# HIGHLIGHTING Japan





### BRIDGES OF JAPAN <PART 1>

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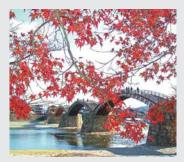
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30 THE BEAUTY OF KIMONO Kosode (a Garment with Small Wrist Openings) with Autumn Flower-Plants Pattern on Twill Weave Silk, Painted by Ogata Korin Japan has a long history of building wooden bridges. In modern times, stones have also been used skillfully to build bridges. In this month's *Highlighting Japan*, we present various bridges built in traditional Japanese styles, sharing their history and telling their stories. Meanwhile, we also introduce bridges depicted in ukiyo-e art and unique Japanese perceptions of bridges.



On the cover: The bridge blends into scenes depicting the features and traditions of all four seasons: the turning leaves of autumn, blanketed with snow in winter, set against rows of blossoming cherry trees in spring, and appearing as a backdrop to a scene of cormorant fishing in summer.

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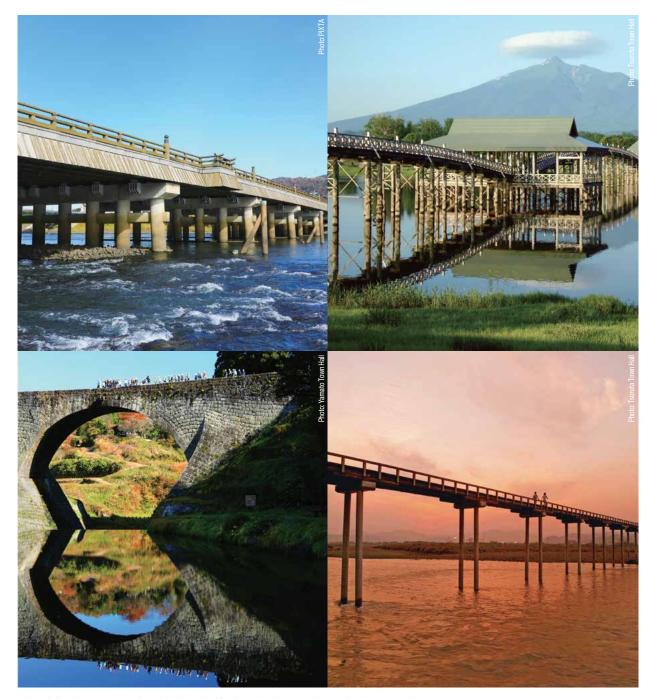
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Japanese names in this publication are written in Japanese order: family name first, personal name last.

### **FEATURES**

# Bridges of Japan <Part 1>



Above left: This Japanese-style *sori-hashi* arched bridge is 101.8 meters long and 8.4 meters wide. Above right: Every 100 meters, at the foot of each arch, there are *azumaya* stages. Below left: The top of the bridge is also open for visitors to enjoy the view. Below right: The structure of the bridge was inspired by a desire to pass down to the next generation the warm ambience of wood. apan has a long history of building wooden bridges. In modern times, stones have also been used skillfully to build bridges. In this month's *Highlighting Japan*, we present various bridges built in traditional Japanese styles, sharing their history and telling their stories. Meanwhile, we also introduce bridges depicted in ukiyo-e art and unique Japanese perceptions of bridges.



### A History of Traditional Japanese Bridges, with Several Remarkable Examples

apan has a lengthy history of bridge construction, primarily those with wooden structures.

We turned to Matsumura Hiroshi, an expert on the bridges of Japan, to learn more about the history of traditional Japanese bridges and a number of famous examples, known as "*meikyo*."

### Could you tell us about traditional Japanese bridges, their history starting from ancient times, and their special characteristics?

Up until the early modern period, almost all Japanese bridges were wooden except for extremely short stone bridges — and most were *mokugeta-bashi*<sup>1</sup> (woodenbeam bridges). There are a number of reasons: lumber was relatively easy to obtain in all regions; many rivers have swift currents, so using forms like stone arches that would obstruct the flow was not feasible; and Japan's complex topographical factors such as mostly mountainous prevented the development of mass transport involving carriages for

Matsumura Hiroshi **Employed by the Osaka City Public Works Bureau's** Bridges Division, the Planning Bureau's Urban Planning Division, the Osaka Urban Engineering Information Center, and others. His written works include Osaka no Hashi ("Bridges of Osaka," Shoraisha, 1987) and Nihon Hvaku Meikvo ("One Hundred Famous Bridges of Japan," Kajima Institute Publishing Co., Ltd., 1998).

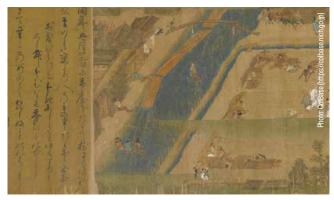
been excavated, only things like wooden piles that were identified as bridge parts were found. There are

> virtually no examples of bridges from ancient times where we have enough information to understand how the upper structures were built. Sources including *Nihonshoki* ("The Chronicles of Japan")<sup>2</sup> contain passages on bridges, and from these, the locations of bridges can be presumed. However, it is difficult to reconstruct the structures they would have had.

> In a later era, *emaki-mono* (picture scrolls)<sup>3</sup> produced in Japan's Middle Ages contain some considerably realistic depictions of bridges. From those, we can presume what the structures of bridges in those times might have been like. These were primarily wooden beam bridges, and the small-scale ones almost all had simple wooden structures, like *itabashi* (wooden plank bridges) and *dobashi* (earthen bridges with wooden frames). As Yasuda Yojuro<sup>4</sup> noted in his *Nihon no Hashi* ("Bridges of Japan"), for the most

war and other vehicles. It is also thought that general technological innovation in bridge construction did not progress much for such reasons.

While the remains of several ancient bridges have



A section of *Ippen Hijiri-e* ("Paintings from the Life of the Holy Man Ippen," 1299) depicts a wooden plank bridge across the Horikawa River at that time in Kyoto toward the top.

part "the bridges of Japan generally lacked names and were, moreover, built simply for practical use."

The early modern period (around the latter half of the l6th century to the latter half of the l9th century) brought advancements in infrastructure development, and bridges were put in place in main castle towns and cities, including Edo (now Tokyo), Kyoto, and Osaka. Due to the natural features of rivers, bridges were usually located in alluvial plain settings, and almost all were made with wooden poles and beams. The wood material was gradually damaged, however. Flooding could wash them away, and there were sometimes fires. All this meant they required frequent repairs and restorations. On the other hand, wooden beam bridge construction techniques did become established, and bridge designs became more stylized, as well. We can deduce what special charac-



Toto Meisho Ryogokubashi Yu-suzumi no Zu ("Enjoying the Evening Cool at Ryogoku" from the Series Famous Places of the Eastern Capital") by Utagawa Sadafusa (woodblock print, c. 1830–43) depicts a lively scene of people cooling off in the evening air atop a bridge.

teristics these had from *nishiki-e* ("brocade" prints)<sup>6</sup> produced in the late Edo period.

In the Edo period, stone-arch bridges started to be constructed in parts of Kyushu, and *hanebashi* (arch bridges with series of cantilever beams) were built in certain regions of Yamaguchi Prefecture. Stone-arch bridges were seen in just a small area on the main island of Honshu as well, but I think they can be considered exceptional cases.

### Could you give a few examples of historical "*meikyo*" famous bridges?

Before I respond to that, let me outline the standards for defining *meikyo*.

- •Bridges whose construction had been strongly desired
- ·Bridges with outstanding technical features
- ·Bridges with beautiful shapes and forms
- •Bridges that blend in harmoniously with stunning surroundings
- •Bridges with long histories or ancient traditions associated with them
- •Bridges that are familiar to people

To be considered a *meikyo*, a bridge needs to possess more than one of these traits. *Meikyo* can be found in all regions of Japan, but if we really narrow the list, the main examples include the Seta no Karahashi Bridge in Shiga Prefecture, the Ujibashi Bridge in Kyoto Prefecture (see page 10), and the Nagarabashi Bridge in Osaka Prefecture.

These bridges all have long histories and ancient

traditions and folklore associated with them, while at the same time still being in use today. This gives them special charm to people.

Bridges designated by the Japanese government as National Treasures or Important Cultural Properties should fall under the category of *meikyo*, as well.

One example is the Tsujunkyo Bridge (see page 18), which is designated as a National Treasure in September, this year, 2023. It had to be restored after the 2016 Kumamoto Earthquake. Also, a portion of the Gokurakubashi Bridge that was inside Toyotomi Hideyoshi's Osaka Castle has been relocated and reconstructed on Chikubu Island in Lake Biwa, where it now stands as the Karamon Gate. While it may not technically be a bridge, it has been declared a National Treasure and can be considered a precious remnant of a bridge.

As far as bridges from before the Edo period that

are designated Important Cultural Properties, other than stone-arch bridges in Kyushu and Okinawa's Tennyobashi Bridge, all are located on the grounds of shrines and temples. Representative examples of these include three bridges at the Itsukushima Shrine in Hiroshima Prefecture

> Above: The Seta no Karahashi Bridge in Shiga Prefecture Below: The Karamon Gate on Lake Biwa's Chikubu Island, a National Treasure





and five bridges in Kyoto City: three bridges located at Kamo-wakeikazuchi Shrine, also known as Kamigamo Shrine, plus the Kangetsu-dai Bridge at Kodaiji Temple, and the Engetsukyo Bridge at Tofukuji Temple. Other famous examples include three bridges at the Hiyoshi Taisha Shrine in Shiga Prefecture and the Shinkyo Bridge on the Futarasan Shrine's grounds in



The Sorihashi Bridge of the Itsukushima Shrine in Hiroshima Prefecture, an Important Cultural Property



The Tsutenkyo Bridge at Tofukuji Temple in Kyoto City



A *mikoshi* portable Shinto shrine is carried across the *taikobashi* bridge at Osaka's Sumiyoshi Taisha Shrine during a festival.

Nikko, Tochigi Prefecture.

