge from the teacher to the student. Ole Nydahl himself and the community’s administration recommend that Karma Kagyu followers refrain from media communications about Buddhism and resort to offline practice. Ole Nydahl’s followers began to use new media technologies instrumentally—mainly in order to promote the brand Diamond Way of the Karma Kagyu tradition as that representing Russian Buddhism in the public sphere of media. As a result, the repertoire of Karma Kagyu media is limited to a website, a magazine website, a mobile application duplicating the content of the magazine’s website and Vk accounts that serve as business cards of local communities.

The digital strategy of Ole Nydahl’s Karma Kagyu communities is based on the community discourse about the distinction between ways of self-presentation in the offline public spaces and in the public sphere of media. According to the interviews with the board members, in their offline activity, Karma Kagyu representatives strive for achieving extensive public self-presentation «traditional Buddhism» by lecturing and holding seminars at universities, holding conferences with famous scientists and representatives of different confessions as guest speakers, engaging with the press and television, etc. The Karma Kagyu media platform has open and closed communication formats. In the Russian-speaking segment of the Internet, a website, a mobile application and a magazine website are freely available under the same logo and with the same design. So, in the public sphere of media, they represent the brand of the International Association of Karma Kagyu Communities and the address, according to the interviewee, newcomers, municipal and state officials, of prominent members of local communities.

Traditional Buddhism in Buryatia, Kalmykia and Tuva built their strategies for the Internet and new media on completely different premises. For a long time, traditional Buddhist regions have chosen a very cautious approach to new media, limiting themselves to the sites of *datsans*, *khuruls* and *khure*. This position, in our opinion, is largely held due to the fact that it was crucially important for the followers of the Gelugpa tradition to first rebuild the traditional pipeline for the Buddhist clergy in the regions and to reinstitutionalize their own ethnic patterns of Buddhist practice. The advent of social media in the early 2000s brought Gelugpa digital strategists into the broader semantic contexts of the cultural public media space. We believe that mediatization as a process of total inclusion of media in semantic reinterpretation of reality has revealed four key trends in the reinstitutionalization of Russian traditional Buddhism in Buryatia, Kalmykia and Tuva.

The first trend was the traditional Russian Gelug’s acceptance of religious authority redistribution (shifting religious authority) between different streams of Buddhism. The acceptance was largely facilitated by the Gelug community discourse about the need to advance their pattern of reproducing Buddhism (monasteries and lay followers) in the Russian public media sphere. This trend appears characteristic of Buddhist interfaces in the public media sphere. Online cartography of the most popular Russian social network VK.com has demonstrated that communities and public accounts of the Russian Buddhist Gelugpa tradition prevail in terms of their number, followship and actual digital activity. In fact, Buddhist professionals of Buryatia, Kalmykia and Tuva—authoritative Buddhist heads in the regions, such as mentors and abbots—are actively involved with the content of programs about Buddhism in federal and regional journalism on religion. Thus, the advancement of traditional Gelug Buddhism is mediated into the public sphere of media

through media popular in Russian, such as the Russian social network VK.com, Russian legacy media and the YouTube digital platform.

The second trend in the cultural public sphere of media is for the traditional Russian Gelug Buddhism to promote itself as a collective religious brand. In the Russian-language Internet space, Russian Gelug Buddhism is mainly represented by the sites of *datsans*, *khuruls* and *khure*. Likewise, Russian Gelug Buddhism advances itself through communities and public accounts of monasteries, educational institutions, lay parishioners of specific monasteries and public digital communities of Buddhist mentors in the most popular Russian social network VK.com. As to the YouTube platform, it operates through branded channels of *datsans* and *khuruls* and associations of Buddhist organizations.

The third more recent trend, which became apparent after the 2020 lockdown, is a considerable growth in media strategies of traditional Russian Buddhism. Mediatized Gelug Buddhism communicates four discourses about Buddhism. The first discourse speaks of Buddhist strategists: monks and abbots who lead or supervise the activity of monastic websites and secular media about Buddhism. The second rapidly developing discourse is of Buddhist bloggers delivered through VK public accounts, branded YouTube channels of monasteries and blogs on YouTube. They provide the ever-growing Russian-speaking digital audience with access to Buddhist mentors from the Buddhist University and from various *datsans*, *khuruls* and *hure* in remote areas of Buryatia and Kalmykia. The third trend involves weekly editions of programs on Buddhism in regional digital media with secular journalists and scientists as authors and presenters. This trend also concerns media created by laity, among which are documentaries about outstanding Buddhist teachers, about the role of Buddhism in the history of Buryatia, Kalmykia and Tuva, about biographical narratives and about the formation of contemporary Buddhist preachers, teachers and mentors.

The fourth trend is the novel emphasis of traditional Buddhist mentors on the large-scale online promotion of Buddhism on various digital platforms and social networks. As our research has revealed, the media communications of Buddhist bloggers and Dharma bloggers are an intermediary on the way to the offline practice of Buddhism. Vlogs allow for personal contact with the author of the YouTube channel through the tagged e-mail addresses and links to accounts on other social networks. By means of online communication with mentors, subscribers of Buddhist blogs and public accounts can choose a suitable mentor for their offline practice. They come to their favorite influencer blogger in real life, take refuge with them, and become consistent followers of Buddhism. The trend of appealing to a wider Russian audience is indeed novel for traditional Buddhism of the regions.

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Notes

- ¹ VK (short for its original name VKontakte; Russian: ВКонтaкте, meaning InContact) is a Russian online social media and social networking service based in Saint Petersburg. VK is available in multiple languages, but it is predominantly used by Russian speakers. VK users can message each other publicly or privately, edit these messages, create groups, public pages and events, share and tag images, audio and video and play browser-based games. According to Semrush, in 2024, VK is the 30th most visited website in the world with more than 100 million users per month.
- ² FidoNet is a worldwide computer network that is used for communication between bulletin board systems (BBSes). It uses a store-and-forward system to exchange private (email) and public (forum) messages between the BBSes in the network, as well as other files and protocols in some cases. For details, see (Driscoll 2022).
- ³ The Dalai Lama XIV visited the USSR and Russia eight times: in 1979, 1982, 1986, 1991, 1992, 1994, 1996, and 2004. As dates suggest, His Holiness's paid visits long before perestroika. His visits had a lasting impact on the Buddhist environment both in the regions of ethnic Buddhism and in large cities of the so-called European part of the country.
- ⁴ This self-description is given in all issues of the Narthang Bulletin, digitized and posted on the website of the Buddhism of Russia. See: <https://buddhismofrussia.ru/buddhism-of-russia/> (accessed on: 15 September 2024).
- ⁵ <https://vk.com/dalailama> (accessed on: 15 September 2024).
- ⁶ The phenomenon of Khambo Lama Ethigelov is the Riddle of the Buryat Lama, URL: <https://www.youtube.com/watch?v=SzY-NiQwumc> (accessed on: 15 September 2024). On the phenomenon of Khambo Lama Ethigelov in details see: (Quijada 2019, pp. 111–37).

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Article

Bridging Ecologies through Contemplative Technologies: Existential Relevance of *Huatou* 話頭 and the *Huayan sanmei men* 華嚴三昧門 for Oxytocin and Environmentally Sustainable Behavior

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Abstract: Contemplative technologies in the form of Buddhist practices that challenge the sense of self and thereby enhance the experience of interrelationality are viable strategies for addressing existential concerns such as the environmental crisis. Much of the existing research on Buddhism and ecology neglects to measure environmentally sustainable behavior or engage with empirical research. Likewise, experiments measuring the effects of contemplative practice on oxytocin, a neuropeptide hormone often implicated in interrelational contexts, are scarce. This study explores the existential relevance of Chan and Huayan practices for oxytocin and environmentally sustainable behavior. Using empirical methods, it reports on an experimental fieldwork study among international participants in a one-month retreat at a Buddhist monastery in Taiwan. Salivary oxytocin, recycling, and food waste were measured, while phenomenological reports of experiences during contemplative practice were also obtained. Results of enzyme-linked immunosorbent assay indicate a marginal increase in oxytocin following Chan practice of the *huatou* “Who recites the Buddha’s name?” which targets the sense of self, consistent with phenomenological reports reflecting an interrelational, ecological sense of self through *huatou*. Results also indicate increased recycling and decreased food waste by mass as a function of time on retreat. While the precise mechanisms explaining why participants exhibited more environmentally sustainable behaviors are currently unclear, the discussion proposes an empirically testable framework for bridging ecologies that links emotion, sense of self, and behavior. Contemplative practices may contribute to changes in oxytocin and environmentally sustainable behavior through activation of existential, aesthetic emotions such as doubt and awe, thereby inducing changes in the practitioner’s sense of self, which they may then experience as interrelated with broader ecologies, a possibility awaiting further research. The *huatou* fieldwork and proposed follow-up study on the *Huayan sanmei men* thus shed light on the relevance of contemplative technologies from Chinese Buddhism for bridging ecologies in the existentially relational sense.

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1. Introduction

“We must see the organism and environment as bound together in reciprocal specification”. (Varela et al. 1993, p. 174)

“In the body of each being are various lands, in the lands, beings”. (*Huayan jing* tr. Cleary 1993, p. 764)¹

“The creature that wins against its environment destroys itself”. (Bateson 1972, p. 501)

Coining the term ecology,² zoologist Ernst Haeckel first offered a working definition encompassing its panoramic scope: “By ecology, we mean the whole science of the rela-

tions of the organism to the environment including, in the broad sense, all the ‘conditions of existence’” (quoted in Stauffer 1957, p. 140). Inclusive from its inception, ecological theory has since been applied to a range of fields, both philosophical and practical. Especially keen on contemplating selves and interrelational dynamics between microcosm and macrocosm are the varieties of Buddhism, arguably among the more fruitful fields to interface with ecology. The present research explores the existential relevance of two contemplative technologies from Chinese Buddhism—*huatou* 話頭 and the *Huayan sanmei men* 華嚴三昧門—for environmentally sustainable behavior and oxytocin (a hypothalamic neuropeptide hormone expressed in primarily interrelational contexts) through a fieldwork experiment involving *huatou* and a proposed follow-up study on the *Huayan sanmei men*, while further offering an empirically testable framework for bridging ecologies that links Buddhist practices to emotion, sense of self, and behavior.

2. Bridging Ecologies

Previous attempts to relate Buddhism to ecology largely focus on comparing Buddhist teachings of interrelationality to the theoretical foundations of deep ecology, a social movement rooted in environmental philosophy. Its progenitor, eco-philosopher Arne Næss, characterizes deep ecology as entailing “organisms as knots in the biospherical net or field of intrinsic relations” (Næss 1973, p. 95), imagery resembling Indra’s net (Ch. *yintuoluo wang* 因陀羅網, *di wang* 帝網; Skt. *indrajāla*), a cosmic web of intersecting threads, at each vertex of which are embedded iridescent, multifaceted jewels, mutually reflecting all others. While discussing Buddhist environmental philosophy, Francis Cook highlights the ecological perspective which “views existence as a vast web of interdependencies in which if one strand is disturbed, the whole web is shaken” (Cook 1989, p. 213), thus invoking Indra’s net in an ecosystemic capacity. Examining systems theory alongside dependent origination (Ch. *yuanyi* 緣起; Skt. *pratityasamutpāda*), Joanna Macy emphasizes that “we are also as interrelated as parts of a tree—out of whose interweaving relationships we cannot fall, for we are they” (Macy 1991, pp. 219–20), imagery which likewise resembles Indra’s net in its arborescent meshwork. David Barnhill even argues that Buddhism may help clarify and refine deep ecology (Barnhill 2001, p. 78) through its discussion of relationships among phenomena, simultaneously highlighting distinctness and interrelatedness, both of which are key to discussions of self and relationality (pp. 85–86). Multiple scholars have found value in placing Buddhist interrelationality, variously expressed, in dialogue with ecological theory, though none have endeavored to scientifically corroborate the connection, making the intersection between Buddhism and ecology an area worthy of empirical investigation.

The *Huayan jing* 華嚴經, after which *Huayan* 華嚴³ adopts its name, houses a body of teachings especially ecological in content. Given the vastness of the *Huayan* corpus and limits of space in the present article, a modest handful of examples will be examined here. Consider, for instance, a verse from Chapter 1, “The Wonderful Adornments of the Leaders of the Worlds” (*Shizhu miaoyan pin* 世主妙嚴品), which implies that nature may be a source of Dharma (Ch. *fa* 法): “Far-reaching practice—the stage of oceanic wisdom,/Totally comprehending all aspects of the teachings,/Appearing in all lands like space:/The voice of these teachings comes from the trees” (Cleary 1993, pp. 146–47).⁴ While it receives little commentarial attention, such imagery can nonetheless be interpreted as giving reason to safeguard nature as a potential source of the Buddha’s teachings and site of enlightenment. Perhaps even suggesting a form of ecological reciprocity, a passage from Chapter 26, “The Ten Stages” (*Shidi pin* 十地品), alludes to mutual containment between individual bodies (Ch. *shen* 身; Skt. *kāya*) and lands (Ch. *sha* 刹; Skt. *kṣetrā*): “In the body of each being are various lands, in the lands, beings” (Cleary 1993, p. 764).⁵ Interpreted broadly in light of ecology, each instantiation of embodiment houses micro-ecologies and is itself in turn housed by macro-ecologies, the health of which are mutually entangled. What we do to the environment, we do to ourselves. Inclusive of the entire *dharmadhātu* (Ch. *fajie* 法界), Chapter 33, “Inconceivable Qualities of Buddhas” (*Fo busiyi fa pin* 佛不思議法品), features a list

of ten exhaustive knowledges (Ch. *dabian zhi* 大遍知; Skt. *sarvajña*) with which all Buddhas are endowed, the eighth, ninth, and tenth of which are relevant to ecology through their interrelational insights: “They know all phenomena come from interdependent origination. They know all world systems exhaustively. They know all the different phenomena in all worlds, interrelated in Indra’s net” (Cleary 1993, p. 925).⁶ The relationship between the *dharmadhātu* and Indra’s net is especially significant to the existential and ecological application of Huayan philosophy as practice. While a comprehensive assessment of the entire *Huayan jing* and other Huayan treatises is not feasible here, their interrelational contemplations find a home in the broad field of ecology.

Previous work converges around the consensus that the *Huayan jing* and Huayan Buddhism are sources of ecological insight. Environmental ethics philosopher Holmes Rolston III contends that, contrary to the anthropocentric view emphasizing human dominion over nature, the *Huayan jing* offers a biocentric view (Rolston 1987, p. 182). Barnhill (2001) in environmental studies likewise insists that “Huayan has provided the fullest Buddhist philosophy of nature” given its detailed analysis of both the part–whole relation and the part–part relation (p. 84), thus highlighting the Huayan perspective on relational holism, which “affirms and focuses on individuals as well as the whole, [...] upholds the integrity and importance of relationships” (pp. 99–100), and “helps us realize that we can value both individuals in their concrete relationships as well as the total field of relationships of which we are a part” (p. 102). In other words, all phenomena are equally embedded in the Huayan vision of Indra’s net, yet each is simultaneously its own. Rather than fold the many into one in such a way that collapses and conflates them, both the manifold and its individualities are preserved in the net’s myriad distinct yet integrated pieces. Each jewel is uniquely its own microcosm, yet simultaneously intertwined and of the same cloth, reflecting all other jewels in the vast net as macrocosm. Existentially, all phenomena are interdependently originated, existing not in and of themselves, but embedded in a tapestry defined by its intersecting threads. With damage to one node, one strand of netting, the entire ecosystem is at risk of unraveling.

Affirmation of the *Huayan jing* and Huayan Buddhism as sources of ecological insight is also reflected in a sampling of the available literature in Chinese. For instance, the integrity referenced in general systems theory, according to which living organisms or ecological systems are constituted by interrelationships among their internal elements, runs parallel with the Buddhist teaching of dependent origination, which regards the *dharmadhātu* and any single condition as a whole composed of various conditions (Chen 2015, p. 478).⁷ Contemplation of the *dharmadhātu* in the form of the *Huayan fajie guan* 華嚴法界觀 has been called the pinnacle of dependent origination and is believed to provide an in-depth theoretical foundation for ecological holism and symbiotic environmental protection (Lai 2010).⁸ In the Huayan framework, that all dharmas are empty and have no intrinsic nature allows them to mutually blend and integrate without obstructing or obscuring their differences (Zhao 2015, p. 335).⁹ Specifically, Indra’s net expresses the idea that all phenomena in the universe are in complex multi-level interrelationships and has thus been deemed the most appropriate metaphor for the integrity of the phenomenal world (Zhang and Ren 2003, p. 45).¹⁰ On this basis, humanity may move beyond an anthropocentric view of human beings as holding priority in the ecosystem, just as we should not mistake a single jewel in isolation for the entirety of Indra’s net (Shan 2007, p. 126).¹¹ Although it is unrealistic to pin the hope of changing the environment and maintaining ecological balance on Buddhism, ecological ethics and practices in Buddhist culture are nonetheless significant for ecological and environmental protection (Bi 2013, p. 124).¹² Building upon such theoretical foundations, the *Huayan jing* and Huayan Buddhism are worth further investigation for their existential and ecological relevance.

However, the *Huayan jing* and Huayan Buddhism are not without their skeptics. Although at times favorable in his attitude toward both, Rolston questions the relevance of Indra’s net as a causal model comparable to empirical discoveries in ecosystems and instead emphasizes its function as a metaphor model describing operations in ecosystems,

either by direct mapping or by an interlevel translation from metaphysics to science (Rolston 1987, p. 182). Unfortunately, Rolston neglects to substantiate his assertions with reference to either primary texts from Huayan Buddhism or empirical literature. For instance, consider parallels between the *Huayan jing*'s references to the pores of the body containing infinite lands¹³ and discoveries of environmental pollutants such as microplastics in the human body, including their detection in the bloodstream (Leslie et al. 2022) and placental tissue (Ragusa et al. 2021). While these findings post-date Rolston's skepticism by decades and the *Huayan jing*'s metaphysics by millennia, Rolston also neglects to engage with scientific studies contemporary to him. Research into the vulnerability of human lungs to radioactive particles (Booker et al. 1967) was already underway a full 20 years before the publication of Rolston's article, while environmental pollutants were found in human follicular fluid (Trapp et al. 1984), crucial to fertilization and the development of a viable embryo, several years prior. Yet Rolston and his contemporaries in comparative Buddhist-ecological research regrettably make no mention of such scientific studies despite their existential and ecological relevance.

While the purpose of passages on pores of the body from the *Huayan jing*, having no concept of microplastics or other such contemporary concerns, is not explicitly to predict or warn against the effects of environmental degradation, they nonetheless can be integrated into a fusion of Buddhist and ecological horizons, where "old and new are always combining into something of living value" (Gadamer 2004, p. 305). Hermeneutical research on Huayan Buddhism suggests a mere attempt at historical reconstruction risks presenting only corpse-like information having nothing to do with the present existence (Obert 2023, pp. 25–26). "The real meaning of a text, as it speaks to the interpreter," writes Gadamer, "does not depend [only] on the contingencies of the author and his original audience [...] for it is always co-determined also by the historical situation of the interpreter" (Gadamer 2004, p. 296). Multiple further examples abound for comparison, but suffice it to say that Rolston and other skeptics neglect to cite or reference emerging technologies and empirical findings either supporting or opposing the relevance of the *Huayan jing* and Huayan Buddhism for contemporary ecology. Nor have most researchers examined Huayan practice, an area almost entirely neglected by existing studies.

Relevant to ecology and more amenable to scientific investigation as a function of Buddhist practice is oxytocin. An existentially salient neuropeptide, oxytocin's life-facilitating functions include its contributions to reproduction, childbirth, and nursing (Lee et al. 2009), hence family ecologies. Beyond immediate kin, oxytocin also contributes to increased generosity toward strangers (Zak et al. 2007), thereby implicating broader social ecologies. Given that oxytocin often implicates interrelational dynamics, oxytocin is existentially relevant to ecology. The experimental fieldwork that follows specifically investigates the effects of *huatou*, a form of contemplative technology from Chan Buddhism, on oxytocin alongside potential connections to environmentally sustainable behavior. Meanwhile, a proposed follow-up study discusses the *Huayan sanmei men*, a form of contemplative technology from Huayan Buddhism, given its practical potential for bridging inner and outer ecologies. The role of oxytocin in bridging ecologies in the existentially relational sense originally put forth by Haeckel is thus worth further investigation, especially in the context of contemplative technologies.

3. Contemplative Technologies

Buddhist practices represent a rich toolbox of contemplative technologies, "rigorous, replicable methods" in the study of consciousness "that science needs [in order] to expand its scope and encompass all of reality, including the subject pole of experience" (Wallace 2021, p. 3). B. Alan Wallace deems meditation training a form of contemplative technology that develops the primary tools to directly explore mental phenomena (Wallace 2007, p. 111). Contemplative technologies hence entail introspective examination of individual minds and thus investigation of inner ecologies, which may be defined in a phenomenologically intrasubjective sense as the contents of consciousness and their relational structures,

such as the relationship between emotion (e.g., doubt, awe, etc.) and sense of self. Contemplative technologies also entail application to outer ecologies, which may be defined in a phenomenologically intersubjective sense as networks of social and environmental interactions among organisms, such as behavioral relationships between humans and the non-human world. In Buddhist contexts, a thoroughgoing contemplation of inner ecologies transforms the practitioner's engagement with outer ecologies. The present research intends to illuminate the role of two contemplative technologies, *huatou* and the *Huayan sanmei men*, in their use of existential, aesthetic emotions (doubt and awe) to invoke empirically measurable changes in sense of self (as constituted by ecologically interrelational dynamics, potentially reflected in the variability of oxytocin and phenomenological reports) alongside environmentally sustainable behaviors, thereby offering a framework for bridging inner and outer ecologies.

Few studies attempt to investigate the relationship between contemplative practices and environmentally sustainable behavior. A single study reports no effect of Mindfulness Based Stress Reduction (MBSR) on self-reported pro-environmental behavior (Riordan et al. 2022), while another study identifies positive correlations between mindfulness meditation and self-reported pro-environmental behavior (Jacob et al. 2009). However, both studies relied entirely on survey, in which behaviors can be easily misrepresented, and on mindfulness, one of many varieties of contemplative practice that is often secularized and severed from its Buddhist roots. While theoretical work on Buddhism and environmentalism has been undertaken, no experimental research exists bridging these fields.

Likewise, the variability of oxytocin as a function of contemplative practice is relatively uncharted territory in both scientific research and religious studies. Although oxytocin has been investigated extensively in the context of mother–infant relationships (Feldman et al. 2007), empirical examination of changes in oxytocin as a function of Buddhist practice, or other traditionally religious contemplative technologies, remains entirely neglected. While a relationship between self-reported spirituality and endogenous oxytocin has been observed (Holbrook et al. 2015), scientific literature investigating contemplative practice and oxytocin is remarkably scarce. In non-religious contexts, previous research suggests secularized yoga therapy can increase oxytocin among patients with schizophrenia (Jayaram et al. 2013) while secularized mindfulness can increase oxytocin among psychology students (Bellosta-Batalla et al. 2020). Although exogenous oxytocin has been administered as an antecedent to meditation in order to examine their combined effects on emotion (Van Cappellen et al. 2016), such research neglects to examine the effect of meditation on subsequent endogenous oxytocin. The possible link between various other contemplative technologies and oxytocin is unknown.

No scientific studies to date have examined the effects of traditional Buddhist practices in naturalistic religious contexts on both neuroendocrine and behavioral measures. Highlighting different variables in non-naturalistic lab settings, some have experimentally investigated contemplative technologies from Chinese Buddhism, including *nianfo* 念佛 and *huatou* 話頭. Briefly, *nianfo* translates approximately to “Buddha recitation (or recollection)” and involves verbal or silent repetition of the name of Amitābha Buddha (“Namo Amitufo” 南無阿彌陀佛 or “Amitufo” 阿彌陀佛 in Chinese language contexts). Meanwhile, *huatou* translates approximately to “head (or source) of speech” and involves silent repetition of a short phrase or word, often excerpted from the broader context of a traditional narrative exchange between a Buddhist teacher and student. *Nianfo* may induce focus and can be accompanied by visualization of Amitābha's Pure Land, a realm of respite from suffering. *Huatou* may induce insight into the topic of inquiry (such as “Who recites the Buddha's name?” to be discussed in detail shortly). Empirically most relevant to this article are, first, a study on the effects of *nianfo*, characterized as a form of repetitive religious chanting, on decreased brain activity associated with stress and fear (Gao et al. 2017) and, second, recent work on the differential effects of *huatou*, characterized as a form of self-inquiry, between two exclusively male samples: (1) lay, beginner meditators, among whom no significant effects were observed, and (2) monastic, long-term meditators, among

whom *huatou* helped detach from the concept of self, as reflected by decreased differences in brain activity in response to self vs. other images (Gao et al. 2023). Previous research classifies self-inquiry as belonging to the deconstructive family of meditation, which “aims to undo maladaptive cognitive patterns by exploring the dynamics of perception, emotion, and cognition and generating insights into one’s internal models of the self, others, and the world” (Dahl et al. 2015, p. 519). Such research, by its own admission, neglects relevant outer ecologies and their contexts, including religion, instead dealing only with inner ecologies in the form of cognitive mechanisms and phenomenological targets of meditation, acknowledging that “if we are to fully understand these practices, it will also be important to study the wider context within which these practices are engaged” (Dahl et al. 2015, p. 521). Therefore, the present research intends to integrate scientific theories and methods more equitably with contemplative technologies utilized in Chinese Buddhist contexts, attempting a recontextualization of meditation by situating it within some of its more explicitly religious ecologies.

3.1. *Huayan Practice as Contemplative Technology*

Often treated as a philosophical school, the practical innovations of Huayan Buddhism are frequently overlooked despite their immense potential for inducing an interrelational or ecological sense of self. Broadly, Huayan meditation involves progressing through “increasingly more holographic perspectives on a single phenomenological manifold” (Fox 2009, p. 73; Fox 2013, p. 185; Fox 2015, p. 269) and culminates in a vision of reality reflecting all phenomena as “omnipotentially present and mutually non-obstructing” (Fox 2015, p. 284). Of existential relevance, to fully realize the Huayan vision of the world requires transcending a mere intellectual grasp of its system and instead embodying its experiential account of existence, the actual living of which entails drastically altering one’s ethical stance in relation to others (Cook 1989, p. 228). Huayan offers methods for putting an understanding of interrelationality into practice. Its practices translate its complex philosophy into an experience of the relationship between parts and whole, organisms and environment. Multiple Huayan practices await systematic investigation, a sampling of which will be examined here.

Beyond their theoretical appeal, the insights provided by Huayan Buddhism into the interrelational structure of reality have practical inspirations and implications. A foundational treatise and basis for Huayan practice is the *Huayan fajie guanmen* 華嚴法界觀門, attributed to the tradition’s first patriarch, Dushun 杜順 (557–640 CE). The *Huayan fajie guanmen*’s conceptual innovations were products of Dushun’s meditative encounter with the *Huayan jing* and were “explicitly intended as devices by means of which the grand visions and vistas of that immense scripture could be incorporated into an individual’s practice of meditation and thereby transformed from text into religious experience” (Gimello 1976, p. 129). Such devices function as contemplative technologies for practical illustration of the *Huayan jing*’s otherwise potentially overwhelming content, including its cosmically all-encompassing interrelational imagery. Further reflecting its practicality, Zongmi’s commentary on Dushun’s *Huayan fajie guanmen* deems it a distillation of the essential meaning of the *Huayan jing* in light of Dushun’s meditative experience, presenting the truths of the *Huayan jing* from the perspective of religious practice, a hermeneutical approach that differs significantly from traditional scholastic exegesis (Gregory 1991, p. 8). Also relevant to practice is the *Huayan wujiao zhiguan* 華嚴五教止觀, likewise attributed to Dushun.¹⁴ Its fifth section specifically invites the audience into the experience of entering the jewels of Indra’s net (Obert 2000, p. 127). Thus, not only do Huayan metaphysics directly inform Huayan meditation (Fox 2015, p. 260), Huayan meditative experiences are grounds for the metaphysical insights expressed in Huayan texts.

Despite distillation, the contents of the *Huayan fajie guanmen* 華嚴法界觀門 remain surprisingly dense. The text includes three contemplations (1. *zhenkong guan* 真空觀, 2. *lishi wuai guan* 理事無礙觀, 3. *zhoubian hanrong guan* 周遍含容觀), each with multiple philosophically abstruse subdivisions, which collectively “represent a successive progression

through increasingly correct ways of looking at the world, culminating in the Huayan vision of a world comprising a multitude of phenomena existing in complete interpenetrative harmony" (Hammerstrom 2020, p. 170), a viewpoint from which "one sees the entirety of reality as a grand profusion of interrelated and interdependent phenomena, a wholeness wheeling in a cosmic dance of arising and passing away" (Hammerstrom 2020, p. 144). Originally, contemplation of the *dharmadhātu* (*fajie guan* 法界觀) was practiced as a contemplation of dependent origination (*yuanqi guan* 緣起觀), through which the objective was "to observe the myriad phenomena of the universe in their totality and in their absolute interdependence with one another" and in which "one should see the entire universe in a mote of dust" (Hammerstrom 2020, p. 171). Such interrelational imagery of macrocosm within microcosm is reminiscent of Indra's net, an awe-inducing visual with potential ecological applications that was uniquely developed and emphasized by Huayan Buddhism, though arguably lacking full potency in the *Huayan fajie guanmen*.

A striking image of Indra's net is conjured by a set of meditation instructions in the more existentially and ecologically evocative *Huayan wujiao zhiguan* 華嚴五教止觀. The text includes five "gates" or methods (1. *fayou wowu men* 法有我無門, 2. *sheng ji wusheng men* 生即無生門, 3. *shili yuanrong men* 事理圓融門, 4. *yu guan shuang jue men* 語觀雙絕門, 5. *Huayan sanmei men* 華嚴三昧門) and has been characterized as "a systematic description of successive stages of mental stabilization and analytic contemplation" (Cleary 1983, p. 12) containing rich philosophical ideas and rigorous rational argumentation (Yu 2009, p. 172). Opening with a familiar medicinal metaphor, Dushun makes clear the purpose of the five methods:

Prescriptions are designed in response to illness; when the illness is ended, the prescription is finished with. Medicine is dispensed to quell attachments; when attachments are gone, the medicine is done with. Since illnesses are manifold, the medicines given are not one. According to potentials, progress and practice differ; therefore techniques are not the same. (Cleary 1983, p. 45)¹⁵

The five methods Dushun prescribes can thus be understood as contemplative technologies to be applied medicinally, as appropriate to the practitioner-patient's existential illness. Although the *Huayan wujiao zhiguan* appears to have played a less central role in Huayan than the *Huayan fajie guanmen*, its weaving of the meditator into Indra's net makes it significantly more existentially and ecologically evocative.

Whereas the *Huayan fajie guanmen* presents contemplation of the *dharmadhātu* (*fajie guan*) in philosophically convoluted terms inaccessible to the average person, the *Huayan wujiao zhiguan* presents it by way of a far more accessible proxy: the image of Indra's net. Indeed, the *dharmadhātu*'s tendency to elude description is evident in the *Huayan jing* itself: although the term *fajie* appears frequently in the *Huayan jing*, it is never addressed separately, treated systematically, philosophically defined, explained, or analyzed (Oh 1979, p. 78; Fox 2015, p. 268). The *dharmadhātu* refers to worlds encompassing "the myriad factors of experience [...] the manifold of data that is apprehended and cognized by human consciousness" (Fox 2009, p. 73). Unfortunately, for the ordinary worldling, the *dharmadhātu*'s nebulosity makes its contemplation especially arcane. A clearer picture comes into focus through Indra's net as the *dharmadhātu*,¹⁶ particularly as illustrated in the *Huayan wujiao zhiguan*. Its fifth and final practice, the *Huayan sanmei men*, directly invokes the imagery of Indra's net, a simile for a "coalescing whole that can only be envisaged through the most encompassing contemplation" of radiant jewels functioning as "living mirrors that have the power to perceive and to reflect each other and the entire universe" (Yu 2007, p. 315). Such visualization depicts the relationship of mutual containment of each *dharma* or "quanta of experience" within all others (Fox 2013, p. 182). Interestingly, the *Huayan sanmei men* describes the meditator sitting within the net's jeweled structure.¹⁷ The visual content of the *Huayan sanmei men*, which viscerally situates the meditator directly in Indra's net, is thus of particular relevance to the integration of contemplative technology with ecology.

Although Huayan practices are of special interest to the empirical study of Buddhism and ecology, they are seldom widely or explicitly taught in Chinese Buddhist contexts. Rather than a departure from Huayan, more broadly circulated Chan methods may induce a comparable pivot in perspective. Among other fusions, Huayan has been synthesized with Chan across multiple historical iterations (Wang 2020; Wei 1998; Yoshizu 1985).¹⁸ Drawing a common thread, Robert Buswell highlights the correlation between Huayan and Chan in their interrelational scope: “In seeing the macrocosm of the universe reflected in the microcosm of the individual, the Ch’an conception of enlightenment is framed in terms evocative of the summum bonum of Hua-yen philosophy, the ‘multivalent interfusion of all phenomena’” (Buswell 1987, p. 356). Thus, Chan and Huayan understandings of interrelational ecology are significantly overlapping. As shall be shown, *huatou* and the *Huayan sanmei men* function as complementary contemplative technologies for challenging and resolving existential matters concerning the sense of self and its relationship to broader ecologies.

3.2. *Huatou Practice as Contemplative Technology*

Huatou 話頭¹⁹ is a form of meditation most often associated with the Linji Chan tradition of Chinese Mahāyāna Buddhism. Starting with Chan Master Dahui Zonggao 大慧宗杲 (1089–1163 CE), Linji methods shifted from the literary *gongan* 公案 to the practical *huatou* (Hsieh 1994, pp. 66–67), a contemplative technology that has been characterized as existential (Yü 1979, p. 226; Buswell 1987, p. 353; Levering 2013, p. 362; Eichman 2016, p. 282; Adamek 2020, p. 136). The *huatou* “Who recites the Buddha’s name?”²⁰ has been attributed to either Chan Master Zhenxie Qingliao 真歇清了 (1089–1151 CE) of the Caodong School or Chan Master Zhiche Duanyun 智徹斷雲 (1309–? CE) of the Linji School, but likely traces its origins to Pure Land Master Youtan Pudu 優曇普度 (1255–1330 CE) of the White Lotus School.²¹ According to Chün-fang Yü’s pioneering work, both *gongan* and *huatou* can be regarded as an “opening wedge” in the sudden and intuitive apprehension of a new reality (Yü 1979, p. 221), creating a clearing or opening for its onrush (Yü 1979, p. 224). Though it can simply refer to a means of creating an entry point, an opening wedge is also a surgical device that shifts pressure from the damaged side of a joint to its healthier side. As painful and invasive as surgeries are, their purpose is to relieve unpleasantness. By interpreting the phenomenology and functioning of *gongan* and *huatou* as comparable to a medical procedure and instrument, both practices are instilled with connotations of contemplative technology for the transcending of suffering.

Practices involving *gongan* and *huatou*, however, may appear crude in their use of blunt force and brute power. Both *gongan* and *huatou* are characterized by a complex emotional and phenomenological palette: from “bewilderment, frustration, anxiety, and anger” (Yü 1979, p. 221) to “perplexity, bursting, power, and interfusion” (Buswell 1987, p. 349). The power of great doubt (Ch. *dayi* 大疑) stirred by *gongan* and *huatou* is comparable to the force of *samvega*, an existential, aesthetic emotion that functions as a catalyst for a reorienting pivot in perspective, prodding one to realize the danger in complacency and pushing one out of it through the sheer shock of witnessing existential, often unpleasant truths, otherwise disguised by the illusion of worldly enchantment (Liang and Morseth 2021, p. 215). While *samvega* may accidentally arise through encounters with death or stories of suffering, it can also be intentionally induced through meditation (Brons 2016, pp. 84–85). Both *gongan* and *huatou* instigate *samvega*, the existential urgency to resolve the great matter of life and death (Ch. *shengsi dashi* 生死大事).

Importantly, the transmutation of doubt into faith is key to the success of *huatou*, making it an especially potent contemplative technology. Exploring its similarities to existentialism, Wendi Adamek refers to *huatou* as an “active device” that makes use of the non-duality of doubt and faith (Adamek 2020, p. 146). Likewise, Miriam Levering deems *huatou* an “innovative verbal tool” that concentrates and harnesses the power of uncertainty and doubt, primarily through its approach to mortality, “a critical node in samsaric experience”, in order to enable its practitioners to reach a feeling of ease that Dahui calls “saving

strength” (Levering 2013, p. 362). The ease associated with saving strength (Ch. *shengli* 省力) is reminiscent of the serene faith of *pasāda*, another existential, aesthetic emotion, especially as it synergizes with the existential urgency of *samvega*: “*Samvega* devoid of *pasāda* can feel meaningless, like the anxious itch of agitation, a debilitating ache without purpose. *Pasāda* helps regulate and redirect *samvega*’s oppressive dismay and dissatisfaction, harnessing and channeling those energies into purposeful practice” (Liang and Morseth 2021, p. 207). Doubt is to *samvega* as faith is to *pasāda*; *gongan/huatou* as contemplative technology functions to transmute the former into the latter. Perhaps relevant to faith, oxytocin is associated with increased trust (Kosfeld et al. 2005) and buffers against decreased trust following betrayal (Baumgartner et al. 2008). In combination with the abundance of research on oxytocin in interrelational contexts, the potential relationship between oxytocin and trust lends itself to the following hypothesis. Oxytocin may also be activated by contemplative technologies that invoke doubt or other self-transcendent emotions and transmute them into faith or trust—including the existential certainty that one is inextricably embedded in broader ecologies, of which all are equally part.

While ostensibly verbal in methodology, the purpose of *huatou* is not to indulge discursive contemplation, but to exhaust and transcend it. The renowned Chan monk Xuyun 虛雲 (1840–1959 CE)²² illustrates the existential characteristics of *huatou* as a form of contemplative technology by invoking another medical analogy:

The aim of this method was to use a single thought to oppose and arrest myriad thoughts because the masters had no alternative. It was like an operation which became imperative when poison had been introduced into the body. There were many kung ans (devised by the ancients but) later only hua t’ous were taught such as: “Who is dragging this corpse here?” and “What was my fundamental face before I was born [i.e., before my parents gave birth to me]?” In the present day, the masters use the hua t’ou: “Who is the repeater of Buddha’s name?” (Luk 1970, p. 23)²³

Whether in its pre-natal or post-mortem forms,²⁴ the methodology of *huatou* may be characterized as leveraging the beginnings of a thought to still all thought, without relying on the full rational faculty or pursuing thought to its furthest end. Its use of language functions as a form of “spiritual homeopathy” in which a minimal yet potent dosage of the “poison of words” is utilized in order to “cure the malady of conceptualization” (Buswell 1987, p. 348). The self-referential content of *huatou* is an expedient and ought not reify or reinforce the assumption of any self-existent referent. Dahui’s instructions offer additional clarification for the practice of *huatou* by way of negation:

When you observe it, do not use extensive evaluation, do not try to explicate it, do not seek for understanding, do not take it up when you open your mouth, do not make meaning when you raise it, do not fall into vacuity, do not hold onto your mind waiting for enlightenment, do not catch a hold of it when your teacher speaks, and do not lodge in a shell of no concerns. (Heller 2009, p. 301)²⁵

Parallel to its provisional use of language, the existential urgency that *huatou* conjures in the form of *samvega* is likewise not to be indulged, but to be exhausted and transcended. As Dahui confirms, “While one can access the path through the gate of expedients, it is a sickness to conserve expedients and not discard them” (Buswell 1987, p. 349).²⁶ Once a medicine serves its purpose and the patient is free of disease, that medicine is to be discontinued lest it become an addiction or poison,²⁷ just as a raft is to be set aside upon crossing a river and reaching the further shore.

4. Methods

In order to begin to bridge a conspicuous gap in existing research, experimental fieldwork was conducted in July 2016 at Fo Guang Shan 佛光山, a prominent Chinese Buddhist monastery in Taiwan. Prior to data collection, Institutional Review Board approval was obtained, an Environmental Health and Safety Report was filed, and research was en-

dorsed by the Retreat Coordinator, a monk and Vice Abbot of Fo Guang Shan at the time of the study. Prospective participants were screened in advance and excluded for use of hormonal medications that may interfere with oxytocin levels. Although 36 participants initially enrolled in the study, only 32 participants remained after withdrawal or providing incomplete data, while 30 participants were included in the final dataset after exclusion of outliers. Participants were international retreatants from North and South America, Europe, Asia, and the Pacific, ages 19–31 ($M = 24.75$, $SD = 3.14$; 16 males, 14 females). All participants were attendees of the 2016 Fo Guang Buddhist Monastic Retreat (FGBMR), a one-month immersive study-practice program on Chinese Buddhism.

The FGBMR program consisted of a variety of Buddhist study and practice opportunities intended for participants “interested in experiencing authentic Chinese Buddhist monastic life”. Over the course of the one-month retreat, participants were introduced to Chinese Buddhist doctrine through lectures by monastics and professors, Chinese Buddhist chanting liturgy (e.g., Pure Land Dharma Assembly), Chinese Buddhist meditation practice (e.g., *huatou* Chan), and community service in the form of assisting with common chores around the monastery, among other activities.

For the *nianfo* component of the study, saliva samples were collected in cryovials at two time-points, three hours apart, at 6:30 p.m. and 9:30 p.m. on a single evening, 30 min before and shortly after a period of *nianfo* practice. The period of *nianfo* practice consisted of a Pure Land Dharma Assembly (Ch. *Jingtu fahui* 淨土法會). Participants were first briefed on visualization of the Pure Land, while the assembly proper began with slow repetition of “Namo Amitufo” 南無阿彌陀佛 and gradually increased in pace to fast repetition of “Amitufo” 阿彌陀佛. Participants were led in *nianfo* by a small team of Buddhist nuns, who recited into a microphone and played liturgical instruments such as the wooden fish (Ch. *muju* 木魚) and hand bell (Ch. *yingqing* 引磬). A longer period of vocal recitation while standing, walking, and sitting was followed by a shorter period of silent meditation on the Pure Land. The practice period ended with a Pure Land dedication liturgy.

For the *huatou* component of the study, saliva samples were collected in cryovials at two time-points, three hours apart, at 12:30 p.m. and 3:30 p.m. on a single afternoon, 30 min before and shortly after a period of *huatou* practice. The period of *huatou* practice consisted of alternating sitting meditation and walking meditation in silence. The Retreat Coordinator, a Buddhist monk, provided participants with simple instructions to meditate on the *huatou* “Who recites the Buddha’s name?” 念佛是誰, which was contextualized by the Pure Land Dharma Assembly attended by participants four days earlier. Participants were permitted to simply meditate on the question “Who?”

Immediately after data collection, samples were stored in a monastery freezer. Nine days after *huatou* data collection and 13 days after *nianfo* data collection, samples were shipped on dry ice from Taiwan to the United States. Samples arrived semi-frozen at the receiving laboratory 36 h later and were stored in a laboratory freezer. Two months after arrival at the laboratory, assays were performed on the samples. During data collection, participants were required to produce at least one milliliter of saliva in the two-milliliter vial provided to them in order to remain viable once samples were centrifuged and the aqueous layer was aliquoted. All samples underwent extraction, after which oxytocin was measured through enzyme-linked immunosorbent assay (ELISA) using commercially available oxytocin ELISA kits (Enzo Life Sciences, Inc., Farmingdale, NY, USA).

