



Replica of Man-nen Tokei, ©Toshiba Science Museum

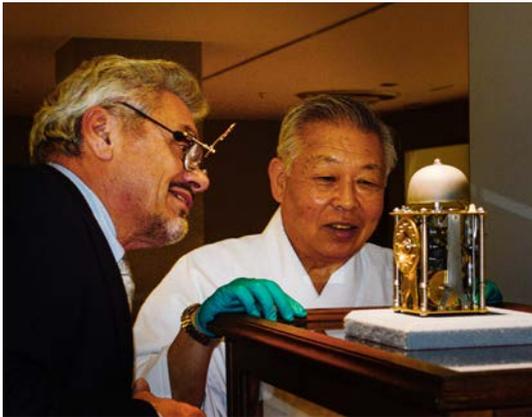
Time of the Tokugawa Period

Early Japanese clocks and the skills of the craftsmen who made them

Ashley Strachan, Great Britain

Time of the Tokugawa Period

Early Japanese clocks and the skills of the craftsmen who made them



The Author receiving a lecture from the Head Priest at Kunozan Toshogu Shrine
©Laurina Strachan

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Motivation I have always had a passion for clocks and watches, a subject that has fascinated me from my earliest childhood. Pursuing a career as a Precision Mechanical Design Engineer gave me the privilege of a life filled with intricate mechanisms. The pieces of my European clock and watch collection are generically similar, despite spanning 300 years, – all having traditional gear trains with dials numbered 1 to 12.

It was therefore of great delight, on my first visit to Japan in 2011, to discover a whole new world of clocks that had developed during the 250 years of the Tokugawa Period – generically unique from the rest of the world.

Objective Whilst most parts of the world from the early 15th Century onward adopted the 24 equal-hour day, Tokugawa Japan retained a measurement of time that had been in existence from 2500BCE. Japanese metalworking craftsmen developed unique and ingenious clock mechanisms which are today termed *wadokei*. The display of time is based on temporal hours – six hours of day and six hours of night – varying in length throughout the year.

Discovering, researching and collecting these time pieces has opened up a wealth of interesting places to visit and people to meet on subsequent visits to Japan. An avenue of horology not found anywhere else in the world.

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Context Wadokei provide their own story, however, the skills of the craftsmen who made them tell an equally unique story. The Tokugawa Shogunate did not support developments in mechanical engineering as it was considered an unnecessary European influence, conflicting with the free spirit of the arts. Amongst entertainers and merchants, engineers were in the lower classes of society. Japanese engineering progressed mainly through the efforts of individuals. In contrast, European nations competed at the highest level of government with new engineering developments. As a result, there was extensive European advancements in railways, ship-building, textiles, printing, mining machinery and the like. In contrast, the Japanese craftsmen showed phenomenal craftsmanship, applying months of skill, tranquility, and patience to the making of wadokei.

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Makura Dokei or pillow-clock, evoking a traditional Geisha pillow, with fixed hand and rotating dial

©Laurina Strachan

Additional features of wadokei include:

A multitude of unusual dials – revolving, linear as well as movable hour markers. Similarly, hands might be stationary, linear, or radially moving. The numbering and striking of the 12 hours of the day follows an unusual pattern; starting with 9 for midnight, counting down to 4 before reaching noon, again identified with 9. Dawn and dusk are marked by 6 respectively. The origins of counting down and not up are unknown but may be aligned to various ancient methods of measuring time with water, sand, candles, and incense, all of which were diminishing with the progression of time. Hours are indicated also by the 12 signs of the Chinese zodiac. Midnight for example is referred to as *the Hour of the Rat* and noon as *the Hour of the Horse*.

My admiration for wadokei followed a brief introduction on my first holiday to Japan. It has subsequently grown after extensive home-based research plus three further holidays to Japan. As well as visiting some exceptional Japanese museums and collections, my interest in wadokei has led to my wife and myself meeting many Japanese people with a shared interest. We have experienced formal and informal guided tours, outings, house visits, meals in Japanese homes and restaurants, and generally meetings with fellow enthusiasts and scholars. I thank them all for supporting and sharing my passion.

