

Timepieces as Gifts: Exploring European Clocks and Watches in Tibet

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Background

Tibetans, like any other civilisation, were concerned about timekeeping and the measurement of time. Before the introduction of European mechanical clocks or watches, Tibetans used various methods to measure and keep time. Various concepts and terms, which described the measurement of time, appeared in Buddhist scriptures and scholarly works. In some Tibetan villages in Amdo, for example, they used butter lamps and incense as time measuring instruments and they even had special terms such as *thun rkong* (“candle session”) and *thun spos* (“incense session”) to describe them.

Tibetan Buddhism is filled with many ritual practices and norms. Many of them deal with timekeeping and time measurements. Similar to the Islamic tradition of fasting during the month of Ramadan, Buddhism also has fasting traditions that require precise time management. When fasting, Buddhist practitioners are required to engage in specific tasks at specific times, the latter an order that ranges from when to wake up to when to eat breakfast and pray, etc. Likewise, the daily schedule for Tibetan monks’ is regulated by Buddhist doctrine discipline (*dul khrims*) and rules (*bca’ yig*) that require a strict adherence to time.

Tibet has a long tradition of studying and engaging in astronomy, and the precision of time measurement was discussed and debated among astronomers and calendar makers. As celestial stars are constantly moving around, time measurement was important to determine the accuracy of measuring the years, months, and days as well as the moments of time. After Buddhism came to Tibet in 7th century, the ancient Indian system of time measurement was introduced: day and night were divided into sixty water clock measurements that were based on the number of breaths. One healthy man was believed to inhale 360 times in an hour. As it was thought that there were sixty hours in a day and night, a man would have inhaled a total of 21,600 breaths. Another time measuring equipment was the water clock where sixty

drops were counted as one night.¹ In other words, one hundred twenty water drops were seen to measure one day and one night.

The tantric text known as *Rgyud rdo rje mkha' 'gro* (*The Daka Vajra tantra*) describes in detail how to make a copper buckets for water clocks and sundials.² Perhaps, following this text, Tibetans may have developed various water clocks or clepsydrae to measure time. Although I have not seen any clepsydra in Tibet, according to bSam grub rgya mtsho (1923–2006), a famous astronomer from Amdo, copper buckets were commonly used in Lhasa to measure time. Three layers of buckets of water were used to measure the time.³

Tibetan twelve Zodiac times

<i>Tibetan names</i>	<i>English names</i>	<i>Zodiac Signs</i>	<i>Modern times</i>
ནམ་གུང་།	Midnight	བྱི་བ། Rat	11 p.m. to 1 a.m.
ནམ་ཡོལ་ཕྱེད།	Half past midnight	མ་ང་། Ox	1 to 3 a.m.
ཚོ་རངས།	Early morning	ཁྲུག། Tiger	3 to 5 a.m.
ནམ་ལངས།	Daybreak	ཡོལ། Rabbit	5 to 7 a.m.
ཉི་ཤར།	Sunrise	འབྲུག། Dragon	7 to 9 a.m.
ཉི་རྒྱུ་མཉམ།	Morning	ལྲུ་བ། Snake	9 to 11 a.m.
ཉི་མཚེན།	Noon	རྒྱ། Horse	11 a.m. to 1 p.m.
ཉི་མཚེན་ཡོལ།	Afternoon	ལྷ་བ། Sheep	1 to 3 p.m.
ཉི་མཚེན་མཉམ།	Late afternoon	མྱེ་བ། Monkey	3 to 5 p.m.
ཉི་ཐུབ།	Sunset	བྱ། Bird	5 to 7 p.m.
མ་ལོགས།	Evening	བྱི། Dog	7 to 9 p.m.
མོད་འཁོར།	Late evening	ཕག། Pig	9 to 11 p.m.

European timepieces

The introduction of European timepieces to Tibet in the 18th century was one of most important historical events for Tibetan astronomy and it occurred at the juncture of European explorations and missionary activities in Asia and the Tibetan Buddhist missionary activities in

¹ Ngag dbang nyi ma (1982: 443–444).