Food waste and recycling were also measured throughout the retreat. Unbeknownst to participants, at quasi-random intervals during the one-month window under investigation, plates were collected after formal lunch meals in the monastery’s dining hall, while the contents of recycling receptacles in common areas were gathered after break periods. Both were measured by mass in order to track relative volume of food waste and recycling as a function of time on retreat. Food waste was collected onto a single receiving plate, weighed, and divided by the sample size to produce an averaged value. Recycling contents were likewise weighed as a single unit in a bin. However, given the impracticality of verifying whether all participants contributed to recycling, in addition to significantly

greater variability in individual contributions to recycling, the resulting mass was left as a total instead of averaged through division by an estimated sample size of recycling contributors. Recyclable materials available to participants were plastics in the form of beverage bottles, whose quantity of usage remained consistent throughout the retreat, as verified by visual inspection and counting of used bottles on the days of data collection. Signage around the trash and recycling receptacles consisted of bilingual labels in both traditional Chinese characters and English specifying the content of the receptacle. Neither recycling nor food waste were topics discussed by the retreat staff and participants over the course of the one-month program. All reported values are the net weight, reflecting the tare weight subtracted from the gross weight. Quantifiable recycling and food waste were thus treated as ecologically viable alternatives to mere self-reported survey measures of environmentally sustainable behavior.

Phenomenological reports were also solicited from participants in the form of journal entries following each practice. Participants were provided with pens and paper and were given the prompt: "Please describe your experience during [*huatou/nianfo*] practice". There was no time limit to the journaling task and participants were allowed to write as much or as little as they wished.

5. Results

All statistical analyses were performed using IBM SPSS Statistics Version 28.0.1.0. Following common practice, statistical significance was set at $p < 0.05$. Both datasets, for *nianfo* and *huatou*, were first analyzed separately through paired-samples t-tests. Results of analysis reveal a slight decrease in salivary oxytocin concentration as a function of *nianfo* practice and a slight increase in salivary oxytocin concentration as a function of *huatou* practice. Although both practices resulted in quantifiable changes in oxytocin, neither the results of *nianfo* ($t(29) = -1.252, p = 0.221$, Cohen's $d = -0.229$) nor *huatou* ($t(29) = 1.545, p = 0.133$, Cohen's $d = 0.282$) reached the threshold for statistical significance. The increase in salivary oxytocin concentration as a function of *huatou* practice, however, approaches statistical significance and remains viable for discussion and follow-up. Hence, a within-subjects repeated-measures analysis of variance (ANOVA) was also conducted combining both *nianfo* and *huatou* datasets. Results of analysis reveal a marginally significant time*practice interaction effect ($F(1,27) = 3.728, p = 0.064$), such that oxytocin increased after *huatou* practice and decreased after *nianfo* practice. In other words, the mean oxytocin values for each practice trended in opposite directions as a function of time.

Assessment of food waste and recycling also revealed quantifiable trends reflective of environmentally sustainable behavior: an overall decrease in food waste and increase in recycling by mass. Despite no change in the amount of food or recyclable material available to participants over the course of the testing period, participants produced less food waste and more recycling as a function of time on retreat.

Phenomenological reports of practice yielded a variety of experiential accounts. Representative examples from *huatou* include:

"Definitely the most immersive experience so far. Almost like being inside and a part of a fractal pattern—of human bodies [...] of consciousness. I was able for the first time so far to overcome the discomfort of sitting upright by thinking about the idea of no-self".

"I felt varying degrees of out-of-body experience. Certainly there was a loss of individual identity [...] My sense of 'I' was melded with a bigger, more universal, sense of 'we'. Yet, I felt very awake—not mindless or diminished in terms of attention and clarity".

Representative examples from *nianfo* include:

"The chanting was a very metaphysical experience. At some point the words stopped becoming words and more of a fluid sound".

“As soon as I shut my eyes I felt an invigorating rush. Almost a bit like vertigo, I felt a sense of momentum, which was in tune with my visualisation of soaring across grass hills towards a bright sky with a glowing Buddha. I also saw ‘electric’ sparks and streaks”.

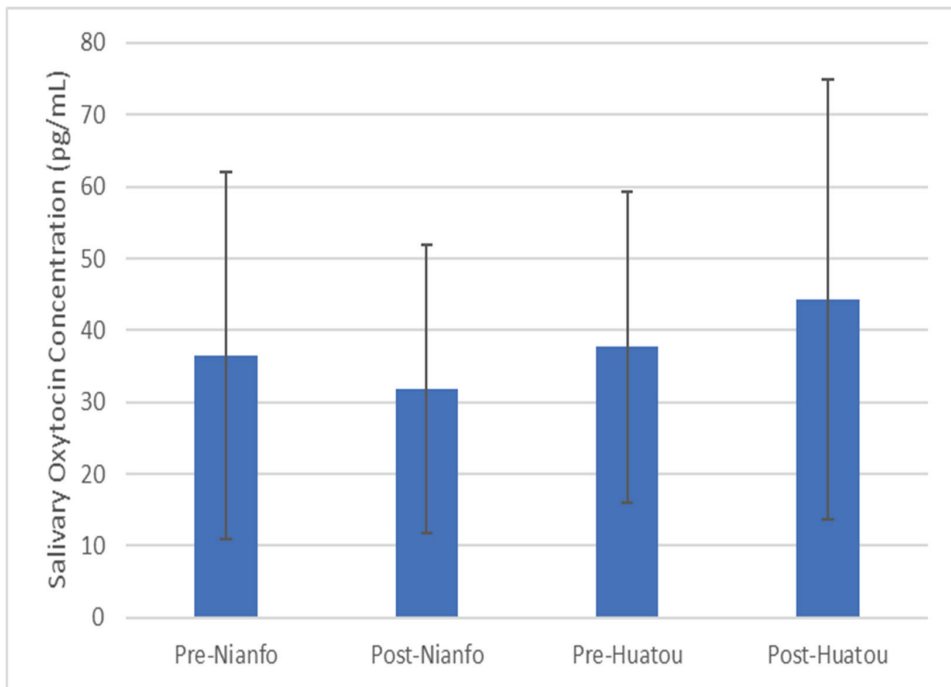
“The experience was very unusual. At times it felt psychedelic. I stopped understanding the words o mi tuo fo and just heard sounds. I couldn’t distinguish the words at one point”.

Interpretation of phenomenological reports will be carried out in the following discussion.

Oxytocin data for pre- and post-measures of *nianfo* and *huatou* are presented in Table 1 and Figure 1a,b. Food waste data are presented in Table 2a and Figure 2a. Recycling data are presented in Table 2b and Figure 2b.

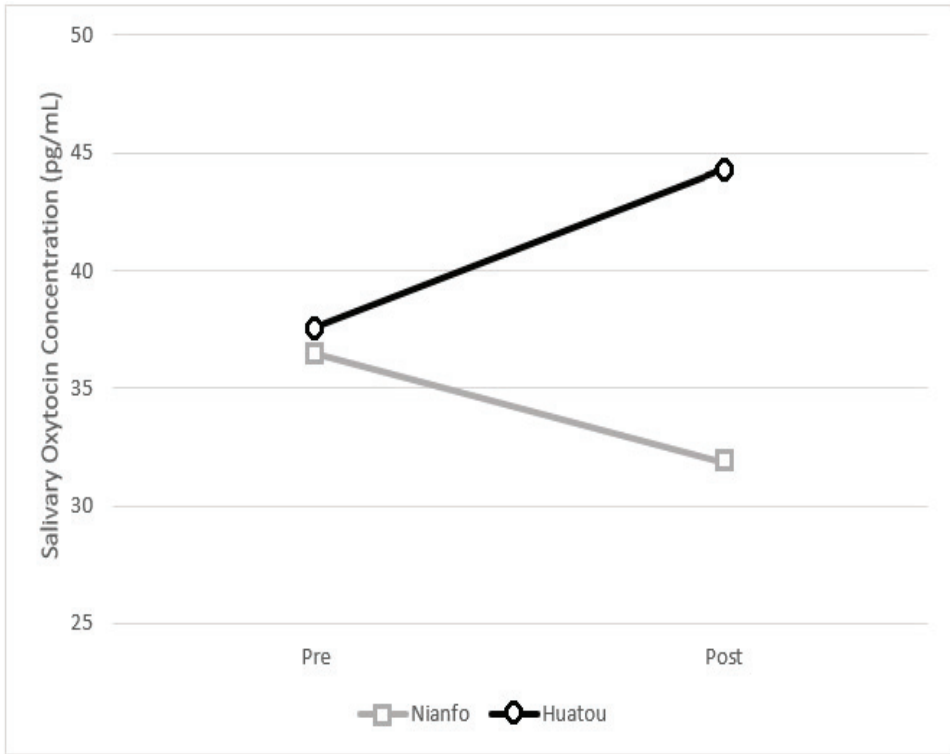
Table 1. Salivary oxytocin concentration. Values reported are means (*M*), standard deviations (*SD*), and standard errors (*SE*) for pre- and post-*nianfo* and *huatou*. All units are in picograms per milliliter (pg/mL).

Time-Practice	Mean (<i>M</i>)	Standard Deviation (<i>SD</i>)	Standard Error (<i>SE</i>)
pre- <i>nianfo</i>	36.4652	25.63092	4.67954
post- <i>nianfo</i>	31.8623	20.05921	3.66229
pre- <i>huatou</i>	37.6425	21.58006	3.93996
post- <i>huatou</i>	44.2473	30.67912	5.60122



(a)

Figure 1. Cont.



(b)

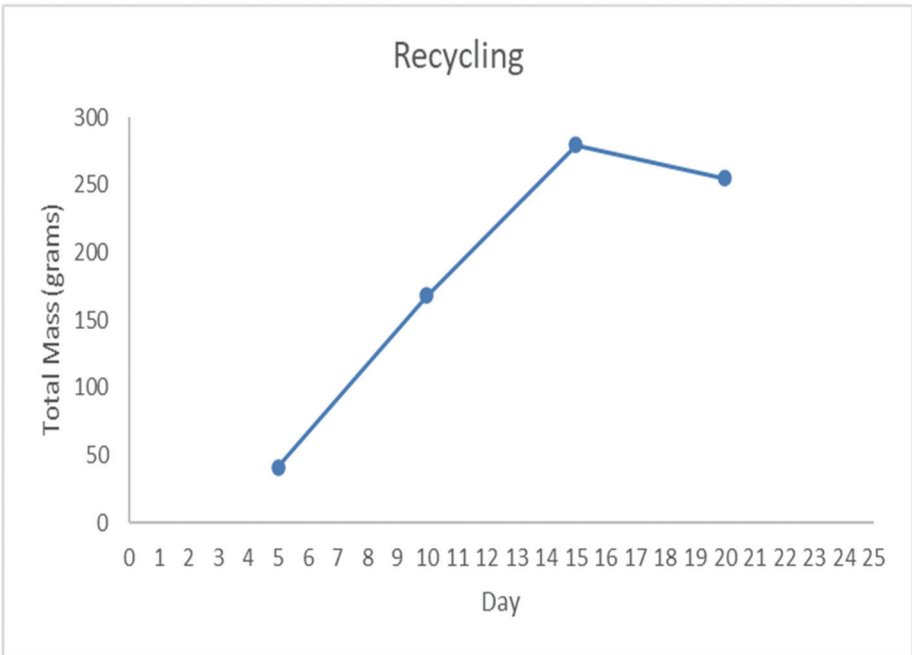
Figure 1. (a) Salivary oxytocin concentration pre- and post-*nianfo* and *huatou* (mean \pm one standard deviation). (b) Time*practice interaction for salivary oxytocin concentration.

Table 2. (a) Food waste by mass. (b) Recycling by mass.

(a)	
Day	Average Mass (grams)
2	8.07
9	1.72
14	1.28
21	3.27
(b)	
Day	Total Mass (grams)
5	41.1
10	168.1
15	279.6
20	254.8



(a)



(b)

Figure 2. (a) Food waste by mass as a function of time on retreat. (b) Recycling by mass as a function of time on retreat.

6. Discussion

The presently reported fieldwork is the first of its kind to experimentally evaluate endogenous oxytocin as a function of Buddhist contemplative practice. Given that oxytocin is usually expressed in interrelational contexts, its increase following the introspective practice of *huatou* may initially appear to be an anomaly. However, *huatou*, especially when invoking the question “Who?” as in the present study, explicitly targets the meditator’s sense of self. Consistent with targeting the sense of self,²⁸ Yunqi Zhuhong 雲棲株宏 (1535–1615 CE) affirmed the use of doubt as a form of investigation,²⁹ while Hanshan Deqing 憨山德清 (1546–1623 CE) linked *huatou* directly to self-investigation.³⁰ By investigating, even interrogating, the sense of self, *huatou* may thus induce an altered sense of self, such as self-transcendence. Self-transcendence is linked to oxytocin. Previous research indicates that exogenous oxytocin administration increases self-reported measures of spirituality, interconnectedness, meaning, purpose, and self-transcendent positive emotions following meditation (Van Cappellen et al. 2016). Additional research likewise confirms that oxytocin implicates the sense of self. Oxytocin is associated with decreased self-focus (Liu et al. 2013), increased other-focus (Bartz et al. 2011), and decreased self–other distinction (Zhao et al. 2016). Hence, the link between *huatou* and oxytocin likely entails self-transcendence or another form of altered sense of self, consistent with the existential function of *huatou* in targeting the sense of self and the expression of oxytocin in interrelational contexts in which the sense of self is shaped by its broader ecologies.

Indeed, while both *nianfo* and *huatou* yielded vivid experiential accounts via phenomenological reports, only *huatou* directly implicated the sense of self. As reported above, post-*huatou*, one participant commented, “I was able for the first time so far to overcome the discomfort of sitting upright by thinking about the idea of no-self”, while another wrote, “Certainly there was a loss of individual identity [...] My sense of ‘I’ was melded with a bigger, more universal, sense of ‘we’”. In contrast, post-*nianfo*, participants were more likely to describe their visual and auditory experiences, which did not directly implicate a sense of self.

Alterations in the sense of self are induced by contemplative technologies from Chan Buddhism, both anecdotally and experimentally. Buswell paints a vivid picture of the self-transcendence process in the context of *huatou*:

Whereas previously all of one’s experiences were seen to revolve around one’s self, and interpreted as either self or other, through *k’an-hua* practice the mind opens into a new, all-inclusive perspective from which the limiting “point of view” that is the ego (*ātma-vāda*) is eliminated. Awareness now has no fixed locus. The distinctions ordinarily perceived between self and other disappear, and consciousness expands infinitely, encompassing the entire universe both spatially and temporally. (Buswell 1987, p. 355)

Such alteration in the sense of self is consistent with a previous study on the effects of *huatou* practice among Chinese Buddhist monks, whose brain waves reflected greater flexibility in self-schema processing via decreased differences in self-oriented vs. other-oriented neural activity (Gao et al. 2023). These findings begin to address previously acknowledged gaps in existing scientific research regarding forms of insight that may arise through self-inquiry (Dahl et al. 2015). Contemplative insight into the malleability of the self–other boundary, found instantiated in neuroelectrical correlates such as brain waves and neuroendocrine correlates such as oxytocin, may in turn contribute to behavioral change reflective of increased awareness of interrelational ecologies, a possibility awaiting further empirical research.

Especially relevant to ecology and the *huatou* results of the presently reported fieldwork, the prevalent role of oxytocin in the parent–child bond also reflects the role of oxytocin in existentially shaping one’s sense of self. Previous research has demonstrated a cross-generation transfer of oxytocin from parents to children through caregiving, shaping both affiliative biology and social behavior (Feldman et al. 2013). Hence, oxytocin plays a part in shaping relational habituations, which are generalizable from parent–child con-

texts to broader ecologies. Relevant to deep ecology, according to Næss, to have a home and thus develop a sense of self in an ecological capacity is shaped not only by interactions with one's mother and father, but also by interactions with the broader manifold of the natural world (Næss 1989, p. 164).³¹ This ecological self is evident to infants and is "always situated in environments" (Neisser 1999, p. 207), hence largely defined by its relational positionality or embeddedness in the ecosystem. The ecological relationship between sense of self and oxytocin, both particularly malleable in an infant's early years and measurably altered by interaction between children and parents, perhaps sheds new light on the possible implications of Chan practices inquiring into one's original face before one was born.³² That light may be as follows. If *huatou* can increase oxytocin, parallel to increases in oxytocin within parent-child ecologies, then it seems plausible that both *huatou* and the parent-child relationship act on the sense of self in order to achieve such effects.

6.1. Limitations

Despite their novelty and potential, the *huatou* oxytocin results are to be treated with caution. The *huatou* samples were obtained during the first day of a seven-day Chan retreat, a point at which participants were introduced to *huatou* in simple terms. Due to unforeseen challenges in the data collection process, no subsequent measures of oxytocin were obtained from participants in later *huatou* practice further into the seven-day Chan retreat. Additionally, the study's use of *huatou* practice was partially dependent on *nianfo* practice, given that the *huatou* "Who recites the Buddha's name?" built upon earlier participation in *nianfo* several days prior, making the results of *huatou* difficult to disentangle from *nianfo*. Further, participants did not strictly comply with standard methodology for the *huatou* "Who recites the Buddha's name?" and were instead permitted to utilize variations on the question "Who?" as they deemed fit to their circumstances. It must also be noted that in phenomenological reports solicited in the form of journal entries, multiple participants expressed skepticism toward *nianfo* practice. A set of representative examples include:

"I am not into this chanting liturgic stuff. Strange for me".

"Tonight's Pure Land service was interesting, but it didn't get me anywhere".

"I approached this evening's chanting service with the usual scepticism".

"During the session I kept thinking that I wanted it to be over. The service was also opposed to my own personal beliefs, so it was particularly hard to maintain focus. I felt bitter and couldn't wait for it to be finished".

While such doubt may be phenomenologically comparable to that intentionally instigated through *huatou*, its target (*nianfo*) is not the traditional target of *huatou* practice. Thus, further research is needed in order to examine the effects of standardized forms of *huatou*, with and without *nianfo*, among participants across multiple time-points, including those who are more familiar with these contemplative technologies, whether long-term lay practitioners or monastics, especially in comparison to an active control group.

The behavioral results are also to be approached tentatively. Most notably, *huatou* was not the sole or main contemplative technology utilized during the one-month program and it is therefore not possible to attribute changes in environmentally sustainable behavior exclusively or primarily to *huatou*. Although it is certainly possible that recycling and food waste habits were influenced by alterations in the sense of self, including an interrelational or ecological sense of self, the naturalistic study design did not permit rigorous testing of this possibility. The precise mechanisms by which environmentally sustainable behaviors may change as a function of contemplative practice, as well as which practices do or do not contribute to such effects, require further investigation.

Given that the relationship between oxytocin, sense of self, and behavior is not entirely clear, future studies would benefit from methodological improvements and use of statistical techniques such as multiple regression, mediation, and moderation analysis. More frequent measures of oxytocin should be obtained both as a function of contemplative prac-

tice and throughout a typical day's activities, ideally in closer temporal proximity to occasions of environmentally sustainable behavior, in order to evaluate whether contemplative practice reliably increases oxytocin and whether oxytocin is directly linked, possibly via its interrelational implications, to improvements in environmentally sustainable behavior. Additional experiments should also assess a greater range of environmentally sustainable behaviors as ecologically viable dependent variables while more precisely modeling interactions between independent variables, mediating variables, and moderating variables that contribute to behavioral change. With improvements in experimental design and data collection, more rigorous statistical methods could be employed to clarify the relationship between oxytocin, sense of self, and behavior.

Future research would further benefit from an ethnographic approach in which interviews are conducted with retreat participants. While phenomenological reports were solicited from retreatants, their reports describe their experiences of the practices (*huatou*, *nianfo*) in which they participated. Asking retreat participants about their experiences in the broader context of the one-month program, including their reflections on environmentally sustainable behavior and explanations for why they may have produced less food waste or more recycling, as well as how their sense of self may or may not have been a contributing factor in their behaviors, would significantly enhance future research.

It must also be acknowledged that meditating on Chan aphorisms, though potentially transformative of individual behaviors, is of questionable relevance to collective enactment of environmental policies necessary for systemic change in response to the rapidly worsening ecological crisis ravaging the globe. Rolston identifies what he believes to be the practical limitations of Buddhist rhetoric about interdependence: "That is Zen poetry, and the West cannot expect to derive water law in Colorado from it, stipulating minimum stream flow for endangered fish species. It can only produce a reverence for the stream; and water law will follow" (Rolston 1987, p. 186). The gap between poetry and politics, philosophy and practice, appears wide indeed, at least upon first glance.

Yet several intermediate steps can begin to bridge the gap. Rolston's critique recognizes a relationship, albeit indirect, between reverence and law. When philosophy is translated into practice—to the extent that it fundamentally shifts inner ecologies, including the relationship between existential, aesthetic emotions (e.g., doubt through *huatou* and awe through the *Huayan sanmei men*) and sense of self (e.g., as constituted by ecologically relational dynamics, potentially reflected in the variability of oxytocin and phenomenological reports), which are subsequently embodied through outer ecologies, including behavioral relationships between humans and the non-human world (e.g., in the form of environmentally sustainable behavior)—then contemplative technologies may in fact offer the beginnings of a scalable solution to ecological crisis.

6.2. Continuations

While doubt through *huatou* is one route toward bridging ecologies, awe through the *Huayan sanmei men* is another. Deemed the "quintessential collective emotion" (Bai et al. 2017), awe involves overpowering and novel sensory experiences, transforming the individual and influencing their embrace of new values (Keltner and Haidt 2003), particularly through its effects on membership in universal categories of self-concept (Shiota et al. 2007). Recent research demonstrates that awe decreases self-importance, increases a sense of global citizenship, increases values of interconnectedness and appreciation of diversity, and increases donation allocations to global vs. local charities (Seo et al. 2023). Awe also increases willingness to volunteer time to help others (Guan et al. 2019; Prade and Saroglou 2016; Rudd et al. 2012) and willingness to give money to others, including sharing in virtual games (Piff et al. 2015), donating to a stranger in need (Guan et al. 2019), and sharing hypothetical lottery winnings (Prade and Saroglou 2016). Directly implicating ecology, awe increases self-reported environmentally sustainable behavior (Yang et al. 2018; Zhao et al. 2018). Most relevant to Rolston's critique, both art and religious experiences induce awe (Shiota et al. 2007). Whether "Zen poetry" or contemplative technologies

that begin to dissolve the rigid boundaries of one's sense of self and existentially situate it in its larger ecological contexts, both wield similar potential for initiating the cascade from self-transcendent emotional states to behavioral change.

As an offshoot from the *huatou* results, I thus propose a follow-up study on Huayan meditation. Multiple contemplative technologies from Huayan Buddhism are viable candidates for inducing neuroendocrine and behavioral outcomes, but for the sake of brevity and due to its ecological relevance, one Huayan practice is highlighted, the *Huayan sanmei men* from the *Huayan wujiao zhiguan* attributed to Dushun. Whereas the variation of *huatou* from the reported fieldwork posed the question "Who?" as a form of existential inquiry, the *Huayan sanmei men* is seemingly oriented around the question "Where?"³³ Such emphasis on positionality is consistent with Neisser's contextualization of the ecological self, insofar as "we are continuously aware of ourselves as physically located and active in a particular environment" (Neisser 1999, p. 207) along with characterization of the environmental orientation forwarded by Næss, in whose framework of deep ecology, the human self can only come to know itself through others (Valera 2018, p. 662). The *Huayan sanmei men* offers a complementary contemplation of interrelational ecology.

In the *Huayan sanmei men*, an interrelational vision of ecological reciprocity is evidenced through the image of Indra's net, a vastly arrayed and all-inclusive cosmic web adorned with iridescent, multifaceted jewels at each of its interstices. Any given jewel as microcosm reflects and thus contains the entire tapestry as macrocosm. While all jewels are reflected in every other jewel, each remains simultaneously unique, an example of how Huayan reconciles identity and difference, part and whole, which are mutually defining (Fox 2013, p. 183; Fox 2015, pp. 266–67). Invoking a complementary idea, neurophenomenologist Francisco Varela identified *autopoiesis* as a mode of self-organization in which local and global are "braided together" through reciprocal causality (Varela 1991, p. 84). *Autopoiesis* has been further developed into *ecopoiesis*, originally expounded by geneticist Robert Haynes in reference to "the fabrication of a sustainable ecosystem on a currently lifeless, sterile planet" (Haynes 1990, p. 180) and later expanded by psychiatrist Alexander Kopytin to encompass "a form of ecological intimacy implying the interaction and interpenetration of different living systems" (Kopytin 2020, p. 6). Embodying the view of the jeweled net (i.e., Indra's net) as organism (「珠網機體論」Yu 2009, p. 182), the *Huayan sanmei men* is arguably the most existentially and ecologically relevant contemplative technology from Huayan Buddhism. Ecologically, each aspect of nature can be visualized as a jewel in the net, where local and global, part and whole, intersect. Damage to any particular node in the ecosystem impacts its entire structural integrity. A single jewel fully constitutes the net, such that its collective structure begins to unravel if any of its constituents are compromised, sending ripples cascading throughout the entire ecosystem.

As a distinctly Huayan practice, the *Huayan sanmei men* draws upon the awe-inducing aesthetics of Indra's net, describing the meditator sitting within and thus woven directly into its cosmically all-encompassing structure. In the *Huayan sanmei men*, Indra's net simultaneously functions as (1) a simile for perfect interfusion (Ch. *yuannrong* 圓融),³⁴ (2) an object of contemplation,³⁵ (3) an embodied visualization,³⁶ and (4) an illustration of mutual non-obstruction (Ch. *wu'ai* 無礙).³⁷ The awe-inducing potential of Indra's net is therefore relevant to self-transcendence and other phenomenological shifts in sense of self, which may find expression in elevated oxytocin and environmentally sustainable behaviors. Given that the *Huayan sanmei men* prescribes a method for putting the philosophy of interrelationality into practice, its functions as a contemplative technology and implications for bridging ecologies deserve further investigation.

7. Conclusions

Huatou and the *Huayan sanmei men* are two contemplative technologies from Chinese Buddhism with potential for bridging ecologies by inducing changes in emotion, sense of self, and behavior. Although Huayan Buddhism has yet to be examined through a synthesis of religious studies and empirical methods, the available evidence in related

research areas is promising. Data from multiple previous experiments suggesting a relationship between oxytocin and sense of self, including the preliminary findings from the reported experimental fieldwork on *huatou*, combined with theoretical work on the ecological relevance of Huayan Buddhism, provide a basis for further investigation. While the experimental fieldwork results require replication in a more statistically robust capacity and with methodological improvements to the study design, they nonetheless offer possible insight into the existential relevance of contemplative technologies. The significance of this research includes not only its forging of interdisciplinary relationships, but also extends to urgently needed practical applications. In our increasingly globalized world under growing threat of intergroup conflict and ecological crisis, contemplative technologies that challenge the practitioner's sense of self and thereby enhance the experience of interrelationality are viable strategies for addressing existential concerns. The reported experimental fieldwork on *huatou* and proposed follow-up study on the *Huayan sanmei men* begin to fill major gaps in previous research, bridge inner and outer ecologies, and pave the way for further interdisciplinary research in contemplative science with potential to transform "the relations of the organism to the environment including, in the broad sense, all the 'conditions of existence'" (Haeckel quoted in Stauffer 1957, p. 140).

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Abbreviations

J Jiaxing dazang jing 嘉興大藏經; see (Xinwenfeng chuban gongsi, comp. 1987).

T Taishō shinshū daizōkyō 大正新修大藏經; see (Takakusu and Kaigyoku 1924–1932).

X Shinsan dainihon zokuzōkyō 社叅纂大日尊續經; see (Maeda and Nakano 1980–1989).

Notes

¹ T no. 279, 10: 198c22: 剎中種種衆生身 身中復有種種剎 (T = Taishō shinshū daizōkyō; see (Takakusu and Kaigyoku 1924–1932)); *sattoakāyi sugatā vīvidhakettrā/ksetri sattva* [...] Sanskrit from Vaidya, *Daśabhūmikasūtram*, 8.8ab.

² German: *Ökologie*; from Greek: *oikos*, *oikos*; house/home.

³ Huayan 華嚴 is a tradition of Chinese Mahāyāna Buddhism that flourished during the Tang dynasty (618–907 CE) and derives its orientation from the *Avatamsaka Sūtra* (*Huayan jing* 華嚴經), a Buddhist scripture translated twice in full into Chinese, first (T no. 278) by Buddhahadra 佛陀跋陀羅 c. 420 CE and second (T no. 279) by Śikṣānanda 實叉難陀 c. 699 CE under the royal patronage of Empress Wu Zetian 武則天. Reflecting its multifaceted character and contents, the *Huayan jing* has been described in such colorful terms as “holographic”, “fractal”, “psychedelic”, and “a hodgepodge” (Fox 2013, p. 181).

⁴ T no. 279, 10: 25b17-18: 廣大修行慧海地 一切法門咸遍了 普現國土如虛空 樹中演暢此法音。

⁵ See note 1.

⁶ T no. 279, 10: 248c14-15: 知一切法。皆從緣起。盡無有餘。知一切世界種。盡無有餘。知一切法界中。如因陀羅網。

⁷ 「一般系統論所說的整體性是指生命有機體或生態系統是由系統內在諸要素之間相互關聯、相互作用組成的有機整體。

「緣起相由」將法界以及任何一事物（「一緣」）均視作諸緣或要素構成的整體，體現了同樣的整體性」（Chen 2015, p. 478).

⁸ 「『華嚴法界觀』是緣起說之頂峰，亦可為提供生態學的『整體觀』與環保之『共生思想』深入的理論基礎」（Lai 2010).

- 9 「諸法無盡相融緣起的根本原因是緣起之法即空無自性，因此能夠全體相收而不礙彼此差別，彼中有此，此中有彼」(Zhao 2015, p. 335).
- 10 「這張“網”表達了宇宙萬物處在複雜的多層次的相互關聯之中的思想， 這也是對現象世界整體性最貼切、真實的比喻」(Zhang and Ren 2003, p. 45).
- 11 「人類與所有生命物種在生態系統中的相互依存關係是一個事實，人們不應當把自己一個物種當成是整個生態系統，就像不應當把一顆寶石誤認為是整個“因陀羅網”一樣」(Shan 2007, p. 126).
- 12 「雖然把改變環境、維護生態平衡的希望寄托在佛教上並不現實，但佛教文化中的生態倫理思想及其實踐無疑對生態環境保護仍具有積極意義」(Bi 2013, p. 124).
- 13 E.g., T no. 279, 10: 198c16-17: 一毛孔內無量刹 各有四洲及大海 須彌鐵圍亦復然 悉見在中無迫隘 “In a single pore are infinite lands, each with four continents and seas,/As well as polar and peripheral mountains, all seen therein, uncrowded” (Cleary 1993, p. 764). Note that this passage does not appear to occur in the Sanskrit *Daśabhūmikāsūtram* edited by Vaidya, nor the earlier version of the *Huayan jing* translated by Buddhahadra c. 420 CE, nor the *Shizhu jing* 十住經 (T no. 286) translated by Kumārajīva 鳩摩羅什 c. 402–409 CE, but occurs in the later version of the *Huayan jing* translated by Śīkṣānanda c. 699 CE, as well as slightly modified (using 有 in place of 在) in the *Foshuo shidi jing* 佛說十地經 (T no. 287) translated by Śīladharma 尸羅達摩 c. 790 CE.
- 14 Based on its peculiar terminological, historical, and ideological details, Gimello (1976) asserts the *Huayan wujiao zhiguan* is not the work of Dushun, but plausibly an early draft of the *Huayan youxin fajie ji* 華嚴遊心法界記 (T no. 1877) by Fazang 法藏 (643–712 CE). The same conclusion is drawn by Yūki (1930), as well as by Liefke and Plassen (2016). Meanwhile, Choe (1918) and Plassen (2020) suggest Wonhyo 元曉 (617–686 CE), a Korean contemporary and student of Fazang, as possible author. Authorship particularities aside, the meditation account in the *Huayan sanmei men* is of far greater relevance to the present investigation.
- 15 T no. 1867, 45: 509b2-4: 夫對病而裁方。病盡而方息。治執而施藥。執遣而藥已。為病既多。與藥非一。隨機進修異。所以方便不同。
- 16 T no. 279, 10: 108b18: 入因陀羅網法界。
- 17 T no. 1867, 45: 513b6-7: 若於一珠中坐時。即坐著十方重重一切珠也。
- 18 Interestingly, Kai Ji identifies Dahui Zonggao as playing a crucial role in Huayan-Chan, asserting that while Dahui was not the first to fuse Huayan thought with Chan, he was the first to specifically promote Huayan-Chan thought (Kai 1996, p. 41). Dahui used 相即相入 and 重重無盡 as bridges between Chan and Huayan (Ibid., p. 53) while his orientation toward Huayan-Chan entailed “crushing” (打散) and “reshaping” (再形) Huayan teachings to form new meanings out of them (Ibid., pp. 54–55).
- 19 Variations on the practice of *huatou* 話頭 are expressed in terms such as *kan huatou* 看話頭 and *kanhua Chan* 看話禪. For the purposes of this article, the term *huatou* will be used throughout.
- 20 Such practice is also called “*nianfo gongan*” 念佛公案, “investigating *nianfo*” 參究念佛, or “investigating Chan through *nianfo*” 參禪念佛 and usually takes the form of the inquiry “*nianfozhe shi shei*” 念佛者是誰 or “*nianfo shi shei*” 念佛是誰. Identical references to “investigating *nianfo*” are included in the *Yunqi fahui* 雲棲法彙, J no. B277, 33: 194c27 and the *Hanshan laoren mengyou ji* 憨山老人夢遊集, X no. 1456, 73: 656a12-13, e.g., 從參究念佛得力。至是遂開淨土一門。(J = *Jiaying dazang jing*; see (Xinwenfeng chuban gongsi, comp. 1987); X = *Shinsan dainihon zokuzōkyō*; see (Maeda and Nakano 1980–1989)).
- 21 For a detailed analysis of various origin theories surrounding the “*nianfo gongan*”, see Shi Shi (1999) and Schlütter (2013).
- 22 Shi Yinqian attributes the flourishing of *kanhua Chan* in the early Republic era to Xuyun and Laiguo (Shi 1999, p. 108).
- 23 「目的在以一念抵制萬念。這實在是不得已的辦法。如惡毒在身。非開刀療治。難以生效。古人的公案多得很。後來專講看話頭。有的『看拖死屍的是誰。』有的『看父母未生以前。如何是我本來面目。』晚近諸方多用『看念佛是誰。』」(Xuyun 1998, p. 40).
- 24 See also the *Boshan chan jingyu* 博山禪警語, X no. 1257, 63: 756a15-19: 做工夫。貴在起疑情。何謂疑情。如生不知何來。不得不疑來處。死不知何去。不得不疑去處。生死關竅不破。則疑情頓發。結在眉睫上。放亦不下。越亦不去。忽朝撲破疑團。生死二字是甚麼閑家具。噫。古德云。大疑大悟。小疑小悟。不疑不悟。
- 25 T no. 1998A, 47: 901c28-a3: 看時不用博量。不用註解。不用要得分曉。不用向開口處承當。不用向舉起處作道理。不用墮在空寂處。不用將心等悟。不用向宗師說處領略。不用掉在無事甲裏。
- 26 T no. 1998A, 47: 919a5-6: 借方便門以入道則可。守方便而不捨則為病。
- 27 See various discussions of Chan sickness, including those instances occurring in the process of fording the stream, prior to reaching dry land, either from abuse or misuse of meditation, or as troubling side-effects of meditation properly undertaken. One textual source among many is the *Zhi chanbing miyao fa* 治禪病祕要法 (T no. 620).
- 28 For elaboration, see the following assessment Eichman provides on the existential potency of *huatou*: “Both Zhuhong and Deqing saw this practice as one that delved into questions about the nature of reality—Deqing specifically refers to ‘life and death’ (*shengsi* 生死)—and the gap between the awakened Buddha and the unenlightened self. Such quandaries were framed in terms of the following questions: Where am I from? Who am I? Where did the sound go? From whence did it arise? In other words, they are not asking practitioners to entertain ‘doubt’ in a fuzzy, abstract sense, but to participate in a quite focused, inwardly directed spiritual inquiry” (Eichman 2016, p. 282).
- 29 J no. B277, 33: 78c16: 疑是參究體察之意。

- 30 X no. 1456, 73: 499b8-10: 要你參究自己。不是向他玄妙言句取覓。今人參禪做工夫。人人都說看話頭。下疑情。不知向根底究。只管在話頭上求。
- 31 For elaboration, see the following linkage Næss provides between ecology and sense of self: “‘To have a home’, ‘to belong’, ‘to live’ and many other similar expressions suggest fundamental milieu factors involved in the shaping of an individual’s sense of self and self-respect. The identity of the individual, ‘that I am something’, is developed through interaction with a broad manifold, both organic and inorganic. There is no completely isolatable I, no isolatable social unit. To distance oneself from nature and the ‘natural’ is to distance oneself from a part of that which the I is built up. Its ‘identity’, ‘what the individual I is’, and, thereby, sense of self and self-respect, are broken down. Some milieu factors, e.g., mother, father, family, one’s first companions, play a central role in the development of an I, but so do home and the surroundings of home” (Næss 1989, p. 164).
- 32 See variations on the relation between 父母未生 and 本來面目 in the *Yuanwu foguo chanshi yulu* 圓悟佛果禪師語錄 (T no. 1997), *Dahui pujue chanshi yulu* 大慧普覺禪師語錄 (T no. 1998A), and *Mi’an heshang yulu* 密菴和尚語錄 (T no. 1999), among others.
- 33 E.g., T no. 1867, 45: 513b13-15: 只由不出此珠。是故得入一切珠。若出此一珠入一切珠者。即不得入一切珠也。何以故。離此珠內無別珠故。 “It is only because one does not leave this one jewel that one can enter into all jewels. If one left one jewel to enter into all jewels, it would not be possible to enter into all the jewels. Why? Because outside of this one jewel there are no other jewels” (Fox 2015, p. 266).
- 34 T no. 1867, 45: 513a25-26: 明多法互入猶如帝網天珠重重無盡之境界也。 “The manner in which all dharmas interpenetrate is like an imperial net of celestial jewels extending in all directions infinitely, without limit” (Fox 2015, p. 265).
- 35 T no. 1867, 45: 513b2: 取一顆珠驗之。 “[W]e can pick one particular jewel and examine it closely” (Ibid.).
- 36 T no. 1867, 45: 513b6-7: 若於一珠中坐時。即坐著十方重重一切珠也。 “When one sits within one jewel, one is simultaneously sitting in all the infinite jewels in all ten directions” (Ibid.).
- 37 T no. 1867, 45: 513b9-11: 既於一珠中入一切珠。而竟不出此一珠。於一切珠入一珠。而竟不起此一珠。 “Just as one goes into one jewel and thus enters every other jewel while never leaving this one jewel, so too one enters any jewel while never leaving this particular jewel” (Ibid.).

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Article

Permutations and Oblong Numbers in the *Theravāda-vinaya*: A New Intersection of Buddhism and Indian Mathematics

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Abstract: Within the context of Indian religions, Jainism has long been recognized for its extensive use of permutations and combinations. However, the application of these principles within Buddhist scriptures has received relatively little scholarly attention. This paper introduces a new example of the specific application of permutations and combinations in Buddhist scriptures. In this paper, we focus on the first *saṅghādisesa* rule in the *Theravāda-vinaya*, which lists a series of element sets and arranges these elements according to a certain pattern known as “ten-roots” (*mūla*), and we discover that these arrangements form a regular numerical sequence, called “oblong numbers”. Moreover, similar patterns with different quantities are also found in the fourth *Pārājika* and the fifth *saṅghādisesa* rules. This indicates that the compilers of the *Theravāda-vinaya* did not use this mathematical knowledge without basis. Interestingly, we also found the use of this sequence in the *Bakhshālī* manuscript. Therefore, in this article, after summarizing and verifying the arrangement rules of the *Theravāda-vinaya*, we discuss whether the oblong numbers were influenced by Greek mathematics.

Keywords: Buddhism and mathematics; *Theravāda-vinaya*; permutation; oblong numbers

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1. Introduction

The origin of Indian mathematics has always been a controversial topic among scholars. Due to the dominance of Eurocentrism for centuries, some scholars believed that Greece was the source of modern science and that Europe inherited Greek culture.¹ This led to the neglect of the mathematical development of other regions. This belief prompted them to think that Indian mathematics was largely influenced by Greek mathematics. For example, Kaye looked for traces of Greek mathematics in the *Bakhshālī* Manuscript and insisted that the *Bakhshālī* manuscript was written no earlier than the 12th century. He also listed some examples of Greek mathematical influence on Indian mathematics, but these have been refuted by scholars (Hayashi 1995, pp. 132–33).

As Heeffer (2010) pointed out, as early as the late 19th century, the German scholar M. Cantor (1880–1908) expressed that “the Indians learned algebra through traces of algebra within Greek geometry” and “Brahmagupta’s solution to quadratic equations has Greek origins.”² However, these views were strongly refuted by Herman Hankel (1839–1873), as follows:

That by humanist education deeply inculcated prejudice that all higher intellectual culture in the Orient, in particular all science, is risen from Greek soil and that the only mentally truly productive people have been the Greek, makes it difficult for us to turn around the direction of influence for one instant.³

On the other hand, many scholars hold a “non-Eurocentric” stance; that is to say, they have come to acknowledge the independence and originality of Indian mathematics. They suggest that the origins of Indian mathematics can be traced back to the Harappan civilization of the third millennium BCE, regarding which archeologists have discovered that “the archaeological finds described below do provide some indication, however meager, of the

nature of the numerate culture that this civilization possessed” (Joseph 2010, pp. 317–21). These include a number of different plumb bobs of uniform size and weight and scales and instruments for measuring length (Merzbach and Boyer [1968] 2011, p. 186; Katz 2009, p. 231). Throughout the subsequent extended periods, Indian mathematics saw significant developments in religion, music, medicine, architecture, and astronomy, among other areas.

Regarding Buddhism and Indian mathematics, many scholars have discussed the use of large numbers and units in Buddhist scriptures (Niu 2004, pp. 22–32) and the concepts of “*śūnya*” (emptiness) and zero (Joseph 2010, p. 345), which are also featured in the scriptures of Hinduism and Jainism (Joseph 2010, pp. 338–47). Additionally, many scholars have focused more on Buddhism and astronomy, such as (Kotyk 2017, 2020; Niu 2004; Goble 2019; Yano 2013). Thus far, very few scholars have discussed specific cases in which mathematical knowledge is utilized in Buddhist scriptures. This article aims to provide some new cases showing the use of permutations and combinations from mathematics in the Vinaya text.

The mathematical case discussed in this paper is drawn from the Vinaya texts in Buddhism. The Vinaya “refers to the body of teachings concerning monastic discipline or law attributed to the historical Buddha” (Clarke 2015, p. 60), and the *Theravāda-vinaya* is the *pāli* Canon of vinayas, which, according to the Sri Lankan chronicle *Mahāvamsa*, was committed to writing and commentaries on it were produced in the first century BCE, thus probably predating the redactional closure of the other Vinayas (Kieffer-Pülz 2014, pp. 50–52).