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Early Japanese clocks and the skills of the craftsmen who made them



Kake Dokei with fixed hand, rotating dial, and adjustable hour-markers
 ©Laurina Strachan

Throughout the last millennium, the mechanical clock more than any other device has arguably demonstrated human's continual quest for technological development. Whereas the last two centuries have seen a phenomenal growth in many other technologies, the mechanical clock with its power source and escapement has retained the same fundamental principles. Despite the abundance of clockmakers around the world all striving for improvements, there have been relatively few breakthroughs in technology.

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The popular mechanical clock of today, whilst undoubtedly embedding many improvements, has varied little over the last two centuries. In particular, while the outer cases for these clocks might have varied considerably, the dials have in the main remained unchanged. Virtually all had a 12 hour dial and an hour hand. Later the minute hand appeared and subsequently a second hand, followed by date and moon phase indication.

The most significant period of the clock's development was from the early 1500's, coincidentally around the same time the Spanish and Portuguese sailors started exploring the world. These sailors, along with missionaries and traders, often brought gifts. The first European clock reached Japan in 1549. This clock does not survive, however, a gift to Tokugawa Ieyasu in 1611 can be found at the Kunozan Toshogu Shrine – an ideal starting point for exploring wadokei.



Kunozan Toshogu Shrine
 ©Laurina Strachan

Kunozan Toshogu Shrine, Shizuoka

The shrine sits atop Mount Kuno, overlooking Suruga Bay. It was originally reached by a stone stairway of 1159 steps, an approach still used today by priests, staff, and pilgrims. However, today it can also be approached by car or taxi and then a ropeway cable car on an adjacent hill, where a short descent takes the traveler to within 100 steps of the shrine. This approach provides greater access as well as stunning views from the cable car.

The museum displays many exhibits of Tokugawa Ieyasu's personal belongings. He was the first in the long line of Tokugawa Shogunates who ruled Japan for 265 years. Many of the artifacts are world heritage cultural objects that have never left the shrine since the days of Tokugawa.

Time of the Tokugawa Period

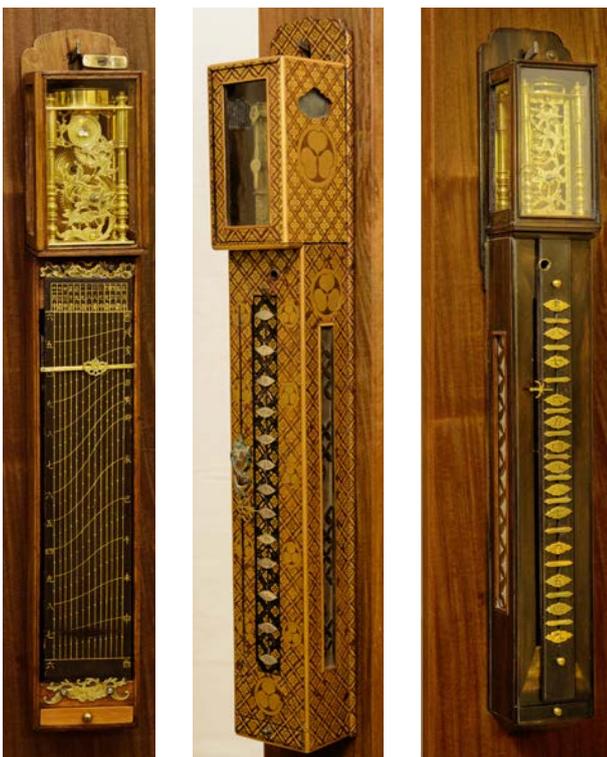
Early Japanese clocks and the skills of the craftsmen who made them



Table Clock
 ©Kunozan Toshogu

Although there is only one original clock in the museum, it is of immense importance. A Flemish clock of 1573, it is the oldest mechanical clock in Japan and is an example of the type of clock that Japanese craftsmen of the 1600's studied, adapted, and reproduced to create early wadokei. This clock was given in thanks to Tokugawa Ieyasu by Spanish survivors of a ship wrecked near the eastern Japan coast. Tokugawa had arranged for one of his ships to carry the Spanish home, as well as lending a substantial sum of money. Sitting alongside in a separate case, is a recent replica that allows visitors to take a closer look at the workings of this early clock.