The Kintaikyo Bridge (see page 16) in Iwakuni City, Yamaguchi Prefecture, which has been designated a National Place of Scenic Beauty by the Japanese government, is also worthy of special mention. This bridge features a superstructure with a wooden-arch construction not seen elsewhere in the world. It is also highly noteworthy for its special, inventive design features, including its bridge pier structure and stone paving set into the riverbed to help it withstand swift currents. I have heard that there are currently efforts underway to achieve a UNESCO World Heritage site designation for the Kintaikyo Bridge.

### What special features are unique to Japanese bridges? Also, is there a particular cultural background that might be relevant, such as certain perceptions or sensibilities Japanese people have about these bridges?

There is a great deal of folklore from all regions of Japan concerning bridges: mysterious phenomena occurring on bridges, *kami* spirits and deities inhabiting bridges, even possibly *hitobashira*<sup>8</sup> sacrifices. This may not be unique to Japan, but as Amino Yoshihiko<sup>9</sup> has indicated, bridges were conceived of as "*muen no ba*" — sites free of the usual bonds or connections — that is to say, existing in the world, yet belonging to nowhere and no one. People sensed fear or awe associated with them as extraordinary places where *oni*<sup>10</sup> ogres made frequent appearances.

Meanwhile, bridges had a feminine image associated with them as well. They seem to have been thought of as inhabited by female spirits and deities. The fact that one Hashihime ("maiden of the bridge") metamorphosed from a being with strong spiritual power into the image of a lovelorn woman must be a reflection of Japanese sensibilities.

Also, *taikobashi*<sup>11</sup> (arched drum bridges) in front of Japanese Shinto shrines' gates, which are conceived of as bridges traversed solely by *kami* deities, feature distinctive forms with large, round curves. I believe this design might represent a high degree of uniquely Japanese originality. On the grounds of shrines, where *kekkai* (dividing lines between sacred and secular zones) are established, *taikobashi* appear to act as barriers to enter by people. They can also, however, be thought of as something like stage-setting structures encouraging people to adopt the proper frame of mind to make their entry into the *shin'iki* (sacred precincts) of the shrine.

# Are there any bridges you would like to particularly recommend that visitors to Japan see for themselves – and cross over – in person?

I think there are many examples of bridges that blend into the surrounding landscapes and actually add something to them. One of the best examples would have to be the Togetsukyo Bridge in Kyoto City's Arashiyama district. In its present form, it is made of steel, with components like bridge piers given reinforced concrete structures, yet the design recalls its original wooden form. This is a bridge that can be said to blend in harmoniously with stunning surroundings.

Others I can think of include the Sanjo Ohashi Bridge, also in Kyoto City, the Kintaikyo Bridge that I mentioned a little earlier, and the Kai no Saruhashi Bridge in Yamanashi Prefecture. Some historical *meikyo*, such as the Ujibashi Bridge in Kyoto Prefecture and the Seta no Karahashi Bridge in Shiga Prefecture, bear signs of the different ways those in charge of keeping up the bridges have tried to preserve the original feel the wooden bridges had in past days.

Additionally, I think Japanese gardens are designed to express nature as it is, at the same time, its space is created well by incorporating man-made objects such as bridges. There are also examples of bridges that exist as gardens' compositional elements and objects to be appreciated for their appearance, while at the same time providing garden-viewing locations themselves. In particular, the Koishikawa Korakuen Garden,<sup>12</sup> a *daimyo* garden in Tokyo, incorporates a number of different types of Japanese bridges — stone, red-painted lacquer, earthen, and more — into its single landscape with well-balanced arrangement.

- 1. A simple form of bridge made of wooden *keta* beams spanning a pair of support bases, with planks laid on top of them.
- The first official history of Japan, completed in 720. Toneri Shinno, the son of Emperor Tenmu, compiled it by decree of Emperor Gensho. The work consists of 30 chapters, the first two concerned with the mythological age of divine beings and the rest detailing successive imperial reigns in the nation's history.
- 3. A form of Japanese painting in which long sheets of paper (or silk) are connected horizontally to form a canvas of great width for the depiction of a series of scenes or tales.
- A literary critic born in Nara, who lived from 1910 to 1981. Founding the Nihon Romanha ("Japanese Romantics") literary magazine in 1935, he came to advance traditionalism and criticism of modern civilization. His collections of critical writings include Nihon no Hashi ("Bridges of Japan").
- 5. A type of plainland with topographical features formed primarily by sedimentation from rivers.
- 6. A form of multi-colored *ukiyo-e* woodblock printing that became prevalent after late 18th century.
- A form of bridge in which single ends of structural components are embedded in opposing banks or cliff faces and secured, and cantilever beams are laid across the opposite, protruding ends of them.



The Togetsukyo Bridge in Arashiyama, Kyoto



The Tsutenkyo Bridge in Tokyo's Koishikawa Korakuen Gardens



The Engetsukyo Bridge in Ritsurin Park, located in Takamatsu City, Kagawa Prefecture

- A type of sacrifice made to deities to pray for the successful completion of a castle, bridge, levee, or other structure, involving a person's burial in the ground or underwater. It is not considered actually to have been practiced in Japan.
- 9. A Japanese historian born in Yamanashi Prefecture, who lived from 1928 to 2004. He specialized in medieval Japanese history and the history of Japanese maritime peoples. His written works include Nihon Chusei no Hi-Nogyomin to Tenno ("Non-Agricultural Peoples and Emperors of Medieval Japan"), Muen - Kukai - Raku ("Freedom from Bonds - The Public World - Comfortable Ease"), Igyo no Oken ("Variant Royal Authority"), Moko Shurai ("The Mongol Invasions"), and Nihon no Rekishi o Yominasu, Seli/Zoku ("Rereading Japanese History: Principal Text and Sequel"), among many others.
- 10. Imaginary demons and monstrous apparitions considered capable of causing harm to people.
- 1. A form of bridge with a rounded arch that curves upward like the frame of a *taiko* drum.
- 12. The oldest extant Edo daimyo garden, constructed by Tokugawa Yorifusa, the first daimyo feudal lord of the Mito branch of the Tokugawa family and completed by the second daimyo, Tokugawa Mitsukuni. Located in Tokyo's Bunkyo City.

### FEATURES

# Uji-bashi Bridge and Its Historic Tea House

Constructed around 1,380 years ago, Uji-bashi Bridge is recognized as one of the oldest bridges in Japan. At the foot of the bridge stands a tea house established over 860 years ago, whose owner, a *hashimori* bridge guard, continues to serve tea and watch over the bridge to this day. (Text: Morohashi Kumiko)

ocated in Uji City, south of the city of Kyoto, Uji-bashi Bridge spans the Uji River, which runs through the center of town. This bridge connects Byodoin Temple<sup>1</sup> and Ujigami Shrine,<sup>2</sup> two World Heritage sites, and has become a landmark of Uji. We spoke with the Tourism Planning Section of the Tourism Promotion Division at Uji City Hall about the bridge's origins.

"According to the inscription on a stone monument at Hashidera Hojoin temple,<sup>3</sup> Uji-bashi Bridge was erected in 646 by Doto, a monk from Gango-ji temple in Nara. After the bridge was built, Uji became a strategic location along the water and land transportation



A statue of Murasaki Shikibu stands at the west end of Uji-bashi Bridge. The statue of the author was erected here in honor of the fact that the final ten chapters of *Genji Monogatari* are set in Uji.

routes between the ancient capital of Nara and the city of Kyoto, playing an important role in Japan's history. During the Heian period (794 – end of the 12<sup>th</sup> century), the Fujiwara clan, an aristocratic family at the height of their prosperity, built their villa here, and a splendid dynastic culture flourished. Ho'oudo Hall (Phoenix Hall) was built at Byodoin Temple to embody the idea of the Pure Land of Paradise in this world."

Uji-bashi Bridge appears in the *Kokin Wakashu* ("Collection of Ancient and Modern Japanese Poetry")<sup>5</sup> and in Murasaki Shikibu's *Genji Monogatari* ("The Tale of Genji"),<sup>6</sup> both masterpieces of Japanese literary history. In fact, Uji is known as the setting for the last ten



This Japanese-style sori-hashi arched bridge is 101.8 meters long and 8.4 meters wide.



Tsuen Yusuke (president, Tsuen Co., Ltd.) of

customers for over 860 years.

Tsuen Chaya, a tea house that has been serving





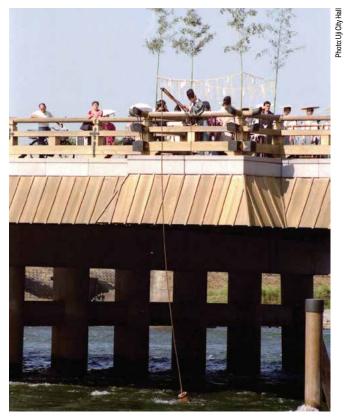
Left: Rich matcha sundae made with an abundance of freshly ground Uji green tea (Tsuen Chaya)

Right: Visitors from overseas are particularly interested in the Fujitsubo, Uji gyokuro tea, and sweets set. (Tsuen Chaya)

of the 54 chapters in Genji Monogatari.

"The bridge was reconstructed to its current state in March 1996. Although it is now made of concrete, it is designed as it was when it was constructed in wood. With balustrade and plates made of Japanese cypress and decorative *giboshi*<sup>7</sup> post caps in bronze, Uji-bashi Bridge retains its historical image. The extended platform on the upstream side, called the San-no-ma, is said to have housed a shrine to the bridge's guardian deity, the Hashihime. It is also where renowned 16<sup>th</sup>-century warlord Toyotomi Hideyoshi had water drawn for a tea ceremony. Even after the center of politics moved from Kyoto to Edo (modern day Tokyo) in Japan's early modern period, Uji tea was prized for its superior quality, as it still is today."

At the foot of Uji-bashi Bridge stands Tsuen Chaya, a tea house established some 863 years ago, which



During the Uji Tea Festival, held on the first Sunday in October, water is drawn from the extended San-no-ma platform.



The Tsuen Chaya building (a Kyoto Prefecture designated cultural property) was constructed in 1672.

continues to serve tea to this day. We spoke with owner Tsuen Yusuke, president of Tsuen Co., Ltd.