This paper focuses on the first *saṅghādisesa* rule in the *Theravāda-vinaya*, which lists a series of element sets and arranges these elements according to a certain pattern known as “ten-roots” (*mūla*). After reconstructing all the arrangements, in this paper, we discover that these arrangements form a regular numerical sequence. Moreover, similar patterns with arrangements and combinations are also found in the fourth *pārājika*, the fifth *saṅghādisesa* rules of the *Theravāda-vinaya*, as well as in the fourth *pārājika* of *Shisong lü*. Therefore, in this article, we will summarize and verify the arrangement and combination rules in these vinaya texts, and we will discuss the possible origins of these arrangements and combinations.

2. The Permutation of the First *Saṅghādisesa* Rule in the *Theravāda-vinaya*

The first *Saṅghādisesa* rule in the *Theravāda-vinaya* prohibits a monk from intentionally ejaculating, which is specified as follows:

Intentional emission of semen, except during a dream, is an offense of *Saṅghādisesa*⁴.

In the explanation of this rule, the *Theravāda-vinaya* lists ten methods and reasons for ejaculation, ten purposes of ejaculation, and ten colors of semen. Regarding the ten purposes of ejaculation, the *Theravāda-vinaya* presents a unique arrangement from one root to ten roots. The ten purposes of ejaculation are as follows:

- ① ārogyatthāya (for health)
- ② sukhatthāya (for experience pleasure)
- ③ bhesajjatthāya (for medicinal purposes)
- ④ dānatthāya (for giving)
- ⑤ puññatthāya (for beneficial practices)
- ⑥ yaññatthāya (for festivals)
- ⑦ saggatthāya (to be born in a heaven)
- ⑧ bijatthāya (for seed)
- ⑨ vīmaṃsatthāya (to try)
- ⑩ dāvatthāya (for fun)⁵

Following this, the *Theravāda-vinaya* lists the arrangement methods from one-root to ten-root cases, but they are presented in an abbreviated form. In this article, efforts will be made to reconstruct the complete permutations from one-root to ten-root cases.

2.1. One-Root Permutation (*Ekamūlaka*)

First, let us examine the one-root permutation called *ekamūlakassa khaṇḍacakka*⁶. It involves combinations of two elements. Specifically, combinations of element ① with other elements leading to a total of nine forms are listed below:

- ① Ārogyatthañca ② sukhatthañca
- ① Ārogyatthañca ③ bhesajjatthañca
- ① ārogyatthañca ④ dānatthañca
- ① ārogyatthañca ⑤ puññatthañca
- ① ārogyatthañca ⑥ yaññatthañca
- ① ārogyatthañca ⑦ saggatthañca
- ① ārogyatthañca ⑧ bijjatthañca
- ① ārogyatthañca ⑨ vīmaṃsatthañca
- ① ārogyatthañca ⑩ davatthañca

Next, we move to the *ekamūlakassa baddhacakka*⁷ segment. The pairs start with element ② sukhatthāya combining with ③ bhesajjatthāya, and end with the combination of ② sukhatthāya and ① ārogyatthāya. The nine types are as follows:

- ② Sukhatthañca ③ bhesajjatthañca
- ② Sukhatthañca ④ dānatthañca
- ② sukhatthañca ⑤ puññatthañca
- ② sukhatthañca ⑥ yaññatthañca
- ② sukhatthañca ⑦ saggatthañca
- ② sukhatthañca ⑧ bijjatthañca
- ② sukhatthañca ⑨ vīmaṃsatthañca
- ② sukhatthañca ⑩ davatthañca
- ② Sukhatthañca ① ārogyatthañca

Thereafter, combinations of element ③ bhesajjatthāya start with merging with ④ dānatthāya and end with merging with ② sukhatthāya, yielding nine varieties:

- ③ Bhesajjatthañca ④ dānatthañca.....
- ③ bhesajjatthañca ⑤ puññatthañca...
- ③ bhesajjatthañca ⑥ yaññatthañca...
- ③ bhesajjatthañca ⑦ saggatthañca...
- ③ bhesajjatthañca ⑧ bijjatthañca...
- ③ bhesajjatthañca ⑨ vīmaṃsatthañca...
- ③ bhesajjatthañca ⑩ davatthañca
- ③ Bhesajjatthañca ① ārogyatthañca...
- ③ bhesajjatthañca ② sukhatthañca

Following this, similar types of combinations are formed between each pair, leading to a total of ninety forms, which can also be viewed as a permutation of a set (ten elements) two at a time. Using the permutation formula, $P(10, 2) = 90$.

- {④, ⑤}, {④, ⑥}, {④, ⑦}, {④, ⑧}, {④, ⑨}, {④, ⑩}, {④, ①}, {④, ②}, {④, ③}.....
- {⑩, ①}, {⑩, ②}, {⑩, ③}, {⑩, ④}, {⑩, ⑤}, {⑩, ⑥}, {⑩, ⑦}, {⑩, ⑧}, {⑩, ⑨}

2.2. Two-Root Permutation (*Dumūlaka*)

Two-root permutation in the *Theravāda-vinaya*:

① Ārogyatthañca ② sukhatthañca ③ bhesajjatthañca ceteti upakkamati muccati, āpatti saṅghādisesassa...pe... ① ārogyatthañca ② sukhatthañca ⑩ davatthañca ceteti upakkamati muccati, āpatti saṅghādisesassa.

Dumūlakassa khaṇḍacakkam.

② Sukhatthañca ③ bhesajjatthañca ④ dānatthañca ceteti upakkamati muccati, āpatti saṅghādisesassa...pe... ② sukhatthañca ③ bhesajjatthañca ⑩ davatthañca...pe... ② sukhatthañca ③ bhesajjatthañca ① ārogyatthañca ceteti upakkamati muccati, āpatti saṅghādisesassa.

Dumūlakassa baddhacakkam saṃkhittam

⑨ Vimamsatthañca ⑩ davatthañca ① ārogyatthañca ceteti upakkamati muccati, āpatti saṅghādisesassa. ⑨ Vimamsatthañca ⑩ davatthañca ⑧ bijatthañca ceteti upakkamati muccati, āpatti saṅghādisesassa.

Dumūlakam niṭṭhitam.⁸

In the two-root permutation, the first step is to pair the two elements to form a unit; for example, Elements ① and ② form the unit ①②. This unit is sequentially combined with each of the elements from ③ to ⑩, resulting in a total of eight different forms. This rule is called *khaṇḍacakka*.

Next, Element ② is paired with ③ to form the unit ②③. This pair is then sequentially combined with every element from ④ to ⑩, as well as ①, also resulting in a total of eight different forms.

Finally, Element ⑨ is paired with ⑩ to form the unit ⑨⑩. Then, this pair is sequentially combined with each of the elements from ① to ⑧, also resulting in eight forms. This rule is called *baddhacakka*. It is noteworthy that there is no type where ⑩ is paired with ① and then combined with other elements. It can be considered that each element appears only once.

In the two-root case, there are nine types, each type has eight different forms, totaling seventy-two different forms. This is different from the number of combinations and permutations achieved by choosing three elements from 10, which would be $C(10, 3) = 120$ and $P(10, 3) = 720$.

However, we can still discern certain patterns. First, the arrangement can be divided into two parts: the “fore element” can be a single element or a unit of elements, such as ①② in the two-root case, while the “after element” consists of only one element.

Second, the sequence of choosing fore elements adheres to an order from ① to ⑩. For example, ① and ② or ② and ③ can form a unit, but ⑩ and ① cannot form a unit.

Third, numbers do not repeat within a combination. For instance, in the two-root scenario, the unit made up of ⑦ and ⑧ acts as the fore element, initially combining sequentially with ⑨ or ⑩, then with ①, until it finally combines with ⑥, without recombining with elements ⑦ or ⑧. This is referred to as *baddhacakka*. For the two roots group, a configuration like {⑨, ⑩; ⑧} is possible, while {⑨, ⑩; ⑨} is not.

Based on these characteristics, we can consider the rules of “two roots” as a permutation calculation within a set of these ten elements, where initially, two consecutive elements are chosen as fore elements, and then they are combined with other elements. This process essentially equates to a permutation calculation selecting two elements from a set of nine elements. For example, initially selecting elements ① and ② as fore elements and then combining them with the after element ranging from ③ to ⑩ results in $P(9, 2) = 72$, which matches the previously computed number. Therefore, we can infer that the method of root calculation in the *Theravāda-vinaya* can be regarded as $P(10-r+1, 2)$, with r representing the number of roots.

2.3. The Conjecture from Three Roots (Timūlaka) to Ten Roots (Sabbamūlaka)

The *Theravāda-vinaya* lacks a comprehensive explanation of the transition from three-root to ten-root configurations.⁹ Nevertheless, we can project these permutations using characteristics and formulas derived from one-root and two-root transformations. Additionally, these calculations will be presented through a visualization of the permutation process.

For permutations involving three-root, the process begins with the selection of three sequential elements defined as fore elements, which are then paired with other elements:

{①, ②, ③; ④}, {①, ②, ③; ⑤}, ..., {①, ②, ③; ⑩} (seven forms in total)
 {②, ③, ④; ⑤}, ..., {②, ③, ④; ⑩}, {②, ③, ④; ①}
 {③, ④, ⑤; ⑥}, ..., {③, ④, ⑤; ⑩}, {③, ④, ⑤; ①}, {③, ④, ⑤; ②}
 {④, ⑤, ⑥; ⑦}, ..., {④, ⑤, ⑥; ⑩}, {④, ⑤, ⑥; ①}, ..., {④, ⑤, ⑥; ③}
 {⑤, ⑥, ⑦; ⑧}, ..., {⑤, ⑥, ⑦; ⑩}, {⑤, ⑥, ⑦; ①}, ..., {⑤, ⑥, ⑦; ④}
 {⑥, ⑦, ⑧; ⑨}, {⑥, ⑦, ⑧; ⑩}, {⑥, ⑦, ⑧; ①}, ..., {⑥, ⑦, ⑧; ⑤}

{⑦, ⑧, ⑨; ⑩}, {⑦, ⑧, ⑨; ①}, ..., {⑦, ⑧, ⑨; ⑥}
 {⑧, ⑨, ⑩; ①}, {⑧, ⑨, ⑩; ②}, ..., {⑧, ⑨, ⑩; ⑦}

Calculations for the three roots system yield fifty-six unique permutations, derived via the permutation formula calculation: $P(8, 2) = 56$, confirming the consistency of both forms.

For four roots, the permutations result in forty-two distinct arrangements, calculated as $P(7, 2) = 42$, demonstrated by configurations such as:

{①, ②, ③, ④; ⑤}, {①, ②, ③, ④; ⑥}, ..., {①, ②, ③, ④; ⑩} (six forms)
 {②, ③, ④, ⑤; ⑥}, ..., {②, ③, ④, ⑤; ⑩}, {②, ③, ④, ⑤; ①}
 {③, ④, ⑤, ⑥; ⑦}, ..., {③, ④, ⑤, ⑥; ⑩}, {③, ④, ⑤, ⑥; ①}, {③, ④, ⑤, ⑥; ②}
 {④, ⑤, ⑥, ⑦; ⑧}, ..., {④, ⑤, ⑥, ⑦; ⑩}, {④, ⑤, ⑥, ⑦; ①}, ..., {④, ⑤, ⑥, ⑦; ③}
 {⑤, ⑥, ⑦, ⑧; ⑨}, {⑤, ⑥, ⑦, ⑧; ⑩}, {⑤, ⑥, ⑦, ⑧; ①}, ..., {⑤, ⑥, ⑦, ⑧; ④}
 {⑥, ⑦, ⑧, ⑨; ⑩}, {⑥, ⑦, ⑧, ⑨; ①}, ..., {⑥, ⑦, ⑧, ⑨; ⑤}
 {⑦, ⑧, ⑨, ⑩; ①}, ..., {⑦, ⑧, ⑨, ⑩; ⑥}

Calculating for five-root gives thirty permutations according to $P(6, 2) = 30$.

{①, ②, ③, ④, ⑤; ⑥}, ..., {①, ②, ③, ④, ⑤; ⑩} (five forms)
 {②, ③, ④, ⑤, ⑥; ⑦}, ..., {②, ③, ④, ⑤, ⑥; ⑩}, {②, ③, ④, ⑤, ⑥; ①}
 {③, ④, ⑤, ⑥, ⑦; ⑧}, ..., {③, ④, ⑤, ⑥, ⑦; ⑩}, {③, ④, ⑤, ⑥, ⑦; ①}, {③, ④, ⑤, ⑥, ⑦;

②}

{④, ⑤, ⑥, ⑦, ⑧; ⑨}, ..., {④, ⑤, ⑥, ⑦, ⑧; ⑩}, {④, ⑤, ⑥, ⑦, ⑧; ①}, ..., {④, ⑤, ⑥, ⑦,

⑧; ③}

{⑤, ⑥, ⑦, ⑧, ⑨; ⑩}, {⑤, ⑥, ⑦, ⑧, ⑨; ①}, ..., {⑤, ⑥, ⑦, ⑧, ⑨; ④}

{⑥, ⑦, ⑧, ⑨, ⑩; ①}, ..., {⑥, ⑦, ⑧, ⑨, ⑩; ⑤}

Six roots result in twenty variations, calculated as $P(5, 2) = 20$:

{①, ②, ③, ④, ⑤, ⑥; ⑦}, ..., {①, ②, ③, ④, ⑤, ⑥; ⑩} (four forms)
 {②, ③, ④, ⑤, ⑥, ⑦; ⑧}, ..., {②, ③, ④, ⑤, ⑥, ⑦; ⑩}, {②, ③, ④, ⑤, ⑥, ⑦; ①}
 {③, ④, ⑤, ⑥, ⑦, ⑧; ⑨}, ..., {③, ④, ⑤, ⑥, ⑦, ⑧; ⑩}, {③, ④, ⑤, ⑥, ⑦, ⑧; ②}
 {④, ⑤, ⑥, ⑦, ⑧, ⑨; ⑩}, ..., {④, ⑤, ⑥, ⑦, ⑧, ⑨; ①}, ..., {④, ⑤, ⑥, ⑦, ⑧, ⑨; ③}
 {⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ①}, ..., {⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ④}

For seven roots, there are twelve variations, found by $P(4, 2) = 12$:

{①, ②, ③, ④, ⑤, ⑥, ⑦; ⑧}, {①, ②, ③, ④, ⑤, ⑥, ⑦; ⑨}, {①, ②, ③, ④, ⑤, ⑥, ⑦; ⑩}

(three forms)

{②, ③, ④, ⑤, ⑥, ⑦, ⑧; ⑨}, {②, ③, ④, ⑤, ⑥, ⑦, ⑧; ⑩}, {②, ③, ④, ⑤, ⑥, ⑦, ⑧; ①}
 {③, ④, ⑤, ⑥, ⑦, ⑧, ⑨; ⑩}, {③, ④, ⑤, ⑥, ⑦, ⑧, ⑨; ①}, {③, ④, ⑤, ⑥, ⑦, ⑧, ⑨; ②}
 {④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ①}, {④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ②}, {④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ③}

Eight roots show six variations, calculated as $P(3, 2) = 6$:

{①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧; ⑨}, {①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧; ⑩} (two forms)
 {②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨; ⑩}, {②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨; ①}
 {③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ①}, {③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ②}

Nine roots come to two variations according to $P(2,2) = 2$:

{①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨; ⑩} (one forms)

{②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩; ①}

Finally, there is one configuration for the full complement of roots (an exception):

{①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩}

In our analysis of the *Theravāda-vinaya*, we have identified distinct patterns in the arrangement of elements:

1. Within the *Theravāda-vinaya*, the configurations are categorized as *khaṇḍacakka* and *baddhacakka*. *Khaṇḍacakka* refers to a sequence arranged naturally from ① to ⑩. *Baddhacakka*, on the other hand, includes arrangements such as those starting from ②, continuing to ⑩, then looping back to incorporate ①, or starting from ③, moving through to the set with ⑩, and then looping back to include ① and ②. This reflects the cyclic pattern inherent in *baddhacakka*.
2. From two-root to nine-root configurations in the *Theravāda-vinaya*, each configuration can be viewed as a permutation of two elements drawn from distinct sets. For instance, the two-root configuration is perceived as a permutation of two elements

selected from a pool of nine elements, and this pattern holds similarly for other configurations. The total number of permutations from oneroot to nine roots is calculated using the formula $P(10-r + 1, 2)$, where r represents the number of roots. This is depicted in the following Table 1.

3. Interestingly, the counts of permutations conform to a pattern wherein each sum is the product of two consecutive non-negative integers, i.e., $n \times (n + 1)$, such as $2 = 1 \times 2$, $6 = 2 \times 3$, $12 = 3 \times 4$, $20 = 4 \times 5$. This series is known as oblong numbers.

Table 1. The sum of the *khaṇḍacakka* and *baddhacakka* of the r -roots and the corresponding formulas in the first *Saṅghādisesa* rule.

r-Root	SUM	Formula $P(10 - r + 1, 2)$
one-root	90	$P(10 - 1 + 1, 2)$
two-root	72	$P(9, 2)$
three-root	56	$P(8, 2)$
four-root	42	$P(7, 2)$
five-root	30	$P(6, 2)$
six-root	20	$P(5, 2)$
seven-root	12	$P(4, 2)$
eight-root	6	$P(3, 2)$
nine-root	2	$P(2, 2)$
ten-root	1	Exception

Now, we will examine several of the annotations provided in *Samantapāsādikā*.

2.4. Commentary on the Theravāda-vinaya: Samantapāsādikā

The *Samantapāsādikā* is Buddhaghosa’s commentary on the *Theravāda-vinaya* from the 5th century.

First, concerning the concepts of *khaṇḍacakka* and *baddhacakka*, the commentary in the *Samantapāsādikā* states:

Tattha ārogyatthaṅca sukhatthaṅca ārogyatthaṅca bhesajjatthaṅcā ti evaṃ ārogyapadaṃ sabbapadehi yojetvā vuttamekaṃ khaṇḍacakkam. Sukhapadāḍiṇi sabbapadehi yojetvā yāva attano attano aṭṭānantarapadaṃ tāva ānetvā vuttāni nava baddhacakkāṇi evaṃ ekamūlakāni dasa cakkāni honti. (Sp. III, p. 525).

Translation:

“ārogyatthaṅca sukhatthaṅca ārogyatthaṅca bhesajjatthaṅcā” (in the *Theravāda-vinaya*) states that combining the element ① ārogyattha (for health) with all other elements refers to *khaṇḍacakka* of one-root. Elements such as ② sukhattha (for pleasure) etc. when combined with all other elements up to the element preceding itself, characterize the nine forms of *baddhacakkam*. These are referred to as the ten kinds of *cakka* based on one-root.¹⁰

Next, regarding the forms from one-root to ten-root configurations, the *Samantapāsādikā* explains the following:

idāni ārogyatthāyā’ ti ādisu tāva dasasu padesu paṭipāṭiyā vā uppaṭipāṭiyā vā hetṭhā vā gahetvā upari gaṇhantassa, upari vā gahetvā hetṭhā gaṇhantassa, ubhato gahetvā majjhe ṭhapentassa majjhe vā gahetvā ubhato gaṇharantassa sabbamūlakamṃ katvā gaṇhantassa cetanūpakkamamocane sati visaṅketo nāma natṭhīti dassetuṃ ārogyatthaṅ ca sukhatthaṅcā ’ti khaṇḍacakkabaddhacakkādibhedam vicittam pāḷim āha. (Sp. III, p. 525).

Translation:

Regarding the ① *ārogyattha* (for health) etc. in the *Theravāda-vinaya*, and the previously mentioned ten phrases, it is possible to organize these phrases (1) in order, (2) in reverse order, or (3) starting from the bottom and moving progressively upward, (4) starting from the top and moving progressively downward, (5) starting from both ends and placing in the middle, (6) starting from the middle and extending to both sides, (7) or considering all roots in their entirety. If one engages in “thinking, acting, and then releasing,” there is no “exemption from offense” (*visaṅketa*). To illustrate this, the text categorizes various

collections of khandacakka and baddhacakka, such as referring to ① *ārogyattha* (for health) and ② *sukhattha* (for pleasure).

This explanation also refers to a complex assortment of combinations ranging from having one root to ten roots, where the processing of sequences (1) and reverse sequences (2) or of full roots (7) are comprehensible. The concept of starting from below (3) or above (4) reflects similar thinking, while the condition of approaching from the edges to the middle (5) or conversely (6) might denote different integration tactics within the structural alignment of the root series. However, based on our presumed patterns, such an occurrence does not exist.

In summary, although the *Samantapāsādikā* describes some observable regularities, the lack of detailed explanations makes it challenging to fully comprehend its meaning. It is clear, however, that the *Samantapāsādikā* does not lay out precise computational results in its explanations.

3. The Permutation of the Fourth *Pārājika* Offense in the *Theravāda-vinaya*

The fourth *pārājika* offense in the *Theravāda-vinaya* concerns false claims of having attained the highest spiritual state. It includes thirty-one specific instances of the highest spiritual practices and exhibits a more complex arrangement compared to the first *Saṅghādisesa* offense.¹¹

The *Theravāda-vinaya* lists the 31 elements as follows:

- ① paṭhamam jhānam (First jhāna)
- ② dutiyam jhānam (Second jhāna)
- ③ tatiyam jhānam (Third jhāna)
- ④ catuttham jhānam (Fourth jhāna)
- ⑤ suññato vimokkho (Void liberation)
- ⑥ animitto vimokkho (Signless liberation)
- ⑦ appaṇihito vimokkho (Desireless liberation)
- ⑧ suññato samādhi (Concentration on void)
- ⑨ animitto samādhi (Signless concentration)
- ⑩ appaṇihito samādhi (Desireless concentration)
- ⑪ suññatā samāpatti (Attainment of void)
- ⑫ animittā samāpatti (Signless attainment)
- ⑬ appaṇihitā samāpatti (Desireless attainment)
- ⑭ tisso vijjā (Three knowledges)
- ⑮ cattāro satipaṭṭhānā (Four foundations of mindfulness)
- ⑯ cattāro sammappadhānā (Four right efforts)
- ⑰ cattāro iddhipādā (Four bases of psychic power)
- ⑱ pañcendriyāni (Five faculties)
- ⑲ pañca balāni (Five powers)
- ⑳ satta bojjhaṅgā (Seven factors of enlightenment)
- ㉑ ariyo aṭṭhaṅgiko maggo (Noble Eightfold Path)
- ㉒ sotāpattiphalassa sacchikiriyā (Realization of stream-entry)
- ㉓ sakadāgāmiṭṭhassa sacchikiriyā (Realization of once-returning)
- ㉔ anāgāmiṭṭhassa sacchikiriyā (Realization of non-returning)
- ㉕ arahattassa sacchikiriyā (Realization of arahantship)
- ㉖ rāgassa pahānam (Elimination of greed)
- ㉗ dosassa pahānam (Elimination of aversion)
- ㉘ mohassa pahānam (Elimination of delusion)
- ㉙ rāgā cittaṃ vinīvaraṇatā (Removal of greed from the mind)
- ㉚ dosā cittaṃ vinīvaraṇatā (Removal of aversion from the mind)
- ㉛ mohā cittaṃ vinīvaraṇatā (Removal of delusion from the mind)

3.1. The Khaṇḍacakka and Baddhacakka According to R-Root Cases

In the fourth *Pārājika* offense, the one-root *khaṇḍacakka* consists of individual combinations of ① and the remaining 30 elements, totaling 30 forms. Similarly, the one-root *baddhacakka* involves combinations of ② with the remaining 30 elements, starting from ③ to 31, then looping back to incorporate ①, and so on, up to the 31st element combined with the other 30 elements, resulting in a total of $30 \times 31 = 930$ for one-root. Using the arrangement formula we previously speculated on, the result is calculated as $P(31 - 1 + 1, 2) = 930$, which matches our computation.

Subsequently, the *Theravāda-vinaya* omits the cases from two-root to thirty-one-root cases. However, based on the description for the one-root cases, we know that the structure of the one-root *khaṇḍacakka* and *baddhacakka* follows the same pattern as the first *Saṅghādisesa* offense. Consequently, we can extrapolate based on the pattern of the first *Saṅghādisesa* offense. Table 2 presents the specific numbers of arrangements:

Table 2. The sum of the *khaṇḍacakka* and *baddhacakka* of the r-roots and the corresponding formulas in the fourth *pārājika* offense.

R-Root	SUM	Formula $P(31 - r + 1, 2)$
one-root	930	$P(31, 2)$
two-root	870	$P(30, 2)$
three-root	812	$P(29, 2)$
four-root	756	$P(28, 2)$
five-root	702	$P(27, 2)$
six-root	650	$P(26, 2)$
seven-root	600	$P(25, 2)$
eight-root	552	$P(24, 2)$
nine-root	506	$P(23, 2)$
ten-root	462	$P(22, 2)$
more than eleven roots	Not mentioned in the <i>Theravāda-vinaya</i>	
all-root	1	Exception

It is also noteworthy that numbers such as 930, 870, 812, and 756 manifest as oblong numbers. This indicates that the arrangement in both cases involves selecting two items from different sets, which ultimately reveals a pattern characteristic of oblong numbers. We now further explore the explanation provided by the *Samantapāsādikā*.

3.2. The Annotation of Samantapāsādikā

Regarding *khaṇḍacakka* and *baddhacakka*, the explanation given by the *Samantapāsādikā* aligns with that of the first *Saṅghādisesa* offense. *Khaṇḍacakka* consists of combinations of Element ① *paṭhamam jhānam* (first *jhāna*) with each of the subsequent 30 elements, while *baddhacakka* involves initially pairing Element ② *dutiyam jhānam* (second *jhāna*) in sequence with Elements ③ to 31, and then returning to the beginning to pair it with the Element ①. Within the one-root case, in addition to the *khaṇḍacakka* of Element ① *paṭhamam jhānam*, and the *baddhacakka* of Element ② *dutiyam jhānam*, there are twenty-nine other *baddhacakka* (*aññānipi ekunatimsa baddhacakkāni*), equaling a total of thirty-one “types” (Sp. II, p. 497).

In terms of the calculations for two-root schema, three-root schema, and so on up to all-root schema, the *Samantapāsādikā* posits that the methodology for the one-root case applies uniformly, listing the respective combinations for each configuration: the two-root case has 29 “types”, the three-root case features 28 “types”, and so forth, decreasing by one for each additional root up to 30 roots, which present just one “type”, totaling 435 for the cases between two roots and thirty roots (Sp. II, p. 497).

However, it is necessary to clarify what exactly the 29 “types” or 28 “types” mentioned in the *Samantapāsādikā* refer to. Taking “two-root has 29 ‘types’” as an example, first, it can be ascertained that these “types” do not refer to the total number of arrangements. According to the rules of root, *khaṇḍacakka* and *baddhacakka*, the two-root case, means that ① and ②

first form the fore elements, which are then combined one by one with the remaining 29 elements. This corresponds to the permutation calculation of selecting 2 elements from a set of 30, yielding $29 \times 30 = 870$ permutations. Therefore, the assertion by the *Samantapāsādikā* that there are only 29 “types” for two-root cases is clearly incorrect. Thus, these 29 “types” cannot represent the total number of arrangements. Second, in terms of quantity, these 29 “types” might refer to the number of arrangements for each group of *khaṇḍacakka* or *baddhacakka* in the two-root configuration (this possibility was suggested to me by Professor Sasaki Shizuka), or they might refer to the number of *baddhacakka* in the two-root configuration, as the *Samantapāsādikā* explains the number of *khaṇḍacakka* and *baddhacakka* for the one-root case immediately prior to this.

Therefore, it can be concluded that the explanations provided by the *Samantapāsādikā* do not represent the total number of arrangements for the r-root case. This appears to be a straightforward progressive decremental summation.

4. Incomplete Combinatory Methods in *Shisong lü*

In comparison to other Vinayas, it is only in the *Shisong lü* that we observe cases comparable to those in the *Theravāda-vinaya*, and this is especially evident within the fourth *Saṅghādisesa* offense. This offense prohibits a monk from seeking carnal desires from a woman by praising sexual intercourse, which is deemed the highest kind of ministration. In this context, the *Shisong lü* enumerates nine types of ministrations used by monks in flattering praises: 1上 (superior), 2大 (great), 3勝 (excellent), 4巧 (skillful), 5善 (good), 6妙 (wonderful), 7福 (blessed), 8好 (pleasing), and 9快 (delightful), which are coupled with three distinct combinatorial methodologies.

The first type involves pairing “1上 (superior)” with each of the next eight qualifiers, followed by “2大 (great)” with each of the seven remaining qualifiers, and so on. This pairing is similar to the one-root *khaṇḍacakka* in the *Theravāda-vinaya*, where it is sequentially paired with subsequent elements without looping back to the beginning to continue the pairing, as in the following:

{1, 2}, {1, 3}, {1, 4}, ..., {1, 9}, totaling eight forms;

{2, 3}, {2, 4}, {2, 5}, ..., {2, 9}, totaling seven forms;

{3, 4}, {3, 5}, {3, 6}, ..., {3, 9}, totaling six forms;

This pattern continues up to {8, 9}, yielding thirty-six combinations.¹²

The second method aligns more closely with the *khaṇḍacakka* with a two-root technique from the *Theravāda-vinaya*, where “1, 2” serve as the fore element and are paired with each subsequent set of seven qualifiers:

{1, 2; 3}, {1, 2; 4}, {1, 2; 5}, {1, 2; 6}, ..., {1, 2; 9}, totaling seven forms;

{2, 3; 4}, {2, 3; 5}, {2, 3; 6}, {2, 3; 7}, ..., {2, 3; 9}, totaling six forms;

{3, 4; 5}, {3, 4; 6}, {3, 4; 7}, {3, 4; 8}, ..., {3, 4; 9}, totaling five forms;

Progressing thusly until {7, 8; 9}, aggregating to twenty-eight combinations.¹³

The third methodology integrates “1, 2, 3” as a collective base, with subsequent pairs stemming from sequential involvement from “4” to “9”. Unlike the previous types, here, combinations start with “1” and systematically incorporate more elements to construct the fore element, subsequently forming pairs for the *khaṇḍacakka*:

{1, 2, 3; 4}, {1, 2, 3; 5}, {1, 2, 3; 6}, ..., {1, 2, 3; 9}, totaling six forms

{1, 2, 3, 4; 5}, {1, 2, 3, 4; 6}, {1, 2, 3, 4; 7}, ..., {1, 2, 3, 4; 9}, totaling five forms

{1, 2, 3, 4, 5; 6}, {1, 2, 3, 4, 5; 7}, {1, 2, 3, 4, 5; 8}, {1, 2, 3, 4, 5; 9}, totaling four forms

{1, 2, 3, 4, 5, 6; 7}, {1, 2, 3, 4, 5, 6; 8}, {1, 2, 3, 4, 5, 6; 9}, totaling three forms

{1, 2, 3, 4, 5, 6, 7; 8}, {1, 2, 3, 4, 5, 6, 7; 9}, totaling two forms.¹⁴

Totaling to twenty distinctive forms.

Although the *Shisong lü* does not incorporate the r-root combination classification, it still shares similarities with the *Theravāda-vinaya*. For instance, in the *Shisong lü*, combination elements can also be divided into a fore element and an after element. The fore element may consist of a single element or a group of elements, such as the previously mentioned “1, 2, 3”, while the after element consists of only one element.

Additionally, the fore elements in the *Shisong lü* follow a sequential order from 1 to 9, akin to the r-root category found within the *Theravāda-vinaya*. This arrangement follows the rules of *khaṇḍacakka* strictly. Since the rules of *baddhacakka* are not implicated here, the combinatorial number for the *Shisong lü* can be calculated using the combinatorial formula $C(n, 2)$. For instance, the first type consists of the selection of two elements from a set of nine, resulting in $C(9, 2) = 36$ combinations. The second type, where the fore elements are '1, 2', involves combinations of two elements from a set of eight, yielding $C(8, 2) = 28$ combinations.

However, the third type of combination in the *Shisong lü* does not adhere to this logic. In the first and second types of combinations, the fore elements can be units starting from numbers other than 1, such as '2, 3' or '3, 4'. However, in the third type of combination, the fore elements invariably start from 1. For instance, combinations are presented as {1, 2, 3, 4; 5} or {1, 2, 3, 4, 5; 6}, with no examples, like {2, 3, 4; 5} or {3, 4, 5, 6; 7}, that begin with a number other than 1. It is apparent that in the third type, the combinatorial rule is not complete. However, it is uncertain whether this inconsistency originates from the translation or from the original Sanskrit.

Additionally, in the *Shisong lü*, the number of combination types in the three categories, i.e., eight forms, seven forms, six forms, five forms, four forms, three forms, two forms, one form in the first type, decrease sequentially. The total sum is applicable to the sum formula of an arithmetic sequence, i.e., $S = n(n + 1)/2$. For instance, the first type of combination amounts to a sequence sum from 8 to 1, which is $S = 36$; the second type constitutes a sum from 7 to 1, which is $S = 28$; and the third type represents a sum from 6 to 2, which is $S = 20$. Interestingly, this aligns with the combination sum rules found in the interpretation of the fourth *Pārājika* of *Samantapāsādikā*.

Overall, the three types of combinations within the *Shisong lü* closely resemble the *Khaṇḍacakka* in the *Theravāda-vinaya*. Moreover, the first two types fully conform to the combinatorial calculation formula $C(n, 2)$. Additionally, the *Shisong lü* also demonstrates features that are similar to those found in the *Samantapāsādikā*.

Additionally, in the *Abhidharma-mahāvibhāṣā-śāstra* (*Apīdamodapīposhalun*), we can observe combination methods similar to those found in the *Shisong lü*.¹⁵

5. Permutations and Combinations in Ancient Indian Mathematics

The permutations presented in the *Theravāda-vinaya* are calculated according to two rules. First, there is the *khaṇḍacakka*, which combines elements sequentially from start to end, as well as the *baddhacakka*, which combines elements from the beginning to the end and then loops back to the start. Second, the configurations of roots must also be considered. However, it is important to note that regardless of the number of roots, the permutations can be seen as selecting two elements from an $(n - r + 1)$ -set, with r representing the number of roots, leading to a formula such as $P(n - r + 1, 2)$, which is a standard formula in the *Theravāda-vinaya*.

Furthermore, the permutations for the r-root case in the *Theravāda-vinaya* demonstrate a systematic numeric sequence, the product sequence of two consecutive non-negative integers, and these numbers are called oblong numbers.

Lastly, unfortunately, while the *Samantapāsādikā* explains *khaṇḍacakka* and *baddhacakka*, it does not provide valuable reference information regarding the number of arrangements for elements within the sets.

The subsequent question that we must ask is as follows: what influences the permutations found in the *Theravāda-vinaya*? Additionally, are there other instances of the use of oblong numbers in Indian contexts?

In the *Suśruta-saṃhitā*, combinations of the six flavors—sweet, acidic, saline, pungent, bitter, and astringent—are enumerated (Chakravarti 1932, p. 81; Datta and Singh 1992, p. 232). It documents the calculation of various combinations, including combinations of one element up to combinations of all six elements. The calculations are specified as $C(6, 1) = 6$, $C(6, 2) = 15$, $C(6, 3) = 20$, $C(6, 4) = 15$, $C(6, 5) = 6$, and $C(6, 6) = 1$, leading to a total of 63 combinations.

This method appears similar to the first and second types of combination described in the *Shisong lü*.

Prosody constitutes a significant component of the *Vedas*, and *Pingala's Chandah Sūtra* presents intriguing operations on syllable combinations, which can be elucidated using the commentary by *Halāyudha* (10th century). Initially, *Pingala* employs a long syllable (guru, abbreviated as g) and a short syllable (laghu, abbreviated as l). Subsequently, he establishes rules for composing different numbers of syllables. For instance, a monosyllable is represented as g or l, while two syllables can be combined to form gg, lg, gl, or ll, resulting in four combinations. Three syllables yield eight possible combinations: ggg, lgg, glg, llg, ggl, lgl, gll, and lll. Four syllables can produce sixteen combinations, and five syllables yield thirty-two combinations, and so forth (Dvivedi and Singh 2013, p. 247).

This combinatorial calculation can be understood as 2^n , representing the sum of different combinations of g or l in n syllables. The results are expressed as $C(n, 0) + C(n, 1) + C(n, 2) + \dots + C(n, n-1) + C(n, n) = 2^n$. For example, the number of combinations for four syllables is sixteen (2^4), which includes one combination that is all g syllables ($C(4, 4)$), four combinations with one g syllable ($C(4, 3)$), six combinations with two g syllables ($C(4, 2)$), four combinations with three g syllables ($C(4, 1)$), and one combination with no g syllable ($C(4, 0)$). The total number of these different combinations is sixteen. When represented graphically as Figure 1, this process forms the Staircase of Mount Meru, also known as Pascal's triangle or Yang Hui's triangle (楊輝三角) (Ibid. pp. 261–65).

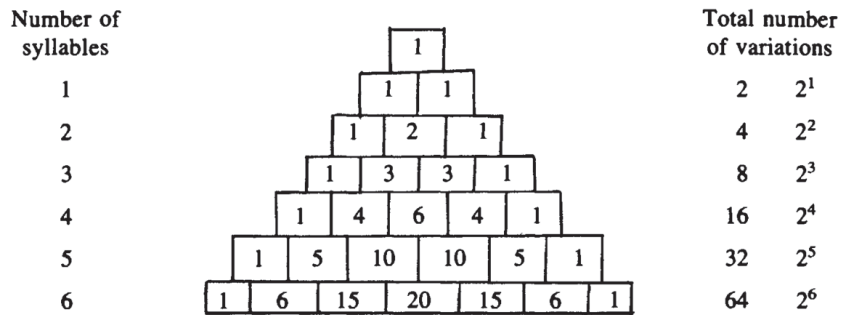


Figure 1. The Staircase of Mount Meru (Datta and Singh 1992, p. 244).

With respect to these combinations, three syllables ($n = 3$) are formed by combining the previous two-syllable ($n - 1$) combinations ($2^2 =$ four types) with g and l ($4 \times 2 = 8$). Similarly, four-syllable combinations ($n = 3$) are formed by combining the eight combinations of three syllables ($n - 1$) with g or l. Thus, these combinations can be conceptualized as consisting of a fore element and an after element, where the fore element is the combination of the previous $n - 1$ syllables, and the after element is a single syllable (g or l). This characteristic of preceding and succeeding elements is analogous to the r-root rules deduced in the *Theravāda-vinaya*.

Arrangements and combinations are also areas in which Jaina is specialized. The *Bhagavati-sūtra*, dating from between the 1st century BCE/1st century CE and the 3rd century CE¹⁶, is filled with numerous examples of permutations and combinations. Scholars have verified that these calculations align with modern formulas (Datta 1929, pp. 133–36). For example, two souls entering into the seven hells are stated as follows:

When lodged in one hell—7 forms

When distributed in two—42 forms

When in three—35 forms, total 84 forms (Lalwani 1985, pp. 37–38).

As scholars suggest, this issue can be resolved using modern formulas for permutations and combinations. For the calculation of “distributed in two” hells, we can first consider the combination of selecting two hells from seven possible hells, represented by $C(7, 2) = 21$. Within these seven hells, as three people enter two different places, and we

do not consider the order of the three people, there are only two possible scenarios—either the first hell has two individuals and the second has one, or the first hell has one and the second has two. Therefore, the total is $21 \times 2 = 42$ forms. This can also be seen as a permutation calculation that does not consider the order of the three people but considers the order of the two hells, as it involves distributing three people, which is $P(7, 2) = 42$. When three people enter three different hells, this is calculated as $C(7, 3) = 35$.

Additionally, instances where two souls enter into the seven hells are mentioned:

Together, they may be born in Ratnaprabhā hell, or any other, till the lowest seventh, (7 forms) or, one in Ratnaprabhā and another in one of the six hells, (6 forms) or, one in śarkaraprabhā and another in one of the five, (5 forms) or, one in Vālukāprabhā and another in one of the four, (4 forms) or, one in Pañkaprabhā and another in one of the three, (3 forms) or, one in Dhūmaprabhā and another in either of the two, (2 forms) or, one in Tamahprabhā and another in the lowest one, (1 form), total 28 forms.(Ibid, p. 36).

In simplified numerics, the combinations are:

{1, 1}, {2, 2}, {3, 3},..., {7, 7}, 7 forms

{1, 2}, {1, 3}, {1, 4},..., {1, 7}, 6 forms

{2, 3}, {2, 4},..., {2, 7} 5 forms

{3, 4},..., {3, 7}, 4 forms

And continuing until {6, 7}, making for a total of 28 combinations.

This case is equally applicable to the sum of an arithmetic series formula used in both *Shisong lū* and *Samantapāsādikā*, where $S = n(n + 1)/2$, for $n = 7$, yielding $S = 7 \times 8/2 = 28$.

Overall, Hindu and Jain scriptures have furnished us with methods for calculating permutations and combinations, traceable even to before the Common Era. These observations suggest that during the era of the *Theravāda-vinaya*, ancient India might already have possessed a mature knowledge of how to apply permutations and combinations. However, we have not found any clues about the concept of oblong numbers.

Interestingly, we encounter this sequence in the *Bakhshālī* manuscript within a calculation concerning the impurities of gold:

Example (3 for Sūtra 27).

Listen to me. There are (nine) gold pieces, the quantities of which are (severally) one, two, three, four, five, six, seven, eight, and nine suvarnas. (Their) impurities begin with two māśas and decrease one by one in order. When you have mixed up those gold pieces into one, let (the impurity of the alloy) be told.....

1	2	3	4	5	6	7	8	9
-2	-3	-4	-5	-6	-7	-8	-9	-10

‘Having multiplied by the impurities’ (Sūtra 27). The result is: 2, 6, 12, 20, 30, 42, 56, 72, and 90. The sum of these is 330.....(Hayashi 1995, p.3 12, the sanskrit text see p. 205).

Although this example is unrelated to permutations and combinations, it provides us with a sequence of oblong numbers similar to those found in the *Theravāda-vinaya*.

The *Bakhshālī* manuscript primarily consists of “the original rules and examples” and “the commentary”, with the commentary dating from around the 7th century, indicating that the content of the original rules and examples significantly predates the 7th century.

While this case does not allow us to fully resolve the origin of the oblong number sequence used in the *Theravāda-vinaya*, it does demonstrate that India had a certain awareness of this sequence and utilized it in various contexts. This further verifies that the compilers of the *Theravāda-vinaya* did not randomly use permutation formulas, but rather based it on solid knowledge, setting out permutations as the selection of two elements from differing numbers in sets to arrive at the oblong number sequence. So, where might the oblong numbers used in the *Theravāda-vinaya* originate? It seems that we may find some clues in ancient Greek mathematics.

6. The Figurate Number in Ancient Greek

The oblong number, also known as the pronic number, is typically grouped with triangular numbers, polygonal numbers, and square numbers under the category of figurate numbers. Some scholars attribute the origin of figurate numbers to Pythagoras (c. 570–495 BCE) or the Pythagorean school. This view is supported by scholars such as Burnet (1914, pp. 52–54), Dickson (1952, p. 1), Zhmud (1989, pp. 261–62), Heath (1921, pp. 82–84), and D’Ooge et al. (1926, p. 254, note 3), among others.