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Various Types of Shaku Dokei
 ©Laurina Strachan

The main challenge for Japanese clockmakers was to accommodate the seasonal variations of day and night hours. Clocks of this time were regulated by an escapement; the speed of which was controlled by two weights on a pair of oscillating arms – *foliots*. Moving the weights inwards accelerated the oscillations, whilst moving them outward slowed the escapement down. Accordingly, the clock owner, usually a *daimyo*, would employ someone to change the position of the weights at dawn and dusk throughout the year.

The first significant development of wadokei was to fit two foliots – typically one slow running and the other fast running, as well as a mechanism that would switch between each at the *Hour of the Hare* – dawn – and the *Hour of the Cock* – dusk. This reduced the need for twice daily attendance of what was termed a *Tokei-shi* or clock doctor. Accordingly, except for simple daily winding, the wadokei only required a clock doctor every two weeks to adjust the weights to take account of the seasons. Both single and double foliot clocks continued to be made throughout the Tokugawa period, with double foliots dominating in the later period.

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Another unique development of Japanese wadokei, was the fundamental adoption of the fact that the weight which powers the clock falls vertically at a constant speed throughout the day. Accordingly, by fixing a hand to the weight and having the hours on a vertical scale, time can be indicated. In order to accommodate the varying seasonal hours, the hour markers could be adjusted on the vertical scale. These clocks were relatively small and narrow, approximately one *shaku* in height – an old Japanese measure of around 300mm. They were ideal for hanging on the structural pillar of Japanese rooms. Today they are known as *Shaku Dokei* or pillar-clocks.

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Over the 250 years of wadokei developments, it is evident that makers strived to reduce the need for interventions to make adjustments. No greater example of such a clock was that made by Tanaka Hisashige in 1851, which he termed the Myriad Year Clock – *Man-nen Tokei*, albeit in reality it would run continuously for just less than one year. This clock can be seen at the National Museum of Nature and Science.



©National Museum of Nature and Science

National Museum of Nature and Science, Ueno, Tokyo

For the most extensive selection of wadokei to view, there is no better place than the National Museum of Nature and Science. Here one will find an extremely amazing display and variety of wadokei. Each has a unique combination of clockmaking and artistic skills, floor or alcove standing pieces, pillar clocks, table clocks, *inro* and pocket watches, and one with a decorative hen on top of a drum clock.

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The original Man-nen Tokei
©National Museum of Nature and Science

The most interesting clock in the permanent collection is Tanaka Hisashige's Man-nen Tokei, deposited from Toshiba Corporation. This hexagonal table clock, also known as *Man-nen Jimeisho*, has six dials and a glass domed planetarium above. Made in 1851 the year-going clock is driven by two springs.

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Each of its six faces shows time in a different way:

Day of the month in the old Japanese Calendar together with current phase of moon

Western time – adapted from a French pocket watch

Japanese Temporal Time clock with six hours of day and six hours of night together with the 24 solar terms of the ancient Chinese lunisolar calendar
Old Japanese calendar of 24 seasons

Day of the week together with the number of respective chimes

Chinese sexagenary cycle, combining the 10 Heavenly Stems of the week and the second one of the twelve Earthly Branches of the year.



The six faces of the Mane-nen Tokei, ©Toshiba Science Museum

The clock consists of more than 1,000 parts and it is said that Tanaka Hisashige made all the parts by himself using simple tools such as files and saws – after building a metal turning lathe. It took more than three years for him to finish the assembly. The clock was listed in the Japanese Mechanical Engineering Heritage as item No. 22 in 2007. Tanaka went on to found one of the companies which would later become Toshiba.



The Author with Kamise Chiharu,
President of the NAWCC Tokyo chapters,
in the Daimyo Clock Museum
©Laurina Strachan

Daimyo Clock Museum, Taito ku, Tokyo

Before leaving the Ueno area, a visit to the Daimyo Clock Museum in the nearby charming Yanaka district is also a must. The very unique collection of over 200 wadokei and a few western clocks from the Meiji era was brought together by Kamiguchi Guro, a local trader and artist since the early 20th century. His son Kamiguchi Hitoshi established the present museum in 1974. The wadokei are generally static displays, but at least one clock is always operating. To get to this highly authentic museum you will need to rely on the guidance of helpful locals.

