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JOURNAL OF JESUIT STUDIES 7 (2020) 204-220



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Jesuits and Western Clock in Japan's "Christian Century" (1549–c.1650)

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Abstract

This paper explores how the Jesuits in Japan's "Christian Century (1549–c.1650)" used Western mechanical clocks in missionary activities and how this new technology was received and transformed in the country. Sources show that it was a common practice for the missionaries to present clocks as unusual gifts to gain access to the ruling class. This policy eventually led to the production of mechanical clocks by local craftsmen by around 1600. Although Christianity was strictly prohibited after 1614, the technology survived and found its way into the secular world.

Keywords

Japan – Christian Century – mechanical clocks – Jesuit missionaries – Japanese clockmakers

1 Introduction

The Jesuit mission to Japan began in 1549, when Francis Xavier (1506–52) first arrived in the country. Despite the language barrier and cultural differences, Christian teachings were received with enthusiasm. Reliable estimates show that more than 760,000 people had been converted throughout Japan by the early seventeenth century.¹ This mission, however, ended in the harsh persecution begun in 1614. From that year on, the Tokugawa shogunate, the Japanese

1 Gonoï Takashi 五野井隆史, *Nihon Kirisutokyo Shi* 日本キリスト教史 [History of Christianity in Japan] (Tokyo: Yoshikawa Kobunkan, 1990), 12.

government of the time, banned the Christian religion. While the Society succeeded in establishing the grounds for the China mission in the same period, all their efforts to restart the Japan mission were in vain. By the middle of the seventeenth century, all the missionaries had been expelled from the country or had died. The rise and fall of the first Christian presence in Japan thus spanned the hundred years from 1549 to around 1650, which inspired a British historian Charles Boxer (1904–2000) to call it the "Christian century."²

From the viewpoint of the history of science and technology, what makes that century notable is the introduction into Japan of Western mechanical clocks by the Jesuits. It was common practice for missionaries to present clocks as unusual gifts to gain access to members of the ruling class. This aspect of the Jesuit mission has, however, received little attention, especially compared with the more famous case in China.³ The aims of this paper are first to give a general picture of the process and its development and second to discuss how this new technology was received and transformed in the secular world after the persecution. It was under the Jesuits' guidance that the domestic production of mechanical clocks began around 1601/2, and it is to this Jesuit foundation that we can trace the origins of the indigenous clock-making industry, which was well established by the end of the seventeenth century.

2 From Xavier to Valignano, 1549–c.1600

Francis Xavier (Fig. 1), the first Christian missionary to enter Japan, was also the first Jesuit who presented a Western clock to a dominant figure in politics. In April 1551, when he had an audience with Ouchi Yoshitaka 大内義隆 (1507–51), lord of Suo province (nowadays Yamaguchi prefecture), he brought exotic gifts, among which was a mechanical clock. Portuguese Jesuit Luís Frois (1532–97), who was active in Japan mission from 1563 until his death in 1597, describes the clock in his *History of Japan* as "hum relogio de horas de grande artificio" (an exquisitely made striking clock).⁴ Interestingly, a biography of Ouchi also remarks on this unusual gift, which seems to be the first appearance of such a

2 Charles Boxer, *The Christian Century in Japan 1549–1650* (Berkeley: University of California Press, 1951).

3 See Catherine Pagani, *Eastern Magnificence and European Ingenuity: Clocks of Late Imperial China* (Ann Arbor: University of Michigan Press, 2001); Tang Kaijian, *Setting off from Macau: Essays on Jesuit History during the Ming and Qing Dynasties* (Leiden: Brill, 2016), 257–81.

4 Luis Frois, *Historia de Japam*, ed. and annot. Joseph Wicki, 5 vols. (Lisbon: Biblioteca Nacional de Lisboa, 1976–1984), 1:39.



FIGURE 4.1 Portrait of Francis Xavier
SOURCE: KOBE CITY MUSEUM

device in Japanese sources: “Among the various gifts offered by the man from India was [a device that] showed the invariable length of day and night when ticking away twelve periods, ringing a bell that played tunes of five and twelve scale tones without needing to pluck the thirteen strings of a *koto* [lute].”⁵

Subsequent missionaries, who came one after another to Japan, also chose clocks as gifts to build relationships with those in power. Frois, for example, brought a clock with him to Kyoto in 1569, when he had an informal audience with Oda Nobunaga (織田信長, 1534–82), then the most powerful feudal lord in Japan, who was promoting the unification of the country. Wada Koremasa (和田惟正, d.1571), one of Nobunaga’s leading retainers and the lord of

5 *Ouchi Yoshitaka ki* 大内義隆記 [Biography of Ouchi Yoshitaka], in Hanawa Hokiichi 塙保己一, ed. *Gunsho ruiju* 群書類従 (published around 1779–1819), vol. 394, 7b.