"Tsuen Chaya began when my family was appointed *hashimori*, guardian of Uji-bashi Bridge. We have been serving tea here since 1160. Our job is to combine tea leaves to create blends with a well-rounded flavor."

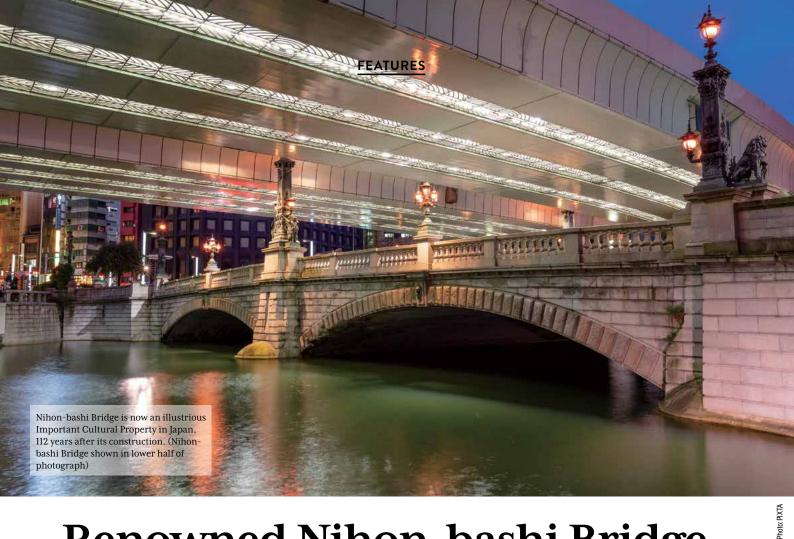
These days, visitors from overseas come to the teahouse in search of original steamed *sencha* and shade-grown *gyokuro* teas.

"I like the sunset hours on Uji-bashi. The mountains and the river upstream are especially beautiful, so this is definitely a sight you should see when you visit Uji."

 A temple founded in 1052 by Fujiwara Yorimichi in Uji City, Kyoto Prefecture. Ho'oudo Hall (Phoenix Hall), with phoenixes perched atop the roof. It is a designated national treasure. It was registered in 1994 as a UNESCO World Heritage site. Along with Ujigami Shrine and other properties, the site is listed as a Historical Monument of Ancient Kyoto.

The main shrine, a national treasure, is renowned as the oldest original shrine building in Japan, built in the 900s.

- 3. The temple was built by Prince Shotoku to pray for protection, and after Uji-bashi Bridge was erected, was assigned the role of bridge guardian temple. The Uji-bashi Danpi stone monument on the temple grounds is inscribed with the year that the Uji-bashi Bridge was built.
- The first imperial anthology of waka poems, compiled in 905 by Ki no Tsurayuki and three other renowned poets. The 20-volume anthology with over 1,000 poems was presented to the emperor.
- Author, poet, and lady-in-waiting in the 900s (mid-Heian period). Known as the author of *Genji Monogatari* ("The Tale of Genji") and *Murasaki Shikibu Nikki* ("The Diary of Murasaki Shikibu"), she is a leading figure in Japanese literary history.
- Genji Monogatari is world-renowned as a classic work of Japanese literature. Set in Uji, the latter half of the 54-chapter novel is known as Uji Jucho, suggesting that the characters' residences were located on the east and west banks of the Uji River.
- Balustrades on palaces, bridges, bridge-like corridors, and other structures are known as *koran*. The metal ornaments that top the posts, called *giboshi*, are shaped to resemble Nyoi-hoju or *cintamani* (of Buddhist origin, meaning "magical jewel that manifests whatever one wishes").



# Renowned Nihon-bashi Bridge, Traffic Origin on Japan's Major Roadways

Constructed in 1603, Nihon-bashi Bridge stands in Chuo City, Tokyo and has marked the starting point of Japan's major highways for some 420 years. We spoke with the Nihonbashi Preservation Society about the bridge's long history and the current activities to preserve it.

### (Text: Morohashi Kumiko)

I ihon-bashi Bridge is said to have been originally built in 1603, the year the Tokugawa Shogunate was established by Tokugawa Ieyasu. It was initially constructed as a wooden *taikobashi*<sup>1</sup> type bridge and designated the following year as the starting point for the five major land routes across Japan: the Tokaido, Nakasendo, Oshukaido, Nikkokaido, and Koshukaido roads. Fukushima Miyuki of the Nihonbashi Preservation Society describes Nihonbashi Bridge at the time.

"Nihon-bashi Bridge stood in the center of Edo, an area that bustled with lively fish markets lining the Nihonbashi-gawa River. It flourished as the most prosperous part of Edo thanks to the many wholesal-



Tokaido Gojusantsugi Nihonbashi Asa no Kei ("Morning View at Nihon-bashi Bridge" from "Fifty-three Stages of the Tokaido Highway") by Utagawa Hiroshige



Haneda Nihonbashi, a half scale reproduction based on Nihon-bashi Bridge in the early 19<sup>th</sup> century, in Tokyo's Haneda Airport Terminal 3





Nihon-bashi Bridge rebuilt in 1911



The *qilin* statue (left) and *karajishi* lion statues (right) installed on the bridge



The Nihon Kokudo Genpyo plaque marking the starting point of Japan's major highways was added in 1972.

ers there. The bridge is depicted in many books and ukiyo-e woodblock prints, including the multi-colored *nishiki-e*<sup>2</sup> prints and *kusazo-shi*<sup>3</sup> woodblock-printed illustrated literature, usually looking so crowded that people could hardly move. In fact, at Haneda Airport Terminal 3 in Tokyo, there is a half-scale replica of the wooden Nihon-bashi Bridge from the early 19<sup>th</sup> century, which may give you an image of what the bridge originally looked like when it was made of wood."

The current bridge, completed over 110 years ago in 1911, is a stone double-arched bridge standing 49 meters long and 28 meters wide. In 1999, it was designated a national important cultural property. It has a statue of the mythical *qilin* beast erected at its center and *karajishi* lion statues at the bridgeheads on each side.

"The *qilin* is a mythical creature from ancient China which, according to legend, can only be seen when a virtuous king or saint appears, and the statue stands at the center of the bridge as a prayer for Tokyo's prosperity. The *Karajishi* lions, the king of all beasts, are thought to have been placed at the bridgeheads to add dignity."

Bronze for the ornamental elements and illumination, an example of cutting-edge technology at the time, were used to create an exquisite bridge.

Today, the Nihon Kokudo Genpyo plaque is displayed at the midpoint of the bridge as the traffic origin of Japan's major national highways.

"The bridge is also the starting point for the seven major national highways that connect modern Honshu, and many travelers begin their journeys from here. The Nihonbashi Tourist Information Center at the foot of the bridge sells *goshukuba* stamps indicating that the location was once the starting point of the historical major land routes, National Route 1 stickers, and other souvenirs, which many people purchase as mementos of their trip."

The cityscape around the bridge has been dramati-

cally transformed since Japan's period of rapid economic growth, with the opening of the Metropolitan Expressway built over the bridge in 1963 and other changes. Regretting the changes that have taken place, volunteers came together to form the Nihonbashi Preservation Society. The society continues its work to move underground the overhead expressway passing over the bridge and otherwise restore the landscape around the bridge.

"The preservation society holds an annual 'bridge washing' event. Local neighborhood associations, nearby businesses, and others with ties to Nihonbashi gather to clean up the area."

Fukushima explains why Nihon-bashi Bridge is loved by so many today.

"Nihon-bashi Bridge is not only one of the most famous bridges in Japan. The bridge and its surroundings have also been a center of culture coming out of Tokyo since the early period of modern history. The area leaves a legacy of great historical value that endures today. When you come to Japan, be sure to visit Nihonbashi for feeling some traces of its good old days."



<sup>1.</sup> A bridge with a semi-circular curve at the center to form a drum-like shape

<sup>2.</sup> Multi-colored ukiyo-e woodblock prints that were increasingly popular from late 18th century

Popular illustrated reading material written mostly in the phonetic kana alphabets of Japanese This literature began to be published in the 18-19<sup>th</sup> centuries (mid-Edo period).

### FEATURES

# Bridges Depicted in Ukiyo-e

Bridges are often depicted as motifs in ukiyo-e woodblock prints, which often portray in vivid detail the lively everyday activity of the people. Tando Masako, curator at the Edo-Tokyo Museum, explained the presence of bridges in ukiyo-e. (Text: Morohashi Kumiko)

W kiyo-e was born as an art genre in the late 17th century and became widely popular as a form of entertainment for the masses during the Edo period (1603 – mid-late 19th century). The names of Katsushika Hokusai and Utagawa Hiroshige are perhaps the first that come to mind as representative ukiyo-e artists.

Tando says, "Katsushika Hokusai, who lived from 1760 to 1849, is an ukiyo-e artist who, in his creative career spanning about seven decades, drew shinrabansho,<sup>1</sup> and left behind masterpieces in a variety of media, including nishiki-e,<sup>2</sup> book illustrations, and nikuhitsu-ga.<sup>3</sup> Utagawa Hiroshige, who lived from 1797 to 1858, on the other hand, was an ukiyo-e artist who painted, in a profoundly lyrical manner, scenes of Edo (present-day Tokyo) and other parts of Japan. Although his art spanned a wide variety of subjects, including bijin-ga ("paintings of beautiful women") and kacho-ga ("flower-and-bird paintings"), he is regarded in the history of ukiyo-e as a leading artist of Japanese landscape painting in particular. Both Hokusai and Hiroshige are also known for their influence on Western impressionist painters such as Vincent van Gogh and Edgar Degas in the late 19th century."

According to Tando, the works of these two artists are part of a rich legacy of ukiyo-e masterpieces that feature bridges as motifs.

"Over a period of about 250 years after the establishment of the Shogunate, the city of Edo was transformed in a series of expansions and improvements. As a key element of the transportation infrastructure, bridges served both as crossings for large numbers of people going about their everyday business and as important local landmarks. Their interesting appeal and beauty, which stood out from the natural scenery, and their presence as symbols, must have made bridges quite attractive to the eyes of ukiyo-e artists."