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Experiencing an excellent overview of time throughout history at the Seiko Museum, Tokyo, ©Seiko Museum



Matsumoto Timepiece Museum ©Ashley Strachan

The Seiko Museum, Sumida ku, Tokyo

From the Ueno area of north Tokyo, a short taxi ride takes one to the Seiko Museum. Here one can experience an excellent overview of the measurement of time throughout history from the earliest Egyptian Period through to modern wrist watches and sports timers. On the second floor of the Museum is a room dedicated to many examples of Tokugawa Period wadokei. Here one can find the basic types of wadokei as well as a clock with a unique fixed dial and a hand that extends outwards and inwards over a six-month cycle automatically telling time throughout the year without manual intervention beyond a simple daily winding.

Matsumoto Timepiece Museum, Nagano

Another museum to see wadokei operating is the Matsumoto Timepiece Museum in Nagano Prefecture. This museum is where my interest in wadokei first began. One of the pleasing features of this museum is that all their exhibits are functioning. On the other hand they are understandably behind glass panelled cabinets. This museum has a variety of clocks from around the world, and includes early clockwork gramophones and the like. It is also in a most picturesque mountainous region of Central Japan, particularly if one's journey to it is through the Kiso Valley that runs through to Nagoya.

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Closing Sadly, one obstacle wadokei enthusiasts and researchers are facing is that relatively few have survived. This is in contrast to European and American clocks of the same period, which can be found in abundance in their native countries.

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In the book *Tokei Hattatsu Shi* by Takabayashi Hyoe, 1924, he states: *Since the early days of the Meiji era, it was worthy of notice that everything antique met destruction as it were, and goes on a great earthquake and fire the 1st September, 1923, which ravaged the Kanto district, thereby rare collections owned by three or four of the well-known collectors have been mercilessly destroyed forever.*

Ten Years later, N.H.N. Mody published his book *Japanese Clocks* which catalogues his fine collection of clocks. Mody's collection was housed in a single room of the Oriental Hotel, Kobe, and was destroyed by US bombing of Japan in the Pacific War of 1941-45.

It is most gratifying to experience wadokei with its unique concept of time and the skilled handwork it represents today.

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Ashley Strachan is by profession a precision mechanical design engineer. Now retired, his later occupation was as Head of Special Projects in corporate business management, however, in his spare time he retained an enthusiasm for all things mechanical. A clock and watch collector and restorer, he is Chairman of the British Horological Institute Museum Trust. Over the last five years he has specialised in wadokei and given several talks on the subject within the UK.

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www.wadokei.org

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Places **Daimyo Clock Museum**

Showcasing a range of wadokei collection of Kamiguchi Guro, a tailor of western fashion and artist in the early 20th century of the Yanaka district, Taito ku, Tokyo. A true hidden gem, this intimate authentic museum exhibits around 50 original pieces of its collection comprising more than 200 wadokei and a few western clocks.

A typewritten pamphlet provides a comprehensive introduction to wadokei and the collection in English.

110-0001 Tokyo, Taito ku, Yanaka 2-1-27 (ca 10min.walk from Nezu Sta.)

Open: 10:00-16:00/closed on Mon., Jul.1-Sep.30, Dec.25-Jan.14

Admission fee: 300Yen (adults)

▶Kamiguchi Guro

Kiso Valley

Crossing the Japanese Alps in Nagano and Gifu Prefecture, the valley is a stretch of the ancient Kisoji trade route, itself part of the Nakasendo Highway linking Kyoto and Edo, present day Tokyo. Access from Tokyo conveniently via the JR Chuo line.

Kunozan (Mount Kuno)

A 270m tall peak of Suruga Bay, accessible by foot or ropeway from Nihondaira in Shizuoka Prefecture.

▶*Kunozan Toshogu Shrine*

Kunozan Toshogu Shrine

Built 1617 on the top of the steep Mount Kuno near Suruga Bay this has been the first of many Toshogu Shrines dedicated to Tokugawa Ieyasu, who is enshrined here following his last wish. Major events are the Spring Festival on February 17/18 and the shrine's main Festival on April 17.

422-8011 Shizuoka ken, Shizuoka shi, Suruga ku, Negoya 390

[web-site](#)

Matsumoto Timepiece Museum

One of the museum gallery exhibiting clocks that are all operating.

390-0811 Nagano ken, Matsumoto shi, Chuo, 1-21-15

[web-site](#) (japanese)

National Museum of Nature and Science

Offers an extensive collection of wadokei.