Takatsuki castle (nowadays north Osaka), introduced Frois to Nobunaga. Being an ardent supporter of Christian missionaries,⁶ Wada suggested that Frois should bring a clock to the meeting, because Nobunaga was very anxious to see it.

[Wada] told the Father [Frois] to come with him [to meet Nobunaga] and to bring with him the small striking clock of exquisite mechanism that the priest had shown him before, for he had mentioned it to Nobunaga, and he very much wished to see it. They [Frois and Japanese Brother Lorenzo] went and found him [Nobunaga] with only a few gentlemen in attendance. He saw the clock with great admiration and said to the priest, who offered several times to send it to him as a gift: "I do wish very much to have it. However, I do not want it because it would be wasted on me" [which he said] because he felt it would be difficult to adjust it. [...] He would then spend two hours asking the Father and Brother Lorenzo about Europe and India, while the Lord Wada, stayed outside on a veranda on his knees, helping with everything he could.⁷

Wada was also acquainted with Ashikaga Yoshiaki (足利義昭, 1537–97), who had just re-established the Muromachi shogunate as its fifteenth shogun with the support of Nobunaga. Again, it was a clock which Wada chose in order to make the audience take place. Frois says:

Since Lord Wada was a wise man and a close friend of the Father, he considered it very important that the Shogun sees him [the Father] [...] It soon occurred to him the remedy that could resolve this situation [that the Priest was not in the Shogun's good graces]. Then he told the Father to send someone very quickly to the house to bring the small striking clock. Since it is a very rare and beautiful item, he would certainly call the Father to adjust it in front of him, which would gain him admittance. When that clock was brought to the Shogun, he called the priest at once and was very pleased to see it, and called his uncle Lord Koga [久我晴通 Koga Harumichi, 1519–75], one of the highest court nobles of the Inner Palace, as well as many nobles to show it to them. [The Shogun] called the Father to him and asked many questions about the particularities of the clock. Once Lord Koga said that the one he saw in Bungo was much better and it struck time day and night even though nobody touched it,

6 Frois, *Historia de Japam*, 2:262.

7 Frois, *Historia de Japam*, 2:276–77.

[the Shogun] was much surprised and ordered it to be brought so that he could see it. There were about seventy people of noble rank present.⁸

Wada tried to use a clock to make many other people to visit the Jesuit church. For Wada, the clock was a pretext for leading the Japanese to the church, and not only did he encourage them to listen to the preaching by the priest, but even repeated the important points in the sermon to them. As for the event that happened in 1571, Frois reports as follows:

When the noblemen and the great lords from different kingdoms [i.e. fiefs], who came to Kyoto when Nobunaga was there, visiting the Lord [Wada] because they were friends or acquaintances of his, he persuaded them to go to church on the pretext that he would like to show them a small striking clock that we possessed there, and which was a novelty for the Japanese. Informing us in advance, he accompanied them and encouraged them to hear the sermons. After [Japanese] Brother Lorenzo had preached to them, Lord Wada repeated the most essential points, praising with many words the perfection of God's law, the zeal of the Fathers and the great discrepancy that existed between Christians and gentiles.⁹

Wada's behavior here seems to be closer to that of a Christian missionary than one of their followers. Nevertheless, he himself never was baptized and remained a follower of the Zen sect until his death. Whatever the reason for this was, these sources tell us that the diplomatic use of the clock in the Japan mission had already been established at least by around 1570. Furthermore, they also show that the background to this strategy was not only the initiative of missionaries but also the important role played by Japanese collaborators like Wada.