Hokusai's *Kameido Tenjin Taikobashi* ("Drum Bridge at Tenjin Shrine, Kameido") from the series *Shokoku Meikyo Kiran* ("Famous Bridges in Various Provinces") is one of his masterpieces that dynamically capture the appearance of bridges.

"This is one of a series of 11 ukiyo-e prints that feature bridges in various provinces. The Drum Bridge at Kameido Tenjin Shrine (Koto City, Tokyo) is depicted in an exaggerated manner to look larger than it actually is. Although the bridge was popular as a wisteria viewing spot, the artist deliberately did not depict the flowers, focusing the structure of the bridge and the composition of the painting."

Another masterpiece, this one by Hiroshige, is *Ohashi Atake no Yudachi* ("Bridge Ohashi and Atake in Sudden Shower").

"It depicts people running across a bridge over the Sumida River (present-day Shin-Ohashi, Koto City, Tokyo), bent over and covering their heads in a sudden summer evening shower. What is special about this print is the line of the rain legs is characterized by being expressed with changing those angles using two types of woodblocks. This work is also famous as a source of inspiration for Vincent van Gogh, who copied it using oil painting techniques".

Ukiyo-e prints depicting bridges convey the lifestyle of the period.

"For instance, traditional Japanese hairstyles (topknots) differed depending on social status and age, and there were various fashion trends in the patterns and shapes of clothing (kimonos). From this perspective, ukiyo-e prints also represent a valuable source of information on the lifestyle and culture of the era when they were created."

Tando also hopes that viewers will appreciate the beauty of the colors as well as the carving and printing techniques.

"The vibrant colors and the uneven, textured surfaces typical of woodblock prints that have been reproduced over and over again can only be appreciated firsthand. If you have a chance, make sure to visit the museum and see the actual prints," emphasizes Tando.

<sup>1.</sup> A Japanese concept that signifies all things in nature, the whole of creation

<sup>2.</sup> A type of multi-colored uklyo-e woodblock print that gained popularity around 1765 with the development of woodblock printing technology. The publisher directed the creative process, which was performed by an artist who made the preliminary drawings, an engraver who carved separate woodblocks for each color, and a printer who printed the images on paper.

A type of original painting done with a brush and color ink directly on paper or silk. The formats of nikuhitsu-ga include folding screens, hanging scrolls, rolled-up scrolls, shikishi (squares of thick colored paper for painting and calligraphy), fans, etc.



ITTERING TRANSPORT

富豪三十二景梅桃川岸

帯がきちな

Above: Onmayagashi Yori Ryogokubashi no Sekiyo o Miru ("Viewing the Sunset over Ryogoku Bridge from the Onmaya Embankment"), from the series Fugaku Sanjurokkei ("Thirty-six Views of Mount Fuji") (Katsushika Hokusai, c. 1831-34)

Middle: Fukagawa Mannenbashi Shita ("Under the Mannen Bridge at Fukagawa"), from the series Fugaku Sanjurokkei ("Thirty-six Views of Mount Fuji") (Katsushika Hokusai, c. 1831-34)

Below: Kameido Tenjin Taikobashi ("Drum Bridge at Tenjin Shrine, Kameido"), from the series Shokoku Meikyo Kiran ("Famous Bridges in Various Provinces") (Katsushika Hokusai, c. 1833)

> Above: Ohashi Atake no Yudachi ("Evening Shower at Ohashi Bridge") (Utagawa Hiroshige, 1857) Left: Ryogoku Hanabi ("Fireworks at Ryogoku"), from the series Meisho Edo Hyakkei ("One Hundred Famous Views of Edo") (Utagawa Hiroshige, 1858)

The NDL Digital Collections https://dl.ndl.go.jp/pid/1304080 (Referenced 2023-8-27) Stout stonework piers and stone-paved riverbed protection solidly support the bridge with its series of wooden arches reminiscent of outstretched wings. The top of Iwakuni Castle's keep is visible just beyond the top of the mountain in the background. FEATURES

# The Kintaikyo Bridge and Its Wooden Arch Structure, a Rare Example in the World

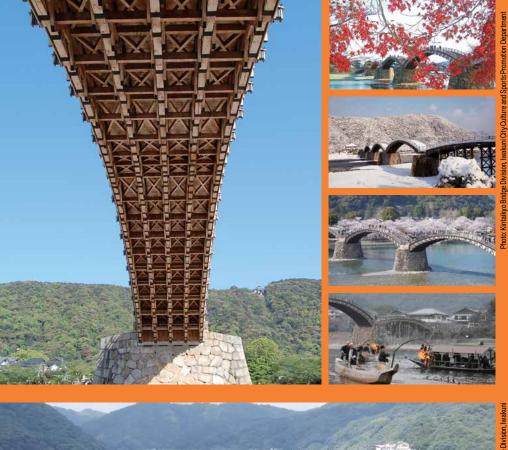
In 2023, Kintaikyo, one prime example of a traditional Japanese bridge, marked the 350th anniversary of its construction. Construction techniques used when the bridge was originally built continue to be maintained, and the bridge still stands today in the same location and has virtually the same form as it always has. We visited to see the beauty of the Kintaikyo Bridge for ourselves. (Text: Kurosawa Akane)

Wakuni City is located at the western edge of Japan's main island of Honshu in eastern Yamaguchi Prefecture. The Kintaikyo Bridge is a fivearched wooden bridge spanning the lower reaches of the pristine, clear-flowing Nishiki River. The bridge is 193.3 m in length and 5 m wide. Designated a National Place of Scenic Beauty,<sup>1</sup> Kintaikyo invariably receives mention as a representative example of traditional Japanese bridge. We interviewed Matsuoka Tomonori, curator of the local Iwakuni Chokokan Museum, about the bridge's historical background and fascinating features.

"Iwakuni was originally a castle town, with a history of development starting at the beginning of the 17th century. Due to the defensive advantages of the

mountainous area on one side of the Nishiki River, a castle was built up on the mountain, with the center of administrative affairs situated at the mountain's base. Since there was only a narrow strip of land on that side, though, the town ended up extending to the opposite shore of the river, where samurai residences and merchant houses were located. This called for a bridge to connect the two parts of the castle town. However, while this river, the Nishiki, has a shallow, peaceful flow ordinarily, when the water depth swells, it transforms into a rapid-flowing torrent. After a repeated process of trial and error seeking to find a way to design a bridge that would not be swept away even by swift currents, the local feudal lord had the Kintaikyo Bridge built in 1673. The bridge has a wooden arch construction (see photo) employing an elaborate kigumi wood joinery technique, supported by stonework piers, that is unparalleled anywhere in the world – a sophisticated, original one-of-a-kind structure."

There have been two instances when the bridge washed away: first in flooding in 1674, right after the bridge was built, and a second time when a typhoon struck the area in 1950. Nevertheless, it was rebuilt each time by replacing damaged sections without altering the original structure and has been maintained in this way. A "Heisei Reconstruction" project led to the com-



#### Above

Left: A view from below allows closer inspection of the intricate kigumi wood joinery. The unique arch structure<sup>3</sup> employs a sophisticated combination of components, including keta (beams), kusabi (wedges), hari (crossbeams), and munagi (ridge beams).

Right: The bridge blends into scenes depicting the features and traditions of all four seasons: the turning leaves of autumn, blanketed with snow in winter, set against rows of blossoming cherry trees in spring, and appearing as a backdrop to a scene of cormorant fishing<sup>2</sup> in summer.

#### Below

Left: Panoramic view of the Kintaikyo Bridge Right: Vestiges of the old castle town still remain in the area south of the Kintaikyo Bridge, Visitors will enjoy strolling along streets lined with traditional machiya townhouses.



pletion of the current form of the bridge in 2004. The Kintaikyo Bridge still stands today in the same location and has virtually the same form as it always has.

In 2021, the cultural landscape of the Kintaikyo Bridge and castle town below Iwakuni Castle in the lower reaches of the Nishiki River was designated an Important Cultural Landscape by the Japanese Government.

"By the 19th century, well-known ukiyo-e artists, including Utagawa Hiroshige and Katsushika Hokusai were already depicting the Kintaikyo Bridge as a famous landmark. The beauty of the Kintaikyo Bridge has captivated many people across the ages."

Another charming aspect of the Kintaikyo Bridge is the way it reveals beautiful forms amid the assortment of richly colorful natural scenes that appear around it over the course of the changing seasons: blossoming cherry trees, vibrant autumn foliage, blankets of snow. With each season showing the bridge in such completely different appearances, visitors will not likely tire of visiting the bridge any number of times. Cormorant fishing near the bridge is a local tradition of summer as well. Visitors will also enjoy crossing to the south side of the bridge to stroll through the remaining vestiges of the traditional castle town.

"Iwakuni City is currently working to achieve World Heritage site designation for the Kintaikyo Bridge. We hope this beautiful bridge, which has been maintained over the ages thanks to the passion and effort our predecessors put into it, will be preserved for future generations."

Visitors can take a ropeway to the top of Mount Shiroyama to enjoy stunning views of the bridge from Iwakuni Castle's keep. Views from beneath the bridge also offer closer looks of the



Rokujuyo-shu Meisho Zue: Suo Iwakuni Kintaikyo ("Famous Views of the Sixty-odd Provinces: The Kintaikyo Bridge of Iwakuni, Suo Province") by Utagawa Hiroshige

structure's intricate kigumi wood joinery. Also consider traversing the bridge's rhythmical series of five arches on foot. When you have a chance to visit to Japan, be sure to look into making the trip to Iwakuni to experience the charm of this beautiful bridge, which has remained unchanged since so many ages ago.

<sup>1.</sup> A form of Cultural Property corresponding to places of high artistic or scenic value as designated by the Japanese national government or local public bodies.