² *zangs ma srang ni bcu gnyis la / / snod ni dpangs su sor brgyad dang / / rgyar ni sor mo bcu gnyis pa / / legs pa nyid du brdung bar bya / / gser ni 'ol se sum cu las / / sor drug pa yi tshad tsam du / / thur ma legs par brdungs nas ni / / thur ma de yis bu ga ni / / zangs ma'i snod la mkhas pas dbug / / chu ni rnyog ma med pa las / / srang ni drug cu'i tshad du bya / / srang 'dis chu tshod tshad yin te / / skye bo rnam la phan phyir bshad / / (Rdo rje mkha' 'gro, 2009: 152–153).*

³ He wrote several works on Tibetan astronomy and calendar making science. In one of these, he expounds on the history of this particular form of water clock.

Inner Asia. The mechanical clock was a distinctively European invention, first mentioned around 1300s.⁴ Joseph Needham, author of a series of books on science and civilisation in China, defines it as “one of the greatest scientific achievements of all science and technology”.⁵ It has an escapement that allows a rotating wheel to turn slowly, continuously, and with context speed. The fundamental difference between water clock and mechanical clock is that the first involves a continuous process, which is the flow of water through an hole, whereas a mechanical clock depends on a mechanical motion that, by continuously repeating itself, divides time uniformly into discrete segments.⁶

It is not easy to pinpoint the exact arrival of European clocks in Tibet, due to its location at the crossroads of several civilisations: historically, in fact, there were several trade routes that connected Tibet to the rest of the world. In the south, it was connected to Nepal, India, and Bhutan and in the north and the east it was bordered by China and Inner Asia. Two of the most important trade routes were the Northern Route, or *byang lam*, which referred to routes heading towards Zunghar, and the Eastern Route, or *shar lam*, which referred to the routes to China.

Along these transnational religious and commercial networks, many foreign ideas and products were exchanged, which some eventually ending up in Tibet. From 13th century onwards, Tibet was closely linked to the Mongol Empires and the Yuan dynasty. Tibetan Buddhism also became an important religious and cultural force in Inner Asia at this time, making Tibet a significant part of the political, cultural, and religious networks.

By the 17th century, Europeans had built sophisticated vessels and obtained enough navigational knowledge to travel virtually anywhere in the world. Driven by commercial and religious activities, Europeans expanded their trade networks and sent missionaries all over the world. In Inner Asia, by the early 17th century, there were three important empires, the European Muscovite (1613–1917), the Zunghar Khanate (1671–1760), and the Manchu Qing (1644–1911), who were all contending for power in the heart of Eurasia.⁷

Occurring within such Inner Asian networks, Tibetan encounters with Europeans determined the introduction of new crops and products as well as ideas and knowledge. During the time of the 5th Dalai Lama, Galdan Boshugtu Khan (1644–1697), a leader of the Zunghar Khanate, had contacts with the Russians, from whom he bought a camera obscura, an old European form of camera. He then carried it with

⁴ Wigelsworth (2006: 130).

⁵ Needham (1965: 435).

⁶ Whitrow (1989: 99).

⁷ Perdue (2005: 1).

him to Tibet and presented it to the 5th Dalai Lama as a present.⁸ Even George Bogle (1746–1781) reported to have seen a camera obscura at the residence of 6th Panchen Lama Blo bzang dpal ldan ye shes (1738–1780),⁹ at the time of his stay in bKra shis lhun po Monastery in 1775.

At the turn of the 18th century, we see one of the earliest instances of European timepieces being bought to Tibet, leading to the mechanical clock being added to the Tibetan vocabulary. In 1698, the ex-abbot of sGo mang grwa tshang (one of the colleges of 'Bras spungs Monastery), sent his greeting party to the 6th Dalai Lama Tshangs dbyangs rgya mtsho (1683–1706). Thor god Don grub rgya mtsho came from the Torghuts, one of the major subgroups of the Four Oirats in the Western Mongolia. In 1618, many from the Torghuts left for Caspian Sea on the banks of the Volga River and established the Kalmyk Khanate. Thor god Don grub rgya mtsho was born in a Torghut family and came to Lhasa at a young age to study at sGo mang grwa tshang. In 1673, he became the 29th abbot of the college, leaving for Kalmyk soon afterwards. In 1704, he came back to Lhasa and was appointed abbot of Li thang Monastery in Kham by the Tibetan Government.¹⁰

In 1698, he dispatched a few staff members from Kalmyk to Lhasa to see the 6th Dalai Lama. In the latter's biography, *sde srid* Sangs rgyas rgya mtsho (1653–1705), the regent of the Dalai Lama, recorded that Thor god Don grub rgya mtsho sent many gifts, including what he called "the wheel of understanding time" or "*dus rtogs 'khor lo*".¹¹ *Dus tshod*, which refers to mechanical timepieces, was a new word specifically created to indicate European mechanical pieces.

