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We take for granted that our twenty-four-hour days are made up of twenty-four hours of equal length, but it was not always so everywhere. In Edo-period Japan, there was a different way of telling the time, which necessitated the development of a timekeeper that could count according to entirely different rules – the wadokei



It is not often that the very beginning of historical eras can be pinpointed, but the period known to historians of Japan as the “Christian Century” began on Monday, August 15, 1549, with the arrival of the Jesuit priest Francisco Xavier in the Japanese port of Kagoshima, southern Kyushu.

As well as the word of God, he brought with him a great European invention. Among the gifts that Xavier presented to the local lord was that technological marvel of Renaissance Europe, the mechanical clock. Despite it being an alien object from a faraway culture, the clock so entranced Yoshitaka Ouchi, the lord of Suo Province (today’s Yamaguchi prefecture), that he rewarded Xavier with a disused Buddhist monastery in which to practice his religion and make converts. The teachings of Christ and clockmaking had taken root in Japan. More Christian priests followed, and in around 1600 a school was established by missionaries in Nagasaki that taught, among other things, clockmaking.

But the term “Christian Century” can be misleading inasmuch as it suggests too long an amount of time. In 1603, even as the first watchmakers were graduating from the Nagasaki school, a powerful shogun came to power in the castle town of Edo (which grew into the city now called Tokyo), initiating a period of feudalism named after the town and also called the Tokugawa shogunate. Warring states made peace and submitted to Tokugawa. Foreign influences were rejected, and by 1639 the 90-year-old Christian Century was pretty much over. The Sakoku (closed country) period had begun.

The Tokugawa shogunate had seen what Europe had to offer and on the whole it was not interested, but a passion for timepiece-making had been ignited. One of the few elements of European culture to take hold, indeed flourish, in Edo-period Japan was clockmaking, and it would take an evolutionary path that diverged from the way it advanced in Europe, creating a fascinating

Page 5: some lantern wadokei were set on stands. This black-lacquered, pyramid-shaped one gives the clock an overall height of 4.6 ft. The stand has mother-of-pearl inlays in an inscription on the front and in motifs of birds and sprays of blossom on the sides. The c. 1700 clock has a single foliot balance, a fixed lacquered dial, a revolving hand, and an engraved silvered-brass case. Above: wadokei feature in these ukiyo-e prints. The title of the print on the left (*Hour of the Dragon from The Twelve Hours of Springtime Amusement*) is written on a cartouche in the shape of a clock on a stand like that on page 5. The right-hand print shows a single foliot balance wall clock

alternative horological culture adapted to an entirely different concept of time.

The clocks that European visitors had introduced adhered to the notion of fixed time being a conceptual framework by which life was ordered, but the Japanese way of understanding and reckoning time was less rigid. During Edo, the time in Japan was told according to the perceived rising and setting of the sun. As the tide of cultural nationalism swept over the archipelagic nation, a new type of mechanical timekeeper

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This lantern clock has a four-legged lacquered-wood stand that gives it a height of 2.7 ft, a fixed, lacquered dial, and an engraved brass case. The double foliot balance, seen under the bell, enables adjustments to the speed of counting time. Moving the weights in and out along the foliots shortens or lengthens each *koku* (as the sections of time were called). A double foliot balance was a useful advance on the earlier single version, as it did not need to be adjusted for the change between night and day. All of the wadokei shown on these pages are in the collection of the British Museum in London



was devised. The age of the wadokei had dawned, and this esoteric and uniquely Japanese timepiece would regulate daily life under the shogunate for the next 250 years.

The Edo day did not begin at a time set by a clock, say, midnight, but commenced whenever daylight began. Split between light and dark, the day and the night each comprised six periods of time known as *koku*, which varied in length with the seasonal changes of the duration of the natural day and night.

Japanese clockmakers devised a system whereby the regularity of Western clockwork could be adapted to reflect Edo timekeeping, with the days and nights of irregular length each broken into six equal parts that could be constantly adjusted in length. Thus, at the summer solstice, each of the six nocturnal *koku* would be at their shortest and diurnal at their longest, vice versa at the winter solstice. Using the foliot balance, the counting of time was either slowed down or sped up by moving the regulating weights at the end of the foliot's arm farther apart or closer together. As the length of nocturnal and diurnal *koku* varied

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slightly every day, the weights had to be moved twice daily.