Ukar. A traditional fishing method using trained cormorant birds to catch ayu (sweetfish) and other fish. Keta beams are stacked on top of each other, stretching at angles from the bridge piers toward centers of arches, with kusabi wedges used to fill gaps created by variations in beams' angles. Five parallel keta beams are secured transversely with hari (crossbeams). Keta beams protruding from bridge piers in this fashion are then connected at centers of arches with *munagi* crossbeams.

### FEATURES

## The Tsujunkyo Bridge: a Masterpiece of Early-Modern Stone Bridge Architecture



The Tsujunkyo Bridge is the only arched stone aqueduct bridge equipped with a water discharge function.

The Tsujunkyo Bridge is one of the largest arched aqueduct bridges in Japan. It is also known as "Rainbow Bridge" because of the magnificent water flow discharged from the center of the bridge. The bridge was designated as a National Treasure in September of this year. We interviewed an official of Yamato Town, Kumamoto Prefecture, about the bridge's appeal.

### (Text: Morohashi Kumiko)

amato Town spreads out in the foothills of Mount Aso in Kumamoto Prefecture, central Kyushu, Japan has a famous stone bridge. The arched stone bridge that extends to the Shiraito Plateau, which is surrounded on three sides by deep valleys, is the Tsujunkyo Bridge. The function of the bridge is to convey water from the Sasahara River to the Shiraito Plateau. It is a truly magnificent structure: the aqueduct is about 119 meters long, while the bridge itself is about 78 meters long, 6.6 meters wide and 21.3 meters high, and the radius of the arch is about 28.1 meters.

It is an aqueduct bridge originally built as part of an agricultural irrigation channel in 1854. "At that time, the Shiraito Plateau did not have a stable water supply system for agriculture due to its topographical constraints, so it was suitable only for low-productivity farming that used spring water. The local government of the time, led by Futa Yasunosuke, *So-joya (or So-shoya)*,<sup>1</sup> the chief of the Yabe area, built the Tsujunkyo Bridge to help the local people who suffered from water shortage. Futa was a prominent figure in the Yabe area. In addition to the Tsujunkyo Bridge, he built many canals and stone bridges, and a bronze statue of him stands near the bridge."

Built as an aqueduct for water supply, the stone bridge features an ingenious structure that uses the difference in elevation to channel water through three



Water is discharged from the center of the Tsujun Bridge at scheduled times throughout the year.



In mid-June, Otaue-sai ("Rice Planting Festival") is conducted in the rice paddies below the Tsujunkyo Bridge to pray for rain and a bountiful harvest.

pipes installed in the upper part of the bridge.

"The Tsujunkyo Bridge's water pipes, which are called fukiage toi ("push up pipes"), utilize the approximately two-meter difference in elevation between the north channel intake and the south outlet to push water up with great force to the Shiraito Plateau, which is higher than the bridge. In order to make the pipes strong enough to withstand the force of the surging water, *shikkui*<sup>2</sup> is applied to the joints of the stone pipes. The push up pipes are made of stone and are extremely heavy. To make sure that the structure would bear the weight of the pipes while maintaining stability and boosting earthquake resistance, the builders adopted a variety of creative methods, such as the technique for saya ishigaki stonewalls<sup>3</sup> modeled after the walls of the Kumamoto Castle. Water outlets are located on both sides of the center of the bridge (two upstream and one downstream). Usually, they are closed with plugs, but are occasionally opened to discharge water. The purpose of the discharge is to flush out sediments (earth and sand) and debris that have accumulated in the water pipes, a function unique to the Tsujunkyo Bridge. Ordinary aqueducts utilize the natural flow of water, so the water is not pushed up, but the Tsujunkyo Bridge uses water pressure to push the water up to the bridge, so when the plugs are removed, the water gushes out in powerful streams."

With its inverted siphon<sup>4</sup> push up pipes made of highly-durable stone canals, and the use of traditional masonry techniques, this bridge is truly a masterpiece of early-modern stone bridge architecture. However, it was severely damaged by the Kumamoto earthquake in April 2016 and the heavy rains in 2018, and has undergone a series of restoration works.

"The Kumamoto earthquake caused damage to the *shikkui* of the water pipes, resulting in water leakage. Later, a part of the stone wall collapsed when it was exposed to the heavy rains. Due to the restoration work required to repair these damages, the water discharge was suspended, but we were able to resume it in July 2020. The occasions of water discharge increases from September onward each year. So please check the website for the dates on which water is discharged, we will invite many visitors to come and see the Tsujunkyo Bridge."

- 1. A position similar to that of the mayor of a town today.
- 2. Shikkui (a type of Japanese plaster) is a proprietary mixture made by combining slaked lime as the main ingredient with aggregate, hemp, seaweed, and other organic materials. It is known under the Japanese name shikkui even in English-speaking countries. The shikkui used in the Tsujunkyo Bridge is a mixture of clay, sand, slaked lime, salt and pine needle juice, which is made by bolling pine needles and branches.
- 3. The term "saya ishigaki" (lit. "sheath stone wall") refers to a stone wall which slopes upward in a concave curve. Such walls were built using the technique of the *ano* (castle builders), changing the angle of the slope at each height interval, so that the slope is gentle at the bottom and becomes steeper and steeper towards the top.
- 4. An inverted siphon is a conduit structure installed in a section of an open channel. It is called an inverted siphon not because of its hydraulic siphon effect, but because of its shape. It is used when a waterway crosses a river. Both sides of the inverted siphon have free water surfaces, and the difference in water levels creates a flow.



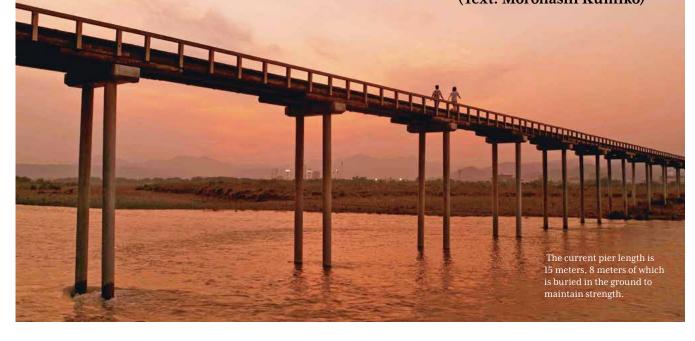
Water is dynamically discharged from three outlets



The top of the bridge is also open for visitors to enjoy the view.

# A wooden bridge that shares the history of a famous Japanese tea-making region

Horai-bashi Bridge over the Oi River in Shizuoka Prefecture was recognized by Guinness World Records in 1997 as the longest wooden pedestrian bridge in the world. You can enjoy the river's flow and the seasonal scenery as you stroll across the bridge, feeling the gentle wood underfoot. This is especially true in winter, when visitors enjoy a magnificent view of Mt. Fuji. We made a visit to Horai-bashi Bridge. (Text: Morohashi Kumiko)



H orai-bashi Bridge is a wooden pedestrian bridge measuring 897.4 meters in length and 2.4 meters in width that spans the lower reaches of the Oi River in Shimada City, Shizuoka Prefecture.

Shimada City is one of Japan's leading tea-growing areas. "The history of Japanese tea has much to do with the construction of Horai-bashi Bridge," says Takahashi Hiromichi from the Agriculture and Forestry Civil Engineering Section, Shimada City Agriculture and Forestry Development Division.

"Tea production in the Oi River basin began to flourish around 1540. In 1869, soon after the end of the Tokugawa Shogunate, the retainers who had guarded the last shogun, Tokugawa Yoshinobu, started growing tea in the Makinohara Heights on the river's right bank. As cultivation stabilized, people from Shimada, on the left bank of the river, began asking to cultivate the land, and a method of crossing the river between the banks was considered. However, the Oi River at that time was famous for strong currents that made it impossible to build bridges over it."

At the Oi River, which was also known as the most difficult section of the Tokaido<sup>1</sup> road, the *kawagoshi* system<sup>2</sup> for crossing the river was established and developed by a group of operative laborers

> Above: The Makinohara Tea Plantation, which accounts for 40% of Shizuoka's tea production and is currently the largest tea plantation in Japan Below: Horai-bashi Bridge around 1960. The original height was tall in anticipation of water level increases.





Shimada Oigawa Sungan ("Suruga Bank of the Oi River at Shimada"), an ukiyo-e painting by Utagawa Hiroshige from Tokaido Gojusantsugi ("Fifty-three Stations on the Tokaido") depicting kawagoshi Tokyo National Museum Collection

called *ninsoku* who had mastered the skills of crossing the river.

However, when the system was abolished in 1870, Shimada's laborers were left jobless, and the tea plantation on the Makinohara Plateau became the perfect place to find new employment. On the other hand, the former shogunate retainers on the Makinohara Heights also used boats to go to and from Shimada to obtain everyday goods, but they couldn't cross the river when the water level rose, and being unable to cross the Oi River freely at all times posed a major problem for them. Therefore, a Shimada City innkeeper named Shimizu Eizo and others started up a movement to build a bridge over the Oi River.

"Shimizu Eizo and other representatives of Shimada's reclaimed land cultivators' association submitted an application to the Shizuoka prefectural governor for permission to build the bridge. And making the most of traditional wooden bridge-building techniques passed down over many years in Japan, Horaibashi Bridge was built," Takahashi explains.

At first, Horai-bashi Bridge was toll-free for tea farmers and other agricultural workers, but charged others a small fee as a *chintori-bashi*.<sup>3</sup>

However, due to typhoons, heavy rains and other



Above: The soft feel of the wood creates a nostalgic atmosphere at Horaibashi Bridge

Below left: Mount Fuji as seen from Horai-bashi Bridge. If you're lucky, you can also get beautiful a view of Fuji reflected on the river's surface.

Below right: At the Bonbori Festival, visitors can enjoy traditional Japanese performing arts, including shamisen (three-stringed traditional Japanese musical instrument) and Japanese taiko drum performances.

factors causing water levels to rise, the bridge was washed away and rebuilt several times. In 1966, a full-on disaster restoration project was completed. The wooden piers of the bridge were replaced with concrete ones and the bridge has remained unchanged to this day.