In 1580, when Visitor Alessandro Valignano (1539–1606) (Fig. 2), who was in charge of the Jesuit mission in the whole East Indies, had a plan to visit Kyoto to have an audience with Nobunaga, it was again a clock that came to his mind as a special gift. That clock, which was originally presented by Teotónio of Braganza (1530–1602), the archbishop of Évora, Portugal, was very big and gorgeous. In his letter to the archbishop, dated August 25, 1581, he wrote:

We have received the clock and the large breviary that Your Lordship [Teotónio of Braganza] gave to us. Because the clock is such a large object

⁸ Frois, *Historia de Japam*, 2:295–96.

⁹ Frois, *Historia de Japam*, 2:344.



FIGURE 4.2 Portrait of Alessandro Valignano
SOURCE: STADTMUSEUM INGOLSTADT

and since Your Lordship gives me the freedom to present it to whom it will be best [used], I will bring it to Kyoto and I might present it to Nobunaga, his son, or another great lord.¹⁰

It is unclear if that clock was presented to Nobunaga, but there is no doubt he was pleased with another clock as well as other novelty items from Europe when he happened to visit the Jesuit residence in his own domain, Azuchi, nowadays the Shiga prefecture. The Annual Report of 1581 stated:

10 *Cartas que os Padres e Irmãos da Companhia de Iesus escreverão dos Reynos de Iapão [...] des do anno de 1549 até o de 1580*, 2 vols. (Evora: Manoel de Lyra, 1598); facsimile published by Tenri Central Library (Tenri: Tenri Central Library, 1972), 1:fol. 478^v.

One day Nobunaga suddenly visited our residence and he came upon the Fathers before they knew of his arrival. [...] Nobunaga kept his attendants on the lower floor of the residence and went up to the top floor, and spoke to the Fathers and the Brothers with great affection and familiarity, and went to see the clock, and also saw a clavier and a viola that we had in the house, and he had someone play both, listening to them with pleasure. [...] (then) he went to see the bell and the other curious things that the Fathers have in that house. Those items are extremely necessary in order to attract the gentiles. For they are very curious, they flock to see them and, as we experience every day, this serves as a lure to make them familiar with us and listen to our sermon.¹¹

Nobunaga was very happy to give permission for the Society to build the first Christian seminary in the same city in 1580. In fact, he had been very friendly to, and never against, Christianity throughout his life, until his death in 1582. No matter how much clocks contributed to this result, there is no doubt that the Jesuits recognized it as a useful tool to entertain influential people and, by creating a friendly atmosphere, to make them listen to Christian preaching.

It should be pointed out here that in this same period, the Society began missionary activities in mainland China, and, from its very beginning, the missionaries used mechanical clocks as a tool for propagation. For example, Michele Ruggieri (羅明堅, 1543–1607) was the first to succeed in getting permission to settle in mainland China by presenting a clock to the governor general Chen Rui 陳瑞 (*fl.* sixteenth century) at Zhaoqing 肇慶 in December 1582, although that permission was immediately withdrawn. Matteo Ricci (利瑪竇, 1552–1610) brought that clock from Goa to Macau in August of the same year and while in Goa, frequently visited a craftworker to learn about clocks. In 1583, Ricci, in order to obtain permission to settle in China again, brought a clock-maker from Macao to Zhaoqing with him and let him make a clock for Wang Pan 王泮 (*fl.* sixteenth century), the governor of the city.¹² Did these attempts by the two pioneers of the China mission to make use of Western clocks, have anything to do with the early cases in Japan as described above?

When we think of this possibility, we should first note that the mission in China in this early stage was not separate from the Japan mission but rather a part of the activities of the vice-province of Japan, the administrative mission unit of the Society. It was not until 1619 that the China mission was formally

11 *Cartas que os Padres e Irmãos da Companhia de Jesus*, 2: fols. 40^v–41^r.

12 See Pagani, *Eastern Magnificence and European Ingenuity*, chap. 1; Tang, *Setting off from Macau*, 258–60.

separated to become an independent vice-province.¹³ More importantly, Jesuit activities in both countries during this period had two critical points in common: Valignano as the common leader and Macao as the common base. It was Valignano who summoned both Ruggieri and Ricci to Macao to prepare to enter China. We should not forget that they needed to respect Valignano's judgment, including to whom they should present clock as a special gift. Macao was the meeting point of the missionaries who were traveling from and to both countries where they could exchange information and experiences with each other. Ruggieri, Ricci, and Valignano stayed together in Macao from August to December 1582. Valignano stayed in Japan for a long time before he came back to Macao. He was not only acquainted with the diplomatic use of clocks in Japan, but also in 1580 he brought with him that magnificent large clock to present to Nobunaga or any other powerful lord. Lastly, according to the letter of Francesco Pasio (1554–1612) who visited Governor General Chen of Zhaoqing with Ruggieri, it was Valignano who made the decision to present a clock to Governor General Chen "not to miss this chance but to try our luck,"¹⁴ which eventually led to the first permission to stay in Mainland China.