110-8718 Tokyo, Taito ku, Uenokoen 7-20

[web-site](#)

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Places **Omi Jingu**

The shrine owns a small museum with around 40-50 wadokei on display, as well as a reproduction incense and water clock within the site.

520-0015 Shiga ken, Otsu shi, Jingu cho 1-1

[web-site](#)

The Seiko Museum

Telling the history of timekeeping from ancient to modern times, also exhibiting continuous innovation accomplished by Seiko.

131-0032 Tokyo, Sumida ku, Higashimukojima 3-9-7

[web-site](#)

Suruga Bay

Located in the Pacific Ocean on the western side of the Izu peninsula in Shizuoka Prefecture. The deepest bay in Japan (2500m) offers also a great view on its highest peak, Mount Fuji.

Toshiba Science Museum

The founder's room displays amongst a good selection of wadokeis the replica of Man-nen Dokei or *Man-nen Jimeisho*, the result of a national research project to disassemble and rebuild the clock, bringing Tanaka Hisashige's craft back to life and making it accessible to a larger audience of today. Noteworthy are also the regular demonstrations of *Karakuri Ningyo*, highly sophisticated mechanical dolls, demonstrating the same level of technological finesse that made wadokeis possible.

212-8585 Kanagawa ken, Kawasaki shi, Saiwai ku, Horikawa cho 72-34

[web-site](#)

Resources **...About Time**

Coulmas Florian, German Institute for Japanese Studies (2014) Tokyo
A concise essay on the socio-cultural concept of time in Japan.

The Clocks of Japan: a study on the antique Japanese clocks during the period of Tokugawa Shogunate

Yamaguchi Ryuji, Nippon Hyoron-Sha (1942) Tokyo

Well illustrated coverage of a breadth of wadokei.

Daimyo Clock Museum

Judge Tom F., Daimyo Clock Museum (1985) Tokyo

Comprehensive booklet, a good introduction to wadokei.

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Resources **The Evolution of Clockwork**

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Drummond Robertson J. , Cassell & Company, Ltd. (1931) London
Excellent reference with highly detailed descriptive text.

Making Time: Astronomical Time Measurement in Tokugawa Japan

Frumer Yulia, University of Chicago Press (2018) Chicago & London

Mechanization of Time and Calendar: Tanaka Hisashige's Myriad Year Clock and Cosmological Model

Hashimoto Takehiko, UTCB Bulletin, 6 (2006): 47–55.

[web-site](#)

Japanese Clocks and the History of Punctuality in Modern Japan

Hashimoto Takehiko, East Asian Science, Technology, and Society: an International Journal (2008)

[web-site](#)

Japanese Clocks

Mody N.H.N., Tuttle & Co. (1932) Rutland, Vermont and Tokyo

Extensive personal collection, well illustrated, excellent reference book.

Tokei Hattasu Shi

Takabayashi Hyoe, Toyo-Shuppansha (1924) Tokyo

Well illustrated coverage of a breadth of wadokei.

Wadokei

Tsukada Taizaburo, Toho-Shoin (1960) Tokyo

Well illustrated coverage of a breadth of wadokei.

Wadokei.org

Very comprehensive web-site produced by Ashley Strachan.

[web-site](#)

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Glossary

Akemutsu

Literally *the brightening 6*, Akemutsu is the sixth hour and marks the beginning of the day when the lines of one's hand become visible, just before the local sunrise, dawn. It is also called the Hour of the Hare.

- ▶Kuremutsu
- ▶Hour of the Hare
- ▶Temporal Hour

British Horological Institute

There are thousands of people who make, repair, restore, collect and sell clocks, watches and other timepieces. And there are millions who are interested in timekeeping and its instruments. The BHI speaks for them all.

[web-site](#)

Chinese / Buddhist Zodiacs

The twelve hours of wadokei are not only numbered in a unique way – each hour is also represented by a zodiac that can work as a memory aid:

- 9 (midnight): Rat, hunting around
- 8: Ox, chewing the cud
- 7: Tiger, stalking and seeking food
- 6 (dawn): Hare, busy foraging food
- 5: Dragon, the fiery skies of the sun appearing in the east
- 4: Snake, becoming active
- 9 (noon): Horse, being exercised
- 8: Goat, eating grass
- 7: Monkey, getting active
- 6 (dusk): Rooster, returning from the forest to roost
- 5: Dog, scavaenging
- 4: Pig, foraging

Clock doctor

- ▶Tokei-shi

Dai Dokei

Literally *Furniture Clock*, a Lantern Clock placed on a specifically crafted four-legged wooden stand

- ▶Lantern Clock
- ▶Yagura Dokei

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Glossary **Daimyo Dokei**

A term coined in 1937 by Kamiguchi Guro, founder of the Daimyo Clock Museum in the Yanaka district of Taito ku, Tokyo. Wadokei were at first made for exclusive use by Daimyo, local feudal lords in the 10th-mid to 19th century.