The arguments of these scholars are primarily based on the following evidence:

- (1) Aristotle’s *Metaphysics* 1092b (Aristotle 1999, p. 293) comments that Eurytus, a member of the Pythagorean school and a disciple of Philolaus, represented numbers in the shapes of triangles and squares.
- (2) We can also consider references from Callimachus (third century BCE) or Speusippus (Zhmud 1989, pp. 261–62).
- (3) The most significant evidence comes from Nicomachus (c. 60–c. 120 AD) in his *Introduction to Arithmetic*, where he explicitly mentioned that the Pythagorean school employed oblong numbers and introduced a specific type of oblong number, known as heteromecic numbers, as follows:

Heteromecic numbers: 2, 6, 12, 20, 30, 42, and so on.

Oblong numbers: 8, 18, 32, 50, 72, 98 and so on.¹⁷

However, W.R. Knorr presents a different perspective, arguing that figurate numbers did not originate with Pythagoras. He divides the development of figurate numbers into four stages:

(1) The first mathematical appearance of figured numbers arose through the arrangement of pebble-units as squares and rectangles to illustrate the operation of multiplication of integers; (2) The study of these configurations, in the light of practices already familiar in the decorative arts would lead to the mathematical analysis of other patterns, in particular triangular arrays. From this came the discovery of the summation-generation of square and oblong numbers and the formulation of the concept of ‘gnomon’ as the foundation of the further study of figured plane and solid numbers. (3) During Plato’s lifetime, mathematicians like Theaetetus formalized parts of the theory of numbers by means of a modified representation of number, that is, the geometric representation by continuous quantities, lines, plane figures, and solids, rather than by discrete arrays. However, substantial portions of the older arithmetic, overlaid with Pythagorean and Platonic metaphysical speculations on the power and significance of numbers, were continued in a separate tradition of treatises by such authors as Philolaus, Speusippus, and Hypsicles, before definitive compilations were made by Nicomachus and the later neo-Pythagoreans (Knorr 1975, p. 145).

In conclusion, the true origin of figurate numbers or oblong numbers remains uncertain. However, we cannot overlook the consistency between the oblong numbers in ancient Greek mathematics and those found in the *Theravāda-vinaya*. This consistency suggests a possible connection, wherein the oblong number sequence in the *Theravāda-vinaya*, derived from calculating the permutations of two elements within different sets, might be a result of cultural exchanges between ancient Greece and ancient India.

7. Concluding Remarks

Within the context of Indian religions, Jainism has long been recognized for its extensive use of permutations and combinations. However, the application of these principles within Buddhist scriptures has received relatively little scholarly attention. This article aimed to address this gap by presenting a novel case study that illustrates the specific application of permutations and combinations in the Buddhist Vinaya.

This paper analyzes the use of cases of element arrangements involving r -root cases as found in the *Theravāda-vinaya*, revealing some correspondence with permutation formulas in modern mathematics. When combined with the r -root cases in the *Theravāda-vinaya*, a general permutation formula, $P(n - r + 1, 2)$, can be derived. It can be said that the *Theravāda-vinaya* employs r -roots applications to continuously vary the total number of sets,

thereby forming permutation calculations for selecting two elements from sets of different sizes. I propose that the purpose of such calculations in the *Theravāda-vinaya* is to manifest the characteristics of the oblong number sequence.

However, although the extensive use of permutations and combinations in Vedic and Jainism illustrates that ancient civilizations in India were familiar with these concepts—providing fertile ground for the permutation examples in the *Theravāda-vinaya*—we have not found instances in ancient Indian texts that predate the *Theravāda-vinaya* where the use of oblong numbers is evident in the way that it is in these examples. A mention of oblong numbers is found later in the *Bakhshālī* manuscript, regarding calculations for impurities in gold, and showcases practical and secular applications—a shift from the traditionally religious beginnings of Indian mathematics.

Additionally, traces of oblong numbers can also be found in Greek mathematics. While we cannot ascertain their exact origin, this commonality between ancient Greek mathematics and the *Theravāda-vinaya* may suggest that it is possibly the result of cultural exchange between ancient Greece and ancient India.

Moreover, this article underscores the diversity inherent in the study of the Buddhist Vinaya literature. It is conceivable that the compilers of the *Theravāda-vinaya* possessed relatively advanced mathematical knowledge, and the permutations and combinations presented in different texts exhibit variations, suggesting that each Vinaya has undergone a distinct developmental process. Although the current analysis has not yielded more specific insights into the development of Vinaya literature, it is anticipated that future diversified research in this area will uncover additional relevant information.

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Abbreviations

- Sp.** *Samantapāsādikā*. 7 vols. Takakusu, Junjirō, and Makoto Nagai ed. 1966–1982. London: Pāli Text Society. First published 1924–1947.
Taishō shinshū daizōkyō 大正新脩大藏經. 100 vols. Takakusu Junjirō 高楠順次郎 and Watanabe Kaigyoku 渡邊海旭 et al., eds. Tōkyō: Taishō Issaikyō Kankōkai 大正一切經刊行會, 1924–1934. Digitized in CBETA (<https://cbetaonline.dila.edu.tw/zh/>, accessed on 12 April 2024) and SAT Daizōkyō Text Database (<http://21dzk.l.u-tokyo.ac.jp/SAT/satdb2015.php>, accessed on 12 April 2024).
- T** *The Vinaya Piṭakam*. 5 vols. Oldenberg, Hermann ed. 1969–1984. London: Pāli Text Society. First published 1879–1883.
- Vin.**

Notes

- ¹ For the discussion of Eurocentrism, see (Joseph 2010, pp. 4–8).
- ² I use the translation of Heffer, see Heffer (2010, pp. 138–39). Others holding similar views include Paul Tannery (1843–1904), the historian of mathematics, “the very fact that the Indians knew and used sines in their astronomical calculations was sufficient evidence that they must have had it from the Greeks.” see Joseph (2010, p. 311).
- ³ I also use the translation of Heffer, see Heffer (2010, p. 139).
- ⁴ (Horner [1938] 2014, p. 196). *Saṅghādisesa* is the second grave offenses entailing temporary penance in Vinaya.

- 5 Vin. III, p. 114. Due to the numerous omissions in the PTS version of the Vinaya, the content of the *Theravāda-vinaya* in this article also refers to the VRI website: <https://tipitaka.org/romn/>, accessed on 12 April 2024.
- 6 khaṇḍa in pāli means broken, or a break etc.. See (Cone 2001, p. 746). cakka means “a circle of possible cases, a series of permutations”, see (Cone 2010, p. 91).
- 7 baddha means binding; joining together etc. See the site of *A Dictionary of Pāli*: <https://gandhari.org/dop>, accessed on 12 April 2024.
- 8 Vin. III, p. 114. Also see <https://tipitaka.org/romn/>, accessed on 12 April 2024.
- 9 There is only “dumulakādi pi evam eva netabbam” (two-root and others should also be treated in the same manner) in PTS version of the *Theravāda-vinaya* (Vin. III, p. 114), and “Timūlakampi catumūlakampi pañcamūlakampi chamūlakampi satamūlakampi aṭṭhamūlakampi navamūlakampi evameva vitthāretabbam (Three-root, four-root, five-root, six-root, seven-root, eight-root, and nine-root should also be expanded in the same manner)” in VRI website <https://tipitaka.org/romn/>, accessed on 12 April 2024.
- 10 The translation of *Samantapāsādikā* used in this paper is the unpublished Japanese translation by the research association of Sasaki Shizuka and Yamagiwa Nobuyuki.
- 11 Indeed, within the fourth pārājika offense, there is a similar arrangement involving the *khaṇḍacakka* and *baddhacakka* rules, along with a variation known as *Vatthuvīsāraka*. Similarly, the fifth *saṅghādisesa* offense also presents a combination of *khaṇḍacakka* and *baddhacakka*, but in a more complex form. I am still investigating this and plan to write another paper to discuss it in more detail.
- 12 若比丘語女人言：汝能以身作淫欲供養持戒人者，是上大供養。僧伽婆尸沙。
若言：上勝、上巧、上善、上妙、上福、上好、上快供養。僧伽婆尸沙。
若言：大勝、大巧、大善、大妙、大福、大好、大快供養。僧伽婆尸沙。
若言：勝巧、勝善、勝妙、勝福、勝好、勝快供養。僧伽婆尸沙。
若言：巧善、巧妙、巧福、巧好、巧快供養。僧伽婆尸沙。
若言：善妙、善福、善好、善快供養。僧伽婆尸沙。
若言：妙福、妙好、妙快供養。僧伽婆尸沙。
若言：福好、福快供養。僧伽婆尸沙。
若言：好快供養。僧伽婆尸沙。 See *Shisong lü* 十誦律： T1435.17b20-c1.
- 13 若言：上大勝、上大巧、上大善、上大妙、上大福、上大好、上大快供養。僧伽婆尸沙。
若言：大勝巧、大勝善、大勝妙、大勝福、大勝好、大勝快供養。僧伽婆尸沙。
若言：勝巧善、勝巧妙、勝巧福、勝巧好、勝巧快供養。僧伽婆尸沙。
若言：巧善妙、巧善福、巧善好、巧善快供養。僧伽婆尸沙。
若言：善妙福、善妙好、善妙快供。僧伽婆尸沙。
若言：妙福好妙福快供養。僧伽婆尸沙。
若言：福好快供養。僧伽婆尸沙。 See *Shisong lü* 十誦律： T1435.17c1-9.
- 14 若言：上大勝巧、上大勝善、上大勝妙、上大勝福、上大勝好、上大勝快供養。僧伽婆尸沙。
若言：上大勝巧善、上大勝巧妙、上大勝巧福、上大勝巧好、上大勝巧快供養。僧伽婆尸沙。
若言：上大勝巧善妙、上大勝巧善福、上大勝巧善好、上大勝巧善快供養。僧伽婆尸沙。
若言：上大勝巧善妙福、上大勝巧善妙好、上大勝巧善妙快供養。僧伽婆尸沙。
若言：上大勝巧善妙福好、上大勝巧善妙福快供養。僧伽婆尸沙。 See *Shisong lü* 十誦律： T1435.17c9-18.
- 15 如此身1羯刺藍位與此身1羯刺藍位，乃至10老位為同類因。此身2頰部曇位與此身2頰部曇位，乃至10老位為同類因，與羯刺藍位作緣非因。乃至此身10老位與此身10老位為同類因，與前諸位作緣非因。 See *Apidamodapiposhalun* 阿毘達磨大毘婆沙論 T27. 88a23-27. In numerical terms, it can be represented as follows: {1, 1}, {1, 2}, {1, 3}, {1, 4}, ..., {1, 10}; {2, 2}, {2, 3}, {2, 4}, {2, 5}, ..., {2, 10}; {3, 3}, {3, 4}, {3, 5}, {3, 6}, ..., {3, 10}. {10, 10}.
- 16 According to a study by Ohira Suzuki, as cited in (Wu 2015, p. 102).
- 17 D’Ooge et al. (1926, pp. 254–55), Theon also “describes the heteromecic numbers in a manner that agrees in the main with Nicomachus.” Ibid. p. 254, Note 3.

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Article

From Modengjia Jing to Xiuyaojing: The Accumulation of Indian Astronomical Knowledge in the Chinese Buddhist Canon

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Abstract: This paper explores the accumulation of Indian astronomical knowledge within Chinese Buddhist scriptures and its dissemination across Chinese society through a comparative study of the Modengjia jing (Ch1 of the ZKA) and the Xiuyao jing (XYJ). The period from the Ch1 of ZKA to the XYJ was a time when Buddhism was in the midst of developing and maturing within China. The Ch1 of the ZKA is regarded as the first Buddhist scripture including a complete account of Indian nakṣatra astrology and translated from Sanskrit parallel text, rather than a native work codified by Buddhists in Ancient China. The XYJ is not a translation but rather an authoritative handbook of Indian astrological knowledge taught by Amoghavajra. A detailed comparison of the contents of the two texts shows that the knowledge contained within Ch1 of the ZKA belongs to the Vedic era and that the XYJ belongs to the post-Vedic era. Beginning with the Ch1 of the ZKA and ending with the XYJ, Buddhist astronomical knowledge steadily grew. Yang Jingfeng’s revision and explanation of the first fascicle of the Sutra reflects Ancient Chinese intellectuals’ acceptance, digestion, and recreation of Buddhist astronomical knowledge. His abandonment of the “Calculation of weekdays” reflects the influence of the Chinese mathematical and astronomical tradition and the calendar tradition upon his perspective; perhaps this is one of the reasons why China has accepted the weekday within daily life up to the modern era. Every civilization, in learning to assimilate other cultures, has a choice between foreignization and domestication, within which a tension is reflected. Learning from foreign cultures is about keeping up with the most advanced civilizations in the world and advancing with the times, while maintaining one’s own cultural identity and cultural characteristics is necessary for one’s own civilization; these two notions are complementary and should not be neglected.

Keywords: Xiuyaojing; Modengjia jing; Indian astronomical knowledge; Chinese Buddhist canon

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1. Introduction

The Chinese Buddhist canon has preserved a great deal of Indian astronomical data. Some examples include the astronomical systems of lunar stations (nakṣatra), luminaries (graha), and the signs of the zodiac (rāśi); calendar knowledge such as seasons and shadow data; and divinatory sayings. These Buddhist astrological and astronomical texts include locally made changes to the original content according to the natural environment and socio-cultural traditions, such as the addition of Chinese place names to certain texts or the use of Chinese seasonal divisions and calendrical data. In this paper, we analyze the typical documents of astronomical texts within Chinese Buddhist scriptures using the Modengjia jing (摩登伽經, abbreviated as the Ch1 of the ZKA), a Chinese translation of *Śārdūlakarṇāvadāna*, and the Xiuyao jing (宿曜經, abbreviated as the XYJ) as case studies, and discuss the historical details of the accumulation of Indian astronomical knowledge within the Chinese Buddhist canon.

Zenba Makoto initiated the research on the Ch1 of ZKA and XYJ in Kyoto (Zenba 1952, 1968). Yano Michio published *Mikkyō Senseijutsu* 密教占星術 in 1986 and carried out

a comprehensive study on XYJ. He showed the XYJ and its Sanskrit sources at a conference in 1987. (Yano 1987, [1986] 2013, 2019) His work attracted more scholars in this field. Niu Weixing published *Looking Westward to the Brahma—Astronomical Origins in Chinese Translation of Buddhist Scriptures* 西望梵天——漢譯佛經中的天文學源流 in 2004. More and more Chinese scholars are joining in on the research on astronomical texts of the Chinese Buddhist canon (Niu 2004, 2019; Niu et al. 2022).

The focus of this study is on the Ch1 of the ZKA and other parallel texts, discussing exchanges of astronomy, calendars, and literature between China and India. These texts maintain the main elements of Indian astronomy, such as terminology, divination by nakṣatras, the Hindu calendar, solar shadow data, instrument design, and so on. The original text was changed according to the local natural environment as well as social and cultural traditions (Zhou 2020b). From the perspective of translation style, the astronomical translations mainly focused upon quality, combining literal and free translation. The translation team collaborated and used the strategy of a unified combination of domestication and foreignization during the translation process. The translated works included both mathematical and astronomical content popular with intellectual elites, as well as descriptions of timing instruments and simple divination techniques that could be easily disseminated among the common people (Zhou 2020a).

In the following, we analyze the historical data on the Ch1 of the ZKA and of the XYJ in terms of their historical backgrounds, composers, and contents so as to evaluate the accumulation of Indian astronomical knowledge within the Chinese Buddhist canon.

2. Historical Background and Composition

2.1. Historical Background of Chinese Buddhism

Since the Buddhism came to China, a few monks were claimed to be talented in astrology to predict, magical power to survive, etc. Two texts discussed here are systematic explanation of Buddhist astrology, like a handbook or textbook in certain extent. The Ch1 of the ZKA is regarded as the first Buddhist scripture from India including a complete account of Indian nakṣatra astrology before Tang dynasty. The XYJ is an authoritative handbook of Indian astrological knowledge taught by master Amoghavajra in Tang dynasty. It influenced the Japanese Tantrism and school of astrology, and even modern artistic creations.

The translators of the Ch1 of the ZKA were Zhi Qian 支謙 and Zhu Lüyan 竺律炎. Zhi Qian was a translator from Wu during the Three Kingdoms period and came from the Yuezhi 月支 family. From the first year of the Huangwu 黃武 reign to the middle of the Jianxing 建興 reign (222–53), Zhi Qian devoted himself to the translation of Buddhist texts into Chinese for thirty-two years and translated such important texts as the *Vimālakīrti Sutra* 《維摩詰經》, the *Prince's Ruiying Benyiqi Sutra* 《太子瑞應本起經》, and the *Daimingdu Sutra* 《大明度經》. The translated scriptures were considered to be elegant and polished and were widely praised. Zhu Lüyan was an Indian monk who translated sutras during the Three Kingdoms period. In the third year of the Huangwu era (223), he came to Wuchang with Wei Zhinan 維祇難 and translated the *Dhammapada Sutta* 《法句經》, which he had brought with him. In the second year of the Huanglong 黃龍 reign (234), he and Zhiqian jointly translated the Ch1 of the ZKA. It is important to note that the Buddhist canon's catalogs were compiled across many ages, and some of the translators have been inaccurately recorded. More precisely, the Ch1 of the ZKA was recorded during the Sui Dynasty in 594, when the *Fajiing* (法經)'s "Catalog of Sutras (《眾經目錄》)" was compiled. Therefore, the Ch1 of the ZKA should have been translated before the *Fajiing* (法經)'s "Catalog of Sutras", i.e., before year 594.

The full title of the Sutra is "Sutra on Mañjuśrī Bodhisattva and the Sages' Teaching on Auspicious and Inauspicious Times, Good and Evil Constellations and Planets (文殊師利菩薩及諸仙所說吉凶時日善惡宿曜經)", and it was translated by Amoghavajra (不空, 705–74), one of the three great masters of the Tang Dynasty. It was published in the second year of the Qianyuan (乾元二年759), and the complete text was completed in the second year of the Guangde (廣德二年764). Amoghavajra was a Buddhist ācārya and translator in the

Tang dynasty and a native of Sri Lanka in South India who studied the secret method of the Vajradhātu under Vajrabodhi (金剛智). He was active during the three dynasties of Emperor Xuanzong (玄宗), Suzong (肅宗), and Daizong (代宗) of the Tang Dynasty and was closely associated with the latter two emperors. When he passed away at the age of seventy, he was posthumously honored with the titles of Sikong (司空) and “Great Advocate (大辯正)”. He was the sixth inheritor of Tantric Buddhism, and his disciples included Hanguang (含光), Huichao (慧超), Huiguo (惠果), and Huilang (慧朗). Kūkai (空海), a Japanese monk and disciple of Huiguo, then founded the Shingon Sect in Japan and continued the lineage. Amoghavajra’s translations consist of about 110 works and 143 fascicles, which are divided into five categories, namely, Mahāyāna, Miscellaneous Tantra, Vajradhātu, Mahāsukha (大乐), and Miscellaneous Writings. The XYJ was a work he completed with Yang Jingfeng (楊景風), an astronomer and Buddhist of that time. In the fourth year of the Jianzhong (建中) reign of Emperor Dezong (德宗) of the Tang Dynasty (783), the astronomer Xu Chengsi (徐承嗣) and the summer official (夏官) Yang Jingfeng (楊景風) worked together to formulate a new calendar, the Jianzhong Zhengyuan Calendar (建中正元曆), which was used until the first year of the Zhonghe (中和) reign of Emperor Xianzong (憲宗) of the Tang Dynasty (806). Yang Jingfeng lived in the same era as the Indo-Tang Gautama family 瞿曇氏, who provided astronomical calendar services at the Tang court and had some knowledge of Indian astronomy.

Zen Buddhism as a sign of the localization of Buddhism in China dates from the Longshuo 龍朔 to Chuigong 垂拱 periods, corresponding to the reigns of Emperor Gaozong 唐高宗 and Wu Zetian 武則天 of the Tang Dynasty. In this way, the Ch1 of the ZKA was translated before the Sui Dynasty, prior to the advent of the localization of Buddhism in China, and the XYJ was translated and compiled during the reign of Kaiyuan 開元, following the localization of Buddhism in Chinese history. “After the Jin 晉 Dynasty, the styles of Buddhism in the north and the south were indeed different, but they were then synthesized at the time of the Chen-Sui-Dynasty (陳隋), so that the power of Buddhism in our country reached its height afterwards. Sui 隋 and Tang 唐 Dynasty Buddhism can be called the period of great prosperity as well Sui and Tang Dynasty Buddhism, bearing the results of the development of hundreds of years since the Han and Wei Dynasties, underwent a wide range of evolution into sects. And the understanding of the gradual refinement can be blended with the doctrines of India, and self-establishment, such as with the Tiantai 天臺 Sect and Zen 禪 Sect, can be said to be pure Chinese Buddhism as well.” (Tang [1982] 2010, preface) After six or seven hundred years of development, the Buddhist community in the Sui and Tang dynasties was full of talented people, bearing a wide range of sects and highly refined doctrines and incorporating a variety of Indian intellectual traditions. The most influential Buddhist astrological work, Xiuyaojing, was developed under the auspices of the Sixth Patriarch of Tantric Buddhism, Amoghavajra, constituting an inevitability of the times.

2.2. Composition of Two Texts

Looking at a series of Sanskrit and Tibetan–Chinese texts, it is clear from the study of parallel texts that the Ch1 of the ZKA is a Buddhist scripture transmitted from India rather than a native creation of the Han Chinese (Miyazaki et al. 2015; Zhou 2020b). Generally speaking, Buddhist sutras are considered to have been spoken by the Buddha. While avadāna like the Ch1 of the ZKA, actually tell the story of the cycle of karma in two lives, these may have been the versions used by *dārṣṭāntikas* in India of *Sarvāstivādin* sect (Zhou 2023).

The XYJ was orally taught by Amoghavajra and written by his disciple Yang Jingfeng (楊景風) and others. There is no Sanskrit original of the XYJ; rather, it was supposedly originally composed by Buddhist monks in China. According to Prof. Michio Yano’s research, this Sutra is divided into two fascicles, the second of which was dictated by Amoghavajra (不空) and recorded by Shi Yao (史瑤) in 759 AD. The first fascicle was revised, annotated, and organized by the astronomer Yang Jingfeng (楊景風) based on the second fasci-

cle. Zemba Makoto and Yano Michio claimed within their monographs (Zenba 1968; Yano [1986] 2013) that the XYJ is not a translation but rather was written by Chinese monks during the Tang Dynasty, while Li Hui argued that the XYJ is a Chinese translation (Li 2007) of a Sanskrit text. Frankly speaking, Li's conclusion displays a lack of knowledge of Buddhist literature. The Buddhist tripitaka include Dharma, Vinaya, and Abhidharma, many of which were composed by ancient elites along the road of the transmission of Buddhism. After careful reading and comparison, it is reasonable to surmise that the XYJ is not a translation but rather was written by the monks of Tang China.

The Ch1 of the ZKA is clearly a Chinese translation of Buddhist Sanskrit *avadāna*, given that it bears so many parallel texts. The XYJ, on the other hand, is evidently not a translation but rather an original Buddhist Astrology manual written by monks in Tang China.

2.3. History of the Development of Astronomical Literature in the Chinese Tripitaka

From the Eastern Han 东汉 Dynasty to the Northern Song 北宋 Dynasty, Buddhists in ancient China traveled westward in search of the *Dharma* or otherwise brought scriptures eastward, thus producing a large number of Buddhist texts that contained a great deal of astronomical information. Table 1.2 in (Niu et al. 2022), the "List of Extraterritorial Astronomical Literature from China", lists 54 Buddhist texts containing astronomical elements, ranging from An Shigao (安世高)'s *Three Thousand Vigilant Measures of the Great Bhikkhu* (大比丘三千威儀) composed during the Han Dynasty to Shihu (施護)'s *Twelve Margins of Good Fortune Sutra* (十二緣生祥瑞經) composed during the Song Dynasty. Among them, 33 sutras, or 61% of the total number of sutras, were written in the period between the composition of the Ch1 of the ZKA and the XYJ. They include important vinaya texts such as the *Four Points of the Vinaya* (四分律), the *Ten Recitation Vinaya* (十誦律), and the *Mahasamgha Vinaya* (摩訶僧祇律); important sutra texts such as *Digha nikāya* (長阿含經), the *Mahānirvāṇa Sūtra* (大般涅槃經), and the *Mahāsamñipātasūtra* (大方等大集經); and important abhidharma such as the *Mahāprajñā-pāramitā-śāstra* (大智度論), the *Abhidhammakosa* (阿毗達摩俱舍論), the *Yogacaryābhūmi* (瑜伽師地論), and so on.

The above canonical books were translated by Kumārajīva, Xuanzang, Paramārtha, and other monks and occupy an important position within the transmission of Buddhist literature. It is conceivable that Indian astronomical knowledge underwent continuous transmission between learned Buddhist monks. At the same time, the above canonical texts had a certain influence among the intellectuals of Ancient China. For example, He Chengtian (何承天 435–43), an astronomer in Nanjing (南京), paid attention to the Indian astronomical equinoxes, eclipses, the step of light and shadow, the lodging degree of chronology, and the location of the legal day according to the lunar eclipse and questioned the traditional "seven intercalary leaps in nineteen years" of the intercalary week of the Han Dynasty, advocating instead that "the change be made at any time to get its coincidence" and that each of the five stars should be given its own time. Emperor Wu of Liang in the period from 502 to 49 questioned the traditional 7 leaps in 19 years in the Han Dynasty and advocated to "move and change at any time in order to take the conjunction of the five stars" and designate a post-element for each. On the other hand, Emperor Wu of Liang, who possessed some understanding of the ancient cosmology of India, "made a different celestial body, set up a new idea, and rejecting the theory of Sphere-Heavens (別擬天體, 立新意, 排渾天)." In turn, Zhang Zixin (張子信), in the 534–64 period, discovered that the motion of the sun and the planets was not uniform (Niu et al. 2022, p. 25).

From the above, we can assume that Indian astronomical knowledge within the Chinese Tripitaka developed parallel to the growth of Chinese Buddhism and had a profound influence upon intellectuals, imperial court, and Chinese society as a whole.

3. Comparison of Chapters and Contents

Upon comparing chapters and contents, we find that the predominant astronomical elements are graha (曜, luminaries) and nakṣatra (宿, lunar mansions). The ways of making predictions are rather different in the XYJ and Ch1 of ZKA. The upper fascicle of the

XYJ is divided into six chapters (品). Chapter one, titled “Determining the nakṣatra dating (定宿直品)”, outlines a basic geocentric Mt. Sumeru (須彌)-oriented cosmology and a layout of the ecliptic defined by twenty-eight nakṣatras and twelve zodiac houses (十二宮) plus their spatial relations to one another. It is written in the following manner:

“In the first zodiacal sign, nakṣatra Maghā is four *pādas* wide, Pūrvaphalgunī is four *pādas* wide, Uttaraphalgunī is one *pāda* wide, and the *graha* sun is located there. The god is like a lion, so it is called Shizi Gong (師子宮). Its dominant on official issues and wealth. If a person is born to this palace, he will have the right spirit, be rich and filial, and oversee military duties. In the second zodiacal sign, Uttaraphalgunī is three *pādas* wide, Hasta is four *pādas* wide, Citrā is two *pādas* wide, and the *graha* there is Budha (Mercury). (第一(宮), 星四足, 張四足, 翼一足, 大陽位焉。其神如師子, 故名師子宮。主加官得財事。若人生屬此宮者, 法合足精神、富貴孝順, 合掌握軍旅之任也。第二(宮), 翼三足, 軫四足, 角二足, 辰星位焉。”

Chapter two is titled “Born on Nakṣatra Days (宿直所生品)”, and details the twenty-eight nakṣatras (二十八宿). It lists their respective shapes and associated deities, *gotras*, and foods. Chapter three, “Category of the three sets of Nine (三九祕宿品)” describes a method of electional astrology calibrated to the individual in which the twenty-seven *nakṣatras* are divided into three sets of nine, such as the nakṣatra of destiny (命宿), the nakṣatra of prosperity (榮宿), the nakṣatra of decline (衰宿), etc. Chapter four, “Seven-graha day (七曜值日品)”, details the seven planets and the seven days of a week in the modern order: Sunday (日曜日), Monday (月曜日), Tuesday (火曜日), Wednesday (水曜日), Thursday (木曜日), Friday (金曜日), and Saturday (土曜日). Chapter five, “Secret Divinations (祕密雜占品)”, details various secret methods, e.g., the ‘six harms’ 六害, representing six assignments relative to one’s birth nakṣatra: ‘life’ (命宿), ‘affairs’ (事宿), ‘intention’ (意宿), ‘gathering’ (聚宿), ‘common’ (同宿), and ‘overcoming’ (克宿).

Chapter six, “*Kṛṣṇa-pakṣa* and *śukla-pakṣa* (黑白月分品)”, defines the thirty-day Indian month, composed of a *śukla-pakṣa* 白月 (waxing period) and a *kṛṣṇa-pakṣa* 黑月 (waning period) converted into lunar days, together with a hemerological method 撰日法 for selecting auspicious days. Chapter 7 in the Taisho Tripitaka version, “Auspicious days”, provides details on choosing auspicious days, divinations on *kṛṣṇa-pakṣa* and *śukla-pakṣa* days, a divination on 27 nakṣatra days, divinations on journey and tailoring, three sets of nine, etc. This chapter covers the last part of the upper fascicle and the beginning part of the lower fascicle. While a special section was inserted in the Japanese manuscript, namely, the seventh section, “calculating weekdays (算曜直章)”, it is expressly not taught by Mañjuśrī, and is thus called a section 章 and not a chapter 品. It is not included in the Taishō version. It is a complex formula for calculating weekdays 算曜直, citing a translation by the Indo-Tang Gautama family 瞿曇氏. The lower fascicle in the Taisho Tripitaka has Chapter 8 “Divination over seven planet days”, and the corresponding topics cover divinations over Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, etc. The lower fascicle is arranged by subject; most of its content parallels that of the upper fascicle. The lower fascicle contains comments on misunderstandings of the Chinese, whereas the upper fascicle was clearly more adapted for the Chinese readership (Yano [1986] 2013; Kotyk 2015a, 2015b).

The Ch1 of the ZKA is divided into two fascicles. The upper fascicle mainly focuses on stories of the current and previous lives of Prakṛti and Ānanda, which are divided into Chapter one, “Converting the Girl Prakṛti (度性女品)”; Chapter two, “Explaining the Past (明往緣品)”; Chapter three, “Revealing the Truth (示真實品)”; Chapter four, “Inquiries (眾相問品)”; and chapter five, “Explaining Uranography (說星圖品)”. The lower fascicle is primarily made up of astrological content, consisting of Chapter six, “Foreseeing Calamity and Fortune (觀災祥品)”, and Chapter seven “Explaining Time Divisions (明時分別品)”. The contents of astrological prophecies and astronomical calendars include the characteristics of *nakṣatras*; the fractions of day and night, the lengths of time and seasons, and the fractions of *kṣaṇa*; the units of length and those for the measurement of gold and grains; the fate of those born on nakṣatra days; predictions for cities built on nakṣatra days; predic-

tions for the first rainfalls during monsoons on nakṣatra days; predictions of lunar eclipses occurring on nakṣatra days; the desirability of and the undesirability of things that happen on nakṣatra days; the fractions of day and night on the day of the solstice, the length of the day’s shadows, and the change of time and seasons; predictions of earthquakes; the divinatory statements of earthquakes; the divinatory statements of imprisonment; the divinatory statements of moles on a woman’s body; the good and bad characteristics of a person born on nakṣatra days; and so on.

Table 1 comparing the contents of the Ch1 of ZKA and the XYJ from the Taisho Tripitaka version.

Table 1. Contents of Ch1 of ZKA and the XYJ (Taisho Tripitaka Version).

XYJ			Ch1 of ZKA		
Fascicle	Title of Chapter	Contents	Fascicle	Title of Chapter	Contents
Fascicle 1 Revised by Yang Jingfeng	Chapter 1 Determining the nakṣatra dating scheme	Mt.Sumeru, layout of twenty-eight nakṣatras and twelve zodiac houses	Fascicle 1	Chapter 1 Converting the Girl Prakṛti	The story of Prakṛti and Ānanda
	Chapter 2 Born on Nakṣatra Days	Details of nakṣatras		Chapter 2 Explaining the Past	<i>Buddha</i> tells the story of <i>Triṣaṅku</i> and <i>Puṣparasārīn</i>
	Chapter 3 Category of the three sets of Nine	Nakṣatras divided into three sets of Nine		Chapter 3 Revealing the Truth	<i>Triṣaṅku</i> talks about the caste system
	Chapter 4 Seven-graha day	Seven planets and week		Chapter 4 Inquiries	<i>Puṣkarasārīn</i> was convinced by the knowledge of <i>Triṣaṅku</i>
	Chapter 5 Secret divinations	Various secret divinations		Chapter 5 Explaining Uranography	Description of twenty-eight <i>nakṣatras</i>
	Chapter 6 <i>Kṛṣṇa-pakṣa</i> and <i>śukla-pakṣa</i>	Hemerology on selecting auspicious days		Chapter 6 Foreseeing Calamity and Fortune	Natal predictions for individuals born under each nakṣatra; predictions for cities, rainfall, disasters during eclipses, earthquakes, etc.
Fascicle 2 Orally taught by <i>Amoghavajra</i> , written by Shi Yao	Chapter 7 Auspicious days	Details on choosing auspicious days	Fascicle 2	Chapter 7 Explaining Time Divisions	The lengths of day and night in given months and seasons, time units, water clocks, predictions of recovery from sickness and release from jail, mole readings, gnomonic measurements, details of who and what the nakṣatras preside over, etc.
	Chapter 7 Auspicious days	Selecting auspicious days, divinations on <i>Kṛṣṇa-pakṣa</i> and <i>śukla-pakṣa</i> days, divination on 27 <i>nakṣatra</i> days, divination on journey and tailoring, three sets of nine,			
	Chapter 8 Divination over seven planet days	divinations over Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, etc.			

By taking the Comparison of Chapters and Contents into consideration, it can be found that the predominant astronomical elements within the XYJ are graha (曜, luminaries) and nakṣatra (宿, lunar mansions), which are considerably more comprehensive than the Ch1 of the ZKA, which only includes nakṣatra with which to make predictions. This is a key contrast in the history of Indian astronomy. In many talks, Bill Mak shares the idea of dividing the history of Indian astronomy into two phases based on terminology

and technological development: the Vedic period, which was dominated by nakṣatra, with terms such as tithi, nakṣatra, muhūrta, and karana, and the post-Vedic period, which was dominated by grahas, with terms such as navagraha (the nine planets), yoga (planetary conjunction), planetary worship, and so on. Based on their content, the Ch1 of the ZKA belongs to the Vedic period, whereas the XYJ belongs to the post-Vedic period. The XYJ exemplifies the archetype of Indian astrology from the Tang period to the present day.

4. The Accumulation of Indian Astronomical Knowledge between Modengjia Jing and Xiuyaojing

4.1. Nakṣatras, Grahas, and the Zodiacal Signs

In Ancient Indian astronomy, the nakṣatras and the twelve zodiacal signs were the most important coordinate systems along the ecliptic. The coordinate system of the nakṣatras appeared as early as the Vedas, while the system of the twelve zodiacal signs was introduced to India by the Greeks after first year of Gregorian calendar, merging their system with that of the former. The Ch1 of the ZKA contains only the coordinate system of nakṣatras and does not make any reference to the system of the twelve zodiacal signs. The XYJ, in contrast, describes not only the coordinate system of the nakṣatras but also the coordinate system of the twelve zodiacal signs. At the beginning of the upper fascicle in the XYJ, the correspondence between nakṣatras and the twelve zodiacal signs is clearly explained. The Ch1 of the ZKA contains both the twenty-eight- and twenty-seven-nakṣatra systems. The XYJ was originally supposed to be a twenty-seven-nakṣatra system but was changed to a twenty-eight-nakṣatra system in order to correspond with the Han Chinese tradition of twenty-eight constellations.

For the translation of the Indian names of the nakṣatras, the Ch1 of the ZKA employs the traditional Chinese counterpart of the twenty-eight constellations, namely, “角, 亢, 氐, 房, 心, 尾, 箕 ... 井, 鬼, 柳, 星, 张, 翼, 轸,” while other Buddhist scriptures of the same period use either a phonetic or literal translation. In terms of the breadth of later circulation, the Ch1 of the ZKA’s choice is more correct. The XYJ clearly chose the Chinese translation of the twenty-eight constellations, which suggests that this translation was already fixed by that time.

On account of the grahas, the seven luminaries of the Sun, the Moon, Venus, Jupiter, Mercury, Mars, and Saturn are found in the Ch1 of the ZKA but not in the weekly order. Regarding the entirety of the XYJ, the ordering of the days of the week from Sunday to Saturday had already been introduced into ancient Tang China, but it did not replace the upper ten days (上旬)–middle ten days (中旬)–lower ten days (下旬) calendar system of the Chinese imperial court.

4.2. Revision of XYJ by Chinese Astronomers

Compared to the Taisho edition, some Japanese manuscripts of the XYJ add a chapter at the end of the fascicle one titled “The Seventh Chapter on the Calculation of weekdays (算曜直章第七)”. Astronomer Yang Jingfeng, in a two-line note, claims that this is not part of Manjushri’s teaching and therefore is not treated as a “chapter (品)” but rather as just a “section (章)”. This chapter deals with numerology, calculating the total number of days (cumulative days) from the starting point of the calendar to the current day, dividing it by seven, and using the remainder to find the “day of the week”. The majority of the content of the “Section of Calculation of luminaries’ dating” is quoted from the Indian systematic astronomical work “Navagraha Calendar (九執曆)”. Yang Jingfeng was a calendar expert and felt that the content of how to calculate weekdays was important, and so he quoted the content of the Navagraha Calendar to supplement the XYJ. However, the starting point of this calendar was not appropriate, and the constants used were not precise, so the calculation method provided could not determine the correct weekday. In China, where there exists a reliable tradition of calculation, this chapter was discarded for being useless after the discovery of this error. However, Kūkai (空海) received the XYJ from Huiguo (惠果), which contained this chapter, and he himself realized the importance of the weekday so

he kept it. Since later Japanese scholars did not know much about the mathematical aspects of astronomy and could not simply discard the contents of the important classics introduced by the Kūkai, the “Calculation of weekdays (算曜直章)” was preserved in the existing Japan manuscript of the XYJ (Yano [1986] 2013).

The revision of the XYJ by Yang Jingfeng and other Chinese astronomers showed their choices between foreignization and domestication, in which a tension is reflected. Adding “The Seventh Chapter on the Calculation of weekdays (算曜直章第七)” might have been carried out to learn the “Navagraha Calendar (九執曆)” from the Indo-Tang Gautama family 瞿曇氏 to keep up with the most advanced civilizations in Asia and the rest of the world. When Chinese astronomers used their reliable tradition of calculation and discovered the errors of weekday calculations, they discarded this chapter to keep it right in astronomy and mathematics. Learning and adapting are complementary, and neither of them should be neglected.

4.3. Charts of XYJ Composed in China

There are no charts within the upper and lower fascicles of the Ch1 of the ZKA. The lower fascicle of the Taisho version of the XYJ has two charts that show how the host on which one’s birthday falls can be found, and the Japanese manuscript of the XYJ has one chart. The corresponding text is as follows:

“If one takes the host in which the moon is located on the fifteenth day of the month of one’s birth on the chart, and counts backwards and forwards from there to the host to the end of one’s birth day, and then one has found the host to which one belongs 夫欲求人所屬宿者，即於圖上，取彼生月十五日下宿，從此望宿逆順數之，至彼生日止，則求得彼人所屬宿也。(T21, no. 1299, p. 395b1-3)”.

Figure 1 can help astrologers find the correct nakṣatra for one’s birthday. It includes the nakṣatras, the twelve zodiacal signs, and the grahas, presented from the outer hoop to the inner hoop. From the words of “Sun 大阳”, “Moon 大阴”, “Saturn 填星”, and “Jupiter 歲星”, we can unearth a clue regarding traditional Chinese astronomy. The scribe changed the word “太” to “大” to avoid a taboo word.

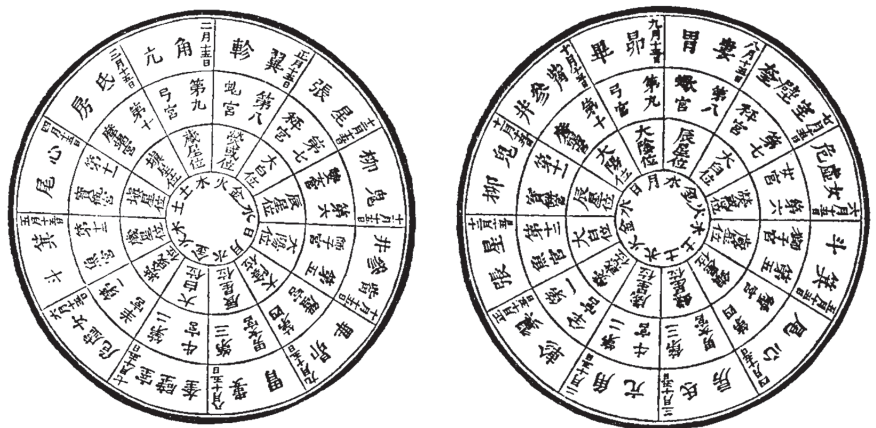


Figure 1. Two charts in the Taisho version of XYJ. (T21, no. 1299, p. 395a5-29).

These two charts with a taboo word might be a special tool that Chinese astronomers and academic monks can use in learning. The above three cases show tension between foreignization and domestication. Elites kept up with the most advanced astronomy in ancient times and preserved their own traditions in science and culture.

5. Conclusions

The Ch1 of the ZKA is considered to be the first Buddhist scripture through which Indian astrology spread to the Han Chinese. The XYJ, on the other hand, is regarded as the most important and influential text of Indian astrological Buddhist literature. From the Ch1 of the ZKA to the XYJ, the literature of Indian astronomy was gradually cemented into an archetype, through which Indian astronomical knowledge was accumulated and transmitted within Buddhist scriptures. Many cases can support this conclusion, like the nakṣatra divination system in the Ch1 of ZKA, but nakṣatras, grahas, and the zodiacal signs emerge in one system in the XYJ.

There are a few standards with which to divide the phases of Ancient Indian astronomy. In his talks, Bill Mak divides the history of Indian astronomy into two phases based on terminology and technological development: Vedic astronomy, which was dominated by nakṣatra, with terms such as tithi, nakṣatra, and muhurta, and post-Vedic astronomy, which was dominated by grahas, with terms such as navagraha (the nine planets), yoga (planetary conjunction), planetary worship, and so on. The Ch1 of the ZKA is part of Vedic astronomy because of nakṣatra 宿, whereas the XYJ is part of post-Vedic astronomy because of nakṣatra 宿 and graha 曜. The XYJ exemplifies the archetype of Indian astrology from the Tang period to the present day.