Taking these factors into account, we can safely assume that the introduction of "clock diplomacy," as one historian has called it,¹⁵ into the China mission was promoted by Valignano, who was very familiar with thirty years of Jesuit experience in Japan. Thus, the Japan mission was the source of this strategy in China that later saw great success at the hands of Ricci.

Valignano also presented a clock to Toyotomi Hideyoshi (豊臣秀吉, 1537–98) who, as a successor to Nobunaga, unified the whole of Japan. In 1591, during his second visit in Japan, Valignano had an audience with Hideyoshi, together with the four young Japanese delegates who had been sent to Rome as the Tensho embassy and had just returned to Japan. It might have been the clock that the archbishop of Évora once gave him or one of the four clocks that the embassy was given by Guglielmo Gonzaga (1538–87), duke of Mantua, and his son.¹⁶ Although we have no detailed record on how Hideyoshi responded to

13 Liam Brockey, *Journey to the East: The Jesuit Mission to China, 1579–1724* (Cambridge, MA: Harvard University Press, 2008), 73.

14 Letter of Francesco Pasio, dated December 15, 1582 (Archivum Romanum Societatis Jesu [ARSI]), *Jap. Sin.* 9I, 112–13^v), as quoted in Hirakawa Sukehiro 平川祐弘, *Matteo Ricci Den マッテオ・リッチ伝* [Biography of Matteo Ricci], vol. 1 (Tokyo: Heibonsha, 1969), 57.

15 Tang, *Setting off from Macau*, 257.

16 Luis Frois in Henri Bernard, João de Amaral Abranches Pinto, and Okamoto Yoshitomo, eds., *KyushuSanko Ken'o Shisetsu Koki* 九州三候遣欧使節行記, 2 vols. (Tokyo: Toyodo, 1942–49), 1:558 and 2:177n5 and 177n8.

this novel gift, it is not hard to imagine that he was very much pleased with it, because the day after the audience (March 3, 1591), he summoned “[Brother João ‘Tçuzu’ Rodrigues (1561?–1633)] and [Ito] Mancio [a member of the embassy], so they could teach him how to adjust the clock that was presented by the Visitor.”¹⁷

3 From Domestic Production to Persecution, 1601–c.1650

Around the turn of the seventeenth century, the domestic production of mechanical clock in Japan began in the workshop or training school attached to the Jesuit seminary in the Kyushu district, western Japan. According to the annual report of 1601/2, it was initially based on the guidance of an Italian Jesuit Giovanni Nicolao (or Cola, 1560–1626), and by that time Japanese trainees in Nagasaki could earn their own income by producing one themselves:

And by the industry of the said Father [Giovanni Nicolao] there have been made many organs and musical instruments for the main churches, and many mechanical clocks, of which some are extremely curious, showing the motions of the sun and moon [...] and which are much admired by the Japanese [...] and some of the Japanese craftsmen [that he has trained] now make them so well, that they gain their bread by this work, and thus free us from many demands.¹⁸

It is still unclear where Nicolao learned clock making as he was primarily known for the Western style of painting.¹⁹ Since he traveled from Goa, via Macao, to Japan with Pasio,²⁰ who presented a clock to Governor General Chen with Ruggieri, he must have been told of the effect the clock produced in mainland China.

In a different report from the year 1601, we learn that an eye-catching clock was installed in the Jesuit residence of Arima, located in the southeast section

17 Frois, *Historia de Japam*, 5:317.

18 Fernão Guerreiro and Artur Vegas, eds., *Relação anual das coisas que fizeram os Padres da Companhia de Jesus nas suas missões do Japao, China...*, new ed., 3 vols. (Coimbra: Impr. da Universidade, 1930–42; first published 1600–9), 2:73.

19 For a biography of Giovanni Nicolao, see Reinier Hesslink, *The Dream of Christian Nagasaki: World Trade and the Clash of Cultures, 1560–1640* (Jefferson: MacFarland & Company, 2016), 117–22.