In 19th century, as the Russian Empire expanded its territories into Central Asia, extensive contacts took place between Russians and Mongols. Through this relationship, many European timepieces were brought to Tibet. For example, Bla ma dkar po (1835–1895), a Tibetan military general in Xinjiang, lists many timepieces in his gift registry, carried by him from Xinjiang to Amdo in late 19th century.¹² Since there were no watch and clock makers in Xinjiang at that time, we can come to the conclusion that these timepieces must have been bought from Russian traders, with whom he had contact, and then brought to Tibet.

It is worth noticing that these exchanges did not occur directly between Tibetans and Europeans, but rather through intermediaries such as the Mongols or other Central Asians. The Northern Route certainly represented an important network in the creation of these contacts, as it facilitated the introduction of quite a few European products

⁸ Ngag dbang blo bzang rgya mtsho (2009: 119).

⁹ Teltcher (2013: 107).

¹⁰ Bstan pa bstan 'dzin (2003: 57–58).

¹¹ Sde srid sangs rgyas rgya mtsho (1989: 450).

¹² Skal bzang legs bshad (1994: 351–352).

to Tibet, among which figured the same mechanical timepieces.

The Jesuits' clocks in Beijing

The scarce information available on the diffusion of European timepieces along the Northern Route is counterbalanced by what we know of the situation on the Eastern Route, an important commercial and human network that connected Tibet with China. Even though Tibetan lamas visited and established their presence in Beijing throughout the Yuan and the Ming dynasties, it was during the Manchu period that their relationship with the court became more extensive and deeper. The reason behind this was the Manchus' connection with the Mongols, who were followers of Tibetan Buddhism and political allies through matrimony; as such, Tibetans' ties with the Manchus preceded the latter's conquest of China in 1644.

After coming to Beijing and establishing a new dynasty under the name of the Qing, the Manchus invited many Tibetan lamas and scholars to their imperial court. Like the Jesuit missionaries, these spiritual masters engaged themselves not only in religious matters but also in political ones. They concerned themselves with the affairs of the state, which included Inner Asia and Tibet. They were further involved in making map and translating a great number of religious works from Tibetan to Mongolian and Manchu and from Chinese into Tibetan and Mongolian.¹³ At this cosmopolitan Qing court, many Tibetan lamas had their first encounters with European clocks.

This leads us to a very important question: why were there European clocks at the Qing court in the first place? This had primarily to do with the Qing emperors' interest in many aspects of European science and technologies. In the 16th century, during the later Ming dynasty several European Jesuits, led by the Italian Jesuit priest Matteo Ricci (1552–1610), came to China to preach and spread Christianity. When he came to China, Ricci brought some timekeeping pieces with him. During his stay at the court, he presented several clocks to the Ming emperor himself.¹⁴

After the Manchus took over the Ming dynasty, the Qing emperors also employed Jesuits and asked them to make clocks for the court and the people associated with it. During the reign of the Kangxi Emperor, a number of *zuo fang* ("workshops") were established, one of which devoted to the making of Western style clocks. During Qianlong's reign (1735–1796), there were two locations in the Forbidden City for making clocks for imperial consumptions, and one of these was in

¹³ Yongdan (2015, 2017).

¹⁴ Tang (2015: 259–263).

Yuanming Yuan, which is also known as the Old Summer Palace in Beijing.