You can get a clear view of massive Mount Fuji from Horai-bashi Bridge, especially in winter, when the air is clear.

"Wooden bridges are easily damaged, and repairing damage wrought by typhoons is expensive, so they're very difficult to maintain. But we appreciate the wishes of the local people who have been safeguarding the bridge since its creation, and we'll continue trying to preserve Horai-bashi Bridge's traditional appearance as much as possible."

Wooden bridges are comfortable to walk across and ideal for enjoying a view. Sometimes Mount Fuji is also visible, and on many days in winter one can see it clearly and looming large. In addition, every May, the Bonbori Festival is held, where Japanese lights called *bonbori*<sup>4</sup> are displayed on the bridge parapets, and various events, including traditional dances and taiko drum performances, are held. The festival lets visitors sense the atmosphere of the time when the bridge was built.

Also popular these days are Horaibashi 897.4 Plaza on the left bank of the Oi River, where a market and events are held, and Horaibashi 897.4 Teahouse, a rest area with a shop that sells various goods.

"They sell take-out green tea, *matcha* soft serve, and other products unique to a place that's famous

for its tea. We'd love visitors to enjoy some Japanese tea on a tatami-mat bench and take their time for viewing the wooden Horai-bashi Bridge, which blends exquisitely with the surrounding scenery.



Horaibashi 897.4 Teahouse, where you can buy local sweets and Shimada tea souvenirs.

The Tokaido Road was an important arterial road for east-west traffic throughout ancient and medieval times. It is one of the Five Highways (see p.12-13), a traffic system fully developed and expanded in the 17th century.

A system of crossing a river on foot with a *rendai* (river palanquin) or on horses and so on. The system was strictly regulated, including the price of a ticket to hire *ninsoku* or use a *rendai* to cross the river. A unique culture developed around the system, but it was abolished in modern times.
 A bridge over which a toll is charged for passage. The toll for the Horai-bashi Bridge today is 100

A bridge over which a toil is charged for passage. The toil for the Horai-Dashi Bridge today is 100 yen for adults and 10 yen for children (elementary school age and younger) (as of August 31, 2023).

Lighting equipment consisting of a candleholder with a long handle and a paper or silk cover. An
andon (lantern) with an attached handle and a base attached below.

### FEATURES

The structure of the bridge was inspired by a desire to pass down to the next generation the warm ambience of wood.

### Tsuru-no-Mai Bridge: A Beautiful Wooden Structure Resembling a Crane with Spread Wings

The Tsuru-no-Mai Bridge is a triple drum wooden bridge<sup>1</sup> that spans Lake Tsugaru Fujimi in Tsuruta Town, Aomori Prefecture. Sakaiya Sakiho, an official of the Tourism Planning Division at the Tsuruta Town Hall explains the appeal of the bridge. (Text: Morohashi Kumiko)

> On autumn and winter nights, the bridge railings are lit up, making it look like a strip of light floating on the surface of the lake.







The changing expressions of the Tsuru-no-Mai Bridge throughout the four seasons of Aomori

Every 100 meters, at the foot of each arch, there are *azumaya* stages.

The bridge forms beautiful arches set against the foothills of Mount Iwaki, the "Tsugaru Fuji."

haped like a crane spreading its wings, the Tsuru-no-Mai ("crane's dance" in Japanese) Bridge blends seamlessly into the lakeside scenery, creating a beautiful sight. Despite its wooden structure, which evokes the image of Japanese traditional style, the bridge is surprisingly new, having been built in 1994. It was constructed over Lake Tsugaru Fujimi for the purpose of monitoring and checking the condition of the water in the lake, which also serves as a reservoir, and for sightseeing purposes.

"Since ancient times, this area has been called 'Tsugaru,' and Mount Iwaki (elevation 1,625 meters), which resembles Mount Fuji when viewed from this location, is also known as the 'Tsugaru Fuji.' In 1660, Nobumasa, the 4th lord of the Hirosaki clan,<sup>2</sup> which ruled the Tsugaru region, built an embankment to facilitate the development of new rice paddies. He also created a large reservoir,<sup>3</sup> which was named Lake Tsugaru Fujimi, because its surface reflected Tsugaru Fuji," explains Sakaiya.

She also provided details about the Tsuru-no-Mai Bridge.

"It is a 300-meter-long triple drum bridge constructed entirely of Aomori cypress. The pier is build using 700 Aomori cypress trees that were more than 150 years old, applying traditional Japanese wooden architecture techniques, in order to maintain harmony with the surrounding natural environment and the landscape."

*Azumaya* stages are located every 100 meters. They can be used for rest and for holding small-scale events, making the Tsuru-no-Mai Bridge a place for recreation and relaxation for the local people.

According to Sakaiya, there is also an interesting story about the numbers related to the Tsuru-no-Mai Bridge.

"We were looking for the number three in connection to its structure as a triple drum bridge, when we discovered that, by pure coincidence, this number was related to almost every element of the Tsuru-no-Mai Bridge."

Indeed, the bridge is 300 meters long and three meters wide, with pier columns 30 centimeters in diameter, and was made using 3,000 logs and 3,000 planks. The number three is truly everywhere.

"In fact, a straight line links the bridge with Kannon Hakkakudo, an octagonal Buddhist pagoda dedicated to the Deity of Mercy, Kannon enshrined on the grounds of the nearby Fujimi Lake Park. The many associations of the bridge with the number three, which is considered auspicious in Japan, gave birth to a widespread belief that it is part of a 'mysticalpath' leading to the Deity of Mercy. Today, the bridge is drawing attention as a spiritual place for good fortune and longevity."

But, above all, the main attraction of the Tsuru-no-Mai Bridge is the beautiful harmony between the bridge and the magnificent nature of the Tsugaru region that brings it into focus.

"In spring, the Tsuru-no-Mai Bridge can be enjoyed against the backdrop of cherry blossoms, and in fall, it is highlighted by crimson foliage. The bridge looks particularly attractive in winter when it's like putting on a hat of pure white snow. In autumn and winter, when the air is crisp and clear, the sight of the Tsuru-no-Mai Bridge illuminated under the starry skies is truly spectacular."

"This September marks 30 years since the construction of the bridge. Because of aging of the structure, it will undergo a major renovation over a period of three years, from 2023 through 2025. Renovation work will be conducted from September 1 to March 31 of each year. The Tsuru-no-Mai Bridge will be closed to all traffic until construction is completed, but visitors will be able to view the exterior of the bridge as it is. We have also scheduled special events during the renovation period, and we hope visitors will enjoy them."

A semicircular highly-arched bridge is called a "drum bridge" because its form makes a full circle when reflected in the water, suggesting the shape of a round drum. Three linked drum bridges are called a "triple drum bridge."

The Hirosaki clan ruled the Tsugaru region of Mutsu Province, which roughly corresponds to present-day Aomori Prefecture, during the Edo period (1603 – late mid-19th century). It was also known as the Tsugaru clan and governed the western part of what is now Aomori Prefecture.

<sup>3.</sup> Officially named Mawarizeki Otameike, it is the largest reservoir lake in Aomori Prefecture.



### Discharge into the Sea of ALPS Treated Water from Fukushima Daiichi Nuclear Power Station

ALPS treated water<sup>1</sup> refers to water from inside the buildings of the Tokyo Electric Power Company's (TEPCO) Fukushima Daiichi Nuclear Power Station (NPS) that has been purified and treated using the ALPS purification system to remove radioactive materials. On August 24, 2023, TEPCO began discharging ALPS treated water into the sea. This article covers the discharge of ALPS treated water into the sea, focusing on the safety of this discharge.

### Safety of discharge into the sea of ALPS treated water

ALPS is the acronym for Advanced Liquid Processing System, which purifies and treats water, removing various radioactive substances. ALPS treated water is water that has been purified and treated until it satisfies safety standards for all radioactive materials other than tritium.<sup>2</sup> To address tritium too, the water is significantly diluted with seawater before discharge so that it fully satisfies safety standards. The tritium concentration after dilution is less than 1/40 of the safety standard (or 1/7 of the WHO standards for drinking water). Because the water satisfies safety standards before it is discharged and the total amount of radioactivity discharged is also limited to a maximum of 22 trillion Bq (becquerels) per year, there is no concern about effects on human health or the environment.

ALPS is stable and performs well, and it also comprises multiple devices that can be replaced in the event of inspections or breakdowns.

In addition to analysis by TEPCO itself, the Japan

Atomic Energy Agency (JAEA) and the International Atomic Energy Agency (IAEA)<sup>3</sup> also implement independent third-party analyses of the concentration of radioactive materials in the ALPS treated water, to ensure the thorough objectivity of the data.

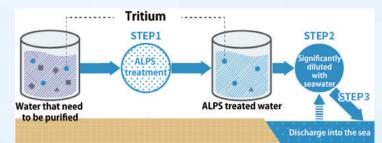
### IAEA has confirmed the safety of discharge into the sea of ALPS treated water

The IAEA is an authoritative UN-related organization with expertise in the field of nuclear energy (possessing the authority to formulate and apply nuclear safety standards). It is the IAEA that conducted an expert, objective review of the ALPS treated water discharge into the sea. The results of the review were announced on July 4, 2023 in a comprehensive report that concluded that the discharge into the sea of ALPS treated water is "consistent with relevant international safety standards," and that the discharge "will have a negligible radiological impact to people and the environment."

The IAEA is committed to confirming the safety of the discharge into the sea of ALPS treated water not only



IAEA experts visit Fukushima Daiichi Nuclear Power Station to conduct a comprehensive review Photo: Tokyo Electric Power Company Holdings, Incorporated



ALPS treatment process

before discharge at the review stage, but also during and after the treated water discharges occur. An IAEA site office has been established at TEPCO Fukushima Daiichi NPS, which will continue with onsite activities, providing realtime data on the discharge to the international community, as well as continuing with additional reviews and monitoring to provide transparency and reassurance to the international community. Rafael Grossi, Director General of the International Atomic Energy Agency, has also stated that the IAEA will remain involved in the process until the last drop of water has been discharged.