The arrangement of the twenty-eight nakṣatras, twelve zodiacal signs, and seven grahas by the editors of the XYJ demonstrates that the translators were familiar with the astronomical knowledge of both India and China and had the ability to make selective translations and non-translations, as well as the capacity to make additions or deletions to its content. For example, the Ch1 of the ZKA only lists seven grahas, while the editors of the XYJ added Rāhu and Ketu in order to form nine grahas. The addition and abandonment of the “Calculation of weekdays (算曜直章)” reflect the familiarity of Chinese astronomers like Yang Jingfeng and other astronomers with the computational tradition. These actions also show that the tradition of the upper ten days (上旬)–middle ten days (中旬)–lower ten days (下旬) calendar system of the Chinese imperial court was stably followed in Ancient China.

Beginning with the Ch1 of the ZKA and ending with the XYJ, Buddhist astronomical knowledge grew and developed over time. Yang Jingfeng’s revision and explanation of the first fascicle of the Sutra reflect Ancient Chinese intellectuals’ acceptance, assimilation, and recreation of Buddhist astronomical knowledge. The abandonment of the “Calculation of weekday (算曜直章)” reflects the influence of the Chinese mathematical and astronomical tradition and the calendar tradition, and perhaps this is one reason why China has not accepted the weekday within daily life. The lower fascicle of the Taisho version of the XYJ has two charts that show one how to find the host on which their birthday falls. These two charts containing a taboo word might be a special tool Chinese astronomers and academic monks can use in learning. In learning to assimilate other cultures, every civilization has a choice between foreignization and domestication, in which tension is reflected. Learning from foreign cultures is about keeping up with the most advanced civilizations in the world and advancing with the times, and maintaining one’s own cultural identity and cultural characteristics is necessary for one’s own civilization. The two are complementary, and neither should be neglected.

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Abbreviations

Ch1 of ZKA	Modengjia jing 摩登伽經
XYJ	Xiuyaojing 宿曜經

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Article

Divine Medicine: Healing and Charity Through Spirit-Writing in China

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Abstract: This study traces the evolution of religious healing practices associated with divine presence in China, from pre-modern traditions to the modern use of spirit-writing for obtaining divine prescriptions. It examines the continuity and transformation of these practices from the late imperial period to contemporary times. It argues that healing through divine prescriptions obtained via spirit-writing challenges the perceived dichotomy between religion and science, demonstrating that they have complementary roles, rather than being strictly opposing categories. For members of Jishenghui 濟生會, a lay Buddhist charity devoted to the Buddhist god Jigong 濟公 in Republican China, religion and scientific medical practice were integrated as complementary elements of daily life, combining doctrinal beliefs, ritual practices, and moral self-cultivation. This study examines how Jishenghui used spirit-writing to obtain and distribute divine prescriptions and medicines, demonstrating that the organization's philanthropic activities and social standing were enhanced by the integration of religious beliefs with medical and charitable practices during the Republican period. This study bridges existing research on the histories of spirit-writing and Chinese medicine, and the distinctions made between "Buddhist medicine" and "Daoist medicine". The article contends that, for ordinary people, no strict distinction existed between Buddhist and Daoist healing practices; instead, a shared religious culture regarding illness and healing was predominant. By contextualizing key analytical concepts such as "divine medicine", especially "divine prescriptions" (*jifang* 乩方 and *xianfang* 仙方) within the broader history of Chinese medicine and religious practices, this article demonstrates the social significance of spirit-writing as a ritual technique to provide healing and charity by lay Buddhists in Republican China, and its enduring relevance in contemporary Chinese societies.

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Keywords: Buddhism; Daoism; spirit-writing; ritual healing; divine prescriptions 乩方; lay Buddhist charity; Jishenghui 濟生會; Jigong cult 濟公信仰; Republican China

1. Introduction

During the initial stages of the COVID-19 pandemic in 2020, before the development of vaccines, an intriguing array of cures and medical prescriptions began circulating online within Chinese communities. These ranged from incantations and talismans to herbal medicine; some of which were prescribed by official institutions traditionally used for respiratory diseases. Among these, a notable case was the "Medical prescription of Bodhisattva Guanyin" 觀音菩薩藥方, which included not only herbal recipes but also exhortations for moral betterment and fasting, intertwined with dire warnings of divine retribution in apocalyptic scenarios. Such prescriptions trace back to texts such as "Divine prescription of Guanyin to save humanity from the apocalypse" 觀音大士救劫仙方,¹ which was widely disseminated during epidemics in late imperial China. These medical recipes belong to a particular genre of Chinese medical prescriptions, known as "prescriptions received through spirit-writing" (*jifang* 乩方) or "prescriptions of immortality" (*xianfang* 仙方).² The effectiveness of spirit-writing prescriptions is not to be understood through modern biomedical criteria but rather within the cultural and religious belief systems of the period. Healing, in this context, was seen as an interwoven process of religion, morality,

and communal engagement. While these prescriptions reflect a distinct fusion of medical and religious practices, they also reveal the influence of religious traditions in addressing public health crises. What role did religious traditions, such as Buddhism or Daoism, play in shaping these unique forms of medical prescriptions during epidemics?

In recent years, scholars have made significant contributions to understand the intersection between religion and medicine in Asia. Several recent works have significantly advanced our knowledge of this complex relationship across different periods and cultural contexts (Salguero 2014a, 2014b, 2017, 2019, 2022; Lo et al. 2022; Stanley-Baker 2022, 2023). Salguero's work provides an overview of the state-of-art, noting the increased scholarly interest in the intersection of Buddhism and medicine (Salguero 2014a). He also emphasizes that Buddhists have consistently adopted proactive and practical approaches to address physical illnesses, offering practical advice for preventing and curing ailments within the religious framework for over two millennia. This pragmatic approach to healing was crucial in Buddhist proselytism in new regions, often being one of the primary benefits extended to new adherents.³

Several critical questions have emerged from these scholarly discussions. For instance, on the question of neologism, Salguero highlights that those modern references to "Buddhist medicine" are convenient but misleading, as they do not encapsulate a single, unchanging tradition. Instead, Buddhist medical practices have consistently evolved, adapting to local cultural and social contexts while remaining anchored in ancient Indian medical principles. This adaptation and transformation process, shaped by intersecting cultural, intellectual, and social realities, reflects the dynamic and non-static nature of Buddhist medicine across time and geography.⁴ Meanwhile, Michael Stanley-Baker also questions the neologism "Daoist medicine" (daojiao yixue 道教醫學), which he considers as anachronistic. He reviews earlier scholarship on the interrelation between Daoism, medicine, and healing; and calls for scholarly attention to the variety of processes by which the healing techniques later came to be known as Daoist (Stanley-Baker 2019). Thus, scholars start to agree that categories such as "Buddhist medicine" or "Daoist medicine" often become problematic or insufficient in scholarly discourse. In this context, Salguero's edited volumes, in particular, addressed the concept of "hybridity" in Buddhist healing in 2017;⁵ as did a section on "Crossing Boundaries" in 2019 (Salguero 2019, pp. 231–74). The contributors interrogate the category of "Buddhist medicine" by introducing healers and practices outside of a strictly defined Buddhist context, so that it becomes clear that the label "Buddhism" does not necessarily fit.⁶ To address the scholarly debate on the categories of "Buddhist medicine" and "Daoist medicine", it becomes necessary to interrogate the foundational assumptions underlying these classifications.

Indeed, the arbitrary separation of Buddhist or Daoist medicine as distinct fields does not align with the actual experience on the ground in the Chinese case. For example, DuBois' fieldwork reveals that for Chinese folk healers, the boundary between Buddhist and non-Buddhist ritual healing is irrelevant. One healer stated that he is unsure whether they are "Buddhist-style Daoists or Daoist-style Buddhists" and is not bothered by the contradiction (DuBois 2019, p. 240). As DuBois suggests, "Rather than dismiss such responses as demonstrating a lack of specialist sophistication, I suggest we take these explanations seriously as indicative of the contours of lived Buddhism".⁷ By incorporating sources outside of Buddhist studies, we could have a more comprehensive view of some general characteristics of the interaction between religion and healing in China. For example, healing provided in non-Buddhist context has been studied by scholars in Daoist studies, who have shown how Daoists also actively incorporated popular healing techniques to serve the local population. Fang Ling's work on Quanzhen Daoism and ritual medicine has shown that the practice of "divination of the cause" (*zhuyou* 祝由),⁸ which includes healing practice through use of talismans, incantations, and exorcistic rituals have been incorporated in the official medical disciplines throughout Chinese dynasties, which are recognized as effective methods alongside other healing techniques (Fang 2013). Thus, these discussions

point to the need for a broader conceptual framework that transcends the limitations of existing categories such as “Buddhist medicine” or “Daoist medicine”.

The second question to be addressed is the relation among various healing traditions in China. Indeed, the appeal of divine medicine is too great to be monopolized by one religion. Various religious traditions compete for reputation and aim to convert patients into their respective orders. We find constant opposition among various traditions claiming to be the most effective. For example, Dominic Steavu’s recent article has highlighted the history of Confucian physicians distancing themselves from the magical elements of therapeutic practices. The tension between orthodox medicine and magic therapeutics has never been resolved. The contemporary coinage of so-called “traditional Chinese medicine” was only made rationally acceptable by removing its religious components, as part of a modernization process (Steavu 2017). However, the situation during the Republican period is much less understood. Beyond the discourses where different traditions wrote against each other, an important question arises: to what extent, if at all, did these competing religious and medical traditions find innovative ways to cooperate in the face of shared crises, such as epidemics and natural disasters?

The third question relates to the scarcity of scholarship on popular religious healing from late imperial to Republican China. Chen Ming has shown that, during the medieval period, Buddhist medicine and therapeutics were hugely successful, appreciated and valued by large number of Chinese people (Chen 2013). Outside of the context of institutionalized religions we know that, historically, access to physicians was extremely limited, and only a small, literate elite could document their practices, leaving popular religion largely unexamined. The recent chapter by the late Nathan Sivin discussed the discourses in which religion and medicine were negotiated from 600 to 1400 CE.⁹ However, as he posits upfront, “popular religion has been so little studied that a general exploration (which would necessarily include it) would be premature”. Indeed, the mechanisms by which religious individuals continued to practice traditional medicine and ritual healing during anti-religious and anti-superstitious movements from the late imperial period to the Republican period are much less studied. Popular practices were dismissed as marginal or superstitious, and ignored for their community roots and significance. This also explains the lacuna in the study of Buddhism with spirit-writing, which was opposed by most Buddhist clergy but was remarkably popular among lay Buddhist circles in Republican China. Thus, it is essential to study religious healing at the popular level, where practices were neither strictly Buddhist nor Daoist, but formed a broader spectrum of healing rituals embedded in everyday life.

To fully capture the diversity of healing practices in Chinese society, and to recognize the fluid boundaries between religious traditions, we must examine key manifestations of healing that were employed in Chinese communities, without being confined to strict Buddhist or Daoist labels; considering them from a *long durée* perspective. In this framework, the concept of “divine medicine”, as will be discussed in this article, could thus be considered a remarkable local manifestation of innovation in medical thought and practice in China. A more inclusive conceptual approach transcends the limitations of existing categories such as “Buddhist medicine” or “Daoist medicine”, encompassing several domains of knowledge, such as ritual healing traditions, Buddhist healing god Jigong 濟公, Daoist ritual techniques such as spirit-writing, medical knowledge on compounding herbal medicines and healing through self-cultivation of morality. This article also aims to show the practical applications and societal impacts of divine medicine by examining how lay Buddhists in Republican China appropriated Daoist ritual techniques to produce and distribute these medicines during epidemics and disasters.

By doing so, this article thus seeks to address several questions raised by the late Nathan Sivin, as summarized by Michael Stanley-Baker in the introduction of this edited volume, “The first is whether or not we can take seriously the efficacy of spiritual therapy, and the utility of frameworks like Moerman’s (2002) reframing of placebo as ‘meaning response’. The second is what do we know, or can we know, about the varieties of religious

curing. And the third is that, given that little was written down and that elite sources are prejudicial, what can we know about popular religion? How can we usefully compare written documents to ethnographic study?"¹⁰

First, as already mentioned above, this article introduces a distinctive form of religious healing which I refer to in this article using an etic term—"divine medicine"—which broadly refers to medicine, medical prescriptions, or healing provided by gods through spirit-writing. While there is not yet a dedicated study analyzing the influence of spirit-writing on Chinese medicine in Buddhist contexts, recent burgeoning scholarship on the history of spirit-writing in the Sinic world has allowed for an examination in this particular aspect (Goossaert 2022b; Schumann and Valussi 2023). A study by Luk Crystal Tsing-Tsing 陸晶晶, in particular, examined one medical book, *Yidao Huanyuan* 醫道還元—which is currently used in the teaching systems of 24 Chinese medicine universities in China—as an example, to show that spirit-writing has impacted the composition, compilation, and publication of Daoist medical books during the Qing dynasty; significantly contributing to the later development of Chinese medicine (Luk 2018). By closely examining the divine prescriptions found in the divination slips within popular household ritual books dedicated to the Stove God, such as the *Jingzao quanshu* 敬竈全書, as discussed in Section 3, we gain a deeper understanding of the content, nature, and perceived efficacy of these remedies among common people. This analysis reveals how these texts served as practical guides for everyday healing, reflecting the integration of religious beliefs with medical knowledge in the lived experience of ordinary Chinese communities.

Second, by presenting a case study of Jishenghui 濟生會, a spirit-writing group which consists of lay Buddhists devoted to the Jigong cult in Republican China, this study aims to illustrate how spirit-writing contributed to healing practices by offering an alternative to conventional medical treatments, especially in times of crisis. While this study continues the existing scholarship on a healing practice in which aspects of Buddhism are combined with different kinds of non-Buddhist healing, I argue that in the case of Jishenghui in Republican China, both the healers (mediums receiving divine prescriptions) and practices (healing by spirit-writing) were hugely successful and popular. Contrary to the long-held belief that spirit-writing was merely superstitious (*mixin* 迷信), marginal, and insignificant, this practice wielded remarkable influence in Republican China, leaving an enduring legacy that persists to this day; as demonstrated by recent ethnographic fieldwork. Thus, this study offers the case study of Jishenghui to illustrate the scale and impact of their philanthropic activities, which were largely facilitated, promoted, and legitimized by their spirit-writing practices.

Third, to address Sivin's concern regarding the scarcity of sources studying the efficacy and understanding of popular religious healing—given the historical bias towards physicians' perspectives and the lack of accounts from the patients themselves—this article draws on four types of sources, which could help us to understand the history of divine medicine. First, ritual documents that prescribe the technique for invoking divine intervention to bestow divine medicines upon humans in medieval¹¹ and pre-modern China. They shed light on the ritualistic processes and religious frameworks underpinning the belief in divine medicine in China. We have specifically selected primary sources on the nature of divine medicine before the advent of divine prescription before the late imperial period, in Section 2. Second, the content of divine prescriptions received through spirit-writing in the late imperial period. By examining divine prescriptions and many other medical treatises, we can understand better the prescriptions' content and nature, and the perceived efficacy of these remedies among common people. This study thereby introduces a new perspective on the diversity of religious healing practices in China, enriching the scholarly discourse on medical practices at the popular level. Third, narrative accounts. These include critiques from observers and commentators in medical treatises and novels, discussed in Section 4. This is combined with firsthand narratives by mediums who received these divine prescriptions, discussed in Section 7. Sections 4 and 5 also give the contextual backgrounds of divine prescriptions; in particular, during epidemics which led

to the Jigong cult in the modern period. We have examined gazetteers, archives, press articles, and contemporary accounts of Jishenghui’s philanthropic activities in Sections 6–8. Last but not least, existing scholarship through ethnographic fieldwork, particularly with testimony from patients, also testifies the longevity of these practices in contemporary Chinese societies. By employing a historical analysis of these primary sources, combined with ethnographical data, this approach aligns with Sivin’s call for a more comprehensive examination of what he refers to as “spiritual therapy”, especially those popular practices often overlooked by elite literature.

2. From Divine Encounters to Ritualized Healing: The Pre-Modern Foundations of Divine Medicine

The history of divine medicine in China is deeply rooted within religious traditions and practices, with gods believed to offer healing elixirs. From early religious texts to the widespread cults of healing deities in the late imperial period, the notion that divine intervention could cure diseases has been a persistent theme. Meanwhile, according to legend, members of local cults and proto-Daoist organizations were experts in herbal medicine and provided healing to the local population. Most actors who played a role in the conceptualization of illness and healing in China were in fact also religious specialists. It was widely acknowledged that the ultimate elixir of longevity and immortality can be given only by gods themselves. One of the first gods in China to produce revelations and regularly intervene to guide humans was Laozi 老子, or Taishang laojun 太上老君 as he was known by his transcendent identity in the late Han dynasty. According to many medieval texts, the emergence of Heavenly Masters (*tianshi* 天師) was associated with the event of the visit by Taishang laojun to Zhang Daoling 張道陵 (34–156) in 142 CE (Goossaert 2022a). In the centuries that followed, Taishang laojun was attributed with the power to grant a divine elixir of longevity, as attested in *Laojun yinsong jiejing* 老君音誦誡經 (Goossaert 2022b, p. 35).

The ability to grant divine elixirs with healing properties gradually became integral to the standard repertoire of local gods. An eminent example is that of the gods of Maoshan 茅山, located in Jiangsu province, which has been the site of a series of revelations since the fourth century. The earliest mention of the major god in Maoshan—referred to as Lord Mao 茅君 in early texts—can be found in a divination book (*chenwei* 讖緯) called *Shangshu diyanqi* 尚書帝驗期 that may date to the Han dynasty (Goossaert and Berezkin 2012). In the text, Lord Mao is portrayed as seeking the secret to longevity from the Queen Mother of the West (*xiwangmu* 西王母). As the cult of Lord Mao began to develop in Maoshan, early hagiographies detail how pilgrims journeyed to venerate him in his temple. The healing ritual involved a divination process to foresee the progression of an illness. Visitors were required to first present ten eggs as offerings to the gods. Subsequently, they would learn about the potential outcome of their illness—whether it would improve or worsen—by interpreting the appearance of the egg yolk returned by the gods (Chang 2008, pp. 152–54).

Maoshan and its surrounding regions of Jiangnan served as the motor of religious innovations in the following centuries, most notably the emergence of the Shangqing 上清 order of Daoism. Shangqing texts from the fourth century offer detailed descriptions of effective minerals sourced from various regions of China, reflecting individualized approaches to treatment based on personal circumstances (Stanley-Baker et al. 2023). The famous Daoist patriarch, Tao Hongjing 陶宏景 (456–546), also wrote one of the most important medical book of his time, *Bencao jing jizhu* 本草經集註.¹² As shown in a study by Michel Strickmann, techniques for healing emerged at the fourth and fifth centuries in this region; these involved the chanting of scriptures, ritual offerings, or the ritual use of seals and talismans, prominently but not exclusively within the Daoist tradition (Strickmann 2002; Strickmann 1990). Meanwhile, from its introduction in China during the late Han dynasty (206 BCE–220 CE), Buddhism integrated Indian medical ideas with local practices, making Buddhist clerics both religious and medical specialists. This adaptability ensured the continued significance of Buddhist healing practices in various cultural contexts (Salguero and Macomber 2020, pp. 2–4). Buddhist therapeutic practices became vital in the medical landscape, alongside Daoist and traditional

Chinese medicine. Buddhist texts promised health and well-being as karmic rewards, with rituals invoking healing deities such as Bhaisajyaguru (Ch. Yaoshifo 藥師佛) (Birbaum 1989b; Birbaum 1989a; Strickmann 1990; Shi 2020) and Avalokiteśvara (Ch. Guanshiyin 觀世音) (Yü 2001).

While religious specialists became the major mediator between gods and humans, a direct “encounter” between gods and humans remains one of the most efficacious ways to attain healing. During the medieval period, healing was already closely linked with moral conduct. Franciscus Verellen has examined such accounts of divine interactions during the medieval period, particularly on those involving individuals who, by virtue of their moral and spiritual integrity, managed to engage with gods or immortals during the ninth and tenth centuries (Verellen 1998). He highlighted the occurrence of divine visions involving divine objects, including medicine. These are purported to appear in response to an individual’s merits or exceptional qualities. These gifts could be presented directly by the divine entities, or practitioners might receive divine instructions guiding them to these sacred objects’ locations.

With the advent of exorcist rituals (*daofa* 道法), healing became an essential function of Daoist rituals during the early modern period. In 955, possibly the earliest known record of spirit-writing appeared as a ritual for producing talismans and divine prescriptions (Goossaert 2022b, p. 174). Another case of healing through encounter with Taishang laojun appeared in a major text in thunder ritual traditions in the early eleventh century.¹³ In this text, a leper offers himself as a serf to a monastery at Maoshan to serve the Daoists. As a reward for his selfless service, he is graced with an encounter with Taishang laojun and given a scripture to heal himself and others.

Various gods from the Buddhist and Daoist pantheon soon began to assume the role of healers. Healing remained one of the most important functions a local god could perform for its believers in the Northern Song period (960–1127).¹⁴ By the Southern Song (1127–1279) at the latest, various cults featuring spirit-writing that provided healing and granted medical prescriptions started to emerge. An early example was a practice referred to as “inviting [the deity] Zigu” (ying Zigu 迎紫姑).¹⁵ One of the aims of the practice was to receive transmitted medical prescriptions.¹⁶ Spirit-writing was not only practiced at home but also in the community. For example, the cult of Hongen lingji zhenjun 洪恩靈濟真君 was based on temples offering ritual services from the resident Daoist priests, among which spirit-writing (for healing, divination, and exorcism) was central (Goossaert 2022b, p. 174). In the late imperial period, popular national deities such as Lord Guan 關公¹⁷ or local deities such as Yuhuang gongzhu 玉皇宮主 (Jade Princess)¹⁸ all assumed the role of healer for the local population.

With the expansion of the pantheon of healing gods, the practices surrounding divine medicine evolved significantly. Initially, healing involved spontaneous encounters with gods, where the sick would be healed in a moment of direct divine intervention. Over time, however, the process became more structured, shifting towards petitioning gods for ritualized healing. Take *Chunyang dijun shenhua miaotongji* 純陽帝君神化妙通紀,¹⁹ compiled by Miao Shanshi 苗善時 (fl.1324), for example. This collection of miraculous stories recounted several stories of sick people’s encounters with Patriarch Lü 呂祖. This is representative of the change during the Tang-Song transition, as pointed out by Vincent Goossaert, that “during the early modern period, communication with Patriarch Lü and the other immortals was played out in the encounter mode, with the immortal appearing in flesh, or in dreams, or as a voice (Goossaert 2022b, p. 155)”. What appears as a spontaneous healing through encounters with gods in the early modern period, which are largely attributed to the moral qualities of the patients, evolved into ritualized encounter in later periods. No later than eighteenth century, we can find local gazetteers with clear mention of “Spirit-written prescriptions” (*jifang* 乩方). An example is found in the 1736 edition of *Yunnan tongzhi* 雲南通志, where locals sought divine prescriptions from local deities, as shown in the text below.

Spirit-writing. In the early days of this current dynasty, Zheng Xiang from Jiangning, who was appointed as governor of Shiping county, was killed in a rebellion. Local people worshiped him. Through spirit-writing, he said that he had become the city god of the province. Whenever locals are ill, the divine prescriptions obtained from the spirit-writing were always effective. The local gentry, Xie, who writes talismans and dispenses medicines on Yanbei Mountain, providing a livelihood for local farmers. When the fields at the foot of the mountain suffered severe drought, through spirit-writing, Zheng gave directions to dig in a certain place. After digging, a spring did, indeed, appear which served to irrigate the fields.

降乩。本朝初，江寧人鄭相署石屏州，為叛將所殺。州人祀之。降乩云，為本州城隍之神。遇有疾者，乩方輒效。州紳謝君符築巖北山，為躬耕之計。山下田高苦旱，鄭降乩指方向，鑿之果得泉以資灌溉。²⁰

With the evolution of the pantheon of healing gods and the practices associated with divine medicine, we see a significant shift from spontaneous encounters with gods to more ritualized forms of healing. The role of spirit-writing became central to these practices, allowing for the distribution of medical prescriptions within communities. This development was particularly significant given the limited access to formal healthcare across much of China. Most people turned to temples and religious specialists to cure illness. Consequently, temples in China historically functioned as regional medical centers, providing essential services for those in medical need. We will illustrate the ritualized presence of gods through divination for medical oracles and moral cultivation for healing purposes, both intimately related to spirit-writing, in the next section.

3. Medical Oracles and Moral Cultivation for Healing in Late Imperial China

Both the ritualized healing and the conceptualization of healing through moral improvements, were further developed and integrated during the modern period. While we are primarily concerned with prescriptions received through spirit-writing in this study, it is important to note that this is only one of the many healing practices used during the modern period. Given the limited access of the common people to physicians, simplified rituals such as spirit-written prescriptions and divination slips emerged as practical alternatives for healing. We observe the emergence of two religious innovations developed during the modern period. The first innovation is the invention of a ritual healing technique referred to as medical oracles (*yaoqian* 藥籤), a divinatory ritual to obtain medical prescription in the form of oracles—with its provenance in divinatory oracles—referred to as *qian* 籤²¹ in Chinese. The second is the discourse of healing through moral reform, most eloquently developed through the wide production and circulation of morality books (*shanshu* 善書), many of which themselves were produced through spirit-writing (Goossaert 2012). These two discourses developed independently; however, they soon hybridized into one coherent discourse on healing in the modern period.

Medical oracles usually come in the form of 100 poems. To understand their meaning, one usually needs to consult specialists. Some of the most popular revealed texts include a section of oracles, usually in the end of the book. While some contain only the divinatory poems,²² others contain significant portions of commentaries which allow the literate to read and understand their oracles by themselves. The commentaries of divinatory oracles usually address all kinds of concerns possible, which include health and illness; however, they are largely short summaries. Take oracles in the popular *Mingshengjing* 明聖經 for example; the very first, and most auspicious oracle simply says “Immediate recover from illness” (*bing jiquan* 病即痊).²³

The incorporation of divine prescriptions also attested in the “Quanshu canon”²⁴ when spirit-writing texts were compiled into complete anthologies. One early example was the 1775 edition of *Lüzū quanshu* 呂祖全書²⁵, compiled by Cai Laihe 蔡來鶴 (d.n.) and his disciple 邵志琳 (1748–1810).²⁶ Under the section titled *Zhibin xianfang jueyi qianshi* 治病仙方決疑籤詩 in *Juan* 57, we find 100 divine prescriptions and another 100 oracles.

In Shao Zhilin's preface,²⁷ he attributed the reception of these texts in the Ancient Lotus temple (gulian an 古蓮庵) in Jiaxing 嘉興 to the compassion of Patriarch Lü toward the people, which is said to be unparalleled other than in the case of Guanyin 觀音. For Shao Zhilin, these divine prescriptions with oracle poems are profound despite them being brief and short, and even the illiterate could understand their meaning. Patriarch Lü's own preface, titled "Admonishments to physicians" (jieshang yishi yan 戒飭醫士言) explains to his disciples who aspire to provide a healing practice to the people that the reason why one cannot blindly follow classical medical recipes is because the ancients were pure and sincere, while many contemporary people are wicked and mean, which is why some classical recipes will not work. Patriarch Lü is also critical of professional physicians who only treat physical maladies, but not the morality of the people. Patriarch Lü particularly used the analogy that using medicine is like military conflicts. Using simple recipes could cure the people, just like a smaller number of soldiers could win a war, if used strategically. Indeed, we find most of the 100 divine prescriptions from Patriarch Lü extremely brief, with one or two herbal ingredients and the method of preparation; each prescription is one to two lines in length. From time to time, the divine prescriptions indicate no herbal ingredients, but call for cultic devotion or moral exhortations. After the section on divine prescriptions, the text is followed by a "talisman to suppress ghosts from Mount Tai" (*Taishan yagui fu* 泰山壓鬼符), then 100 oracle poems, titled "divination poems for resolving doubts" (*jue yi qian shi* 決疑籤詩). These oracle poems have a title of four characters and follow the structure of four verses with seven syllabus each, without commentary. At the end of 100 poems, we find a postface explaining that the oracles are Patriarch Lü's way of sympathizing with the ignorance of people, thus revealing the oracles to indicate orientation. The way to conduct the divinatory ritual was also explained in great detail, with a format of petition to Patriarch Lü provided. The requesters must fill in their name, address, and the reason for requesting oracles on the petition, and specify whether they are asking for the divine prescription or oracle poems. The requesters must keep to a vegetarian diet and precepts, and show devotion before the patriarch. They will offer incense and prostrate themselves before the gods, burn the petition and then proceed to obtain the oracles. It is prohibited to request oracles relating to trivial matters or to request multiple oracles continuously.

Another related text, *Lüzu zhenjing lingqian xianfang hebian* 呂祖真經靈籤仙方合編,²⁸ indicates clearly in the preface that this anthology was revealed to a spirit-writing altar by Lüzu due to his sympathy to the sufferings in the human world. Whenever sincere patients come to ask for help from Lüzu, they must read the scriptures three times before making any demands. The texts emphasize that the divine prescription given by Lüzu will be most efficacious. The texts followed include an autobiography by Lüzu (Lüzu zixu zhuan 呂祖自序傳), followed by a series of incantations (*zhou* 咒) and short moral tracts prohibiting the killing of animals and respecting written characters (*xizi* 惜字).²⁹ The upper limit for the dating of the preface could only be after sixteenth century, as it made reference to the popular *Wenchang dijun yinzhi wen* 文昌帝君陰騭文 and the Buddhist monk Lianchi Zhuhong 蓮池祿宏 (1535–1615), when advocating for respecting lives and releasing animals. While the preface was in the form of a manuscript, the pages that followed were printed; including ten rules to ask for divine prescriptions (*qiufang shize* 求方十則). It was followed by 100 short phrases under the title "Lüzu Oracles" (Lüzu lingqian 呂祖靈籤). The section for divine prescriptions constitutes about half of the content of this anthology, with 100 prescriptions each for men, women, and children of external medicine (*waike* 外科), and 53 prescriptions for ophthalmology (*yanke* 眼科).

Another important *Quanshu* compendium which includes medical oracles is the *Jingzao quanshu* 敬竈全書, published in Shanghai in 1868.³⁰ This text plays a crucial role in the current study, as it provides a concrete example of divine prescriptions received through spirit-writing; reflecting popular medical practices deeply integrated into everyday life. As a widely popular household devotional text, *Jingzao quanshu* illustrates how religious healing was not confined to religious or temple settings, but was part of daily domestic rituals. Here we have two sets of oracles: the general oracles and the medical oracles. There are 50 general oracles;

each starts with one of the five general level of assessment of the situation (best, better, neutral, worse, worst), followed by a short comment to 12 categories of possible questions asked, i.e., home, health, bureaucratic career, tombs, marriage, family members, birth, import, sell, trade, money, lost property. The medical oracles under the section are referred to “Divine prescriptions of Stove God”. It is divided into 50 oracles for internal medicine (*neike* 內科) and another 50 for external medicine (*waike* 外科). The medical oracles usually start with a medical recipe, composed of their ingredients, quantity, method of preparation, and frequency of intake. Each prescription is then followed by a short commentary, usually a miraculous story which attests either the efficacy received by other patients, or the punishments for the patients who did not follow the divine prescriptions.

However, a close reading of all these divine prescriptions reveals the intentions of the compilers behind these divine prescriptions beyond the cure. While divine prescriptions could be considered traditional medical recipes in the form of oracles, however, these texts exhibit features beyond mere medical prescription. Qian Quchun 錢樞春 (d.u.) was mentioned twice in these oracles (with his literary name Qian Shengrui 錢聖瑞 in oracle no.30 and no.80). In the first mention, Qian’s son got sick, and only after he printed large quantities of the *Jingzao quanshu* did he obtain a prescription for the recovery of his son. In the second mention, Qian contributed a miraculous story about two prostitutes’ lamenting of their hellish lives, despite their father and uncle being famous physicians. They got sick and were then cured by the prescription given by the Stove God.

Several remarks could be made on these divine prescriptions for us to understand better the content, nature, and perceived efficacy of divine prescriptions. First, we find the majority of these prescriptions, including messages of exhortation for values and behaviours as advocated in the morality books at the time. This approach represents an innovative strategy to leverage the widespread appeal of morality books, thereby enhancing the dissemination and reach of the divine prescriptions by aligning them with values and behaviors espoused in those popular texts. Many prescriptions involve making vows toward a prohibition of certain taboo foods, such as beef, dogs, frogs, and eels. While many meat-eaters will be prescribed long-term vegetarianism as a cure, however, Buddhist nuns or monks are prescribed meat and pig’s lungs as cures. The stories particularly noted their initial resistance to following the prescription, and being healed of their maladies when they finally abided. Meritorious acts are also prescribed; for example, to stop killing and start liberating the animals (*fangsheng* 放生), patronizing the printing of more copies of these texts. Indeed, these texts are impossible to pigeonhole into either Buddhist or Daoist motivations, as not only do they call for a patronage of printing more copies of the *Jingzao quanshu* itself, but also the Buddhist Heart Sutra and Guanyin oracles. Printing large quantities of flyers with calendars of fasting of Thunder gods (*leizhai dan* 雷齋單) could be meritorious, as they call for devotional acts toward a diversity of gods, not only toward Stove God, but also to chant the name of Amitābha. They are equally prescribed to recite the popular morality text *Taishang ganying pian* 太上感應篇 and the scriptures and litanies of Stove God 竈君經懺.

Second, the texts reveal a significant geographical concentration in the Jiangnan region, particularly in Shanghai, and detail the societal conditions in which these practices flourished. This information provides valuable context, indicating that divine prescriptions, which later became central to Jishenghui’s activities, were already popular and widely circulated in Shanghai before the organization’s emergence. That been said, we also note a heightened societal mobility indicated in these texts, involving travelers passing through Shanghai, businessmen working between Shanghai and their home province (Suzhou, Huzhou, Fujian). The Stove God particularly exhorts them to bring the text back to their hometown, facilitating the spread of these texts.

The patients in these stories come from all kinds of backgrounds, and many have a profession. The miraculous stories address individuals such as commoners, scholars, businessmen, a beef butcher, Buddhist monks, and nuns (never Daoist), a fortune-teller in slip 96, a master of physiognomy (*bian xiang* 辨相) in slip 64, or glyphomancy (*cezi xiansheng*

測字先生) in slip 100; prostitutes, opium smokers, and urban physicians. The relations between several protagonists could be neighborly or familial. The short stories often take dramatic turns in a few lines, with pairs described as having two opposite outcomes, despite following the same divine prescription, due to one of them later being revealed as a beef eater in slip 70. One of the most classic stories was that the protagonists were often described as either ignorant or reluctant to seek help from Stove God, only to be exhorted by the advice of their friends when they did obtain the divine prescriptions and were cured.

Third, a significant proportion of the prescriptions diverged from those of professional physicians, revealing a notable tension between Confucian medical practitioners and popular religious healers who relied on divine medicine. This conflict highlights the ongoing debates and competition between different healing traditions in China. Divine prescriptions (*xianfang* 仙方) were quite different from the, presumably common, medical prescriptions (*yifang* 醫方), with many miraculous stories starting by saying patients resorted to divine prescriptions only after the failure of common prescriptions and much suffering, as there are really few capable physicians 方知良醫竟少 in slip 95. Confucian physicians were not always portrayed in a positive light. They were described as “having eyes but missing the point” (*youyan wuzhu* 有眼無珠) in slip 75. In this story, the said Shanghainese obtained the divine prescription but did not have the courage to take it. He went to consult “vulgar physicians” (*suyi* 俗醫) for a second opinion instead and was prescribed a recipe with more than 20 ingredients, which led to his death. The evident tension between the urban physicians and religious healers reflected in these texts arise due to the diverging incentives of providing medical treatments. Many miraculous stories include discourse directly against such physicians (*yi* 醫); at times referring to them as “vulgar physicians” or “professionals of external medicine” (*waike jia* 外科家) in slip 81. They are described as stolen prescriptions and healing techniques. They are often rich, while still being greedy for more profits, at times fighting among themselves. They treat bureaucrats and the rich as a priority and often neglect the poor. The physicians themselves also got sick but even their own prescriptions were inefficacious. They could only be cured after praying to and obtaining divine prescriptions from the Stove God. When the physicians learned of their recovery, they were also impressed with the efficacy of the Stove God, wondering “how could it be so if it’s not the divine prescription?” 非仙方安能如此 in slip 92. It was spelled out quite unambiguously, that “seeking a physician is not as good as seeking the Stove God” 求醫不如求竈 in slip 89, yet it appears that some texts assumed that some patients would only request the divine prescriptions in secret 暗求 in slip 84.

In terms of the discourse on healing through moral improvement, one such morality book is *Qisheng dan* 起生丹 published in 1901³¹ from which Jigong descended frequently to give instructions at the spirit-writing altar Qingyuntan 青雲壇 in Beijing (Fan and Wang 1996). Medical prescriptions entered the genre of morality books no later than the eighteenth century. One notable example is the expanded edition of *Zengding jinxin lu* 增訂敬信錄.³² The 1797 edition features medical prescriptions, which are included in the latter sections of the book (Goossaert 2022b, p. 197), indicating the integration of medical practices within the moral discourse of these texts.

From the late imperial period, a large number of morality books were produced during an apocalyptic framework with the background of war, natural disasters, or epidemics. The medical prescriptions produced under such circumstances include morality texts titled “prescription of immortality” (*xianfang* 仙方). One such example is an undated medical prescription, titled *Guanyin pusa jiuji xianfang* 觀音菩薩救劫仙方³³, is part of a text titled *Guanyin quanshan wen* 觀音勸善文. The actual prescription comes at the later part of the text, which reads:

...In front of us now is a great apocalypse, the rich and the poor are treated the same. The third, sixth, and ninth months bring disasters; epidemics spread, transmitting disease. Every household cannot escape the calamity; dysentery, plague, and fevers add up. If you catch a disease, it may last a year and a half; even extraordinary medicine struggles to cure the suffering. Evil people will eventu-

ally receive their retribution, and good people each have their own rewards in heaven. Common people, heed my guidance; I have divine prescriptions to rescue those in dire need. On the first and fifteenth days, recite the scriptures; on the nineteenth of the second month, burn paper money. On the nineteenth of the sixth month, set up an incense table, each family burns incense in gratitude to heaven. On the nineteenth of the ninth month, when good deeds are fulfilled, the Bodhisattva will naturally come to guide those with affinity...

...眼前就是大劫現，富貴貧賤是一般，三六九月有災難，瘟疫流行把症傳，家家戶戶劫難免，痢疾瘟疫加傷寒，染病即有一年半，妙藥難醫病中冤，惡人到頭終有報，善人各有一重天，凡民得我來指點，吾有仙方救燃眉，初一十五把經念，二月十九化紙錢，六月十九排香案，一家焚香答謝天，九月十九功德滿，自有菩薩來渡緣...

The integration of medical oracles and moral cultivation into the healing practices of the modern period reflects a significant evolution in the relationship between religion and medicine in China. While medical oracles provided divinatory guidance for obtaining divine prescriptions, moral cultivation emphasized the role of ethical behavior in achieving and maintaining health. These practices often intersected, creating a discourse on healing that combined physical and moral dimensions. The analysis of prescriptions from this period reveals that they were often aligned with values and behaviors that originated in popular morality books, indicating an innovative strategy to enhance their dissemination. Furthermore, the geographical concentration and societal condition of the miraculous stories provide a valuable social and medical context, indicating that such practices were already popular in Shanghai before the emergence of charities such as Jishenghui. However, the practice of seeking divine prescriptions through spirit-writing also faced challenges and criticisms. It is necessary to mention them before examining how these methods evolved in response to opposition and changing societal attitudes.

4. Oppositions and Evolution of Divine Prescriptions

Despite its popularity, the practice of seeking divine prescriptions through spirit-writing faced opposition and skepticism. Criticisms focused on the unorthodox nature of some prescriptions and the dangers of relying on spirits for medical advice. However, the practice persisted, adapting to changing societal attitudes and continuing to offer a spiritual complement to conventional medicine.

The popularity of divine prescriptions could be evidenced from their depictions in popular novels. From the sixteenth to the eighteenth centuries, the way to receive “divine prescriptions” appeared to be subject to meeting the right person, access to whom was limited to the most privileged. The pursuit and accessibility of divine prescriptions gradually entered the discourse of prestigious families in the late imperial period. What remains stable lies in the fact that such divine prescriptions were sought after, as they are usually perceived as the only viable option when all traditional methods failed.

In the famous eighteenth century novel *The Dream of the Red Chamber* 紅樓夢³⁴, when the two protagonists Jia Baoyu 賈寶玉 and Wang Xifeng 王熙鳳 were taken ill by sorcery, the family tried various approaches: sending off ghosts by rituals 送祟, possessions by spirit-mediums 跳神, exorcism by Daoists, prayers and medicine, all to no avail. When a Buddhist monk and a Daoist priest arrived to their rescue, the head of family Jia Zheng 賈政 explained the situation as such: “Yes, two members of the family are bewitched. Have you perhaps some miraculous remedy? 有兩個人中了邪，不知有何仙方可治?”³⁵ The chapter concluded by the pair exorcized the jade from birth of Jia Baoyu, with two protagonists turning for the better.

In the late sixteenth century novel *A Journey to the West* 西遊記 (earliest edition 1592), it includes the following episode.

When the king heard this memorial, he was both frightened and angered. “This means”, said he to the royal father-in-law, “that Heaven wants to destroy us! We

have been sick for months, and the imperial physician has been wholly ineffectual. It was fortunate that the royal father-in-law has bestowed on us a divine prescription. We were just waiting for the noon hour today to lift the knife and take out these boys' hearts and use them as our medical supplement. How could they all be swept away by a gust of cold wind? What explanation could there be other than that Heaven wanted to destroy us?"³⁶

國王聞奏，又驚又惱，對國丈道：「此事乃天滅朕也。連月病重，御醫無效，幸國丈賜仙方，專待今日午時開刀，取此小兒心肝作引，何期被冷風刮去，非天欲滅朕而何？」³⁷

The mentioning of the court physicians (*yuyi* 御醫) in the emperor's pursuit of divine prescriptions indicated that their views on the divine prescriptions received through spirit-writing might have played a role in the discourse about the subject matter. One such text, written by Xu Dachun 徐大椿 (1693–1771), one of the most renowned physicians from Jiangnan during the Qianlong 乾隆 period (1736–1795).³⁸ In his *Yixue yuanliu lun* 醫學源流論 (preface 1757)³⁹, we find a text titled "Treatise on the divine prescriptions" 乩方論, in which Xu writes:

On the topic of divine prescriptions, there are those in the world who write talismans to invite immortals' presence and to request medical prescriptions. Some of these prescriptions are indeed shallow, crude, unorthodox, ineffective, and even misleading. However, there are also those which are profound, ancient, remarkable, and solid, possessing miraculous efficacy when used for healing. The immortals (providing the prescription) might claim to be Lü Chunyang or Zhang Zhongjing, making the prescription seem akin to the therapeutic methods left by Chunyang and Zhongjing. This phenomenon is rather strange and yet has its logical aspects. After all, spirit-writing (*ji* 乩) is about opportune moment (*ji* 機). The call from people's heart can reach anywhere. If one sincerely seeks healing, there must be spirits or deities capable of healing who will respond. While they might not genuinely be Chunyang or Zhongjing, they could be those from the past who were wise in medical principals but died before their time. Their spirits, not yet dissipated, roam between heaven and earth, appearing in response to the call to demonstrate their ability. When the patient recovers as expected, it's considered a fortunate meeting (with the spirits) has happened. This, too, has its own logic. While the prescriptions might not be entirely effective, they carry essential meanings. This contrasts with modern physicians, who often use contradictory medicines that harm people, and at crucial moments of life and death, they are reluctant to say things with certainty, this is because heavenly secrets cannot be leaked out so easily. As for the prescriptions that are unintelligible and unorthodox, they are likely the result of unskilled spirit-writing or insincere patients, and (these prescriptions) cannot be considered genuine divine prescriptions.