One of the first Europeans to introduce Western clocks at the Qing court was Father Jean–Mathieu de Ventavon (1733–1787), a French Jesuit who had been trained as a clockmaker in France. In 1766, he came to Beijing where he served the Qianlong Emperor for twenty years in this capacity. In his later years, according to a letter to the Lazarist Joseph Rauto Bertin dated November 17, 1786, he made an automation that could, at the Emperor’s request, write in Manchu and even in Mongolian. He further states that they “will know how to write in Tibetan”.¹⁵

During the Qianlong’s reign, the imperial court produced an encyclopedia of dresses and styles in fashion known as *Huangchao liqi tushi* 皇朝禮器圖式 (“Illustrations of Imperial Ritual Paraphernalia”), in which were included descriptions of several European timepieces and clocks, the latter an indication of the imperial court’s endorsement of these foreign objects as part of imperial ritual paraphernalia.

Indeed, there are many Tibetan written records, dated to the Qing dynasty, that mention European timepieces, some even providing specific details on how they were made and by whom. One of these written records comes from *Rje bla ma srid zhi’i gtsug rgyan pañ chen thams cad mkhyen pa blo bzang dpal ldan ye shes dpal bzang po’i zhal snga nas kyi rnam par thar pa nyi ma’i ’od zer zhes bya ba* (“The Guru Lama’s Crown Ornament of the World Omniscient One, Blo bzang dpal ldan ye shes’s Biographical Account Known as Sunlight”), the biography of the 6th Panchen Blo bzang dpal ldan ye shes written by his student, the 2nd ’Jam dbyangs bzhad pa kun mkhyen ’Jigs med dbang po (1728–1791) from Bla brang Monastery.

In this biography, the author mentions several instances where the emperor gave many European timepieces to Blo bzang dpal ldan ye shes. Once the Qianlong invited the Panchen Lama to come to Beijing. On his way there, at rDang la, one of the highest mountain paths in Tibet, the Panchen Lama received a watch from the Qianlong with a message saying,

Here I do not allow ICang skya hu thog thu to prostrate in front of me. Since the Panchen is the great Lama from the west, you do not need to prostrate in the front of my portrait. Now I have sent this special watch for you. It is good for your well-being.¹⁶

¹⁵ Pagani (2001: 54).

¹⁶ ’Jigs med dbang po (2002, vol 2: 774–775).



A clock mounted on the top of a pavilion with eight Tibetan Buddhist auspicious signs and Sanskrit mantra of the six-syllable. Made at the imperial workshop in Beijing by European Jesuits during Qianlong's reign (50x23x17 cm, the Palace Museum, 2020).

Since the Panchen Lama was traveling a long distance on horses, the Qianlong was sensitive and considerate enough to send the master one of his personal time-keeping devices in the belief that this might bring relief to the Panchen Lama's stress caused by the long journey. Similarly, when the Panchen Lama arrived in Chengde, formerly known as Jehol, a Tibetan monastic town in China, he was presented with many gifts by the Qianlong; one of these was the *zimingzhong*, or "self-

sounding bell". According to the 6th Panchen Blo bzang dpal ldan ye shes' biography,

On the day, the great Emperor Manjushri sent Pachong Amban with imperial family treasures and a great mechanical clock which had been decorated with a majestic bird and a table for the clock. The bird makes a sound every hour that passes.¹⁷

More importantly, after arriving in Beijing, the Qianlong presented another Kālacakra clock to the Panchen Lama. Again, according to the biography,

The Emperor sent a minister to present a clock to him. This clock was made by a European worker and constructed according to the Kālacakra time. The Panchen Lama was pleased to receive it, and he generously gave the gifts to the official and replied to the Emperor.¹⁸

Before the Panchen Lama entered Beijing, the Qianlong ordered some European Jesuits to make this specially designed clock for the Panchen Lama. The biography does not say much about the details of the clock except that Europeans made it. So, the person(s) who designed it, the materials used, details of motifs as well as dials are not known. However, by mentioning that it was made by Europeans, it indicates that its manufacture could be attributed to the imperial workshop in Beijing, with the possible collaboration of some Tibetan lamas who knew the Kālacakra tradition of time measurement. According to the Kālacakra, a stellar day—in other words, one day and one night—is divided into sixty hours, each hour into seconds, and each second into six breath times. Each breath time is considered as a healthy man's one breath time. This measurement was unlike anything that the Jesuits were using for calculating time. At that time, many Tibetan lama scholars, including lCang skya rol pa'i rdo rje (1717–1786), lived in Beijing: it appears therefore likely a Tibetan Buddhist scholar provided the details of all the Tibetan numerals to the Jesuits, who in turn built the timepieces that the Qianlong had ordered upon those instructions.