20 Hesslink, *Dream of Christian Nagasaki*, 117–18.

of the present Nagasaki prefecture, where Nicolao was teaching painting before he moved to Nagasaki: "There is an iron clock, the steady rotation of whose wheels shows the hours to the sight of men, by which the Japanese are greatly delighted. When Daifu-sama [Tokugawa Ieyasu 徳川家康, 1543–1616] saw it, he feasted his eyes on it with so much pleasure that he was quite insatiable."²¹

Also, the 1603 annual report notes that a giant clock with astronomical display was set up in the Assumption of Mary Church (the so-called "Church of the Cape") of Nagasaki, which was built around that year and was called "the foremost cathedral of Japan." The clock was so magnificent that it greatly entertained the people who saw it.

In addition to the three bells, the tower [of the "Church of the Cape"] was furnished with a big and beautifully crafted clock. Inscribed with Roman and Japanese letters, the clock not only tells the time but also shows the daily path of the sun and the waxing and waning of the moon, which is something new for the Japanese, so looking at this clock of elaborate construction is a great pleasure for them and they are amazed by the exquisiteness of European devices.²²

The fact that the descriptions of several clocks that attracted people's attention appear in the Jesuit sources around that time strongly suggests that clock-making in Kyushu district under the guidance of Giovanni Nicolao had got on the right track so that they could produce such elaborate and eye-catching clocks by their own hands. It seems around this time when Western mechanical clocks, which up to then had only been used to please those in power, began to be exposed to a wider public and became well-known to ordinary people by being showcased in such places as churches.

The Jesuits presented a clock with an astronomical display to Tokugawa Ieyasu, the first shogun of the Edo shogunate, who was referred to as "Daifu-sama" in the above passage. As a present from Pasio, then the vice-provincial of Japan, it was brought to Kyoto by João Rodrigues and was installed in Fushimi 伏見 castle, south of Kyoto, in 1606.

[Rodrigues] brought as a gift from the vice-provincial [Pasio] a striking clock, which Kubo [Ieyasu] had much desired, in order to set it on one of the towers of his castle at Fushimi. It also showed the movement of the

21 John Hay, *De rebus Iaponicis, Indicis, et pervanis epistolae recentiores* (Antwerp: Officina Martini Nutij, 1605), 614.

22 ARSI, *Jap. Sin.* 54, fol. 179^v.

sun and the moon and the days [of the moon]. Kubo was so much satisfied with this visit of the Father, as well as the clock and other gifts that he brought, with things he liked, that he received him warmly, and increasingly calmed his bad feelings towards us, which had been aroused by the appeals from Buddhist monks, [Toyotomi] Hideyori's [豊臣秀頼, 1593–1615] mother, and other enemies.²³

The next year in Edo, Pasio and Rodrigues had an audience with Tokugawa Hidetada (徳川秀忠, 1579–1632), the son of Ieyasu and the second shogun of the Tokugawa shogunate, and this time they presented “a striking clock, which we had made for him in the city of Nagasaki.”²⁴ They were asked to set it up in a tower of Edo castle, and for that purpose a Japanese brother Paul who was present at that time was ordered to stay in Edo for several days.

From 1614 on, however, the Tokugawa shogunate banned the Christian religion. Since the missionaries were forced to accept expulsion from Japan to Macao or Manila, or go into hiding, it became practically impossible to use the clocks for missionary work. Neither could they continue their policy of keeping up their relationships with those in power by maintaining a clock after presenting it—the same method that Matteo Ricci had used in China.²⁵

A case illustrating the changed circumstances appears in the report of persecution by a Spanish Jesuit Pedro Morejon (1563–1639). In Kyoto around 1619, Hidetada ordered Itakura Katsushige (板倉勝重, 1545–1624), then the shogun's deputy in the Kyoto region, to repair a fine clock that was once presented by missionaries. Itakura suggested that he might order a Christian who was in jail to do the job, in the hope that he might be able to let the poor sufferer out of prison, but the shogun's reaction was something he had not expected:

It is said that the shogun [Hidetada] has now returned from Osaka to Kyoto and ordered Lord Itakura, Governor of the city, to have a fine clock repaired, which was previously presented by the Fathers. The Governor, a pious man answered, in the hope that he may be able to release Christians from prison, that there was no one who knew about clocks other than someone who, with others, had been imprisoned as a Christian. Upon this reply the shogun got furious and demanded to know how it was possible that there could still be Christians in the city, despite so