►Kamiguchi Guro

Flemish clock of 1573

Made by De Troestenbergh in Brussels this clock was given in thanks to the shogun Tokugawa Ieyasu for having assisted a ship wrecked in a storm near the town of Onjuku, Chiba Prefecture in 1609. Some fifty passengers and crew died, but with the help of local people over 300 were rescued, amongst them the former governor of the Philippines. Tokugawa received the Governor on friendly terms, lent a substantial sum of money, and arranged for one of his ships to bring the Spanish home accompanied with a retinue of twenty-two Japanese envoys.

►Tokugawa Ieyasu

Foliot

The earliest European balance in a clock escapement, the speed of which was determined by two weights mounted on an oscillating arm. European imports to Japan had a single foliot providing a constant 24 hour time throughout the year with negligible intervention. Adoption of this single foliot design for wadokei in the Edo Period required the foliot weights to be moved daily at Akemutsu and Kuremutsu to provide appropriate periods of day and night. The later ingenious invention in wadokei to use two foliots – one for day time and one for night time, together with an automatic change-over driven by the strike mechanism at Akemutsu and Kuremutsu, removed the need for daily adjustment. However, both variants required seasonal interventions for longer and shorter days and nights, which was generally done every two weeks.

►Akemutsu

►Kuremutsu

Geisha Pillow

A small wooden neck block

►Makura Dokei

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Hashira Dokei

Lantern Clock on a wooden wall bracket that accommodates a wooden framed cover of glass and silk cloth that provides protection from dust
▶Lantern Clock

Horology

Horology is the art, craft and science of making timepieces and of measuring time. (British Horological Institute)

Hour of the Cock

The darkening sixth hour, or the beginning of the night cycle
▶Chinese Zodiacs
▶Kuremutsu

Hour of the Hare

The brightening sixth hour, or the beginning of the day cycle
▶Akemutsu
▶Chinese Zodiacs

Inro

A small case made of wood or urushi lacquerware to keep small items, such as seals or medicines. Mostly suspended from a kimono's obi (belt) making good for the lack of pockets in the costume.

Inro Dokei

Pocket watch in an Inro case
▶Inro

Jimeisho

Literally *the Self-Chiming Bell*, early Japanese term for clock
▶Man-nen Tokei

Kake Dokei

Literally *Hanging Clock*, a Lantern Clock hanging on a wall nail
▶Lantern Clock

Kane Dokei

Literally *Bell Clock*

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Glossary **Kamiguchi Guro (1892-1970)**

A ceramic artist living and working in Yanaka district of Taito ku, Tokyo. Fearing that the traditional clocks whose real value was not much appreciated at his time, would sold out to overseas collectors, he collected over 200 wadokei from all over Japan and is credited for having coined the term Daimyo Dokei.

►Daimyo Dokei

Keisan Dokei

Literally *Paperweight Clock*, a desktop clock modeled after English pocket watches

Kiso Valley

Crossing the Japanese Alps in Nagano and Gifu Prefecture, the valley is a stretch of the ancient Kisoji trade route, itself part of the Nakasendo Highway linking Kyoto and Edo, present day Tokyo. Access from Tokyo conveniently via the JR Chuo line.

Kunozan (Mount Kuno)

A 270m tall peak of Suruga Bay, accessible by foot or ropeway from Nihondaira in Shizuoka Prefecture

►Kunozan Toshogu Shrine

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[web-site](#)

Kuremutsu

Literally *the darkening 6*, Kuremutsu is the sixth hour and marks the beginning of the night when the lines of one's hand become not visible anymore, just after the local sunset, dusk. It is also called the Hour of the Cock.