乩方論，世有書符請仙而求方者，其所書之方固有極淺、極陋、極不典，而不能治病且誤人者。亦有極高、極古、極奇、極穩，以之治病而神效者。其仙或托名呂純陽，或托名張仲景，其方亦宛然純陽、仲景之遺法。此其事甚奇然，亦有理焉。夫乩者機也，人心之感召，無所不通，即誠心於求治，則必有能治病之鬼神應之。雖非真純陽、仲景，必先世之明於醫理，不遇於時而死者，其精靈一時不散，遊行於天地之間，因感而至，以顯其能，而其人病適當愈，則獲遇之。此亦有其理也。其方未必盡效，然皆必有意義，反不若世之時醫，用相反之藥以害人，惟決死生之處，不肯鑿鑿言之，此則天機不輕洩之故也。至於不通、不典之方，則必持乩之術不工，或病家之心不誠，非真乩方也。

Another such work is *Huisheng ji* 回生集 by Chen Jie 陳杰 (fl. 1789).⁴⁰ In the preface dated 1789, Chen Jie discusses the effectiveness of divine prescriptions received through spirit-writing and emphasizes the importance of careful application in medical treatment, as in the following.

Exquisite remedies have often been passed down from immortals, such as those found in the “*Thousand Gold Prescriptions*”, which are particularly renowned. I myself have long suffered from phlegm disease, and later, my left knee developed a cold pain that did not heal despite numerous treatments over twenty years. In the year of Wushen [1788], I respectfully set up a spirit-writing altar to seek a cure, and the ancestral master, Ge Xianweng [Ge Hong], through the spirit-writing, indicated that this knee pain was caused by accumulated phlegm. Fortunately, he bestowed a medical prescription that quickly eliminated the long-standing illness. Since then, whenever my family members have been ill, we have earnestly prayed for prescriptions from the immortals, and all have been effectively cured. However, since the ancestral master treats illnesses based on the individual, the obtained spirit-medium prescriptions have not been widely disseminated. My only wish has been to thoroughly search among the people for proven effective prescriptions, regardless of whether they have been previously engraved (on woodblocks), and publish them for the public. Still fearing that among the compiled prescriptions, some may only work temporarily and should not be considered infallible, I respectfully requested the ancestral master to select, resulting in over four hundred prescriptions. The spirit-writing also stated that I possess a heart dedicated to aiding the world; hence, for all requests made, the spirit-writing was used to guide me. Nowadays if someone has a collection of effective prescriptions ready and ask me for a selection, I would also be happy (to accept such requests). However, as illnesses vary in deficiency or excess, cold or heat, and medicines differ in warming, cooling, tonifying, and reducing properties. Deficiency requires warming and tonifying, excess needs purging and dispersing. If one does not accurately diagnose the condition and mistakenly administers medication, the consequences can be serious. By choosing those prescriptions that are sure to be effective, there will undoubtedly be no failures. Therefore, this book is aptly named *The Collection for revitalization*. Respectfully narrated in the introduction, to embody the ancestral master’s compassionate heart for universally relieving suffering.

從來妙劑，多出仙傳，如千金等方，其尤著者也。余素患有痰疾，後又左膝寒痛，廿載以來，屢治不瘥。戊申歲恭設乩壇求治，葛仙翁祖師乩示云，此膝痛即係積痰所致。幸賜方藥，宿疾頓除。嗣凡眷屬有恙，即虔禱仙方，無不立效，但祖師因人治病，故所得乩方，未敢廣傳。惟立願遍訪世間經驗良方，無論已刻未刻，彙刊公世。尚恐成方中，或有一時偶驗，未可永為準則者，謹求祖師選定，得四百餘方。並蒙乩批雲，予有一片濟世之心，故凡有所求，借乩籌以示爾。今備有成方，請予選定，予亦欣然。但病有虛實寒熱，藥有溫涼補伐。虛宜溫補，實宜瀉散。倘視症未明，誤投藥劑，為害非輕。今擇其必中者用之，自無不驗也。此書即定為回生集可耳。敬敘卷首，以體祖師普濟之慈心雲。⁴¹

When a Jiangsu literati-official Xu Zonggan 徐宗幹 (1796–1866, *jinsi* 1820), returned to his hometown Tongzhou for his mother’s funeral in 1843, he collected a series of local anecdotes into a collection titled *Elu zaji* 惡盧雜記,⁴² two of the anecdotes related to spirit-written prescriptions in Jiangsu area at the time.

[Anecdote 1] In the city of Tongzhou, the divine prescriptions from the Huawang Temple are highly efficacious, known in Sichuan as the “Medical oracles of Transcendant Hua”, and are revered and kept in homes. Recently, it is possible to obtain medical prescriptions through spirit-writing in the temple in Tongzhou, with many prescriptions beginning with mentions of “When so-and-so descended in the altar of Master Dongheng.⁴³” A couplet in the temple reads: “The eternal regret of not splitting Cao Cao’s skull; the fleeting fame for treating Guan Yu’s arm”. The widely circulated stories are expansions from the original narratives, unaware that both the *History of the Later Han* and the *Records of Wei* contain detailed biographies and de-

scriptions of these prescription methods. Thus, a volume has been compiled and printed for distribution, with the preface entered into the anthology of literature.

通郡城中華王廟仙方極靈驗，蜀中稱華真人簽方，供奉於家。近日通郡廟中可扶乩開方，方首必書某某在東垣先生降壇時居多。廟中聯語有：「未騁曹顛千古恨，曾醫關臂一時名」之句。世所傳稱者，皆衍義所載，不知後漢書及魏史均有本傳，所記方術甚詳。爰輯為一卷，序而梓行；傳序入文錄。⁴⁴

[Anecdote 2] The Feng family from Tongzhou, devotees of an altar known as “The Immortal’s Altar”, have been ceaselessly approached by those suffering from illnesses, seeking medical prescriptions through spirit-writing, often witnessing miraculous occurrences. Most astonishingly, there have been times when one or two medicinal pills would fall from the air above the altar. Those who took these pills were cured immediately. Some doubted and suspected deceit, however, upon investigation, the origin of these pills remained a mystery, and it was found that the host family was not known for using tricks to dazzle others.

州後馮姓，供有「有仙壇」，因疾求乩方者不絕，輒著靈異。尤奇者，有時壇間空中墜藥丸一、二粒，病者服之即瘥。或疑其偽，然訪究之，實不知所自來，且主人並非以術炫者。⁴⁵

Another medical treatise *Lenglu yihua* 冷廬醫話 (preface 1858) by Lu Yitian 陸以湑⁴⁶ (1802–1865, *jinsi* 1836), a Zhejiang literati who published a few works on medicine, critiques the practice of using spirit-written prescriptions 乩方 for medical treatment, highlighting its unreliability and potential dangers. Lu writes:

Caution on [using] Medicines: The trend of spirit-written prescriptions is particularly popular nowadays. How could immortals be treating human illnesses? In reality, they are mostly just spirits or ghosts, hence the outcomes are hit or miss. Among the cases I have personally witnessed: In the capital, Zhang Ziya suffered from chills and fever. A spirit-written prescription included ginseng and astragalus, but it led to phlegm obstruction and his death. In Xiaoshan, Li Yixuan, who was elderly and suffered from paralysis of the legs. The spirit-written prescription uses *Aconitum*, *Rehmannia glutinosa*, *Hansenia weberbaueriana*, and *Asarum sieboldii* among others, resulting in a fatal loss of blood. Those who are deceived by this practice argue that if it works, it is due to the efficacy of the immortals; if not, they claim that the person was destined to die, and the immortals merely facilitated their end. Alas! Is this even worth discussing? Medicine is meant to preserve life, but it can also harm life. Those who take it must exercise great caution.

慎藥

乩方之風，於今尤甚。神仙豈為人治病，大率皆靈鬼耳，故有驗有不驗。餘所目擊者，都門章子雅患寒熱，乩方用人參黃耆，痰塞而殞。蕭山李儀軒，老年足痿，乩方用附子、熟地、羌活、細辛等味，失血而亡。彼惑於是者，效則謂仙之靈，不效則謂其人當死，乃假手於仙以斃之也。噫！是尚可與言乎？藥以養生，亦以傷生，服食者最宜慎之。⁴⁷

This opposition against divine medicines continues in the 1930s, when the practice of publishing divine prescriptions as addendum to popular texts must adapt to the changing atmosphere of the time. Due to the anti-superstition movements in urban centres at the time, the divine prescriptions were published under sections which appear more secular. One such example is the *Zhuizi shanding yuquan zhenben taoyuan mingsheng jing* 朱子剛定玉泉真本桃園明聖經⁴⁸, published in Shanghai in 1939. For the content list, we find the title which is now referred to as “Medical prescriptions through experience” 經驗藥方. The priority of the time appears to be epidemics such as cholera and plague. The list of prescriptions was arranged by classical departments, such as internal, external, women, children.

While the practice of divine prescriptions has historically faced criticisms and challenges from professional physicians exercising outside of religious settings, these texts re-

flect the tensions between the two different views on the human body and etiology of illness, reflected in their distinct healing practices. During the nineteenth and twentieth centuries, the practice of spirit-writing and divine prescriptions must evolve within the changing landscape of Chinese medicine and society.

5. Historical Context: Epidemics and the Emergence of the Jigong Cult

Disasters such as epidemics have historically played a crucial role in the veneration of new deities and the evolution of their cults in the late imperial period. For example, the revelation from the Patriarch of Great Peak during the 1898 rat plague,⁴⁹ Lord Guan during the epidemic in 1912⁵⁰ and Master Ming, who gave out free medicine to save more people.⁵¹ The belief in the growing healing efficacy of Chinese gods by the local population would explain the growing popularity of certain local cults. A significant shift was observed in the late Ming dynasty in the way revelations were presented in spirit-writing texts (Goossaert 2022b, chap. 6). During the early modern period, these revelations were usually exclusively addressed to initiated members of spirit-writing groups. However, this period saw a change in audience, with revelations starting to be addressed to the public, indicating that spirit-writing groups began to engage more broadly with the local population.

The number of spirit-written prescriptions surged during the nineteenth century, corresponding to the height of epidemics outbreaks, especially in the regions of South China, including Guangzhou 廣州 and Hongkong 香港. According to the statistics of Lai Wen 賴文 and Li Yongchen 李永宸, there were 645 records of epidemics outbreaks during the period of 1875 to 1911, averaging 2.92 outbreaks per year during 1875–1899 and 5.3 outbreaks per year during 1900–1911.⁵² In this context, medical emergencies made the option of going to temples, monasteries, and charitable halls to seek healing untenable for the locals without other means. Recent scholarship through historical study and fieldwork has shown that medical oracles have been practiced until this day in many parts of the Chinese world, and historically it has been particularly popular in southern coastal provinces such as Fuzhou 福州 (Schumann and Valussi 2023, pp. 334–35). This practice could also be closely related to charitable institutions such as *shantang* 善堂, where pharmacies for traditional Chinese medicines have been an integral part.⁵³

When epidemics spread further to the Jiangnan region, we find some gazetteers of individual *shantang* charities provided an untapped source for the activities of these charities and the role spirit-writing played in it. For example, the Pujitang 普濟堂 in Gaochun 高淳 in the south of Nanjing published in 1900 a large gazetteer⁵⁴ detailing their activities and their intense spirit-writing communications with the gods.⁵⁵ Providing healing to the locals is one of the major functions of Pujitang, with the last section titled “Divine prescriptions for universal relief” 濟世神方 in the gazetteer dedicated to a collection of divine prescriptions revealed by various gods, such as Wang Dadi 汪大帝, Xu Dadi 許大帝, Zhong Liquan 鍾離權, Patriarch Lü 純陽祖師 (or Fuyou dijun 孚佑帝君), Transcendent Zhang 張真人, Patriarch Hua 華祖師. Most of the divine prescriptions were received through spirit-writing in Pujitang, but some were likely collected from different channels; for example, one mentioned “this prescription was sent from *shantang* in other provinces”. These prescriptions addressed various illnesses, but many mentioned terms related to contagious diseases, such as *sha* 痧 and *wen* 瘟. The prescriptions are referred to by names such as *puji wan* 普濟丸, *bao'an dan* 保安丹, *biwen san* 辟瘟散, which we find in sources describing the medicine given out by Jishenghui.

One important piece of textual evidence associating epidemics with an emerging Buddhist healing god Jigong 濟公 (d. 1209) is *Wen da tianjun shouwen jiangfu baochan* 溫大天君收瘟降福寶懺,⁵⁶ a spirit-written litany published in 1891 in Jingyi tan 敬一壇, Zhejiang province, for the ritual expelling of epidemics dedicated to Marshal Wen 溫元帥.⁵⁷ In the preface, Jigong explains the etiology of epidemics as being caused by evil ghosts who wants to bring down people with wicked minds with them. Rituals such as litanies of repentance would be able to allow the sinners to improve their morality and then evade the evil ghosts.

Jigong is the legendary Chan monk from the Song dynasty, known for his eccentric behavior, including drinking wine, eating meat, and other actions running against the traditional Buddhist monasticism (Shahar 1998). Despite his contentious relationship with the Buddhist establishment, Jigong's life and miracles became the subject of various literary and dramatic works over the centuries during the Ming and Qing periods.⁵⁸ Lore about Jigong is often saturated with humor and miraculous stories, making him a beloved character in both narrative stories and especially spirit-writing circles, which emerged from the late Ming dynasty and thrived during the late Qing and early Republican era.

Jigong's efficacy in providing healing circulated in the Jiangnan region, and his cult saw significant expansion partly due to the efficacious medical prescriptions purportedly received through spirit-writing, a practice that gained prominence during these tumultuous times.⁵⁹ In fact, the expansion of spirit-writing groups can be directly attributed to the fact that the leaders of such groups have been often healed by medical prescriptions received from the gods.⁶⁰ The cases of new members being initiated into a religious order due to being healed by religious specialists seems particularly abundant in the Jiangnan region. Min Yide 閔一得 (1749–1836), who was cured by Quanzhen Daoist in Tiantai mountain 天台山 during childhood, later became the founder of the Jin'gaishan 金蓋山 network, which provides healing and other ritual service to the locals. The Jin'gaishan network is intimately associated with the local Jigong network, which also adopted a double identity, worshipping both Patriarch Lü and Jigong since the late nineteenth century (Goossaert 2021).

Another compelling case related to the Jigong cult is that of Falun 法輪 (fl. 1875), whose childhood healing, attributed to a divine prescription from Jigong via spirit-writing, profoundly influenced his later life. As a Buddhist monk at Dinghui Temple 定慧寺, where Jigong's tomb is located, Falun not only strengthened ties with spirit-writing altars, but also actively promoted the Jigong cult, significantly contributing to its regional expansion.⁶¹

6. The Religiosity and Charity of Jishenghui in Republican Periods

The Republican era witnessed profound social transformations, with new social entities—ranging from local community associations to organized religious societies—stepping in to fill the gaps left by weakened state institutions, particularly in response to frequent crises such as famines, floods, and epidemics. A notable aspect of this transformation was the native adaptation to the Christian model of social engagement in philanthropy. By 1937, over 300 Christian missionary hospitals had been established, some of which actively proselytized while providing medical care. This vigorous Christian engagement spurred members of local elites to participate in charity as Buddhists or Confucians, both in imitation of and in contrast to Christian initiatives (Goossaert and Palmer 2011, pp. 78–79). One of these emergent charities was the Shanghai-based Chinese Society for the Relief of Sentient Beings (Shanghai zhongguo jishenghui 上海中國濟生會), established in 1916 (Wang 2008).

The range of charitable activities of Jishenghui was remarkably vast. Its endeavors included offering diverse ritual services, often free of charge. The organization also engaged in punctual acts of philanthropy, stepping in during times of natural disasters to offer crucial relief, such as food, clothing, medicine, and coffins to the affected.⁶² Jishenghui took on the responsibility of establishing and managing key institutions, including clinics, hospitals, soup kitchens, orphanages,⁶³ and temples,⁶⁴ serving both the immediate and long-term needs of local society during times of crisis. The success of Jishenghui not only attracted numerous social elites and prominent lay Buddhists at the time such as Wang Yiting 王一亭 (Wang Zhen 王震, 1867–1938)⁶⁵ to participate and lead their diverse charitable activities in the early twentieth century, but also simultaneously propagated the Jigong cult through their philanthropy activities.

Jishenghui serves as a prominent example of a hybrid institution of philanthropy and religious practices in addressing the era's challenges. Not all activities of Jishenghui were conducted in a religious context, and all associations such as Jishenghui have every reason to make themselves appear modern, secular, philanthropy-oriented rather than faith-oriented, especially for those operating in the social context after 1898 (Goossaert 2006).

However, existing work has shown that the origins of Jishenghui are closely linked to the Jigong cult.⁶⁶

One unique aspect of Jishenghui's activities involved spirit-writing sessions, during which its members received divine revelations from Jigong. These revelations guided their multi-faceted philanthropic work during periods of crises, illustrating how religious practices were integral to their mission. Wang Chien-chuan 王見川 has shown that both their spirit-writing altar called Jiyunxuan 集雲軒 and their philanthropy association, Jishenghui, are but the two sides of the same coin, having their origins in two particular spirit-writing altars of Jigong: Hengji tan 恒濟壇 in Fuyang 富陽, Zhejiang province and Yongji tan 永濟壇 in Wushan 吳山, Hangzhou 杭州.⁶⁷ According to Meir Shahar, the first time when Jigong descended in spirit-writing sessions was during the Boxer revolt around 1900 (Shahar 1998, p. 186). Other than the influence of novels and opera, spirit-writing groups were crucial in promoting the popularity of Jigong worship. By the 1930s, Jigong had become a major deity for spirit-writing within the redemptive society Yiguandao.⁶⁸ Today, Jigong continues to descend through spirit-writing to provide healing to the local population, most notably in contemporary Hongkong.⁶⁹ In some spirit-writing halls in Taiwan, a majority of concerns from worshippers centered around health, followed by career or else (Katz 2023, p. 618). The divine prescriptions, in their current form, are merely divine water, referred to as cinnabar water (*danshui* 丹水), talisman water (*fushui* 符水), or exorcist water (*fashui* 法水); most often, flower tea.⁷⁰ The earlier form of the divine water could have been an infused water or tea with ashes from burned talismans (Katz 2023, p. 618).

These spirit-writing altars of Jigong should be understood in the long history of spirit-writing as a ritual technique to receive divine revelations. Early instances of spirit-writing could be attested to the Song dynasty, and it is considered as a religious technique for a person or a community to communicate with gods, with the aim of seeking response to personal requests, access healing, or moral guidance as means to achieve self-divinization (Schumann and Valussi 2023, p. 1). Many of the spirit-writing groups, including the Jigong cult, developed charitable halls (*shantang* 善堂) dedicated to charitable acts toward the public from the late Ming onwards (Fuma 1997; Liang 1997; Smith 2009). The concept of serving for the benefit the public was a recurring theme in many modern spirit-writing revelations and formed a core part of these groups' activities (Yau 2005; Goossaert 2022b, pp. 214–16). The concept of serving the public good through charity and healing practices, often revealed through spirit-writing, underscores a significant aspect of Jishenghui's identity (Schumann and Valussi 2023, pp. 9–10).

7. Transmission of Knowledge: Spirit-Writers with Medical Expertise

In terms of healing, in many cases, several key members of these groups were persons with significant medical knowledge, or even trained physicians. They employed a range of methods in their healing practice. Some offered medical consultations, while others performed healing rituals such as exorcism, talisman incantations, and spirit-writing sessions, where medical prescriptions were revealed by the gods. This practice was used to help individuals and particularly on a larger scale during epidemic outbreaks. For instance, during the 1894 bubonic plague epidemic in Canton, spirit-writing played a critical role in facilitating the growth of large spirit-writing altars (Yau 2011; Shiga 2010).

Not only were some physicians themselves wielders in spirit-writing altars, they actively trained the next generation of wielders in private homes. One such narrative source, written by Bao Tianxiao 包天笑 (1879–1973), described a widespread presence of two forms of spirit-writing altars, predominantly dedicated to Patriarch Lü and Jigong, in Suzhou during the late Qing dynasty. These altars were set up in public spaces such as charitable halls, as well as private homes. They were places where the sons of literati families were taught to become wielders-cum-mediums and to interpret the divine prescriptions received through spirit-writing.

In Bao's memory, the spirit-writing altar in his home usually takes three persons to conduct a séance, two persons holding the stylus to write in the sand pan, while the third

person writes down the characters as they appear in the sand. Because one of Bao's uncle's being sick often and the family being unwilling to recruit outsiders, Bao was recruited by another uncle to be the recorder (*lu lun* 錄論) of the spirit-written texts. Bao was unsure of himself at the beginning; however, he was assured by his uncle that the characters would mostly be simple ones and even if mistakes were made, it could be corrected afterwards. During the training, Bao was given a spirit-written text from Jigong to read and rehearse. Bao participated in the séance immediately on the second day, kneeling on a table next to the spirit-writing altar, he writes all that appeared in the sand with a brush onto a notebook. Half an hour later, the séance was finished. Bao's first attempt was quite successful, with only two three characters needing to be corrected. However, Bao acknowledges that it was much more difficult to ask for medicinal prescriptions:

However, I faced some difficulties while seeking the "divine prescriptions", as I wasn't familiar with some of the names of the medicines and ended up making typos. But my uncle Yannong is knowledgeable in medicine. He has always studied medical principles. When prescriptions were being given at the spirit-writing altar, he gave detailed instructions and checked carefully, making the process go smoothly.

不過在求“仙方”中，我較為困難，因為有些藥名，我不熟悉，寫了別字。但硯農表叔是知醫的人，他一向研究醫理，乩壇上臨開方子，他更詳細指示，謹慎檢點，也就順利進行了。⁷¹

A survey of the currently available medicinal slips seems to suggest that the Chinese gods prescribe what most village physicians would prescribe for their patients. This is not surprising considering that, in fact, many of the wielders of spirit-writing altars which provide healing service are actually physicians themselves. The identities of such wielders are rarely explicit in the early modern periods. However, we have much more data in many localities for the late imperial period and the twentieth century and can assume that the tradition of appointing physicians, or at least persons with medical knowledge, to the role of wielder was one of the necessities of providing healing services of spirit-writing altars. For example, Lou Dexian 婁德先 (1592–1645) in Liu-han Altar 了聞壇⁷² and Wu Shoushuo 吳壽頤 (d.u.) in Shanqing jingtang 善慶經堂,⁷³ were both physicians-cum-wielders in spirit-writing altars.

The first physicians-cum-wielders for receiving divine prescription at Jigong spirit-writing altar of Jishenghui is highly likely Bu Zhangwu 步章五 (1874–1933) (Zhang 2014, p. 184). Hailing from Henan, Bu Zhangwu was an exemplary literati (*juren* 1903) in the last decade of Qing dynasty. He worked for a time under Yuan Shikai 袁世凱 (1859–1916) until 1915, when Yuan proclaimed himself the emperor. Bu expressed his opposition by leaving the Yuan court, and moving south to settle in Shanghai, together with his friend Yuan Kewen 袁克文 (1890–1931), son of Yuan Shikai. They were said to be hosted in the house of Jiyunxuan 集雲軒-cum-Jishenghui starting from this period, which coincides with the founding of Jiyunxuan in 1915 and Jishenghui in 1916.⁷⁴ The roles played by both men in these groups were only hinted at, if not intentionally blurred in existing public records. Neither of the two men was listed on the 1918 official member list of Jiyunxuan.⁷⁵ Bu Zhangwu was only mentioned in a list of elected employees, one of the three responsible for an auditing department (shenheke 審核科) of Jishenghui in a press article on *Shenbao* in 1920.⁷⁶ Yuan Kewen was even more discrete about his being a "disciple of Jigong", which we learnt only from the reference from mourners on his funeral in 1931.⁷⁷

However, Bu Zhangwu's involvement in the spirit-writing sessions of Jiyunxuan-cum-Jishenghui is clear. If recording the Jigong poems through spirit-writing was only a private pastime,⁷⁸ Bu Zhangwu started to make good use of his medical knowledge to provide healing service to the public for free. Following the operation models of other popular charitable halls, such as Renji shantang 仁濟善堂, founded in late nineteenth century,⁷⁹ the distribution of medicines (shiyao 施藥) featured a prominent role among the charita-

ble activities of Jishenghui, operated by a specific branch “medicine distribution outlet” (shiyao chu 施藥處).⁸⁰

8. Disaster Relief Efforts by Jishenghui

When Chen Runfu 陳潤夫 (1841–1919), the first chief of Jishenghui passed away, Wang Yiting took charge and brought with him wealth of first-hand experience working for other philanthropic groups (Shen 2011, pp. 103–6). In 1920, Jishenghui made a public advertisement on the first page of the popular Shanghai newspaper, *Shenbao*, in which they did not shy away from disclosing publicly that the provenance of the medicines from Jishenghui were through spirit-writing. The advertisement says:

Each summer, in accordance with the medicinal prescription received through spirit-writing, various cinnabar pills were specially prepared to provide timely relief and to cure epidemics, offered for free to both locals and those from other regions for emergency use. Their miraculous efficacy was well-established, and no charges were incurred. If philanthropists come forward to Jishenghui with donations to collect medicines to give away [to the people], the association will produce and distribute these medicines according to the prescription, thus broadening the charitable merits.

每屆夏令，特遵亂方配製應時濟生救疫各種丹丸，為本埠及外埠施贈，救急之用，神效久著，概不取資。如慈善家備款到會，領藥施送者，本會可照製本撥藥，以廣善緣。⁸¹

The spirit-writing flavor of these medicines could be attested from earlier mentions of such medicine names before 1920, when “Immortal merits” Pujidan 仙功普濟丹 and “Immortal merits” Pujishui 仙功普濟水 were distributed to the poor during the epidemics in 1919.⁸² Such divine medicines were given out as charity at least throughout the 1920s. Again, in 1923, we found the same 1920 advertisement for such cinnabar preparations were again put on the front page of *Shenbao* four times from May 24th to the 30th.⁸³ Such an intensive advertising campaign worked on two fronts, first at promoting the efficacy of the medicine from Jishenghui, second at soliciting funds to mass produce their medicine and, in turn, their influence nationwide. In 1924, Wang Yiting wrote in praise of the generosity of one such donor.⁸⁴

During the period of the Central Plains War 中原大戰 from the late 1920s, Jishenghui distributed large quantities of medicines to the disaster area in Qufu 曲阜 in Shandong province, including a few cinnabars: Baoandan 保安丹, Jishengdan 濟生丹, and liquids: Pujishui 普濟水 and Jishengshui 濟生水,⁸⁵ at times with campaigns led by Wang Yiting himself.⁸⁶ Many of the cinnabars produced by Jishenghui are multi-purpose. Take Baoandan 保安丹 for example. Not only were these sent to the disaster-stricken areas, they were also said to cure febrile seizures in children.⁸⁷ We can learn of the extremely popular reception of these various medicines produced by Jishenghui from a 1931 newspaper article, which reads:

The Chinese Society for the Relief of Sentient Beings (Zhongguo jisheng hui 中國濟生會) has recently received letters from Yu Zhusheng 余柱笙 and Zhou Jingfu 周敬甫, the directors of relief activities in Tianjin and Beijing, who report multiple times that as we enter summer, epidemics have broken out and are widespread in areas such as Rehe and Chaoyang in the northern province. The villages lack good doctors and pharmacies, and many disaster-stricken residents succumb to their illnesses. In addition, the displaced refugees from Henan need to carry medicines to prevent epidemics when passing through stations like Tianjin and Beijing. The esteemed association previously sent 20,000 bottles of jishengdan 濟生丹 and 1000 boxes of baoandan 保安丹, both highly effective and life-saving medicines. However, due to the vast disaster area, distribution has been uneven and supplies are nearly exhausted, hence, an increase in aid is requested. The association recently shipped another 10,000 bottles of jishengdan from Tongzhou ship, and the Taishun

ship sent 20,000 bottles of shidishui 十滴水. Still, there are insufficient supplies to distribute, so we plan to send another 20,000 bottles of jishengdan soon to meet the urgent needs. The medicines from the association are effective and valuable. Now, Beijing and Rehe provinces have sent a total of 70,000 bottles of Jishengdan and Shidishui. The cost of the medicines is considerable. If people from all walks of life and philanthropists could generously contribute to the medication fund to produce more aid, the disaster victims could gain relief, and such acts of benevolence and beneficence would indeed be boundless.

中國濟生會，頃接天津、北平等處辦振主任余君柱笙、周君敬甫，迭次來函報告，以北省熱河、朝陽等災區，現當入夏，疫病發生，隨處皆是。鄉間既乏良醫，又無良好藥舖，災民每染病症，恒多坐以待斃。又加河南出關難民，經過平津等車站，各須帶藥，以防疫病。前蒙貴會寄來濟生丹二萬瓶，保安丹一千盒，皆屬非常靈效，有起死回生之功。但災區太廣，施散不周，近已用罄，仍乞增加濟用。該會前日通州輪又寄上濟生丹一萬瓶，泰順輪寄上十滴水二萬瓶，現接來函，仍屬不敷分布，擬日內再寄濟生丹二萬瓶，以應急需。該會藥既靈效，藥本珍貴，今北平熱河兩省已寄濟生丹、十滴水共七萬瓶，成本不資。各界慈善大家，如能樂助藥資，多製救濟，則災民咸登壽口，種德造福，實無涯矣。⁸⁸

Two different approaches for healing existed in parallel in Jishenghui before 1933. One was certainly divine prescriptions received through spirit-writing. After Bu Zhangwu passed away in 1933, Jishenghui started to downplay the aspect of divine prescriptions received through spirit-writing, but rather started to advocate for the new healing methods, referred to as “spiritual operations for healing” (*jingshen shoushu zhibin* 精神手術治病). This approach was explained in a postface written by Qiu Wenqing 邱問清 collected in the *Jishi tayuan zhi* 濟師塔院志 in 1939.⁸⁹ In this text, Qiu Wenqing exclaimed that the “spiritual science” (*jingshenxue* 精神學) was the synonym for the healing ritual of “Healing methods using fingers as needles combined with samadhi and five thunder rites” (*sanmei wulei zhizhen zhi zhifa* 三昧五雷指針之治法). Qiu’s method of “spiritual healing” was taught by his master Zhu Qicheng 朱棄塵 (1871–?), a senior member in both the spirit-writing altar *Jiyunxuan* and philanthropy group Jishenghui. However, we only learnt of this transmission and the specifics of this healing ritual through sparse sources. Both Zhu Qicheng and Qiu Wenqing featured prominently in another major endeavor of repair and reconstruction of Yuxuguan 玉虛觀, a Daoist monastery near Nanjing, in 1936.⁹⁰ Zhu not only took a leading role in the reconstruction project, but also planned for an additional construction of a temple for Jigong (*jigong foyuan* 濟公佛院) on the same site. During the fundraising campaign, Zhu Qichen was the most active and successful collector of donations, raising more than a third of the total funds.

The clinic in Jishenghui organized separate consultation days for men and women, likely to avoid the free mingling of different genders, which would lead to labels of superstition. By all appearance, Jishenghui clinic is a modern scientific medical institution, conducting smallpox vaccinations twice a year during spring and autumn. Nonetheless, the practice of producing cinnabar has not stopped. They distribute various kinds of medicines year-round for the benefit of the sick and needy. For example, when noticing a high prevalence of poor health among women in the country, they made a special medicine for women called “*jishi desheng dan* 濟世得生丹”.⁹¹ In contrast with the 1920 advertisement, where it was particularly emphasized that “the medicine was made according to divine prescription received through spirit-writing”, here in the 1936 advertisement the provenance of the medicine was not mentioned at all.⁹² With spiritual healing being one of the accepted scientific methods, the Jishenghui clinic appears modern and secular. The press article says:

The Jishenghui traditionally provides spiritual healing. It is stipulated that men are treated every Monday, Wednesday, and Friday, while women are treated every Tuesday, Thursday, and Saturday, with no consultation fees. Additionally, smallpox vaccines are administered in the spring and autumn, and vari-

ous medicines are dispensed year-round to benefit the sick. Reflecting on the fact that a majority of women in our country suffer from ill health, the common causes are sadness, depression, and anger, resulting in symptoms such as chest tightness, abdominal distention, back pain, waist soreness, and menstrual disorders. Consequently, many children born to these women are weak. As winter has now arrived, there are many impoverished women in society who are unable to seek medical attention. The Society has specially produced a gynaecological medicine, Jisheng desheng dan, which primarily regulates the liver, soothes the qi, nourishes the blood, and adjusts menstruation. It effectively treats symptoms such as rising heat phlegm, qi obstruction, limb numbness, pre and postpartum conditions, and menstrual loss of blood. Any patient can obtain this medicine from the Society's location in the International Settlement on Ningbo road, Gujia alley, free of charge.

中國濟生會向有精神手術治病。規定每逢星期一、三、五診男，星期二、四、六診女，一律不收診費。並於春秋兩季施種牛痘，以及常年施送各種藥品，以惠病者。復鑒於我國婦女身體失於健康居其多數，其原因每以悲感、憂鬱、忿怒，致成胸悶、腹脹、背痛、腰痠、經期失調等症。遂致所產兒女恒多羸弱。茲者冬令已至，社會中貧苦婦女、無力求醫者比比皆是。該會爰特製送婦科要藥濟世得生丹一種，專治婦女種種危險症候以平肝舒氣養血調經為主。主治熱痰上湧、氣阻昏迷、四肢風麻、胎前產後、停經失血等症，頗著功效。凡有患者，可向公共租界寧波路顧家弄該會索取，不取分文。⁹³

Jishenghui also invented new medicine during the cholera crisis in 1930s, as we can see from the following press article:

Jishenghui donates medicine to help disaster victims. Two hundred bottles of the newly invented Jishadan 急痧丹. Jishenghui recently invented and formulated a special paste for the corners of the eyes, Jisha jiuming dan 急痧救命丹, to treat cholera. It's very effective. Whoever gets cholera, apply this medicine to the corners of the eyes. After application, tears will flow and the eyes will feel painful, while limbs become numb and cold. The medicinal properties immediately reach the dantian 丹田, and the cholera can be cured. If the eyes do not hurt after application, then it is not cholera. However, this medicine must not be taken orally. A single bottle of this medicine can treat three to four people, applied two to three times every two minutes, until the patient's limbs are no longer numb or cold and the body is comfortable. Consequently, the Society donated this medicine to various charitable organizations in Shanghai yesterday, contributing two hundred bottles to the Northeastern Refugee Relief Union (dongbei nanmin lianhehui 東北難民聯合會), to be forwarded to the regular representatives of these charitable organizations, Qu Yingguang 屈映光, Feng Yangshan 馮仰山, for distribution and trial use among the sick in disaster-stricken areas. It is reported that the Society will soon send this medicine to the post office for distribution in plain letters.

濟生會捐送藥品救災民，新發明急痧丹二百瓶。中國濟生會，最近新發明配製點眼角急痧救命丹治痧症，非常有效。凡遇急痧者，將此藥點於四眼角，點後出淚，眼覺甚痛，四肢麻木發冷，藥性即直達丹田，症即可愈。若點眼不痛，即非痧症，惟不可入口。此丹一瓶可治三四人，每兩分鐘點二三次，至病人四肢不麻不冷，肢體舒服為度。故該會於昨日將此項藥品捐送上海各慈善團體賑濟東北難民聯合會二百瓶，請轉致各善團駐平常董屈映光馮仰山二氏，分濟災區病黎試用。聞該會即將該項藥品，交郵局寄平散放云。⁹⁴

In 1933, they sent Yushu dan 玉樞丹 to the disaster areas, in the article, it was specifically mentioned that it was "home-made medicine" (zizhi zhi yaopin 自製之藥品).⁹⁵ The name for the medicine Yushu 玉樞 draws on *Yushu jing* 玉樞經, a fundamental scripture written through spirit-writing and used in the cult of Puhua tianzun 普化天尊 for thunder rituals. At times of utter urgency, such as flooding, Jishenghui will send all the variety of

medicines in their disposal: jishengdan 濟生丹, shishasan 時痧散, medicine for dysentery 痢疾藥, shidishui 十滴水, rendan 人丹, baoandan 保安丹, lingbaodan 靈寶丹.⁹⁶

In sum, during the late 1920s and 1930s, Jishenghui played a crucial role in disaster relief, distributing large quantities of medicines to areas affected by war and epidemics. Led by Wang Yiting, they provided multi-purpose medicinal pills and holy waters, which were highly effective and well received. Despite shifting from divine prescriptions to “spiritual healing”, Jishenghui continued to innovate and produce new medicines. Their clinic offered free consultations, smallpox vaccinations, and year-round medicine distribution, demonstrating a modern and pragmatic approach to public health during a tumultuous period in Republican China.

9. Concluding Remarks

In conclusion, this study proposes a new framework for understanding the interaction between religion and medicine in China, emphasizing the roles of healing gods, healers, rituals, and its contemporary relevance, through ethnographic fieldwork.

First, this study underscores the significance of healing gods and their divine presence in ritual healing practices in China. While previous scholarship has concentrated on well-known figures such as the Medicine Buddha Bhaisajyaguru (yaoshi rulai 藥師如來), Avalokiteśvara (guanshiyin 觀世音/Kannon 觀音), and Mañjuśrī (wenshu pusa 文殊菩薩), this research highlights Jigong 濟公 as an important Buddhist healing deity among lay Buddhists from the late imperial period to the present. The findings align with earlier work by Strickmann (Strickmann 2002) and Yü Junfang (Yü 2001), which showed that in Chinese popular religion, the transformative adaptations of these deities in local contexts often outweigh their original textual or iconographic forms. Jigong, originally a historical Buddhist monk, evolved into a prominent healing god by the late imperial period; exemplifying the later stage of sinification process of Buddhism in China. This evolution highlighted the need for further scholarly exploration of Jigong’s role and significance, not only to deepen our understanding of religious adaptation in Chinese history but also to illuminate the broader processes through which Buddhism was reinterpreted and integrated into local popular practices.

Second, the case study of Jishenghui demonstrates the organization’s enduring commitment to healthcare provision and medicine distribution across diverse regions of China, even amid challenging socio-political climates. Despite prevailing anti-superstition campaigns in Republican China, Jishenghui maintained its credibility and trustworthiness, as reflected in public endorsements and advertisements. This reflects broader historical dynamics, where traditional healing practices were adapted to meet contemporary needs, whether voluntarily or under societal pressure. It is important to note that ritual healing was not the sole approach adopted by Jishenghui. Rather, figures like Wang Yiting epitomized the elite of the time, who were simultaneously faithful to their inherited religious culture and pragmatically open to modern medical practices and innovations. Wang Yiting’s expertise in organizational management, media engagement, and extensive social networks was crucial to sustaining philanthropic efforts such as those of Jishenghui during the tumultuous period of Republican China, when their philanthropic work in societal welfare and healthcare was urgently needed by the common people.

Third, this study reveals the critical role of spirit-writing as a ritual technique to invoke divine presence and obtain medical prescriptions. The practice of obtaining medical prescriptions through spirit-writing should be understood within the broader context of religious healing rituals and their historical evolution. This practice exemplifies the integration of local traditions into Buddhist healing practices, enriching the studies of the history of religions and medicine in China. While existing research often highlights the twentieth century as a period of significant modernization and secularization in Chinese medicine, this study shows how Buddhist individuals such as Wang Yiting and institutions like Jishenghui navigated modernity in the early twentieth century. These divine prescriptions were widely disseminated by religious institutions such as spirit-writing altars and

charity halls, which facilitated their acceptance and utilization across various communities. Within this network, organizations such as Jishenghui emerged as vital agents of healing and philanthropy in Republican China. Their development was closely linked to the established network of spirit-writing altars, practitioners with medical expertise, and support from social elites, institutions and general public, illustrating a unique aspect of the intersection between religion and medicine in this historical context.

Fourth, this study explores the fluid boundaries between Buddhist and Daoist healing practices. While competition between these traditions is frequently emphasized, this study reveals more complex dynamics. It shows that Buddhist figures such as Wang Yiting adopted Daoist methods to further their philanthropic and self-cultivation goals, bridging gaps between religious and medical practices in Republican China. Meanwhile, two conceptions of illness and healing prevalent in contemporary societies can be traced back to their medieval religious origins. First, many individuals turn to religious healing only after conventional medicine fail—a pattern observed since the late imperial period until today—and, second, in contemporary China, illnesses are sometimes perceived as moral failings, with cures involving repentance and atonement, reflecting traditions from medieval and late imperial periods. Notably, these two beliefs are shared across both Buddhist and Daoist traditions, demonstrating a convergence in their approaches to healing. The persistence of these beliefs and practices also serves as a remarkable living testimony to the resilience of religious frameworks in shaping perceptions of health and disease even in modern, scientifically oriented contexts.

Finally, the history of revelation in Chinese society over the past two millennia presents a marked contrast to societies of Abrahamic traditions, where monotheistic traditions often limit revelations. The distinctive cultural context of Chinese societies, with its rich history of spirit-writing, offers a unique case for examining how divine prescriptions are woven into everyday life and medical practices. The emergence of Jishenghui, linked to regional epidemics, parallels developments in other cultures, such as Japan, where the Medicine Buddha's cult rose in popularity during the Heian period (794–1185) amid devastating epidemics (Yiengpruksawan 1996). A comparative study involving pluralistic societies such as India could also open new dimensions of understanding (Weiss 2009). Thus, this study's findings on divine prescriptions in Chinese society not only adds a case study to the broader dialogue in comparative religions, but also invites us to reconsider the very nature of healing, faith, and communal resilience in the face of crises. When faced with epidemics and suffering, historical figures in China were not less rational or more "superstitious" than we are today; rather, they turned to their gods and rituals, finding in their worldview the same courage and hope that modern society seeks through science and reason—illustrating that the fundamental essence of humanity remains consistent, across time and space.

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Abbreviations

DZ: *Daozang* 道藏, numbers following Schipper and Verellen (2004), eds., *The Taoist Canon*.

GDZ: *Daozang jicheng diwuji Guandi juan* 道藏集成第五輯關帝卷, numbers following “CRTA—The Chinese Religious Text Authority 宗教書籍規範索引” (<https://crta.info/>) (accessed 17 August 2024).