23 Guerreiro and Vegas, *Relação anual das coisas*, 3:119.

24 Guerreiro and Vegas, *Relação anual das coisas*, 3:134.

25 Tang, *Setting off from Macau*, 263–64.

many laws, and the strictness of himself and his father. As soon as he knew it, he commanded that they should all be burned alive.²⁶

Unfortunately, no clocks known to be of Jesuit manufacture are still extant, but we have two clocks that Ieyasu once possessed: one is a Flemish clock presented in 1611 by the Spanish king²⁷ and the other is an automaton clock, in the shape of a bear, which is said to have been presented at the same time. The latter's striking mechanism is connected with the movements of several parts of a bear model: it moves its lips and the eyes moves up and down while the bell is ringing.²⁸ In addition, a list of Ieyasu's belongings includes seven clocks, among which at least two might have been mechanical clocks.²⁹ In 1612, he also sent a clock to his son Hidetada in order to celebrate that the news that the stone wall of Edo Castle had been half completed:

The 4th day [of the 6th month in the 17th year of Keicho era (1612)]. Naruse Bungo no kami Masatake [成瀬正武, 1585–1616] arrived at Sumpu castle 駿府城 [where Ieyasu lived] with a message that the stone wall of Edo castle was half completed. He sent a self-ringing bell 自鳴鐘 without weights to Edo.³⁰

Since it clearly says here that the clock has "without weights," it must have not been weight-driven but spring-driven, as was the case with a Flemish clock above.

There is an interesting report in *True Record of Taitokuinden (Hidetada)* that shows how the second shogun based his daily life on the time told by the clock.

26 Pedro Morejon, *Historia y relación de lo sucedido en los reinos de Iapon y China, en la qual se continua la gran persecución que ha avido en aquella Iglesia, desde el ano de 615, hasta el de 19* (Lisbon: por Juan Rodríguez, 1621), fols. 137^v–138^r. The author wishes to acknowledge his gratitude to Mr. Shin Akune in drawing attention to this material.

27 Johan ten Hoeve and David Thompson, "A Flemish Clock at the Shogun's Shrine," *Antiquarian horology* 35 (2014), 1063–76.

28 Tokugawa Bijutsukan 徳川美術館 ed., *Ieyasuno Isan: Sunpu Owakemono 家康の遺産-駿府御分物* (Tokyo: Tokugawa Hakubutsukan 徳川博物館, 1992), 111; Hirai Sumio 平井澄夫, *Tokei no Hanashi 時計のはなし* (Tokyo: Hirai Tokeiten ひらい時計店, 2001), 125–28.

29 Hirai, *Tokei no Hanashi*, 123.

30 *Taitokuinden Gojikki 台徳院殿御実紀* [True record of Taitokuinden (Tokugawa Hidetada)], vol. 19 in Keizai Zasshisha 経済雑誌社, ed. *Zoku Kokushi Taikei 続国史大系* (Tokyo: Keizai Zasshisha 経済雑誌社, 1902–4), 9:567.

According to this record, he was so strict in following the clock tells that his attendants needed to find their own way to cope with it.

It was notified that he [Hidetada] would go to falconry at six o'clock [in the morning] of the next day. [The self-ringing bell] struck six o'clock in the middle of his meal, so he threw his chopsticks away and set out immediately. Since he was so punctual, once while he was having a meal and it was already past the time set, [the attendants] deliberately stopped the clock from ringing and waited to serve him. When Ii Kamon no kami Naotaka [井伊掃部頭直孝, 1590–1659] heard this, he blamed the attendants and admonished them greatly as follows: You still do not know how attendants should behave. His Highness has laid down the rules in all respects according to the right way. If the attendants do not serve with sincerity, the rules will never be accomplished. You are truly wrong to think that it is good to deceive the monarch [...]. You must refrain from it hereafter.³¹

Although it is a literary jotting of later period, we see in Kanzawa Toko's 神沢杜口 *Old man grass* (翁草 *Okinagusa*, compiled in 1791) that there were many clocks installed in Edo Castle in the Hidetada era. According to Kanzawa, since these clocks in different places in the castle did not all tell the same time, Hidetada issued an order that one of them should be chosen to tell the time with a drum.