As it did in Europe, clockmaking in Japan advanced with time, but it was according to entirely different needs. By the end of the seventeenth century the double foliot balance clock was developed. Capable of switching automatically between daytime and nighttime, it represented an enormous technological leap, reducing the number of human interventions required by the ever-shifting lengths of the *koku*.

When, in time, the foliot balance was superseded by pendulum and spring regulators, more reliable but more difficult to speed up or slow down as the seasons demanded, the simple and elegant expedient of a rail around the dial was introduced,

Above, left: this 11.5-in-high lantern wadokei is a striking clock with an alarm, chapter ring, and calendar aperture. Wadokei with a double foliot balance, as seen here, have regulating weights that can be slotted into numerous positions along the foliot arms to adjust the counting speed. Above, right: this dial, the face of an 8.9-in-tall brass mantel clock with a brass movement and strikework on six bells, includes a calendar aperture, a partly lacquered lunar dial, and a sexagenary cycle indication. The latter is a calendar system that counts

60 terms, each being a year, which was introduced in Japan from China in the sixth century and was in use until the Meiji period commenced in 1868. Originally the clock may have had an indication of the 24 seasons, or *sekki*, but this has been lost. Opposite: bearing the date 1692 on its base, this 14-in-high single foliot lantern clock is the oldest wadokei in the British Museum collection. Single foliot clocks needed adjusting twice a day, as the night *koku* were of a different length from those during the daytime



This small brass mantel clock (left), is only 4.25 in high in its rosewood case. It is a later wadokei clock, in which the foliot balance system has been replaced with a spring regulator, which was more reliable but harder to adjust. So to make fine corrections to koku of different lengths, the clock also has a rotating dial with movable numerals (see detail above) that can be moved either closer or farther apart as necessary. Opposite: this 7.25-in-tall double foliot mantel clock has a double calendar. The clock has a brass movement with time strike and alarm, and decorative engraved brass plates on the case and turned brass columns

aforementioned priest, Francisco Xavier. The age of great exploration had given way to the age of colonization, and, emerging from the Edo period, the country faced the shameful prospect of becoming a colony of one or other of the modern, industrially developed military powers, a prospect that could be avoided if Japan itself became a modern, industrially developed military power, too. To achieve that, Japan would need to adopt the time-reckoning system used by the rest of the world.

In 1872, the fifth year of the Meiji period, an imperial edict was issued, replacing the traditional Japanese calendar with the Western solar calendar and decreeing that the method of telling the time also needed to be aligned with the global, international standard, which would additionally “promote the enlightenment of the people.”

After more than two hundred years of self-imposed sequestration, Japan had begun a journey that would, within a century, see it become one of the most technically advanced and economically powerful nations on earth. But it would make that journey without the wadokei. ♦

THE WADOKEI SHOWN ON THESE PAGES WERE PHOTOGRAPHED WITH THE KIND PERMISSION OF THE BRITISH MUSEUM IN LONDON AND CAN BE VIEWED BY APPOINTMENT

along which the hour markers could be moved farther apart or closer together (as on the wadokei seen above).

There was also another difference from European timekeeping: the 12 koku were generally not numbered but named with the characters of the 12 terrestrial branches of the sexagenary cycle. The branches, by tradition, were also associated with the animals from the zodiac. There were just two fixed times, the hour around midday (associated with the horse) and that around midnight (the branch linked with the rat); the remaining koku bunched up or spread out around the dial as the length of daylight dictated. In a notable divergence from Western timekeeping, it was not the hour around dawn that was associated with the cock or rooster, but sunset, when the bird would be flying home.

By the middle of the nineteenth century, wadokei reached the peak of sophistication with a type of pillar clock that showed the time with an indicator that moved up and down a long dial that occupied the majority of the timepiece. It looked like a Western wall-mounted barometer. And then, on January 1, 1873, time ended...at least the way wadokei told it.

By the end of the 1860s, after almost a quarter of a millennium sequestered from the rest of the world, the shogunate was overthrown and the Meiji emperor restored. Although it spanned just a few decades (from 1868 until 1912), the Meiji period reversed the Edo's isolationist policies and took the whole country on a crash course of modernization. The world beyond Japan had changed greatly since the days of the