Notes

- 1 *Guanyin dashi jiuji xianfang* 觀音大士救劫仙方, or *Guanyin pusa jiuji xianfang* 觀音菩薩救劫仙方, anonymous, undated. Available online: <http://taolibrary.com/category/category67/c67002.htm> (accessed on 13 August 2024). See also several texts titled *Guanyin dashi jiuji xianfang* 觀音大士救劫仙方 in vol. 7 and vol. 9 of *Zhongguo yuyan jiuji shu* 中國預言救劫書. Wang Chien-ch’uan 王見川, Song Jun 宋軍, Fan Chun-wu 范純武, comp. Taipei: Xinwenfeng, 2010, 10 vols.
- 2 In this paper, I combine the emic terms *jifang* 乩方 (prescriptions through spirit-writing) and *xianfang* 仙方 (prescriptions of immortality) as an etic term, “divine prescription”. This term encompasses both types of prescriptions—referring to medical prescriptions, herbal recipes, and methods of cures received through the ritual technique of spirit-writing—which have appeared since the twelfth century. The term “prescription” is also more inclusive than “recipe” in the sense that our study reveals some divine cures in China involve self-cultivation through moral behaviors and the accumulation of merits, extending beyond mere medicinal formulations. Stanley-Baker et al. (2023) give the following definition: “prescriptions, refers to recipes prescribed outside of an explicit context of cultivation, which focuses specifically on curing disease. These were prescribed as a form of clinical response in which samples and compounds were chosen for their suitability to treat specific disease conditions. These prescriptive texts served people in their wider social network and addressed entirely pragmatic concerns”. At times, I also use an etic term “divine medicine” to refer to medicine or cures associated with other ritual healing practices, which were not necessarily derived through spirit-writing. This term covers medicine or cures before the emergence of divine prescriptions or those obtained from contexts not explicitly associated with spirit-writing.
- 3 Salguero, *Buddhism and Medicine*, xxi.
- 4 Salguero, xxii; (Salguero 2019, p. xvi).
- 5 Salguero, *Buddhism and Medicine*, 431–530.
- 6 Salguero, xxi.
- 7 DuBois, 236.
- 8 I follow the translation of *zhuyou* 祝由 by Andrew Schonebaum in a recent publication, see (Schonebaum 2022, p. 473).
- 9 (Sivin 2023); See also “Introduction” by Michael Stanley-Baker.
- 10 (Stanley-Baker 2023), Introduction.
- 11 In this paper, I follow the scholarly convention of using the term “medieval” to describe the period of Chinese history from the second to the tenth centuries CE. This term has gained acceptance in recent scholarship to denote a time of political fragmentation, the rise of regional powers, and significant cultural and religious transformations, particularly in Daoism and Buddhism. See (Verellen 2019, pp. 12–13).
- 12 See a recent critical edition of *Bencao jing jizhu* by Wang Jiakui 王家葵 (2023).
- 13 Goossaert, 75.
- 14 Goldschmidt, *The Evolution of Chinese Medicine*; Sivin, *Health Care in Eleventh-Century China*, 95–6, 102–3.
- 15 Boltz, “On the Legacy of Zigu and a Manual of Spirit-writing in Her Name”; Valussi, “Women, Goddesses, and Gender Affinity in Spirit-Writing”.
- 16 Wang Chien-Chuan 王見川, “Spirit-Writing Practices from the Song to Ming Periods and Their Relation to Politics and Religion”, 93.
- 17 Shiga, “The Nineteenth-Century Spirit-Writing Movement and the Transformation of Local Religion in Western Guangdong”, 512–13.
- 18 Shiga, 521–23.
- 19 DZ 305.
- 20 *Yunnan tongzhi* 雲南通志, 30.38a.
- 21 Written as its homophone *qian* 千 in certain manuscripts.
- 22 Guandi mingsheng zhenjing zhujie 關帝明聖真經注解, *Daozang jicheng diwuji Guandi juan*, vol. 21, pp. 521–640.
- 23 Guan di ming sheng jing zhu shi 關帝明聖經注釋, *Daozang jicheng diwuji Guandi juan*, vol. 21, pp. 123–342.

- 24 Goossaert, “Spirit Writing, Canonization, and the Rise of Divine Saviors: Wenchang, Lüzu, and Guandi, 1700–1858”.
- 25 Yin Zhihua 尹志華, “Lüzu Quanshu de Bianzuan He Zengji” 《呂祖全書》的編纂和增輯”; Lai Chi-tim 黎志添, “Qingdai Sizhong Lüzu Quanshu Yu Lüzu Fuji Daotan de Guanxi” 清代四種《呂祖全書》與呂祖扶乩道壇的關係”.
- 26 Goossaert, “Shao Zhilin 邵志琳 (1748–1810), a Religious Life”.
- 27 Shao Zhilin, *Lüzu quanshu*, juan 57, 941a.
- 28 *Lüzu zhenjing lingqian xianfang hebian* 呂祖真經靈籤仙方合編. see: <http://taolibrary.com/category/category62/c62050.htm> (accessed on 13 August 2024).
- 29 I should like to thank an anonymous reviewer’s suggestion to further investigate the apparent contradiction between the practice of cherishing characters (*xizi* 惜字), which emphasizes respecting written characters, and the healing tradition that involves burning talismans (*fu* 符) and feeding the ashes to patients. This dichotomy, though seemingly contradictory, can be understood through their distinct roles and historical contexts in Chinese culture. The practice of *xizi* reflects a reverence for the written word, rooted in the belief that written characters carry knowledge and intrinsic value, which underscores the importance of literacy and the moral duty to treat written characters with respect. Conversely, the use of talismans in healing rituals is grounded in the belief that talismans possess divine power and can invoke divine intervention for healing purposes. The distinction lies in the intended audience and purpose of the writing: while *zi* primarily communicates with humans, *fu* primarily communicates with gods.
- 30 *Jingzao quanshu* 敬竈全書 in *Sandong shiyi*, Volume 11, pp. 626–693. I am grateful to Vincent Goossaert for introducing and discussing this text on his seminars. For a study on the Zaojun 竈君 (the stove god or the kitchen god), also known as Zaoshen 竈神, Zao Wangye 竈王爺, see (Chard 1990).
- 31 *Qisheng dan* 起生丹 in *Zangwai daoshu* 藏外道書. Chengdu: Bashu shushe, 1992–1994, vol. 28.
- 32 Zeng ding jing xin lu 增訂敬信錄, 1797 edition at Bibliothèque nationale de France, accessible online: <https://gallica.bnf.fr/ark:/12148/btv1b90065479?rk=21459;2> (accessed 15 August 2024).
- 33 *Guanyin pusa jiuji xianfang* 觀音菩薩救劫仙方, anonymous, undated. Available online: <http://taolibrary.com/category/category67/c67002.htm> (accessed 13 August 2024) See also several texts titled *Guanyin dashi jiuji xianfang* 觀音大士救劫仙方 in vol. 7 and vol. 9 of *Zhongguo yuyan jiuji shu* 中國預言救劫書. Wang Chien-ch’uan 王見川, Song Jun 宋軍, Fan Chun-wu 范純武, comp. Taipei: Xinwenfeng, 2010, 10 vols.
- 34 Cao Xueqin 曹雪芹. *Chongjiao bajia pingpi Honglou meng* 重校八家評批紅樓夢. Chapter 25.
- 35 English translation from Cao Xueqin (Tsap Hsueh-Chin) 曹雪芹 and Gao E (Kap Ngo) 高鶚, *A Dream of Red Mansions*, 1:p.369. Corresponding original text in Chinese available online: <https://ctext.org/hongloumeng/ch25> (see section 33, accessed on 17 August 2024).
- 36 (Wu 2012), vol. 4, chap. 78, Translated and Edited by Anthony C. Yu.
- 37 Corresponding original text in Chinese available online <https://zh.wikisource.org/wiki/%E8%A5%BF%E9%81%8A%E8%A8%98/%E7%AC%AC078%E5%9B%9E> (accessed on 17 August 2024).
- 38 In 1760, Grand Secretariat 大學士 Jiang Pu 蔣溥 (1708–1761), serving under Emperor Qianlong 乾隆 (1711–1799, r. 1735–1796), fell ill. The Emperor launched a nation-wide search for physicians, leading to the selection of Xu Dachun from Jiangnan as the primary choice. Upon examination, Xu honestly conveyed to the Emperor that nothing further could be done for Jiang’s condition. The Emperor, appreciating Xu’s candor, sought to retain him at court, but Xu requested and received permission to return home. Two decades later, another key official fell ill, and Emperor Qianlong summoned Xu once more. Despite being 79 years old, Xu travelled to Beijing with his son, but passed away three days after arrival. See Yuan Mei 袁枚, “Xu Lingtai xiansheng zhuan 徐靈胎先生傳”, in *Xiaocang shanfang shiwenji* 小倉山房詩文集, juan 34.
- 39 Xu Dachun 徐大椿, *Yixue yuanliu lun* 醫學源流論, 1.59a-b.
- 40 Chen Jie 陳杰, *Hui sheng ji* 回生集, in *Zhenben Yishu jicheng—Fangshu lei* 珍本醫書集成—方書類, vol. 9.
- 41 See note 40.
- 42 Xu Zonggan 徐宗幹, *Elu Zaji* 惡廬雜記.
- 43 Master Dongheng 東垣先生 refers to Li Gao 李杲 (1180–1251), style name elder of Dongheng 東垣老人, famous physician known for his medical theory on spleen and stomach 脾胃說 during the Jin-Yuan period. For an introduction on history of medical theories in China, see Leung, *Miandui jibin*.
- 44 Xu Zonggan 徐宗幹, *Elu Zaji* 惡廬雜記, 20.
- 45 Xu Zonggan 徐宗幹, 31.
- 46 His *zi* (literate name) includes Xinan 薪安 and Dingpu 定圃, as on the title of his *Lenglu Yihua*.
- 47 Lu Dingpu 陸定圃, *Jingjiao Lenglu Yihua* 精校冷廬醫話, 14.
- 48 Zhuzi shanding yuquan zhenben taoyuan mingshengjing 朱子刪定玉泉真本桃園明聖經, *Daozang jicheng diwuji Guandi juan*, vol. 24, pp. 3–128.
- 49 Li Guoping 李國平, “The Rise of Spirit-Writing Cults in Chaozhou: Reassessing the Role of Charitable Halls”, 544.

- 50 See note 17.
- 51 Luo Dan 羅丹, “Spirit-Writing Altars in Contemporary Hong Kong: A Case Study of Fei Ngan Tung Buddhism and Daoism Society”, 573.
- 52 Lai Wen 賴文 and Li Yongchen 李永宸, “Qingmo Guangdong Shantang de Yiliao Jiuji Huodong 清末廣東善堂的醫療救濟活動”, 146.
- 53 Schumann and Valussi, 618.
- 54 *Gaochun Pujitang zhi* 高淳普濟堂志, Dai Fengjun 戴鳳筠 et al., comp., 1900, reprint in *Jiangsu jinxian dai shehui jiuji yu cishan wenxian congkan* 江蘇近現代社會救濟與慈善文獻叢刊, Fenghuang chubanshe, Nanjing, 2015.
- 55 See a study of the *Gaochun Pujitang zhi* 高淳普濟堂志 in (Goossaert 2019) which estimated that 70 percent of the almost 700 pages are devoted to revelations.
- 56 *Wen da tianjun shouwen jiangfu baochan* 溫大天君收瘟降福寶懺, *Sandong shiyi*, Volume 11, pp. 458–83.
- 57 Katz, *Demon Hordes and Burning Boats*.
- 58 Ganany, “Jigong”; Durand-Dastès, “Le Bonze Dément et l’abbé Clairvoyant, Ou Comment Jigong Fit l’apprentissage de La Folie”.
- 59 Luo Dan 羅丹, “Spirit-Writing Altars in Contemporary Hong Kong: A Case Study of Fei Ngan Tung Buddhism and Daoism Society”, 591–95.
- 60 Zhu Mingchuan 朱明川, “The Liu-Han Altar: Between a Literati Spirit-Writing Altar and Popular Religion”, 329.
- 61 Shi Anren 釋安仁, *Huyin chanyuan jishi* 湖隱禪院記事 (1921), pp. 1–25. Cited in (Zhang 2014, p. 180).
- 62 *Shanghai Zhongguo jishenghui zhanxing zhangcheng* 上海中國濟生會暫行章程, 1918. See also *Jishi tayuan zhi* 濟師塔院志, 1928, pp. 45–47.
- 63 “Jishenghui zuokai gaizu dahui 濟生會昨開改組大會”, *Shenbao*, March 4, 1929.
- 64 *Chongjian Jinling Yuxu Guan jishi zhengxinlu* 重建金陵玉虛觀紀事徵信錄, 1936.
- 65 More on Wang Yiting, See (Katz and Goossaert 2021), Chapter 6.
- 66 Wang, “Qingmo minchu”.
- 67 Wang.
- 68 (Billioud 2020). Chapter Three.
- 69 Luo Dan 羅丹, “Spirit-Writing Altars in Contemporary Hong Kong: A Case Study of Fei Ngan Tung Buddhism and Daoism Society”, 564.
- 70 See note 59.
- 71 Bao Tianxiao 包天笑, *Chuanyinglou Huiyilu* 鈞影樓回憶錄. p. 71.
- 72 Zhu Mingchuan 朱明川, “The Liu-Han Altar: Between a Literati Spirit-Writing Altar and Popular Religion”, 320.
- 73 See note 17.
- 74 See note 66.
- 75 *Shanghai jiyunxuan cishan sheyou xingshi lu* 上海集雲軒慈善社友姓氏錄, 1918.
- 76 “Jishenghui dangxuan zhiyuan mindan 濟生會當選職員名單”, *Shenbao*, February 23, 1920.
- 77 “Ji Yuan Hanyun xiansheng zhuidaohui 記袁寒雲先生追悼會”, *Shenbao*, March 1, 1931.
- 78 “Jiyunxuan zashi 集雲軒雜詩”, *Shenbao*, October 20, 1922. Published under Bu Zhangwu’s pen-name Linwu shanren 林屋山人, Bu specifically emphasized that the poems were not his.
- 79 One press article gives a detailed description of the activities of renji shantang, see: “Zuori juxing chengli dahui 昨日舉行成立大會”, *Shenbao*, August 9, 1935.
- 80 “Jishenghui erzhounian dahuiji 濟生會二週年大會紀”, *Shenbao*, December 3, 1918. & “Jishenghui zhi geiyao mang 濟生會之給藥忙”, *Shenbao*, July 14, 1919.
- 81 “Shanghai zhongguo jishenghui shiyaochu qishi 上海中國濟生會施藥處啟事”, *Shenbao*, July 4, 1920.
- 82 “Cishan tuanti zhi jiuyi xiaoxi 慈善團體之救疫消息”, *Shenbao*, August 21, 1919.
- 83 “Shanghai zhongguo jishenghui shiyaochu qishi 上海中國濟生會施藥處啟事”, *Shenbao*, Mar 22, 1923; May 24, 1923; May 28, 1923; May 30, 1923.
- 84 “Song shijun shiyao zhi ren 頌施君施藥之仁”, *Shenbao*, May 31, 1924.
- 85 “Jishenghui luzhen xubao 濟生會魯賑續報”, *Shenbao*, May 26, 1929 and “Jishenghui shizhen qufu zaiqu 濟生會施賑曲阜災區”, *Shenbao*, August 31, 1930.
- 86 “Xu Shiyong Wang Yiting fu lu fangzhen 許世英王一亭赴魯放賑”, *Shenbao*, May 30, 1928.
- 87 “Jiu xiaoler jijingfeng shenfang 救小兒急驚風神方”, *Shenbao*, August 28, 1928.
- 88 “Jishenghui liangyao jishi 濟生會良藥濟世”, *Shenbao*, June 29, 1931.
- 89 Qiu Wenqing, “Nanping pai yixue xinchuan shuhou 南屏派醫學薪傳書後”, *Jishi tayuan zhi* 濟師塔院志, pp. 145–48. *Zhongguo fosizhi congkan xubian* 中國佛寺志叢刊續編, Jiangsu guji chubanshe. See also (Zhang 2014, p. 186).

- 90 Wang Lianyou 王蓮友, ed., *Chongjian Jinling Yuxu Guan jishi zhengxinlu* 重建金陵玉虛觀紀事徵信錄 (1936), in *Zhongguo Daoguanzhi congkan xubian* 中國道觀志叢刊續編 (Yangzhou: Guangling shushe, 2004), vol. 15.
- 91 “Jishenghui zhi jishi desheng dan 濟生會之濟世得生丹”, *Shenbao*, July 13, 1928 & “Jishenghui shisong fuke deshengdan 濟生會施送婦科得生丹”, *Shenbao*, October 10, 1930.
- 92 “Jishenghui liangyao jishi 濟生會良藥濟世”, *Shenbao*, November 9, 1936.
- 93 See note 92.
- 94 “Jishenghui juansong yaopin jiu zaimin 濟生會捐送藥品救災民”, *Shenbao*, July 26, 1933.
- 95 “Dapi yaomin shisong nanmin 大批藥品施送難民”, *Shenbao*, December 18, 1933.
- 96 “Jishenghui zhenyao juzai 濟生會振藥救災”, *Shenbao*, August 9, 1935.

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Article

The Apologetic Discourse towards the Convergence between Pure Land Buddhism and Theoretical Physics of the Contemporary Chinese Buddhist Monk, Da An (1959-)

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Abstract: This article explores the apologetic discourse towards the convergence between Pure Land Buddhism and theoretical physics of the contemporary Chinese Buddhist monk, Da An (1959-). Faced with the formidable challenge posed by contemporary science towards public acceptance of Buddhism, Da An endeavors to employ science as a medium for propagating Pure Land teachings, seeking to accommodate the preferences of scientifically inclined individuals. He utilizes several theoretical physics concepts to validate that certain ostensibly miraculous accounts within Pure Land Buddhist texts are not incompatible with contemporary science. Further, he asserts that certain supernatural narratives therein indicate that some physical principles still residing in theoretical conjectures on Earth have already been validated and can be utilized at will by the celestial beings in Sukhāvātī, thus asserting the supremacy of Pure Land teachings over science. The article endeavors to examine the contemporary dialogue between Pure Land Buddhism and science, which has been overlooked in the current research realm of the interaction between Buddhism and science.

Keywords: Pure Land Buddhism; science; quantum mechanics; modernity

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1. Introduction

The compatibility between Buddhism and science¹ has been a subject of varying opinions, ranging from the belief that Buddhism's fundamental dogmas align seamlessly with scientific discoveries, to the notion that the Buddha's profound insights had already anticipated some of the most significant breakthroughs in modern science, predicting discoveries that would only come to light more than two millennia later. (Lopez 2009, p. 2) The dialogue between certain Buddhist teachings and scientific theories has gained attention in current academia. Some scholars who adhere to Buddhism endeavor to showcase the coherence between certain Buddhist tenets and scientific principles or seek to establish the scientific veracity of Buddhism. Another faction of researchers concentrates exclusively on the scholarly scrutiny of the interpretive approaches towards the comprehensibility of Buddhism and science that have arisen in modern times. Their research areas encompass the crossroads of Madhyamika Buddhism and quantum physics (Balasubramaniam 1992), the confluence of Zen and psychology (Young-Eisendrath and Muramoto 2002), as well as the interconnection between emptiness and relativity (Finkelstein 2003), among others.

In the scholarly discourse surrounding Chinese Buddhist studies, the perspective of the modern monk Tai Xu 太虛 (1890–1947) regarding the correlation between the theory of Yogācāra and modern western science has garnered attention from academics (Pacey 2014). Nonetheless, the dialogue between a prevalent Chinese Buddhist tradition, Pure Land Buddhism, and science remains understudied by current academic circles. It may be due in part to the distinct doctrines and practices of Pure Land Buddhism. Pure Land Buddhist teachings are mainly associated with the practice of nanfo 念佛, or “buddha-recitation/contemplation,” a practice wherein, at its simplest, the devotee recites the name of the Buddha Amitābha (Amitufo 阿彌陀佛) in the expectation of gaining rebirth in the western Pure Land (xifang jingtu 西方淨土) called Sukhāvātī upon their demise (Jones 2019,

p. 1). At first glance, such a devotionism towards the deity Amitabha, fostered with the ultimate goal of rebirth in an ideal world known as Sukhāvati, does not prioritize philosophical analysis of the world’s manifestation and essence like Madhyamika nor concentrates primarily on meditative psychological training like Zen Buddhism. Therefore, it may be difficult for academics to fathom a Buddhist intertwining it with fields of science such as physics and psychology. Thus, even if some Buddhist adherents have endeavored to reconcile Pure Land teachings with science, this field has been largely neglected by the academic community.

Indeed, there exists a Buddhist monk within contemporary Chinese Buddhist circles who has established dialogue between the tenets of Pure Land Buddhism and science. Da An 大安 (1959-), currently serving as the abbot at Donglin 東林 Temple, which is revered as “the patriarchal temple (zuting 祖庭)” of Chinese Pure Land Buddhism, has often incorporated scientific content particularly from modern and contemporary theoretical physics into his teachings and written works. As will be illustrated below, he attempts to reconcile these scientific principles with the doctrines of Pure Land Buddhism. This article will subsequently delve into Da An’s apologetic discourse on the compatibility between Pure Land Buddhism and science.

2. Da An and His Response to Science

Da An, also known as Wei Lei 魏磊, was born in 1959 in Nanchang, Jiangxi Province. He earned his undergraduate degree in Chinese language and literature at Jiangxi University (now Nanchang University); subsequently, he enrolled at the Philosophy Department of Renmin University of China to pursue a master’s degree and received his Master’s degree in 1987. In 1994, Da An became a visiting professor at the Buddhist College of China, imparting knowledge on the Pure Land teachings; in 2000, he assumed professorship at the University of International Business and Economics, Beijing. In September 2001, Da An ordained under Chuan Yin 傳印(1927–2023) and committed himself to studying and advocating the Pure Land teachings exclusively. Since 2004, Da An has been invited to deliver lectures on religion, morality, education, and other topics for university students at institutions such as Nanjing University and Fudan University and has traveled extensively to propagate Buddhism domestically and internationally, reaching regions including mainland China, Hong Kong, Singapore, Malaysia, Indonesia, the United States, and beyond. (Jiao 2020, p. 111)

From Da An’s personal background, he acquired his formal education and teaching experience within secular universities. Consequently, it is plausible that he could gain insight into, and harness knowledge related to, some contemporary scientific concepts. Upon embracing Buddhism, whether prior to ordination or post-ordination, his primary pursuit was the practice and propagation of Pure Land teachings. His Buddhist teachings were not solely received by practitioners of Buddhism but also encompassed individuals who were not wholly devoted to Buddhism, such as university students. This may furnish him with the impetus to utilize secular knowledge such as science as a medium for promoting these teachings.

He employed science as a medium for disseminating Buddhist teachings, directly tied to the societal landscape of contemporary China. Since modern times, Chinese Buddhism has been subjected to criticism for being a constituent element of the array of superstitious notions and rituals that are incongruous with modern lifestyles and societal advancements. Hence, Buddhist innovators believed that the continued existence and lasting significance of Buddhism hinged upon its capacity to effectively adapt to contemporary society, characterized by the inexorable advance of scientific and technological progress, as well as the mounting emphasis on rationalism and societal advancement. (Poceski 2016, pp. 81–82) In contemporary China, an assortment of Buddhist clergy have also recognized that the progression of science will present a formidable obstacle to the social acceptance of Buddhism. For instance, Chuan Yin has articulated:

In the contemporary era, science is flourishing and technology is advancing. Many individuals have developed a mindset that prioritizes scientific and technological advancements, erroneously branding Buddhism as superstition. They have constructed mental barriers and thus missed out on the profound wisdom of Buddhism, which is truly regrettable. (Chuan Yin 2002, p. 1; self-translation)

Likewise, according to Da An, contemporary individuals may struggle to embrace the teachings of Pure Land Buddhism as a result of the pervasive influence of natural scientific concepts and cognitive frameworks. (Da An 2006, p. 25) Due to this, Da An adopted a strategic approach to promote Buddhism that aims to reconcile the principles of Pure Land Buddhism with the tenets of natural science and demonstrate that they are, at their core, not incompatible. This approach serves to better accommodate the needs and beliefs of contemporary individuals, who are significantly influenced by scientific concepts. According to Khenpo Sodargye (1962-)’s interview with monastics in the Larung Gar Buddhist Academy (larong wuming foxueyuan 喇榮五明佛學院), a significant number of Han Chinese within this community have been educated on natural scientific knowledge. Some of them are even natural science educators and researchers. They have chosen to embrace Buddhism and take monastic vows due to their recognition that Buddhism is not contradictory to science but can even provide answers to questions beyond the scope of science. (Sodargye 2015a, 2015b) Perhaps it is precisely because a significant number of Han Chinese have converted to Buddhism on the basis of their understanding of the correlation between Buddhism and science that Da An staunchly insists that advocating the Pure Land teaching through science constitutes a valid methodology.

As a staunch advocate of Buddhism, Da An uses scientific discourse as a medium to disseminate Buddhist principles beyond simply demonstrating the compatibility between these two realms. Rather, he advocates for the superiority of Buddhism over science. He posits that science possesses certain limitations and drawbacks, which can be rectified through Buddhist principles. For instance, he staunchly advocates that the doctrines of Pure Land Buddhism offer ethical checks and balances for modern science and technology. He points out that whilst science and technology significantly improve human life, they also present a myriad of detrimental facets:

As science and technology relentlessly transforms humankind’s existence in dynamic fashion, its adverse repercussions are increasingly apparent. While individuals luxuriate in the conveniences of advanced technology and robust material consumption, they concurrently endure the bitter fruit associated with it such as: environmental degradation, ecological imbalance, threats from nuclear weapons and biological weapons, and the depletion of spiritual sanctuary. These facts unequivocally underscore that technology is not the most dependable solution for alleviating human suffering. (Da An 2006, p. 22; self-translation)

In light of this, he maintains that the multitude of tenets upheld by Pure Land Buddhism, such as “a pure land created by a pure mind”, harmony and equality among all beings, and compassion and tolerance, “can undoubtedly effectively guide contemporary scientific advancement, enabling it to manifest positive effects for the betterment of humanity while minimizing deleterious repercussions against mankind, thereby achieving a harmonious interplay between morality and technology.” (Da An 2006, pp. 25–26)

In addition, Da An believes that the superiority of Pure Land teachings in comparison to science is further demonstrated by the revelations contained within the Pure Land classics, which indicate some scientific technologies that currently remain theoretical but have not been fully realized or applied in Earth. For instance, he elucidated that the Pure Land of Sukhāvāṇī delineated in the Pure Land texts is a “miraculous land teeming with extraordinary scientific and technological prowess,” capable of presenting profound insights for the evolution of advanced technologies on Earth. (Da An 2006, p. 27) This stance pervades his discourse on the dialogue between Pure Land Buddhism and contemporary science, which is further elaborated upon subsequently in this article.

3. Da An's Apologetic Discourse of the Compatibility between Pure Land Buddhism and Science

In Da An's works, he often employs theoretical physics theories such as superstring theory, relativity, time travel, quantum mechanics, and mass–energy interconversion to elucidate the enigmatic elements in Pure Land Buddhist texts. Da An posits that certain, seemingly miraculous aspects within these texts do not contradict theoretical physics. He even asserts that some divine occurrences within these texts signify that principles of physics still residing in theoretical speculation on Earth have already been substantiated and can be freely employed by the deities in the Pure Land of Sukhāvātī. The subsequent discourse will illustrate through several instances the manner in which Da An employs a particular principle of theoretical physics to elucidate the paranormal aspects of Pure Land Buddhist texts.

3.1. The "High-Dimensional Space" Elucidated in Pure Land Buddhist Texts

In the opinion of Da An, the accounts found in Pure Land Buddhist scriptures align seamlessly with the high-dimensional space hypothesis put forth by contemporary theoretical physics. Presently, the high-dimensional space hypothesis primarily stems from superstring theory. According to this theory, in order to unify the established laws of physics in a logical manner, it is imperative to postulate that the dimensionality of space is fixed at ten. (Kaku 1995, p. 172) Michio Kaku points out that higher-dimensional space has become the last refuge for mystics, cranks, and charlatans given the difficulty of observation and comprehension of higher-dimensional space from individuals situated in a three-dimensional world. (Kaku 1995, p. 23) The concept of high-dimensional space often serves as a pretext for Buddhists to validate the "rationality" of enigmatic aspects of Buddhism. For instance, the modern Chinese scientist, Huang Nianzu 黃念祖 (1913–1992), who is devoted to Buddhism, posits that as the dimensionality of space increases, its realm becomes increasingly unfathomable. Hence, scientific discourses on high-dimensional spaces can mitigate societal confusion about some unfathomable elements within Buddhism. (Huang 2002, p. 22) Similarly, Da An endeavored to elucidate the supernatural and enigmatic content in Pure Land Buddhist texts via the concept of high-dimensional space.

According to Da An, high-dimensional spaces are described in Pure Land scriptures. He illustrates this in terms of *The Sutra on Contemplation of Amitayus* (guan wuliangshou jing 觀無量壽經), where Shakyamuni Buddha, upon being requested by Queen Vaidehi, emanates a golden light from his eyes that shines across infinite worlds. An immense platform of light manifests at the top of the Buddha's head. The virtuous territories of all Buddhas are reflected within this platform, enabling Queen Vaidehi to witness and select her desired afterlife realm. In *The Immeasurable Life Sūtra* (wuliangshou jing 無量壽經), before Shakyamuni Buddha proclaimed the Pure Land teachings, he first dispatched an extraordinary display of light that manifest numerous Buddha realms in its radiance. During this teaching session, Ananda desired to witness Amitabha firsthand. As per Shakyamuni Buddha's request and in reverence, Ananda turned westward with clasped palms and a respectful kneeling demeanor. Instantaneously, Amitabha appeared suspended in space, emanating an infinite glow from his palm. At this moment, all Buddha realms, celestial palaces, and even the realms of hungry ghosts, hells, and netherworlds were vividly revealed. (Da An 2006, p. 296) Da An proclaims that the manifestation of various supernatural worlds in the Buddha's light and light platform is not solely a creation from Buddha's divine powers. Rather, it serves as an affirmation of the existence of high-dimensional spaces. These supernatural realms are spaces within higher dimensions that are coexisting with our own current world but are simply unseen by beings residing within this world. (Da An 2006, p. 296)

According to Da An, the existence of these supernatural realms concurrently with this world, yet unseen by ordinary individuals, can be elucidated through the concept of superstring theory:

The superstring theory posits that there exist ten dimensions (or, occasionally, eleven dimensions) of spacetime. If that were the case, one could not resist pondering: where is the six remaining dimensions apart from our discernible four? To address this issue, the superstring theory introduces a concept called “compactification”, suggesting that these other six dimensions are exceedingly compacted into a single point. Such points, in fact, are omnipresent within our three-dimensional space. This implies that those six dimensions are indeed present, but we simply fail to perceive them. Superstring theory is substantiated through purely mathematical methods, which evidently extend far beyond the conventional realm of empirical knowledge. In *The Avatamsaka Sutra*, it is frequently described that “in a mere speck there exists an unfathomable number of lands, each land contains an immeasurable multitude of Buddhas, and each Buddha is surrounded by an incalculable quantity of Bodhisattvas.” Such vastness is encompassed within a speck or even within one pore of Samantabhadra Bodhisattva. In this light, superstring theory’s proposition of multiple dimensions coiling into a compact point does indeed exhibit a tendency to align with the tenets of Buddhist scriptures. (Da An 2018, pp. 53–54; self-translation)

It becomes evident that Da An asserts that the supernatural realms in Pure Land Buddhist scriptures are higher dimensional worlds. To perceive them within this three-dimensional space, additional rigidly compacted dimensions must be unfolded. He postulates that Buddhas and Bodhisattvas in Sukhāvātī already possess the capacity to unfold their compacted spatial dimensions and move freely within multidimensional spaces:

The Buddhas and Bodhisattvas in Sukhāvātī are capable of remaining static and simultaneously manifesting in various dimensions of spaces to enlighten sentient beings. The Sukhāvātī possesses no confinement of space. Each particle possesses infinite splendor of lands of the ten directions. Each tree displays the boundless Buddha lands of the ten directions. The immensity and narrowness of space can be regulated freely and coexist seamlessly. The Sukhāvātī represents a realm of the Dharma Realm, which also encompasses the Dharma Realm and permeates the Dharma Realm. (Da An 2006, p. 296; self-translation)

The current impasse in verifying superstring theory lies in its essence as mere deductions from mathematical formulas and models, with human instruments incapable of observing strings and other spatial dimensions. According to Da An’s perspective, the Buddhas and Bodhisattvas in Sukhāvātī have apparently verified the deductions of multidimensional space in superstring theory and can freely utilize it to unfold the dimensions that are curled up. Da An postulates that the Buddhas of the Pure Land can traverse multidimensional spaces freely, potentially rooted in the belief that the Buddha is omniscient. The scriptures of Mahayana Buddhism affirm the notion of the Buddha’s omniscience and omnipotence. (Guang Xing 2005, p. 75) Da An likely believes that due to the omniscient nature of Amitabha, the chief Buddha of the Pure Land of Sukhāvātī, it is naturally within his capacity to comprehend and utilize the “fundamental principles” of high-dimensional space. As sentient beings who have not yet attained Buddhahood, they naturally lack this capacity. Thus, Da An fervently believed that upon attaining reincarnation in the Pure Land of Sukhāvātī, one could comprehend the truth of the high-dimensional space and acquire the capacity to traverse freely through various spatial dimensions. (Da An 2006, p. 296)

As evident, Da An has endeavored to demystify certain miracles within Pure Land Buddhist texts, advancing a viewpoint that these would be deemed as “scientific”, if the high-dimensional space posited from theoretical physics were indeed tangible. This furnishes him with a compelling argument against prevalent public perception of Buddhism as superstitious and anti-science. The assertion of high-dimensional space, although postulated via intricate mathematical manipulations within string theory, is presently untenable due to the lack of conclusive evidence. This circumstance presents Da An with an abundance of interpretive latitude and facilitates his exaltation of Pure Land teachings as su-

rior to theoretical physics—theories that are currently unverifiable by physics but have been fully validated and actualized by the divine entities in Pure Land texts.

3.2. *The Relativity of Time and Time Travel Illustrated in Pure Land Buddhist Texts*

Da An asserts that the theory of relativity of time and the concept of time travel in theoretical physics are manifest within Pure Land Buddhist texts. In modern times, Einstein's theory of relativity postulates that time and space are not absolute. For objects moving at a specific velocity, there is an effect known as "time dilation". For instance, the passage of time for individuals in a moving vehicle appears to be slower when compared to an individual standing motionless outside the vehicle. In daily life, this effect is hardly noticeable, however, it becomes increasingly distinct when the speed is approaching the speed of light. (Greene 2000, p. 27) Since modern times, a number of theoretical physicists have proposed hypothetical feasibility for time travel. For instance, in 1937, W. J. Van Stockum hypothesized an infinite, spinning cylinder. He postulated that if such a cylinder spun around at or near the speed of light, it would drag the fabric of space–time along with it. Anyone brave enough to travel around the cylinder would be swept along, attaining fantastic speeds. If the individual was exceeding the speed of light, he would have the potential to revisit past temporal points. The faster the cylinder spun, the further back in time one would go. (Kaku 2004, p. 128)

Currently, studies examining the juxtaposition and dialogue of relativity in physics and Buddhism often delve into the alignment between the relativity of everything elucidated by the doctrine of emptiness in Buddhism and Einstein's theory of relativity. (Mansfield 1990, Finkelstein 2003) To date, the exploration of interactions between Buddhist perspectives of time and Einstein's theory of relativity remains sparse. Furthermore, research that amalgamates Buddhist principles with speculative time travel in physics is exceedingly scarce.

Da An points out that these astonishing concepts and hypotheses like time travel within theoretical physics are merely a facet of the commonplace experiences in the Pure Land of Sukhāvātī, where inhabitant "can transcend time, control time at will, or condense an infinite number of kalpas into a single instant, or extend a single instant into an infinite number of kalpas; or traverse from past kalpas into the future; or from present kalpas into the past; or from future kalpas into the present, unifying the past, present and future." (Da An 2006, p. 298)

According to Da An, the Pure Land Buddhist classics also encompass content concerning the relativity of time, transcendence of temporal constraints and liberty to journey freely within time. For instance, Da An points out that within *The Immeasurable Life Sūtra*, Shakyamuni Buddha extols the virtues of all Buddhas to the attendees: "With the duration of merely one meal, he is capable of existing in a duration spanning over a hundred thousand kotis of kalpas." Da An contends that this appears to attest to the virtues of a Buddha's transcendence of temporal constraints and oneness of an instant and a kalpa (nianjie yuanrong 念劫圓融). (Da An 2006, p. 298) He articulated that the saints residing in the Pure Land of Sukhāvātī have the capacity to promptly escort a believer into the Pure Land of Sukhāvātī upon their death, owing to their transcendental abilities which surpass temporal limitations. They can discern precisely the past, present, and future occurrences across all worlds. They are also capable of predicting when sentient beings from every direction will attain enlightenment, be liberated, or achieve rebirth in the Pure Land of Sukhāvātī. (Da An 2006, p. 298) Furthermore, Da An opines that the Pure Land Buddhist scriptures demonstrate that the inhabitants of Pure Land of Sukhāvātī have transcended temporal constraints as they can instantly travel to various Buddha realms and offer homage to the Buddhas. Upon their return, they reappear in Sukhāvātī within a fleeting moment, which is testament to their liberation from time's shackles. (Da An 2006, p. 298)

According to Da An's interpretation, the Pure Land Buddhist texts not only illustrate the relativity of time to inhabitants of the Pure Land of Sukhāvātī, but also validate this notion among Pure Land Buddhist practitioners. For instance, though the Pure Land of

Sukhāvātī lies a staggering distance of ten million billion Buddha realms from Saha world, upon death, devotees are escorted by Amitabha and instantly ascend to the Pure Land of Sukhāvātī. Da An contends that this exemplifies that for those engaged in Pure Land Buddhist practices, temporal boundaries cease to exist. (Da An 2006, p. 298)

In this light, Da An posits that comprehending the theories pertaining to time within contemporary natural science can significantly aid in understanding the profound realms of the Pure Land of Sukhāvātī; meanwhile, the realm of transcending temporal constraints as demonstrated in the Pure Land of Sukhāvātī has significant implications for contemporary scientific exploration of time. (Da An 2006, p. 299)

In fact, as elucidated in Pure Land texts, inhabitants of Sukhāvātī are capable of instantaneous displacement solely due to their possession of an extraordinary divine power known as “divine leg (shenzu tong 神足通)”. This is distinct from Da An’s assertion that it represents a transcendence of temporal constraints. In Buddhist parlance, “divine leg” denotes a supernatural ability to traverse at high speed. (Wu 1992, p. 132) *The Immeasurable Life Sūtra* illuminates that the inhabitants of Sukhāvātī harbor this specific capacity. This text stipulates that Amitabha, prior to his enlightenment, pledged a vow: “If, when I attain Buddhahood, all celestial beings in my land should not possess the supernatural power of “divine leg” which allows them to travel anywhere in one instant, even beyond a hundred thousand kotīs of nayutas of Buddha-lands, may I not attain perfect enlightenment.” (Chen 2008, p. 54) In contrast, Da An views the capability of inhabitants in Sukhāvātī to instantaneously traverse anywhere as a realization of the postulation of altering time duration within theoretical physics. He displays an inclination towards “demystifying” and “scientizing” these enigmatic elements within the Pure Land Buddhist literature.

3.3. *The Convergence of Quantum Mechanics and the Miracles in Sukhāvātī*

According to Da An, narratives within the Pure Land classics also echo several propositions of quantum mechanics, such as quantum entanglement the uncertainty principle. Presently, several dialogues between Buddhism and quantum mechanics tend to focus on the correlation of the concept of emptiness with certain principles within quantum mechanics. (Balasubramaniam 1992, Bhatt 2019) Da An predominantly utilizes several principles of quantum mechanics to elucidate some divine narratives within Pure Land classics.

First, Da An endeavors to erect a communicative bridge between quantum entanglement and Pure Land teachings. Theoretical physicists have elucidated that the motions of subatomic particles are dominated by entanglement. It starts when they interact; in doing so, they lose their separate existence. No matter how far they move apart, if one is tweaked, measured, observed, the other seems to instantly respond, even if the whole world now lies between them. (Gilder 2009, p. 3) Modern physicists have proposed various hypotheses to explain this phenomenon, yet no definitive conclusion has been reached as of yet. (Gilder 2009, pp. 21–34) Da An has elucidated with the following:

Physicist Niels Bohr postulated that if a particle were to be bisected into two halves, the two subatomic particles would perpetuate reciprocal motions (one rotating clockwise, and another counterclockwise), moving to infinite distances (such as the cosmic extremities). If scientists were to observe one of these particles, it is proposed that this act of observation would prompt an immediate reaction from its counterpart particle which then would exhibit symmetric reactions (reactions of both positive rotation and negative rotation). This prediction by Bohr was corroborated by Alain Aspect’s 1982 experiment, demonstrating the existence of a superluminal connection between distant spacetime regions. Two disjunct particles situated at opposite ends of the universe can somehow form a unified organic entity in real time, exhibiting instantaneous response. This experimental finding, which has left the scientific community perplexed and astounded, appears quite natural when viewed through the Buddhist lens of “One dharma encompasses all dharmas (yifa ju yiqiefa 一法具一切法)” and holographic interpenetration theory. (Da An 2006, p. 299; self-translation)

“One dharma encompasses all dharmas (yifa ju yiqiefa 一法具一切法)” represents a tenet of Huayan Buddhism, often referred to as “the one is the all (yiji yiqie 一即一切)”. In accordance with this doctrine, every single phenomenal instantiation of existence both contains, and is contained by, all other instantiations, so that one existence is subsumed by all existences and all existences by one existence; in this vision, all things in the universe are thus mutually creative and mutually defining. Each phenomenon constitutes a part of an organic whole that is defined by the harmonious relationship between each and every member: just as the whole is defined by all of its independent constituents, each independent constituent is defined by the whole with which it is integrated. (Lopez and Buswell 2014, p. 291) From this, it is evident that Da An asserts that quantum entanglement exemplifies the teachings of Huayan Buddhism pertaining to the interconnectedness between all entities, with such interconnection originating from the fact that every single entity in the cosmos reflects and encapsulates the attributes and information of the entire universe.