There are several clocks in Edo castle. Since they are slightly different from one another according to their mechanisms, the [clocks] in different places tell different times. Therefore, Taitokuin-sama [Hidetada] commanded that they should choose only one clock, according to which the drum must be beaten, to announce the time and it was so done.³²

When we think of the fact that he was a very punctual shogun, this is a believable episode.

Tokugawa Iemitsu (徳川家光, 1604–51), the third shogun, was also presented with Western clocks, but these no longer came from the Portuguese *Padroado*, but from the Dutch merchants who took over the hegemony of the Japan

31 *Taitokuinden Gojikki*, vol. 19 in Keizai Zasshisha, *Zoku Kokushi Taikei*, 9:1008.

32 Kanzawa Toko 神沢杜口 [original author] and Nihon Zuihitsu Taisei Henshubu 日本随筆大成編輯部 ed. *Okinagusa* 翁草 (Tokyo: Yoshikawa Kobunkan, 1978), 3:260–61.

trade after 1641. According to VOC archives, they presented several mechanical clocks from 1644 to 1651: a "portable self-ringing bell" in 1644, "clocks" in 1647; "a portable self-ringing bell in gold" in 1651.³³

4 The Establishment of Clock-Making Industry in Seventeenth-Century Japan

Historians of horology in Japan agree that Jesuit clock-making led to the manufacture of *wadokei* (和時計 Japanese clocks), a mechanical clock that displays the traditional Japanese time system, that is, the varying-hour-lengths according to the seasons.³⁴ A recent study suggests that it was in 1623 that the first *wadokei* was made, when a Confucian scholar Fukada Shoshitsu (深田正室, ?–1663) commissioned the first Tsuda Sukezaemon 津田助左衛門, a craftsman in Edo, to present it to Tokugawa Yoshinao (徳川義直, 1600–50), the lord of Owari, nowadays the western half of Aichi prefecture.³⁵

So far, we know of no evidence from that period that proves Fukada or Tsuda had something to do with Jesuits or Christianity. But it is clear that the Japanese clockmakers, who were originally trained by the Society of Jesus, continued to show off their skills to fulfill a strong demand in society for such novelty items, and it is highly conceivable that Fukada or Tsuda learned the technology from them.

One document tells of at least one ex-Christian clockmaker survived the persecution. This document is a record of the inquisition for suppressing

33 As quoted in Hirai, *Tokei no Hanashi*, 124. See also Cynthia Viallé and Leonard Blussé, eds., *The Deshima Dagregisters: Volume XI 1641–1650* (Leiden: Universiteit Leiden, 2001), 262.

34 See, for example, Yamaguchi Ryuji 山口隆二, *Nihon No Tokei: Tokugawa Jidai No Wadokei No Kenkyu* 日本の時計：徳川時代の和時計の研究 [Japanese clocks: researches on "wadokei" of the Tokugawa period] (Tokyo: Nihon Hyoronsha 日本評論社, 1942; repr. 1950), 11–17; Kawamoto Nobuo 河本信雄, "Nihon De No Kikaidokei Seisaku Kaishi Jiki No Kosatsu 日本での機械時計製作開始時期の考察 [an examination of the beginning of the manufacture of mechanical clocks in Japan]," *Wadokei* 和時計 47 (2015): 1–2.

35 Although some source indicates that the first Tsuda Sukezaemon repaired a clock for Tokugawa Ieyasu around the year 1598, Kawamoto argues against this. See Kawamoto, "Nihon De No Kikaidokei Seisaku," 13–14. See also Christopher Cullen and Hiraoka Ryuji, "The Geneva Sphere: An Astronomical Model from 17th-Century Japan," *Technology and Culture* 60 (2019): 219–51, esp. 236.

Christianity in Uji 宇治, near Kyoto, in 1659.³⁶ According to it, a certain Tokei Seizaemon とけい清左衛門 (literally “the Clock[-maker] Seizaemon”), a man of Uji, became a pupil in a “clock smith workshop とけいかち所” in 1607. Since his master was a Christian, Seizaemon also became a Christian. After leaving the master, he returned to the Jodo sect 浄土宗 of Buddhism to which his parents once belonged, but due to the suspicion of his being a Christian, he was sent to prison in 1645 and was finally released in 1654.