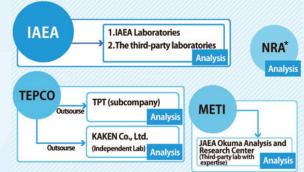
Following the release of the IAEA's Comprehensive Report, many countries and regions expressed support for Japan's efforts regarding the discharge into the sea of ALPS treated water and the results of the IAEA report, noting that these are based on scientific evidence.

### Monitoring of ALPS treated water

ALPS treated water is discharged under strict controls, including measuring the concentration of radioactive materials contained in the water before discharge and confirming that the concentration fulfils the regulatory standard. Accordingly, there are no food safety-related issues for fish and other organisms living in the vicinity. In addition, other organizations concerned, including IAEA COMPREHENSIVE REPORT ON THE SAFETY REVIEW OF THE ALPS-TREATED WATER AT THE FUKUSHIMA DAIICHI NUCLEAR POWER STATION



Comprehensive Report published by the IAEA on July 4, 2023.



Analytical body for ALPS treated water \*Nuclear Regulation Authority, Japanese Government

TEPCO, the Ministry of the Environment, and the Fisheries Agency are implementing marine monitoring relating to ALPS treated water. The results of analysis conducted after the start of the discharge of ALPS treated water have confirmed that no anomalies have been found in tritium concentrations, and that there is no impact on people or the environment. Details about the results of monitoring are updated regularly on the "ALPS Treated Water Marine Monitoring Information" website (https:// shorisui-monitoring.env.go.jp/en/).

- See "Ensuring the Safety of Discharging ALPS Treated Water into the Sea," in *HIGHLIGHTING Japan*, October 2022 edition. https://www.gov-online.go.jp/eng/publicity/book/hlj/ html/202210/202210\_09\_en.html
- Tritium (H-3) is a relative of hydrogen and is present in tap water, rainwater and also in our bodies. The radioactive energy emitted by tritium is extremely weak and can be blocked by a single sheet of paper.
- An international organization established in 1957 as an autonomous body under the auspices of the United Nations (UN) to promote international cooperation relating to nuclear energy.

Note: This article was written with the consent of the Ministry of Economy, Trade and Industry (METI) and on the basis of publicly available data from the Ministry.

# Inverter with High Power Density Cuts Electric Vehicle (EV) Charging Time in Half

The new double-sided direct water cooling power module, which became the key to the successful development of the high power density inverter

Photo: Hitachi, Ltd. and Hitachi Astemo, Ltd.

In the global fight against climate change, there is an urgent need to mainstream electric vehicles (EVs), which do not emit carbon dioxide on the road, and plug-in hybrid vehicles (PHVs). The long time required to recharge EVs, however, has posed a serious hurdle. A new inverter with high power density is solving the problem. The engineer in charge of its development, Nakatsu Kinya, and his team of four other engineers at the companies that developed the inverter, were awarded by the Japanese Government, and that was the "Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology" Science and Technology Award<sup>1</sup> for fiscal 2021.

### Fukuda Mitsuhiro

echnological development in the field of mobility is urgently required in order to slow the advance global warming. Currently, there is one major barrier to the widespread use of EVs and PHVs, which are considered to be the key to achieving carbon neutrality,<sup>2</sup> and that is the recharging time. Conventional EVs require about 40 minutes of recharging to travel 400 km, for instance, and many people, especially in countries and regions where long-distance travel by car is required on a daily basis, have been hesitant to switch to EVs due to concerns about running out of battery.

To overcome this barrier, Hita-

chi, Ltd. and Hitachi Astemo, Ltd. have developed an inverter with high power density. By increasing the voltage of the EV system from the conventional 400V to 800V, the new inverter has made it possible to recharge twice as much energy in the same amount of time. This halves the recharging time from about 40 minutes to about 20 minutes for a vehicle with a driving range of 400 km. As a result, it is now possible to recharge an EV in only five minutes for a 100-kilometer daily drive.

However, raising the voltage of EV systems to 800V has been considered difficult due to numerous technical challenges. In fact, it was not just a matter of raising the voltage. Many other related tasks had to

be confronted, such as reviewing the insulation technology in the device, downsizing the inverter module, which is the heart of the system, and improving the performance of the cooling system for the power module, the part responsible for switching between direct current and alternating current power and other power conversions. The main challenge was improving the cooling system for the power module. Controlling the motor of an EV generates a conversion loss<sup>3</sup> roughly equivalent to the power consumption of a standard household air conditioner for a room with a floor area of about 15 to 20 square meters, so the heat that is produced in this process must be cooled efficiently. Hitachi, Ltd. and Hitachi Astemo, Ltd.



The developer, Nakatsu Kinya, conducts performance verification.



Production line for high power density inverters for EVs/PHVs

Photo: Hitachi, Ltd. and Hitachi Astemo, Ltd.

High power density inverters for EVs/PHVs (two types of products)

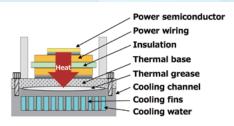


Photo: Hitachi, Ltd. and Hitachi Astemo, Ltd.

Structure of power modules inside conventional inverters

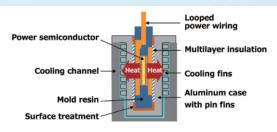


Photo: Hitachi, Ltd. and Hitachi Astemo, Ltd.

Structure of the newly-developed double-sided direct water cooling power module

solved this problem by developing an innovative power module that cools from both sides, replacing the conventional single-side cooling structure. In that development project, through a process of trial and error, they also arrived at a unique method of efficiently cooling power semiconductors by immersing them in cooling water (see attached figure). This innovative double-sided direct water cooling power module, a world-first, became the key to the successful effort to develop the inverter with high power density.

In addition to the high power density inverters for EVs and PHVs, the two companies intend to continue to develop in-wheel motors for EVs,<sup>4</sup> and electrification of various aircraft, including passenger planes, looking to contribute broadly to the entire field of mobility.

Further efforts to build a carbon-neutral world are needed, and quickly. Hopes are high that similarly groundbreaking technologies will be continuously developed in the relentless pursuit of this goal.

- 1. An award presented by Japan's Ministry of Education, Culture, Sports, Science and Technology to those who have achieved significant success in research, development, public understanding, and so on in science and technology.
- 2. Carbon neutrality means achieving a balance between emitting and absorbing greenhouse gases. In October 2020, the Government of Japan declared Japan's aim to reduce greenhouse gas emissions to net-zero by 2050, thereby helping to build a carbon-neutral world.
- 3. A state in which electricity is not effectively converted and energy is released in the form of waste heat, etc.
- 4. Motors that can be installed inside the wheels of vehicles. This configuration can provide a multitude of benefits for passengers and the surrounding environment in a variety of situations. Such benefits may include reduction of the size and weight of the vehicle, energy loss alleviation, expansion of the interior space, and improved ride comfort. Development is still underway, and future social implementation will be funded under the Green Innovation Fund Projects of Japan's New Energy and Industrial Technology Development Organization (NEDO).

# Becoming a musical bridge from Africa to Janan

The djembe, a type of African drum Photo: Latyr Sy

Latyr Sy was born on the Senegalese island of Gorée,<sup>1</sup> a world heritage site. Since coming to Japan in 1995, he has performed as a percussionist and singer with many Japanese artists and at many international events.

e began playing djembe,<sup>2</sup> an African drum, at a young age, and has been active as a percussionist ever since. He says that when he first visited Japan in 1994, at the age of 21, he became interested in the country and felt a desire to popularize African drumming in Japan. He came back to Japan the next year and made it his base for kicking off his career.

"When I first got to Japan, I had opportunities to enjoy *noh*, the Japanese classical theater, and to interact with *ohtsuzumi* player Okura Shonosuke, the Important Intangible Cultural Property General Designation Holder, Noh Musician. The ohtsuzumi is a traditional Japanese hand drum and looks very similar to the talking drum, a type of African drum. They have many things in common, such as the use of animal skin for drumheads. I was greatly inspired by the playing method and timbre."

#### Murakami Kayo

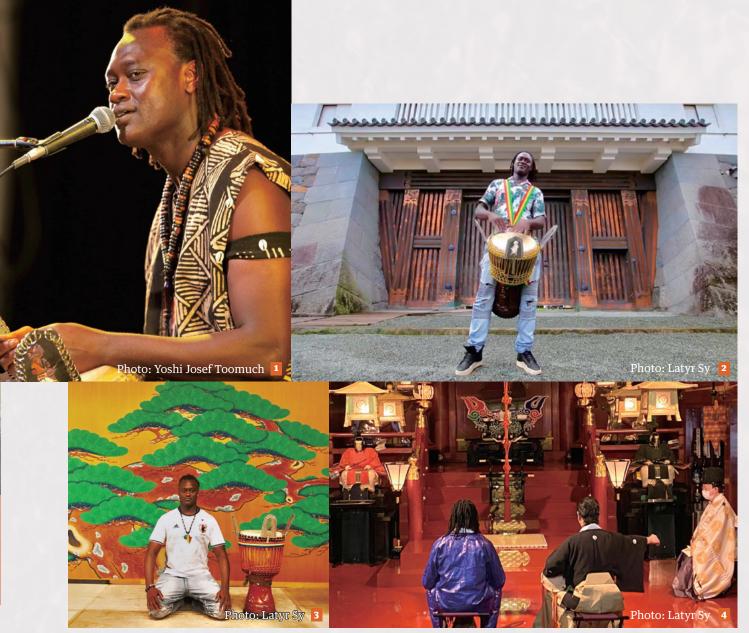
Before long, Latyr was invited to perform internationally in collaboration with performers of Japanese classical theater such as *noh* and *kyogen*. The shows were well-received, and Latyr went on to play at international events in Japan and overseas, such as the Torch Welcome Ceremony for the 1998 Nagano Winter Olympic Games and the 2004 Athens Summer Olympic Games.