From the Panchen Lama's biography, it is clear that Jesuit clocks had been used as exchange gifts between Tibetan lamas and the Qing emperors for a long time. Although it is not certain how much widespread these clocks were, it is nevertheless known that they circulated among members of the Tibetan religious elite like the 6th Panchen Lama. By the time of the Qianlong, *dus tshod* was the standard term used to describe the European mechanical timepieces.

¹⁷ 'Jigs med dbang po (2002, vol 2: 1011).

¹⁸ 'Jigs med dbang po (2002, vol.2: 1014–1015).

The name and usage

Whenever a new object is introduced into a cultural milieu, it needs to be named and identified by the receiving culture. Tibetan civilisation already knew and used items to measure time, e.g. water clocks, candle clocks and incense clocks, yet the European mechanical clock was radically foreign to them. It was produced outside Tibet and then imported or brought into the plateau: when this new object started to circulate, a new term was needed to refer to it. As its use became widespread, at least two terms emerged to describe it: one of them was, as *sde srid* Sangs rgyas rgya mtsho's writings show, *dus rtogs 'khor lo*, "the wheel of understanding time". In the 18th century, when European mechanical clocks became well-known, *dus tshod* affirmed itself as the standard term to describe them. It was not only used by 'Jigs med dbang po in the biography of the 6th Panchen Lama, but also by other scholars. For example, while describing one of the episodes of ICang skya rol pa'i rdo rje at Mount Wutai, Thu'u bkan Blo bzang chos kyi nyi ma (1737–1802), a scholar from Amdo, wrote,

Once he was in Mount Wutai, one monk bought a magnificent walking stick watch in the market and offered it to him. After seeing it, he said that it was the exact same walking stick watch that the Yongzheng Emperor (1678–1735) used when he was strolling around the garden.¹⁹

The etymology of *dus tshod* is not clear and it may be a translation of the Chinese term *Shichen biao* 時辰表, "time-table". In *Huangchao liqi tushi*, *Shichen biao*, the term is used to describe what we might call the pocket watch. Still, from 18th century onwards, *dus tshod* became the standard term to describe the mechanical timepieces that had originated in Europe.

How did the Tibetans use these clocks? Like anywhere else in the world, Tibetans mostly used them for keeping time. However, because of its accuracy and precision, starting from the 18th century, several scholars working on astronomy advocated or used the mechanical clock to measure time. This was an important development. As mentioned earlier, historically, Tibetan astronomers used sundials to measure time and calculate the locations of places, but these objects were not as accurate in their measurements as the mechanical clocks. Thus, as soon as the Tibetans discovered European timepieces, some of the astronomers argued for their use. Among these scholars, A kyā Blo

¹⁹ Blo bzang chos kyi nyi ma (1989: 603).

bzang bstan pa'i rgyal mtshan (1708–1768),²⁰ a Tibetan astronomer who introduced Pythagorean theorem to Tibet, recommended the use of European clocks instead of the traditional sundial.

In the past, Tibetans had largely relied on ancient Indian Tantric works like the Kālacakra to determine the time in specific locations. In the 15th century, mKhas grub Nor bzang rgya mtsho (1423–1513), an important astronomer, had used the Kālacakra Tantra to assert that there were thirty–six hours in the equivalent of a day during Tibet's longest summers, and slightly less in China. Yet A kyā Blo bzang bstan pa'i rgyal mtshan believed that this system could not measure time and location accurately, and instead suggested that periods of observation should be used to measure time,

Instead of relying on the words of the Tantra and some contemporary works on measuring time, [we] should be using good measuring practices like watch to observe time from morning to evening, when people can see their hands clearly, even in the longest summers.²¹

Similarly, another important scholar in Amdo, Sum pa ye shes dpal 'byor (1704–1788), also known as Sum pa mkhan po, wrote,

According to magical mechanical clock, which was originated in Xi-yang 西洋 (Europe) but was made at the imperial court in Beijing, time of Amdo is [...].²²

Here he says that he used Jesuit made mechanical timepiece to measure time while doing his astronomical observations. From these references, we can clearly see that from 18th century onwards, the term *dus tshod* was no longer used by lamas alone, as elite scholars began to employ timepieces not only to keep time, as shown in the works of astronomers such as A kyā Blo bzang bstan pa'i rgyal mtshan and Sum pa ye shes dpal 'byor, but also for astronomical observations.