According to Da An, this concept of “the one is the all” is echoed in the texts of Pure Land Buddhism, notably in *The Sutra On Contemplation of Amitayus*. Da An points out, portions from *The Sutra On Contemplation of Amitayus* embodies the realm of infinite mutual penetration and mutual determination amongst all entities. For instance, this scripture articulates: “Amitabha possesses eighty-four thousand physical characteristics, each having eighty-four thousand secondary marks of excellence. Each secondary mark emits eighty-four thousand rays of light; each light shining universally upon the lands of the ten quarters, embracing, and not forsaking, those who are mindful of the Buddha.” (Da An 2006, p. 300) Similarly, Da An points out this sutra also signifies that Amitabha and infinite Buddhas in all directions are pervasively inter-connected. For instance, this scripture says, “When you see Amitabha, you will also see innumerable Buddhas of the ten quarters. Having visualized these innumerable Buddhas, you will receive from each the prediction of your future Buddhahood. This is the general perception of all the physical characteristics of the Buddha.” (Da An 2006, p. 300)

As Da An posits, the concept of quantum entanglement or interconnectedness of all things is a novel idea in contemporary natural science. It transcends everyday experiences and has yet to be universally accepted by the populace. However, if avant-garde scientists can derive inspiration from the realm of Pure Land Buddhism, it may prove beneficial for the advancement of contemporary avant-garde science. (Da An 2006, p. 301)

Furthermore, Da An has endeavored to establish a correlation between the uncertainty principle of quantum mechanics and the tenets of Pure Land Buddhism. Modern theoretical physicist Werner Heisenberg proposed one can never know simultaneously, no matter how sensitive the measuring devices are, the exact position and velocity of a single electron. one can know one condition or the other, but not both at the same time. This is called Heisenberg’s uncertainty principle. (Kaku and Thompson 1995, pp. 49–50) Niels Bohr utilized the complementarity principle to illustrate the operation of atomic and sub-atomic entities. This tenet elucidates that position and momentum, or wave and particle properties, are incapable of being observed or measured simultaneously; when one existed fully, its complement did not exist at all. (Gilder 2009, p. 5) Da An possesses a certain comprehension of this physics concept and endeavors to reconcile it with Buddhist tenets:

Heisenberg’s uncertainty principle suggests that it is impossible to precisely ascertain both the position and velocity of an atomic particle with any predetermined degree of accuracy...Fundamental particles exhibit wave-particle duality. Depending on the observer’s intent and methodology of observation, these particles may manifest as waves or particles. When one state is observed, the other becomes obscured; conversely, when the latter is observed, the former becomes concealed, demonstrating the coexistence of the hidden and the manifest (yinxian jucheng 隱顯俱成). (Da An 2006, pp. 301–2; self-translation)

Herein, Da An’s concept of “the coexistence of the hidden and the manifest (yinxian jucheng 隱顯俱成)”, is derived from the teaching of “the ten mysteries (shi xuanmeng 十玄門)” of Huayan Buddhism. The idea of “The ten mysteries” illuminates the intercon-

ected, interdependent, and harmonious coexistence of all things from ten distinct perspectives. (Liu 2006, p. 99) Among these, “the coexistence of the hidden and the manifest” constitutes a pivotal perspective. According to Da An, quantum mechanics denotes that depending on the observation methodology, when one state of an atomic or subatomic entity is manifested, another state becomes concealed, and vice versa, mirroring the notion of “the coexistence of the hidden and the manifest”.

Da An elucidates that “the coexistence of the hidden and the manifest” is illustrated in the Pure Land Buddhist scriptures:

The scriptures of the Pure Land Buddhism often employ a portrayal of the coexistence of the hidden and the manifest. In *The Immeasurable Life Sūtra*, Ananda, upon receiving instruction from the Buddha, prostrates towards the west in an attempt to see Amitabha. At this juncture, Amitabha’s radiant light is very brilliant, which resembles a golden mountain, manifesting in the void of the assembly. Simultaneously, the lights of the arhats, bodhisattvas, and holy beings are obscured, and the radiance of all things fades as if gathered into a pool of ink. This mirrors the coexistence of the hidden and the manifest, akin to the moon emerging amidst stars. The waters of the Pure Land can disseminate an infinite number of Buddhist teachings. Despite being just one water, it can expound numerous profound doctrines simultaneously and concurrently... Those who bathe in these waters each hear the dharma they wish to hear, they can manipulate at will whether or not those voices are audible. For those wishing to hear, the water waves will articulate sublime Buddhist teachings; for those who do not wish to hear, the water remains silent. This is also true for the manifestations of buddha-lands the ten directions that appear amidst the jewel trees, on the ground, and on the pillars. If one wishes to observe other buddha-lands, they are instantly reflected on the pillars and jewel trees; if not, there is nothing to be seen. Music, precious incense, etc., all possess the virtues of the coexistence of the hidden and the manifest, manifesting according to one’s thoughts. (Da An 2006, p. 303; self-translation)

Da An elucidates that the aforementioned transcendental phenomena in the realm of Sukhāvātī, where objects can manifest or vanish at will, are corroborated by the principles of quantum mechanics. He further asserts that comprehending the core tenets of quantum mechanics can foster faith in the tangible existence of Sukhāvātī. (Da An 2006, p. 303)

It becomes evident to Da An that quantum mechanics illustrates that atoms and subatomic particles can adopt a specific configuration, as per an individual’s observational intent, akin to the narratives in the Pure Land scriptures, in which entities can manifest corresponding forms based on the subjective intention of its inhabitants. Consequently, quantum mechanics is employed by Da An as a tool to “scientize” certain supernatural narratives within the Pure Land Buddhist texts.

3.4. *The Interconversion of Matter and Energy within Sukhāvātī*

Finally, Da An has declared the presence of records pertaining to interconversion of matter and energy as proposed in modern physics within the texts of Pure Land Buddhism. In modern times, Albert Einstein showed that matter and energy are unified and, hence, can change into each other. If an object becomes heavier the faster it moves, then it means that the energy of motion is being transformed into matter. The converse is also valid—matter can be converted into energy. Einstein calculated the precise quantity of energy that could be transformed into matter, yielding the equation $E = mc^2$, that is, even minute quantities of matter m is multiplied by a huge number (the square of the speed of light) upon conversion into energy E . (Kaku 2004, p. 33) Da An possesses a certain degree of comprehension in this regard:

In 1905, Einstein postulated the equation of mass-energy conversion: $E = mc^2$. This formula illuminates that matter is latent energy and energy is liberated matter; despite their contrasting phenomena, they have an identical essence. Hence,

a process of reciprocal transformation between mass and energy is conceivable. The successful development of nuclear weapons validated in practice that minute quantities of mass can release immense amounts of energy. Converting energy into matter is theoretically possible as well, although it remains beyond the capacity of current human technology to actualize on Earth. (Da An 2006, pp. 303–4; self-translation)

Da An postulates that although the humankind remains incapable of converting energy into matter in practice, residents of the Pure Land of Sukhāvati allegedly accomplish this effortlessly:

The celestial beings and holy individuals of Sukhāvati possess the capability to freely transform matter into energy and then concurrently convert energy back to material. For instance, when their thoughts turn to refueling with food, a jade vessel filled with various delicacies will manifest instantaneously (energy transformed into matter). Once satiated, the vessel vanishes seamlessly (matter reverting back to energy) without the slightest need for cleaning labor. Their dwellings and attire, including ornaments and tassels, are all conjured at will. To extend offerings to the Buddha across the ten directions, an array of offerings such as incense, flowers, canopies, etc., materialize in their hands. The inhabitants of this pure land, devoid of existential pressures and anxieties, are solely focused on spiritual cultivation, reveling in boundless freedom. (Da An 2006, p. 304; self-translation)

Since modern times, various advocates for Buddhism frequently perceive Einstein's theory of interconversion of matter and energy as capable of offering crucial validation to some fundamental tenets of Buddhism. For example, the Tibetan monk Gendun Chopel (1903–1951) has claimed that Einstein's equation $E = mc^2$ provides powerful empirical confirmation of the fundamental Buddhist insight on the ever fluctuating, impermanent nature of things. (Jinpa 2003, p. 73) Similarly, Da An sought to argue that as long as the transformation of energy and matter is feasible, certain enigmatic narratives in the Pure Land texts could also be deemed "scientific," obviating any perceived mystery. Simultaneously, he proclaims that Sukhāvati is a realm featuring "ultra-high scientific technology" surpassing even the most advanced earth science and techniques (Da An 2006, p. 305), demonstrating the superiority of Pure Land teachings over science.

4. Conclusions

In conclusion, faced with the formidable challenge posed by contemporary science towards public acceptance of Buddhism, Da An endeavors to employ science as a conduit for propagating Pure Land teachings, seeking to accommodate the preferences of scientifically inclined individuals. He utilizes several concepts of theoretical physics concepts to elucidate some enigmatic components within Pure Land Buddhist scriptures. Through his endeavour, he seeks to validate that certain ostensibly miraculous narratives within these texts are not incompatible with contemporary science. Further, he asserts that certain divine occurrences detailed therein indicate that some physical principles still residing in theoretical conjectures on Earth have already been validated and can be utilized at will by the celestial beings in Sukhāvati, thus advocating the superiority of Pure Land teachings over science. Notably, it is precisely because much of the physics content he employs remains hypothetical and unsubstantiated to date, which affords him more latitude to interpret and demonstrate the "scientific nature" of Pure Land teachings.

Additionally, what makes natural science scientific is its reasoning through rigorous methods and mathematical formulations. Nevertheless, Da An has failed to demonstrate this kind of reasoning in his arguments. He simply insists upon asserting that some supernatural narratives in the Pure Land scriptures are tangible realities, then seeks similarities with some theoretical physics hypotheses in an attempt to validate them as non-antagonistic to modern natural science. Even if his conclusions are not contraindicated by

modern natural science, at least from his reasoning methodology, it would nonetheless be difficult to assert that it is scientific.

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Notes

- ¹ The term “science” encompasses diverse meanings. Within this article, “science” primarily refers to natural science. Indeed, past studies have also encompassed dialogues between Buddhism and psychology. The classification of psychology as a natural or social science remains unsettled. This article does not address this issue, and the usage of “science” within the text extends to psychology as well.

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Article

Adaptation to Third-Party Payments: Statistical Analysis of Digital Donations Made to Donglin Monastery

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Abstract: This paper explores the adaptations Buddhism has made to digital payment methods in the context of the Chinese mainland. To provide the audience with a relatively comprehensive understanding of the general context in which the new method of donation is applied, this paper first introduces the development and digital landscape of the internet and third-party payments in the Chinese mainland. Then, statistical analysis is used to make large-scale claims by analyzing 1328 donation records made to Donglin Monastery in Mount Lu with the statistical software SPSS to determine whether the digital donation method is linked to the purpose of donations, or the amount of money being donated, and to what extent it substitutes for traditional donation methods.

Keywords: online religion; Chinese Buddhism; virtual religious groups; digital donations; third-party payment; Buddhism and technology; religious economics; Buddhist economics

1. Introduction

As digital payments gain traction in China, monasteries are adapting to accommodate donors who have transitioned away from cash (Liu 2020). What are the features of digital payments in the Chinese market, and how do such features fit into Buddhist donations? To what extent do certain monasteries rely on this new payment method? In terms of the purpose and amount of the donation, do donations made through digital payment methods differ from those made through traditional payment methods? This study aims to answer such questions with a focus on analyzing donation records made to the Donglin Monastery¹.

Academic investigations of virtual religious groups started in the 1990s (Rheingold 1993). After the categorization of religious presence online—Christopher Helland distinguished “online religion” and “religion online” in (Helland 2000)—scholars in religious studies focused on communities using the new media (Cheong 2009; Campbell 2010) and the joining of online and offline religious communities’ communications and practices (Campbell 2016). Scholars in Buddhist studies started to explore this topic in the 2010s, with a focus on new media (Grieve and Veidlinger 2014). In the field of Chinese Buddhism, Natasha Heller explored the usage of the “Buddha-recitation device” and how it is shaped by the Pure Land tradition (Heller 2014); Sun Jing studied the propagation methods and effects of Chinese Buddhist groups using new media (Sun 2016); Francesca Tarocco showed examples of clerics spreading Buddhist teachings through blogging and WeChat (Tarocco 2017); and Qi Liu explored the innovation, malpractice, and supervision of Buddhist digital donations in China (Liu 2020). In general, studies on the adaptation of Chinese Buddhists to modern technology are limited in size (mostly articles rather than books) and mostly exploration investigations documenting novel cases occurring in contemporary China.

This paper will not only illustrate the Buddhist adaptation to digital payments but also quantify the extent of this evolution, assessing the degree to which the new donation method has supplanted traditional methods. To provide the audience with a relatively comprehensive understanding of the general context in which the new method of donation is applied, this paper first introduces the development and particular qualities of the internet and third-party payments in the Chinese mainland. Then, statistical analysis is used to

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make large-scale claims by analyzing 1328 donation records made to Donglin Monastery in Mount Lu with the statistical software SPSS to check whether the digital donation method is linked to the purpose of donations, or the amount of money being donated, and to what extent it substitutes for traditional donation methods.

2. The Act of Giving in Chinese Buddhism

2.1. 供 (Offering) or 施 (Donation)?

This paper analyzes the act of laypeople giving money to monasteries and monastics by means of third-party payments. Although the term “donations” is used in the title, there are two terms in Chinese for the practice of giving that cannot be used interchangeably: *gòng* 供 (offer or offering) and *shī* 施 (donate or donation). *Gòng* 供, when used as a verb, means putting incense, candles, and so on in front of the image, sculpture, or memorial tablets of gods, Buddhas, or ancestors to show worship (DICASS 2006, p. 480, “供”). The indirect objects (recipients) of *gòng* include Buddhas, gods, ancestors, and the three treasures. Phrases related to it are *gòng-yǎng* (ibid., “供养”; Tzu-Yi 1989, p. 3065, “供养”), *gòng-pǐn* (DICASS 2006, p. 480, “供品”), etc. *Shī* 施 refers to the behavior of donating (ibid., p. 1230, “施”; Kleeman and Yu 2010, p. 665, “施”), the indirect objects of which include hungry ghosts and poor people. Its relevant phrases are *shī-zhěn* (ibid., “施诊”; DICASS 2006, p. 1230, “施诊”) and *shī-è-guǐ-huì* (Tzu-Yi 1989, p. 3831, “施餓鬼會”).

A widely used idiom, *shàng-gòng-xià-shī* 上供下施, “to offer upwardly, to donate downwardly”, provides an efficient way to distinguish between the pair. That is, the subject of *gòng* is inferior to its indirect object, while the subject of *shī*, on the contrary, is superior to its indirect object. *Shàng-gòng-xià-shī* has appeared in many Buddhist texts, especially in commentaries. Jizang 吉藏 (549–623 CE) (Cai 2012) wrote: “to offer upwardly to the three treasures, to donate downwardly to everyone” (上供三寶下施一切) in *Weimójing luèshū* 維摩經略疏 (Jizang, cf. X19.343). Hongzan 弘贊 (1611–1685 CE) (Tzu-Yi 1989, p. 1926, “弘贊”) wrote: “to offer upwardly to all Buddhas, to donate downwardly to the masses of sentient beings” (上供諸佛下施群生) in *Fóshuō fānwǎngjīng pùsàjiè luèshū* 佛說梵網經菩薩戒略疏 (Hongzan n.d., cf. X38.0695).

As seen from these examples, when applying the distinction between *gòng* and *shī* to the hierarchy of creatures in Buddhist cosmology, in general, Buddhists use *gòng* to describe their offerings to enlightened beings (Buddhas, arhats, bodhisattvas, etc.) (Rambelli 2004, p. 466) and *shī* for donation to beings in the six paths² of the rebirth cycle, including three superior paths: divinities, jealous gods, and humans; and three inferior paths: animals, hungry ghosts, and hells. It is worth noting that the term *gòng* is also used when the indirect object is divinities who can assist or protect Dharma and Buddhist practices. Therefore, we find the usage of *gòng-hùfǎ* 供护法, to offer to the “guardian devas” or “Dharma protectors or defenders”.

The giving from laypeople to the Sangha is another interesting exception—laities address this act as a “*gòng*”, while the monastics address it as a “*shī*”.³ This exceptional case, in addition to being explainable in terms of the honorific speech system, is also justified within the Buddhist cosmology. On the one hand, 僧 (*sēng*, Sangha) is one of the three treasures and is highly respected in Buddhist communities. On the other hand, monastics are still trapped in the same path of the rebirth cycle as the laity.

Thus, though using the term “donation” in this paper, the topic we are studying is not only within the scope of “donation”. Notably, in many other cases, these digital transactions can be called offerings. The term ‘donation’ is used because the emphasis of our discussion is on the methods of monetary transaction, not how much merit is guaranteed by offering to one of the three treasures.

2.2. The Advocacy of the Practice of Giving

In Chinese Buddhism, the act of giving is of significant importance. Doctrinally, the perfection of giving, known as *Bùshīdù* 布施度, is considered a remedy for greed and is ranked at the top of the six perfections. *Dù* 度, translated from the Sanskrit term “*pāramitā*”,

refers to the practice accomplished by a Bodhisattva in Mahāyāna Buddhism. This term has been interpreted in various ways, including “perfection”, “reaching the other shore”, and “crossing the river”. These interpretations suggest that by accomplishing the required practice, one can cross from the endless cycle of rebirth (this shore) to the liberated world (the other shore) (Kawamura 2004; Tzu-Yi 1989, p. 1901, “布施”). In addition to *dù* 度, *pāramitā* can also be transliterated as *bōluómi* 波罗蜜 or *bōluómiduō* 波罗蜜多. The most common group of perfections are the *liùdù* 六度 (six perfections), including *bùshī* 布施 (giving, Sanskrit: *dāna*), *chíjiè* 持戒 (ethical behavior, Sanskrit: *śīla*), *rěnrǔ* 忍辱 (patience, Sanskrit: *ksānti*), *jīngjìn* 精進 (endeavor or effort, Sanskrit: *vīrya*), *chándìng* 禪定 (contemplation or meditation, Sanskrit: *dhyāna*) and *bōrě* 般若 (wisdom, Sanskrit: *prajñā*) (ibid., p. 1273, “六波羅蜜”). In addition, *pāramitā* comprises other groups, such as the group of ten *pāramitās* and five *pāramitās* (ibid., p. 499, “十波羅蜜”; p. 1116, “五波羅蜜”). The compositions of each group vary according to the context being discussed, but the perfection of giving is always included (ibid., p. 345, “波羅蜜”).

As well as playing a significant role in Buddhist ideology, resources given by the laity are vital to the economy of the monastery, especially after the Land Reform in 1951, when monasteries in mainland China lost their ownership of the land.⁴ During the Tang Dynasty (618–907 CE) and Song Dynasty (960–1279 CE), monasteries developed many commercial methods for agriculture, money lending and land leasing. Later, in the Ming Dynasty (1368–1644 CE) and Qing Dynasty (1644–1912 CE), land ownership became the primary source of income for large Buddhist monasteries (we should also note that the vast majority of Buddhist temples in Chinese history were small- to medium-sized temples with no profitable land⁵). This source of funding, however, ceased to exist after the Land Reform. *The Measures for Financial Supervision and Administration of Religious Venues* issued by the State Administration for Religious Affairs listed six types of incomes for religious venues, none of which are related to monastic land (Article 14). After the economic reform in 1978, monasteries adapted to the market economy and started to earn income by relying on entrance fees, property given by believers, and other businesses such as selling candles and incense (Ji and He 2014)⁶. Among the three pillars of monastery revenue, in addition to entrance fees, the rest can all be contributed to the act of giving.

3. Third-Party Payment in China

3.1. Definition of Third-Party Payment and How It Works in China

Third-party payment (第三方支付) refers to a payment service provided by an institution that is independent of the two parties involved in a traditional transaction: the buyer and the seller. In 2015, the People’s Bank of China (2015), the central bank of the People’s Republic of China and a department of China’s State Council, introduced the *Measures for the Online Payment Business of Non-Banking Payment Institutions* (非银行支付机构网络支付业务管理办法). According to these measures, online payment services enable payers and payees to make long-distance payments using a public network without the need for physical interaction between their electronic payment devices, such as computers or mobile terminals (Article 2). Third-party payment providers, which are non-banking institutions that offer these services, work in cooperation with banks and provide services based on the banks’ payment and clearing systems.

There are currently two major third-party payment models in China. One model, exemplified by PayPal, serves as a trading mediation center, while the other, represented by Alipay, functions as temporary storage for payments. As shown in Figure 1, when purchasing goods online, the initial process is the same for both models: after placing an order, the buyer makes the payment through a third-party payment platform. The difference arises in the second half of the process. With PayPal, the seller receives the payment first and then sends the goods. However, with Alipay, the seller is notified of the order and sends the goods without receiving payment. The money remains in Alipay until the buyer receives and verifies the goods. Once the buyer confirms receipt of the goods, Alipay transfers the payment to the seller to complete the transaction. Despite PayPal

announcing a partnership with Baidu, one of China’s largest internet companies, in 2017, the Alipay model has continued to dominate the Chinese market.

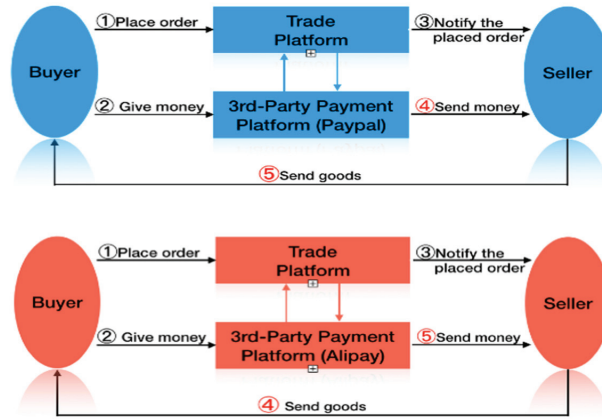


Figure 1. The difference in the payment process between Alipay and PayPal.

3.2. *The Development of the Third-Party Payment Industry in China*

The development of China’s third-party payment industry can be divided into three stages: the establishment of the payment model between 2002 and 2005; the rapid expansion of online payments between 2005 and 2012; and the mobile payment era starting in 2012. We will introduce each of them in chronological order.

3.2.1. *The Establishment of the Third-Party Payment Model*

Before 2002, online inter-bank transactions in mainland China were not possible due to the lack of a unified interface among retailers. This issue was resolved with the establishment of China UnionPay in 2002. Between 2002 and 2005, third-party payment companies were subsidiaries of banks. These companies served as payment gateways, managing the banking–Internet interface, connecting retailers to banks, and linking retail transactions to the online banking system for further payment operations (Li 2012, pp. 32–33). This gateway mode involved initial business cooperation between bank card payments and internet payments.

With the popularization of the internet in China, online trading has shown great potential, as has online payment. Alibaba, a Chinese e-commerce company, recognized mistrust between buyers and sellers as a major barrier to online transactions and launched Alipay in December 2004 to address this issue (ibid., p. 33). As introduced in Section 2.2, Alipay secures online transactions by only releasing money to the seller after the buyer verifies the goods. This guarantee service has since become a fundamental service of third-party payment platforms in China.

3.2.2. *Rapid Expansion of Online Payments*

The Chinese market quickly embraced third-party payments. As shown in Figure 2, the number of online payment users grew rapidly between 2008 and 2020, reaching 854 million by December 2020 and accounting for 86.4% of all Chinese netizens. Among on-line payments in China, the number of transactions handled by third-party institutions far exceeded that handled by banks. According to the (People’s Bank of China 2019), during the second quarter of 2019, banking financial institutions processed a total of 53.671 billion electronic payment transactions (including internet payment, telephone payment, mobile payment, ATM, POS, and other electronic payments), while third-party payment institutions handled 177.777 billion online payment transactions (including internet payment and mobile payment).

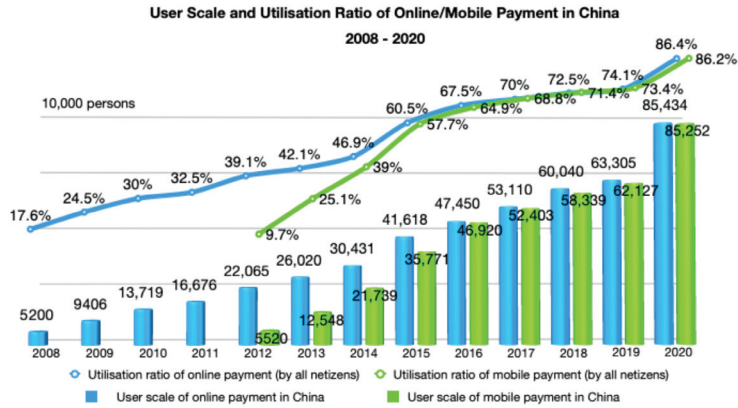


Figure 2. Scale and utilization ratio of online/mobile payment in China 2008–2020.⁷

The rapid adoption of third-party payments in Chinese society was evidenced not only by the alarming growth in the number of third-party payment users but also by the relative lack of concern among Chinese netizens regarding online payment security. According to the Report on Network Payment Security in China released in 2012, third-party payments have become the most popular type of online payment in China, covering 79.2% of online payment users (CNNIC 2012, p. 9). The report also compared concerns about online payment security among internet users in China, Japan, the United States, and Sweden. The percentage of Chinese netizens who “did not worry at all” was the highest at 43.4%, while only 20% of Swedish netizens, 12% of US netizens, and 1% of Japanese netizens chose the same response. Additionally, the proportions of Chinese netizens who expressed concern or extreme concern were the lowest, at only 2% and 7.7%, respectively (pp. 25, 26).

3.2.3. The Advent of the Mobile Payment Era

Based on Chinese netizens’ trust in online payments, the growth in the scale of mobile payment users was even faster. Mobile payments, which were initiated in China in 2012, are based on smart terminals and mobile networks. As shown in Figure 2, from 2013 to 2016, the number of users of mobile payments increased by more than 100 million each year. The number of users of mobile payments reached 583 million by the end of 2018, accounting for 71.4% of Chinese netizens. According to the 2019 *China Mobile Payment Development Report* by the (State Information Centre of China 2019), as of the first half of 2018, the penetration rate of mobile payments among mobile phone users in China reached 92.4% (p. 8).

After its establishment, mobile payments quickly became a major player in online payments. In 2014, the ratio of transactions made through nonmobile online payments to those made through mobile payments was 67:33. Within just four years, this ratio changed to approximately 27:73 in 2017 (p. 8). Mobile payment increased so significantly that it had a substitution effect on its nonmobile counterpart.

In the development of mobile payments, QR code payments have played an important role. QR code, short for quick response code, is a type of matrix barcode that contains data and can be read by imaging devices such as cameras. QR code payment services allow payers and payees to complete transactions by reading each other’s payment codes with mobile terminals (People’s Bank of China 2017) According to the (Payment & Clearing Association of China 2018), 89.5% of mobile payment users reported that QR code payments were their most commonly used payment method. QR code payments have gained widespread acceptance among consumers in China, resulting in a significant number of people not carrying cash and even some merchants refusing to receive cash. The People’s

Bank of China had to issue an announcement to stop merchants from accepting only digital payments (People's Bank of China 2018).

4. Donations through Digital Payment Platforms in the Donglin Monastery

4.1. Combining Merit Boxes with QR Code Payments

The prevalence of digital payments has made it difficult for monasteries to accept donations with one of the main funding sources, merit boxes. Merit boxes, also known as “Gong De Xiang 功德箱”, are commonly found in contemporary Chinese Buddhist monasteries. The appearance of merit boxes can vary based on specific tradition and culture. Typically, it is a rectangular box made of wood or metal, painted red, positioned at the entrance of a religious hall or near the statue being worshipped.⁸ It may be decorated with religious symbols and images such as a lotus flower and promotional text for donations such as “widely planting fields of blessings (*Guang Zhong Futian* 广种福田)”, or simply bear the Chinese characters of “Gong De Xiang”. The box traditionally features a locking mechanism to secure the donations collected and a slot on the top for the insertion of donations, which is designed to accommodate both coins and bills. When people visiting the monasteries no longer carry cash, the donations received by the merit boxes are inevitably undermined.

To accommodate donors who have transitioned away from cash, monasteries had to adapt. One of the major adaptations is to combine traditional merit boxes with QR code payments. A simple way is to print out the QR code of the monastery's third-party payment account and stick it on traditional merit boxes. Scanning the QR code with mobile phones, donors will be directed to the payment page for transferring money to the monastery's third-party payment account. There, donors can enter a donation amount, payment password, and complete the donations. We can also find some monasteries using digital merit boxes. The digital merit box usually has a large monitor that shows the QR code of the monastery's payment accounts. Donors can donate by scanning the QR code with their mobile phones, as well as inputting their names, wishes, and messages. Immediately after the donation, the donor's name, donation amount, and message will then be displayed on the screen of the digital merit box in real time.

These digital merit boxes are not manufactured by the monastery but are purchased from technology companies. One such company is Hongtuzhongchuang Beijing Technology Limited Company (宏图众创北京科技有限公司, commercial registration number 110105021534048). Originally established in 2016 to develop a catering management system, Hongtuzhongchuang expanded its business to include digital merit boxes after 2018. Hongtuzhongzhi states that “traditional merit boxes accept only cash, but as we all know, it is the world of mobile payments... if we do encounter a situation where digital payments are not accepted, there is really no way to make donations” (Hongtuzhongchuang 2020a, 2020b). The company provides not only the equipment for the merit box, but also the money management system behind it. Following the donation, the donor's WeChat or Alipay account will be automatically linked to the monastery's official WeChat account, and the donated funds will be immediately transferred to the monastery's account. The cost of these digital merit boxes, as listed on the company's website, ranges from CN¥ 12,800 to 19,800 (Hongtuzhongchuang 2018).

Which of these two combinations is more commonly used? Though monasteries such as the Shaolin Monastery (少林寺) in Mount Song, Henan province, have adopted digital merit boxes, and Hongtuzhongchuang also claimed to have customers in several provinces, overall, digital merit boxes are relatively uncommon at present. The application of digital merit boxes at the Bailin Chan Monastery (柏林禅寺) in Zhaoxian, Shijiazhuang, was reported on 7 April 2023, to be the first monastery in Hebei Province to adopt a digital merit box. It is a lot more common to find QR code stickers on merit boxes. Donglin Monastery, the main subject of our analysis in this paper, has adopted this approach.

4.2. Introduction of the Donglin Monastery

Donglin Monastery in Mount Lu, Jiujiang, Jiangxi Province, was founded in 386 CE during the Eastern Jin Dynasty. It is famous because Ven. Huiyuan 慧远 (334–416 CE)⁹, one of the most influential monks in Chinese history and the first patriarch (初祖) of the Chinese Pure Land tradition, lived here. The monastery is therefore credited as the origin of Pure Land Buddhism (淨土祖庭) and is very respected by Chinese Buddhists. The monastery is on the list of the 142 “National Key Buddhist Temples in Han Chinese Area (汉族地区佛教全国重点寺院)” released by the State Council of the PRC in 1983. Its acting abbot, Ven. Da’an (大安, *Dà’ān*, Big Easement), born in 1959, was a professor at the University of International Business and Economics and a visiting professor of the China Buddhist Academy before being ordained in 2001 (Donglin Monastery 2017). Ven. Da’an’s Buddhist master, Ven. Chuanyin (传印, *Chuān-yìn*, Transmission seal), was the president of the 8th Buddhist Association of China¹⁰ (2010–2015) and was the honorary president of the association after 2015 and until his death in March 2023 (The Buddhist Association of China 2017a).

Donglin Monastery shows a high acceptance of new technology products. The monastery has not only its own website but also official accounts on both Weibo and the WeChat open platform. Furthermore, while a usual monastery in mainland China has only one WeChat official account, Donglin Monastery owns three for different purposes: ‘Donglin Monastery in Mount Lu of Jiangxi’ (江西庐山东林寺, WeChat ID: jxldsonglins) to share information about Buddhist practice; ‘Virtue Farmland of Donglin Monastery in Mount Lu’ (庐山东林寺福田, WeChat ID: lsdonglinsi) to collect donations; and ‘Ven. Da’an Talks about Pure Land’ (大安法师讲净土, WeChat ID: daanfashi) to spread the Dharma teaching of Ven. Da’an. Among the three accounts, the earliest one (ID: daanfashi) was created on 1 July 2013, and the most popular one owned approximately 284,952 subscribers up to 10 January 2020, according to Xiguaji Data, a data monitoring website that estimates the subscription numbers of WeChat accounts by analyzing their article views, likes, and comments.

4.3. Analysis of the Donations of the Donglin Monastery

On the official website of this monastery, there is an online inquiry page, ‘Merit Names’ (功德芳名, *Gōng-dé Fāng-míng*), which, according to the website, records all the donations to the monastery unless the donor requested not to.¹¹ By searching for a donor’s name, this page will show all donation records with donor names matching the given prefix in the past three months. The records also include the donation date, method, and purpose (Donglin Monastery in Mount Lu). By searching for different Chinese names on the inquiry page (more than 6 months between searches), a total of 1308 donation records (1282 valid and 26 invalid due to the lack of payment method records) from 30 May 2019 to 27 July 2021 were collected.

The sources of donation in Donglin Monastery fall into four categories: cash, postal remittance, bank payment (including bank card payment and bank transferring), and third-party payment (including Alipay, WeChat Pay, and QR code payment with unconfirmed platform¹²). As shown in Figure 3, of the valid records, third-party payments accounted for 81.36% of the total number of donations, with 1043 donations. Bank payments accounted for 99 donations, cash for 131, and postal remittance for only 9. Notably, between 30 May and 29 July 2019, third-party payments accounted for 95.62% of total donations. Within the third-party payment category, WeChat Pay dominated with 89.25% of transactions during those three months, while Alipay accounted for 4.22% and QR code payment with unconfirmed platforms accounted for 6.53%. In summary, third-party payments were the overwhelming source of donations, with WeChat Pay being the dominant platform within that category.

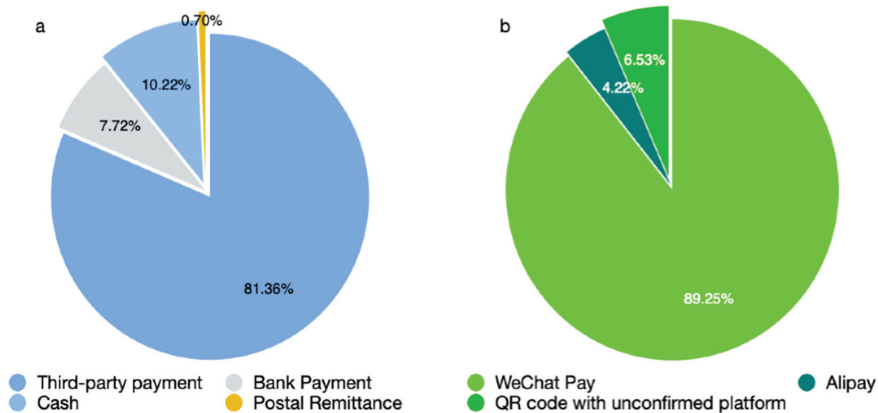
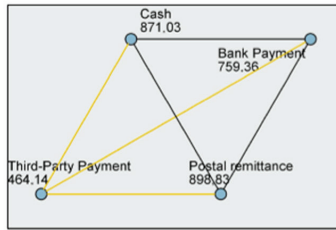


Figure 3. Overview of the number of donations to Donglin Monastery in terms of payment sources: graph (a) shows four categories of all donation sources, and graph (b) shows sources within third-party payment donation.

From the perspective of donor purpose, all recorded purposes accepted by the Donglin Monastery can be made through third-party payments. The variety of recorded donation purposes included performing Buddhist rituals (普佛), offering to the three treasures (供三宝)¹³ and private ancestral tablets (牌位), animal protection and charity (慈善护生), Sutra Printing (印经), general construction work (基建), donations allocated to the pure land garden (净土苑专项认捐), preaching education (弘法教育)¹⁴, and donations to the audiovisual center (视听中心) (Donglin Monastery 2022)¹⁵. All the above-mentioned donation purposes can be and were performed with third-party payment methods in the Donglin Monastery.

Using the payment method as the grouping variable, Figure 4 shows the results of a Kruskal-Wallis test of records between 30 May and 29 July 2019 to compare the donation amount pairwise. The nodes connected by yellow lines in the figure are statistically significantly different, and the nodes connected by black lines are not significantly different. From the figure, we can see that there is no statistically significant difference in donation amount among bank payments, cash, and postal remittances; however, the differences between third-party payments and the other three payment methods are statistically significant. Since the data of the four variables are not normally distributed, we compared the median values of the variables. The median donation amounts of the four donation methods from highest to lowest are CN¥300.00 (cash), CN¥300.00 (postal remittance), CN¥95.50 (bank payment), and CN¥5.00 (third-party payment). This shows that the donation amount made by third-party payment platforms is much smaller than that made by the other three methods. In conclusion, regardless of the donation purpose, third-party payments, especially WeChat Pay, have made a large substitute for traditional payment methods when the donation amount is small.

Pairwise Comparisons of PaymentMethod



Each node shows the sample average rank of PaymentMethod.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Third-Party Payment-Bank Payment	295.225	58.937	5.009	0.000	0.000
Third-Party Payment-Cash	406.891	66.867	6.085	0.000	0.000
Third-Party Payment-Postal remittance	434.695	157.977	2.752	0.006	0.036
Bank Payment-Cash	-111.666	88.215	-1.266	0.206	1.000
Bank Payment-Postal remittance	-139.470	168.129	-0.830	0.407	1.000
Cash-Postal remittance	-27.804	171.070	-0.163	0.871	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is 0.05.

Figure 4. Pairwise comparisons of the four donation methods received by Donglin Monastery.

5. Concluding Remarks

In summary, the development of the internet and the large scope of mobile payment users have provided the basis for digital donations. With third-party payment, the online payment service provided by nonbanking institutions, being fully integrated into Chinese people’s lives, there is evidence of Buddhist monasteries and monastics in contemporary China adapting to the new ways of donating provided by this service. By analyzing the donation data, we found that, in the Donglin Monastery in Mount Lu, regardless of the donation purpose, third-party payments, especially WeChat Pay, have made a large substitute for traditional payment methods (bank payment, cash, and postal remittance) when the donation amount is small, and among third-party payments, WeChat Pay overwhelmed the other platforms.

While the statistical analysis of digital donations made to Donglin Monastery has provided valuable insights into the evolving landscape of online religion and third-party payments in Chinese Buddhism, it is important to acknowledge the limitations of this study. Even though the broader payment environment is the same, each monastery operates within its unique context, with varying fundraising strategies, donor demographics, and cultural influences. The data collected for this study were limited to Donglin Monastery, and comparable data from other monasteries were not readily available. As such, future studies should aim to gather data from a diverse range of monasteries to provide a more comprehensive understanding of the impact of digital donations on Buddhist practices in China. Exploring whether similar patterns exist in other monasteries is a crucial direction for future research.

Furthermore, the study raises intriguing questions about the factors influencing digital donations, such as the dominance of WeChat Pay and the tendency for small donation amounts. From the monasteries’ point of view, it is also worth investigating how much their popularity is affected by having available to their followers these modern methods of donating. While these are complex and interesting avenues for further investigation,

the lack of existing literature and comprehensive data hinders conclusive arguments at this stage.

For future research on these topics, it is important not to overlook the many variables that affect the number of donations received by monasteries. In addition to some of the more obvious economic variables (e.g., local inflation and economic development) and social factors (people not being able to visit monasteries on the ground during a period in the pandemic), we should also pay attention to variables that are unique to the religious donations. Whether the monastery has initiated donation projects over a time period that is particularly attractive to devotees (e.g., the construction of the world's tallest statue of Amitabha), whether the monastery has focused on large-scale fundraising events over a period of time, and the form of the fundraising are all factors that we will take into account. Understanding the impact of digital donations on the overall number of donations is also a significant area for future exploration. Economic variables, the appeal of donation purposes to donors, and the efforts of monastics in fundraising all play a role in shaping donation patterns, highlighting the multifaceted nature of this topic.

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List of Abbreviations

CINIC	China Internet Network Information Center
DICASS	Dictionary Editing Room, Institute of Linguistics, Chinese Academy of Social Sciences (中国社会科学院语言研究所词典编辑室)
SPID	Statistical Report on Internet Development in China
T	Taishō edition (CBETA)
X	Xuzangjing (CBETA)

Notes

- ¹ For an introduction to Donglin Temple, see Section 4.1 of this article.
- ² While some of the Buddhist schools preserve five destinies, most Chinese schools speak of six paths, *liudào* 六道, that comprise the three superior paths: divinities, jealous gods, and humans; and the three inferior paths: animals, hungry ghosts, and beings of hells (Tzu-Yi 1989, p. 1298, “六道”).
- ³ Monastics address people who give or have the potential to give them property or food as ‘*shī-zhǔ*’ (施主), a word that can be translated into English as ‘the person who donates’, ‘patron’, ‘benefactor’, or simply ‘donor’. According to the Modern Chinese Dictionary and the Oxford Chinese Dictionary, *shī-zhǔ* is ‘how monks address people who donate to Buddhist monasteries’, which ‘generally refers to laypeople’ (DICASS 2006, p. 1230, “施主”; Kleeman and Yu 2010, p. 666, “施主”).
- ⁴ In addition, monastery income was usually tax-exempt (Luo 2003).
- ⁵ By citing the work of scholars such as Holmes Welch (1968), some scholars took for granted the assertion that farm rents were the main source of income for monasteries. However, we should not ignore Welch’s research methods and interview subjects;

monks came from large monasteries at the time. Gernet's work (Gernet 1995) shows that (1) the vast majority of land held by monasteries was not always available for cultivation; (2) land with economic value was only available to large monasteries and not at all to small ones; and (3) the number of small temples and Buddha halls in Chinese history was much larger than that of large monasteries. Therefore, farm rents should be considered as the main source of income for large monasteries, not for the majority of the monasteries in Chinese history in general.

- 6 Although it was not mentioned by Ji, monasteries in Ji's article referred to those in China's mainland. Hong Kong, Macao, and Taiwan do not apply the land policies in China's mainland.
- 7 The data in this graph come from the Report on Network Payment Security in China and the 32nd, 34th, 36th, 38th, 40th, 42nd, 43rd, and 45th Statistical Report on Internet Development in China (CNNIC 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020).
- 8 It is important to note that there are more than just Buddhas, Bodhisattvas, and Buddhist-related deities enshrined in current Buddhist monasteries; deities such as the Dragon King (*Longwang* 龙王), the God of Wealth (*Caishen* 财神), the King of Medicine (*Yaowang* 药王), Fox Immortals (*Huxian* 胡仙 or 狐仙), and so on can be enshrined in Buddhist monasteries and have their own offering tables and merit boxes. Located on Mount Fenghuang in Fengcheng, Liaoning Province, the Chaoyang Monastery 朝阳寺 enshrines these aforementioned four. Although some of these objects of worship seem more aligned with the stereotype understanding of Taoism, many of them possess their own unique religious culture.
- 9 Huiyuan 慧远 (*Hui-yuān* (334–416 AD), one of the most influential monks in Chinese history, is a disciple of Dào-ān 道安, another eminent Buddhist master in the Eastern Jin Dynasty. After Dào-ān dismissed all the disciples, Hui-yuān came to Mount Lu and lived in Donglin Monastery after the monastery was built. Hui-yuān advocated the practice of *niàn-fó* 念佛 (recollection of the Buddha) and devoted himself to Amitabha. He is regarded as the first patriarch by the Pure Land tradition in China.
- 10 The Buddhist Association of China (中国佛教协会) was established in Beijing in 1953. It has local branches in each Chinese province and city and is thus far the only national Buddhist organization in mainland China (The Buddhist Association of China 2017b).
- 11 Prior to 2023, the page displayed the description shown in the main text (Donglin Monastery 2019). After the website was revamped in 2023, the page explicitly stated that it no longer included records of cash donations (Donglin Monastery 2023).
- 12 As the source of donation, some of the Donglin records write '扫手机', which literally means to 'scan the mobile phone', to refer to scanning the QR code on the mobile phone to pay through a third-party payment platform. Since no specific third-party platform is shown, we translate that as 'QR code payment with unconfirmed platform'.
- 13 Donation purposes labeled by Donglin Monastery as '供三宝' (offering to the three treasures), '供僧' (offering to monastics), and '供大安法师' (offering to Ven. Da'an) are all categorized here as offering to the three treasures.
- 14 The preaching education team of Donglin Monastery is responsible for organizing activities such as summer camps, preaching training, and meditation classes for laypeople (Donglin Monastery "东林莲社 [Lotus Society of Donglin]").
- 15 The audio-visual center of Donglin Monastery is responsible for the production and distribution of audiovisual materials, and the maintenance of Ven. Da'an's website see <http://www.daans.cn> (accessed on 25 August 2023).

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Note: For Chinese literature, the ones with original English titles are denoted by parenthesis, the ones translated by the author are denoted by brackets.

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