One especially impressive performance for him was with Nomura Mannojo, a Japanese *kyogen* performer, in 2002 for the opening ceremony of the Silk Road Festival in Washington. D.C., attended by then-U.S. Secretary of State Colin Powell and other dignitaries. Latyr said he had to brace himself for such a big event attended by such distinguished guests. "It was an honor to be able to perform on a strict Japanese classical theater stage and to represent Africa, while playing with world-famous artists. Actually, according to its original tradition, such an ensemble would have been inconceivable. I was also very surprised by this new form of Japanese traditional performing arts."

Latyr has also been active in a wide range of other work, including performing with many big-name Japanese artists, working in music production for commercials, and holding African percussion workshops around Japan.

"I want to be a bridge that connects Japan and Africa through music," he says. By this, he means that he hopes not only to pursue new musical possibilities through sessions that go beyond national and genre borders, but also "that more people to feel the attraction of Africa."

"I think that for a lot of people, when they hear the term 'African music,' they picture something intense and rhythmical. But there is also African music that is calm and healing.



1.Latyr Sy 2.Latyr plays an African drum 3.A photo of Latyr on a *noh* stage with a djembe, a traditional African drum 4.A photo of Latyr in a dedication performance at Hakone Shrine with Okura Shonosuke (Important Intangible Cultural Property General Designation Holder, Noh Musician)

Africa is a vast continent with diverse rhythms and cultures, depending on the region, and this goes beyond the realm of music. I want many people to find out what today's Africa really looks like, including its more than 50 nations, and the culture, history, and economy of each region. If my activities could lead to such a realization, I would be very happy."

Latyr says that when he first came to Japan, he hardly understood Japanese, and had many difficulties. However, as the phrase "music has no language" implies, once he started to play music, he saw it transcends national and other differences and brings us together. He strongly felt that this is the appeal of music, and as a Senegalese, as well as an artist who expresses Japanese musical culture, he has expanded the range of his activities.

From now on, Latyr is sure to continue bringing excitement to many people by going beyond the category of African music to create new music that combines a wide range of genres, including Japanese classical music, Western classical music, Latin, jazz, and rock.



1. Gorée, which was registered as a UNESCO World Heritage Site in 1978, is a small island off the coast of the Senegalese capital of Dakar. It was a site involved in the slave trade, and a detention facility built in 1776 still remains.

2. The djembe is a percussion instrument that has traditionally been used in West Africa. It is made by hollowing out a log in the shape of a goblet, covering the wide end with the skin of a goat, sheep or other animal, and leaving the narrow end open. It is played with the bare hands, and several different sounds can be produced, depending on the position and shape of the hands. Also called "jembe" or "djimbe.

### SERIES THE BEAUTY OF KIMONO



### *Kosode* (a Garment with Small Wrist Openings) with Autumn Flower-Plants Pattern on Twill Weave Silk, Painted by Ogata Korin

The kimono is much more than a garment; it is a symbol of traditional Japanese culture. The kimono of contemporary Japan originated with the short-sleeved *kosode* in the Edo period (early 17th century to mid-late 19th century). Around this time, the *kosode* came to be worn by people from a wide range of generations, by everyone from court nobility and the samurai class to commoners, as an outer layer of clothing. The garments came to feature brilliant decorations with techniques including embroidery, *shibori* (shaped resist dyeing), and *katazome* (stencil resist dyeing). This article introduces one such *kosode* of the Edo period featuring a design painted by Ogata Korin (1658-1716), an artist originally from Kyoto. *Kosode* (a Garment with Small Wrist Openings) with Autumn Flower-Plants Pattern on Twill Weave Silk, Painted by Ogata Korin

Edo period, 18th century Important Cultural Property (Collection of the Tokyo National Museum)

Though Ogata Korin was born the second oldest son of a kimono merchant family operating Karigane-ya, he virtually never tried his hand at kimono design. A fully intact, extant *kosode* hand-painted by Korin himself is an extremely rare treasure.

Photo: ColBase (https://colbase.nich.go.jp/)

### OYAMA YUZURUHA

scene of autumn-flowering plants swaying in the breeze in a grass field is \_depicted on the kosode, treating the back of the garment as a painter's canvas. Japan has a long history of appreciation of these flowers and plants of autumn, and one poet representative of ancient Japan, Yamanoue no Okura (c.660-733), who worked mainly with the waka form, praised the seven plants (nana-kusa)1 he saw blooming in autumn fields. In this kosode, a transparent pale blue bellflower is the main character from among these seven flowers, and Japanese pampas grass and bush clover are depicted along with white chrysanthemums. The bellflower blossoms appear in stylized, starlike forms. Also, the background of those flowers is not drawn in detail or realistically, only by expressing a part of the grass, it is drawn as if it had the impression that a wide grassland would continue from there. This distinctive mode of expression would become a major defining characteristic of the signature style of this artist, Ogata Korin, who had an early part in consolidating the Rinpa school of Japanese painting, known for its highly decorative style.

Ogata Korin was born into a kimono merchant family as the second oldest son. The long-standing family business, Karigane-ya, had been in operation since the end of the



*Yatsuhashi Maki-e Suzuri-bako* ("Writing Box with the Eight-Plank Bridge. Lacquered wood with [*maki-e*], lead, and mother-of-pear") by Ogata Korin Edo period, 17th century

National Treasure (Collection of the Tokyo National Museum)

Ogata Korin also designed craft items, including ceramics and *maki-e* boxes, such as this gold-decorated lacquerware. This *suzuri-bako* inkstone box features a motif based on a scene from Japanese classical literature. Inlayding slabs of lead into the part of bridge boldly, represents a highly creatie and effective use of materials not seen in other *maki-e* items.

Photo: ColBase (https://colbase.nich.go.jp/)

*Sabi-e Kan'o-zu Kakuzara* ("Square Plate with Picture of a Man Looking at a Seagull in the Rusty-painting Style) by Ogata Korin and Shinsei

Edo period, 18th century (Collection of the Tokyo National Museum)

After his younger brother Shinsei (Kenzan) made the square dish, Korin painted the image featuring Chinese poet Huang Tingjian (Shangu) inside it. The brothers' collaborative works like this enjoyed considerable popularity among devotees of their work in Kyoto.

16th century. Besides Korin had been painting byobu folding screens, hanging scrolls, and so on, he also designed maki-e lacquerware inkstone boxes, sketched tea bowl designs for his younger brother Kenzan, who became a ceramic artist himself, and more. In particular, the brothers' collaborative works featured designs painted by Korin on pottery crafted by Kenzan. Korin's paintings seem imbued with a power to create spaces of decorative brilliance in daily life with their stylized depictions of natural forms, from flowers and birds to flowing water. Upon making a name for himself as a painter in Kyoto, Korin relocated to Edo (current Tokyo) around 1704, where he remained an active artist. His first patron in Edo was the owner of a lumber retailer, Fuyuki-ya, based in Fukagawa. The kosode introduced here is considered to have been a work Korin created for the wife of this patron as a token of his gratitude.

Photo: ColBase (https://colbase.nich.go.jp/)

At the time, kaki-e kosode with designs painted by famous artists directly on kimono were much sought after as one-of-a-kind luxury items by affluent townswomen. An ukiyo-zoshi2 work penned by Yushiken Masafusa, Koshoku Fumi Denju ("How to Convey Love," publ. 1699), even contains a passage describing "a garment with a sumi-e ink painting of a pine tree design by Korin on white satin"<sup>3</sup> as having "a sense of maturity, or ripeness, defying description." From this, it can be inferred that kosode featuring designs painted by Korin were, indeed, popular items. It is not hard to imagine that the artist may have been desired for taking his brush to the garment by the wife of his patron.



Following the downfall of Fuyukiya, however, the whereabouts of this kosode would be unclear for many years. After a period of unknown owner, it eventually found its way to the collection of the Tokyo National Museum in 1873. By this time, however, it was in such a tattered and damaged state that it could no longer be worn. A scroll accompanying it contained an accurate drawing of the *kosode* with a designation stating that it had been painted by Ogata Korin for Fuyuki-ya. Accordingly, it had been brought to the museum as a precious garment hand-painted by Korin at that time. Today, the piece has been restored based on this drawing and is displayed in exhibitions on occasion.

#### Honkan Room 10, Tokyo National Museum "Highlights of Japanese Art: Costume"

*Kosode* (a garment with small wrist openings) with Autumn Flower Design on White Twill Weave Silk, Painted by Ogata Korin (Important Cultural Property) will be exhibited from October 3 to December 3, 2023.

- Seven plants (*nana-kusa*) considered representative of Japan's flowers of autumn, referred to in a pair of poems by Yamanoue no Okura compiled in the *Manyoshu* ("Collection of Ten Thousand Leaves"): bush clover, Japanese pampas grass, kudzu vine, dianthus, yellow patrinia, boneset, and Japanese morning glory. Some have posited that the seventh, however — referred to as *asagao* in the verse — may correspond to what is now called *kikyo* (bellflower) rather than morning glory.
- 2. A type of novel in the *chonin bungaku* ("townspeople's literature") genre written in the mid-Edo period. Featuring a realistic and amusing style, the form enjoyed popularity mainly in Osaka and Kyoto for around 100 years starting in the mid-late 17th century.
- 3. A type of weave in which somewhat elongated warp threads are made to float over the weft threads on the surface of the fabric, and vice versa, in order to make the points of intersection between the warp and weft threads as inconspicuous as possible.

### Birds of Japan

### Hiyodori Bulbul





he *hiyodori* bulbul can be seen widely anywhere in Japan, including in urban areas and mountainous regions. Males and females are the same color and whole body is dark gray, with a slight pale bluish tinge on the head. They grow to around 27-29 cm in length and can spread their wings span nearly 40 cm, so they are impressive when seen in a park or garden. They are rare in the rest of the world, as they inhabit few areas outside of Japan and its surrounding regions. Most are resident birds that do not migrate with the seasons. They are omnivores, feeding on fruits, insects, blades of grass, and seedlings. *Hiyodori* bulbul also like nectar of flowers including cherry blossoms.

HIGHLIGHTING DEASE VISIT the top page of Highlighting Japan for links to all our past issues including videos. www.gov-online.go.jp/eng/publicity/book/hlj/ HIGHLIGHTING JAPAN ALL PAST ISSUES available online