How were these objects exchanged?

Since there were no watch and clock manufacture in Tibet, these timepieces were brought from outside Tibet. In the early years, at least till the 18th century, most of these exchanges occurred in the context of a *mchod yon* (“priest and patron”) relationship, a religious relationship which existed between a lama and lay person, in particularly between Tibetan lamas and Inner Asian rulers. The question is how we

²⁰ Yongdan (2018).

²¹ Blo bzang bstan pa'i rgyal mtshan (2000: 43a).

²² Sum pa mkhan po (2015, vol 20: 414).

understand this relation. It largely depends on the how we view Tibetan relationship with Inner Asian rulers and particularly the Qing dynasty. In general, there are great debates among historians about the nature of the Qing dynasty. For the most part, there are three models of Qing history. The first is the Sino-centric model. In spite of their origins as a nomadic people from the northeast of China, alternatively known as Jurchen or Manchu, the Manchu themselves accepted that they were “Chinese” and that therefore the Qing dynasty was a Chinese dynasty. The second model is the Empire model. Most Western scholars consider that of the Qing an empire due to its geographical vastness, different ethnicities, religions, and diverse political and economic systems. The third model is the emerging “Altaic” school, where emphasis is placed on the Manchus’ Inner Asiatic roots: since the Qing emperor was seen as the universal ruler, the Tibetan lamas were conceived as his subject. It means that all the exchanges that occurred between Tibetan religious masters and the Qing emperor took place in the context of the Chinese Empire, between, in other words, superiors and subordinates. It not only symbolises the status of relationship between giver and receiver but is also seen as a political and economic system that existed through the exchange of gifts. These models are important as they explain the Qing’s relationship with Tibetans and other Inner Asian subjects.

For most Tibetan Buddhist historians, all these exchanges occurred within the concept of the *mchod yon* relationship and the devotees-students were those who gave or offered something unique and precious to their lamas. In the case of Thor god Don grub rgya mtsho’s sending a watch to the 6th Dalai Lama, it was clear that this gift was given as a part of teacher-student relationship. Thor god Don grub rgya mtsho was the student of the 5th Dalai Lama; at his master’s death, Thor god Don grub rgya mtsho sent these gifts from Xinjiang to the new reincarnation who had been found by the regent—he did so to show his respect to his reincarnated teacher and to maintain its previous relationship. Generally speaking, the use of the honorific terms in conversational language does not necessarily define the speaker’s status as a low one. In a display of humility, high-ranking people could in fact use the same honorific words to address inferiors. However, in the written language, in particular in Amdo, terms like *phul* are conventionally used to describe the offering of something by someone of low or equal status, be it in religious or political terms, to a high-ranking individual, in this case the 6th Dalai Lama. In light of that, the choice of naming these gift-offerings by Thor god Don grub rgya mtsho to his master’s reincarnation as *phul* is telling of the sort of bond that existed between these two figures.

Significantly, the idea of superior and subordinate violates the

principle at the base of a *mchod yon* relationship. The student does not offer things to the lamas to control and dominate him. Rather, it is the teacher who guides the student, to lead him or her to enlightenment or salvation. If the student's status, in this case an emperor, was higher than that of the master, then it violated the principle of the *mchod yon* relationship. Thus, when exploring the history of European watches and clocks in Tibet, we should pay attention to how these timepieces were exchanged between Tibetan lamas and the Qing emperors and what specific terms were used to describe them. In the context of *gnang* ("to give") and *phul* ("to offer"), these two words have the same meaning, namely offering something to someone, however they have completely different connotations when they involve the Qing emperor and Tibetan lamas. Thus, I would argue that such exchanges should not be reduced into a simple relationship between superior and subordinate. The *mchod yon* was both a religious relationship between a lama and a lay person and an economical one that symbolised the status of the bond between the giver and the receiver and assumed the aspect of a political system expressing itself through gift exchanges.

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