It is noteworthy that in 1607, when he became a pupil of his Christian master—it was in the same period that Rodrigues set up a clock for Ieyasu in Fushimi castle in south Kyoto—there already existed a “clock smith workshop” somewhere near Kyoto. Since he was called “the Clock[-maker]” until his later years, he must have continued to work in the industry, even after leaving his Christian master and the religion itself.

The clock industry in Kyoto was already well-established at the end of the seventeenth century. *Jinrin kinmo zui* 人倫訓蒙図彙 (An illustrated explanation of social roles), a book of trades published in 1690, includes the names and addresses of several clockmakers in that city. One of the figures in this book shows a “clockmaker” (tokei-shi 時計師), sharpening the teeth of gear wheels (Fig. 3). Behind him we see two “turret clocks” (yagura dokei 櫓時計) of typical *wadokei* style: the clock to the left, right under its bell dome, shows the balance arm of a verge and foliot escapement of the type introduced by the Jesuits.

Indeed, a turret clock that Hirayama Musashi 平山武蔵, one of the clockmakers who appear in *Jinrin kinmo zui*, had made in late seventeenth century, is equipped with an astronomical display which can show the position of the sun and the phases of the moon (Fig. 4).³⁷ This inevitably reminds us of the fact that several clocks that were made in Nagasaki under the Society’s guidance were also equipped with a similar mechanism, indicating that the tradition was continued in the newly established indigenous industry.

36 As quoted in Yamaguchi Ryuji, “Tsuda Sukezaemon: Nihon Tokeishi Noto Yori (II) 津田助左衛門：日本時計史ノ一トより (II),” *Kokusai Tokei Tsushin* 国際時計通信 3 (1962): 111–12, esp. 111. According to Yamaguchi, this document was offered to him by Shinmura Izuru 新村出, a professor of Kyoto University, but the present location of the original document is unknown.

37 Sasaki Katsuhiko 佐々木勝浩 and Kondo Katsuyuki 近藤勝之, “Hirayama Musashi Saku Tenmon Hyoji Itcho Tenpu Yaguradokei 平山武蔵作天文表示一挺天符櫓時計 [the single foliot [foliot] lantern clock with astronomical display made by Musashi Hirayama],” *Bulletin of the National Museum of Nature and Science: Series E, Physical Sciences & Engineering* 38, no. 22 (2015): 9–22.



FIGURE 4.3
Seventeenth-century Japanese clock-
maker at work (*Jinrin kinmo zui* 5, 5b)
SOURCE: NATIONAL DIET LIBRARY,
JAPAN



FIGURE 4.4 Turret clock by Hirayama Musashi and the astronomical display on its dial,
late seventeenth century
SOURCE: SASAKI AND KONDO "HIRAYAMA MUSASHI SAKU," 10 AND 16

5 Concluding Remarks

In this essay, I have first explored how Western mechanical clocks were used by the Jesuits during Japan's "Christian century." From the very beginning of the century, the missionaries presented clocks as unusual gifts to gain access to the ruling class of the time. This strategy was elaborated into a systematic policy which may be called "clock diplomacy" from at least around 1570. Behind this strategy was not only the initiative of missionaries but also the important role played by Japanese collaborators. It should be noted that the introduction of the same policy into the China mission was pursued by Valignano, who was familiar with thirty years of Jesuit experience in Japan, and, by means of this method, missionaries to China actually succeeded in establishing the necessary conditions for their activities in the country.

The beginning of domestic production, which had been established at least by around 1601/2, should be understood as an inevitable consequence of such diplomatic practices over the years. The clocks produced found their places not only in the private quarters of the political authorities, but also in the towers of castles and churches, where they were seen by a wider public.

The 1614 interdiction of Christianity by the Tokugawa shogunate made it impossible for the missionaries to continue to produce clocks and related instruments. It is clear, however, that their Japanese trainees continued to demonstrate their skills to a wider society that wanted their products, leading to the birth of such unique tradition of ingenious clocks called *wadokei*, as represented by the work of Hirayama Musashi.

Acknowledgement

I wish to acknowledge my deep gratitude to Dr. Christopher Cullen for his support and valuable comments to the earlier draft of this article. I am also grateful to Daniel Said Monteiro for reviewing my translations of Portuguese texts. This work was partially supported by JSPS KAKENHI Grant Numbers JP17K01179, JP17H02392, JP18H00641.