►Akemutsu

►Hour of the Cock

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Lantern Clock

Generic European term for clocks with a rectangular face, square base, and four corner pillars, resembling European lanterns. The early imported clocks to Japan of the 16th century are referred to as lantern clocks, and could be weight driven or spring driven.

- ▶ Dai Dokei
- ▶ Hashira Dokei
- ▶ Kake Dokei
- ▶ Yagura Dokei

Makura Dokei

Literally *Pillow Clock* as the wooden case resembled a Geisha pillow, a mantel or portable table/bedside clock featuring a handle at the top

- ▶ Geisha Pillow

Man-nen Tokei

The Myriad Year Clock, also called Man-nen Jimeisho

- ▶ Jimeisho

Namigata

Literally *Wave Type* as the time scale on the front of the Pillar Clock has wavy lines indicating the hours throughout the year

- ▶ Shaku Dokei
- ▶ Warikoma

NAWCC

The National Association of Watch and Clock Collectors is a US based global community of watch and clock collectors founded by L.D. Stallcup, a Certified Master Horologist from Nashville, Tennessee in 1943. NAWCC has members in 50 countries and 150 local and special interest chapters in North America, Europe, Asia, and Australia.

[web-site](#)

Pillar Clock

- ▶ Shaku Dokei

Ruler Clock

- ▶ Shaku Dokei

Seal-Case Clock

- ▶ Inro Dokei

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Sexagenary Cycles

Also called the Buddhist / Chinese Stems-and-Branches method for labeling days and years. Each label is made up of two characters, the first representing one of the ten Heavenly Stems of the week and the second one of the twelve Earthly Branches of the year.

Shaku

A traditional Japanese linear measure, roughly 30cm, the Shaku is still very much in use with craftspeople.

Shaku Dokei

Also called Pillar or Ruler Clocks, indicating time by a pointer on the falling driving weight to align with a vertical dial. These clocks feature adjustable hour markers, interchangeable dial plates and graph scales.

► Pillar Clock

Shogun

Military leaders of Japan during the 1185-1868 period

Suruga Bay

Located in the Pacific Ocean on the western side of the Izu peninsula in Shizuoka Prefecture. The deepest bay in Japan (2500m) offers also a great view on its highest peak, Mount Fuji.

Tanaka Hisashige (1799-1881)

A gifted craftsman he was also a prolific inventor. His interest in intricate mechanic apparati and astronomy led him to build the Man-nen Tokei in 1851. He is the founder of Tanaka Seisakusho that later became Tokyo Shibaura Denki, Toshiba.

► Man-nen Tokei

Temporal Hour

In traditional Japanese time-representation days are divided into 6 hours of day and 6 hours of night. As the length of a day is roughly defined by the time between dawn and dusk, the duration of hours varies over the course of a year.

► Akemutsu

► Kuremutsu

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Glossary

Tokei

Literally *Time Measuring Device*

►Wadokei

Tokei-shi

In Europe and America there was no distinction between the makers of clocks, clocksmiths, and those who repaired and serviced clocks - including the regular adjustments for temporal time. However, in the Tokugawa period these were considered two separate professions.

Turret Clock

►Yagura Dokei

Tokugawa Ieyasu (1543-1616)

Founder of the Tokugawa Shogunate

Tokugawa Shogunate (1603-1867)

►Tokugawa Ieyasu

Tsurigane Dokei

Hanging Clock

Wadokei

Literally *Japanese Clock*, the collective name for traditional Japanese time pieces

►Tokei

Warikoma

Adjustable hour markers, introduced in the late 17th century to represent the varying length of temporal hours

►Temporal Hour

Yagura Dokei

A variation of the Kake Dokei, capping a pyramid pedestal, often a box that hides the clock's weights and resembles the typical form of traditional Japanese towers, Yagura.

►Dai Dokei

►Kake Dokei

►Turret Clock

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Imprint

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Japan-Insights promotes a deeper understanding of the country – its people, places, and culture.

Leading experts, scholars, and professors in Japanese studies present a broad range of historical and contemporary topics, encouraging visitors to engage with the real Japan through immersive experiences. Essays that share their excitement and depth of insight are complemented by relevant information for travelers on the site.

Looking towards the 2020 Olympics and Paralympics and beyond, we hope to contribute to a Japan that offers people from around the world many opportunities for discoveries and memorable encounters.

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Toshiba International Foundation
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