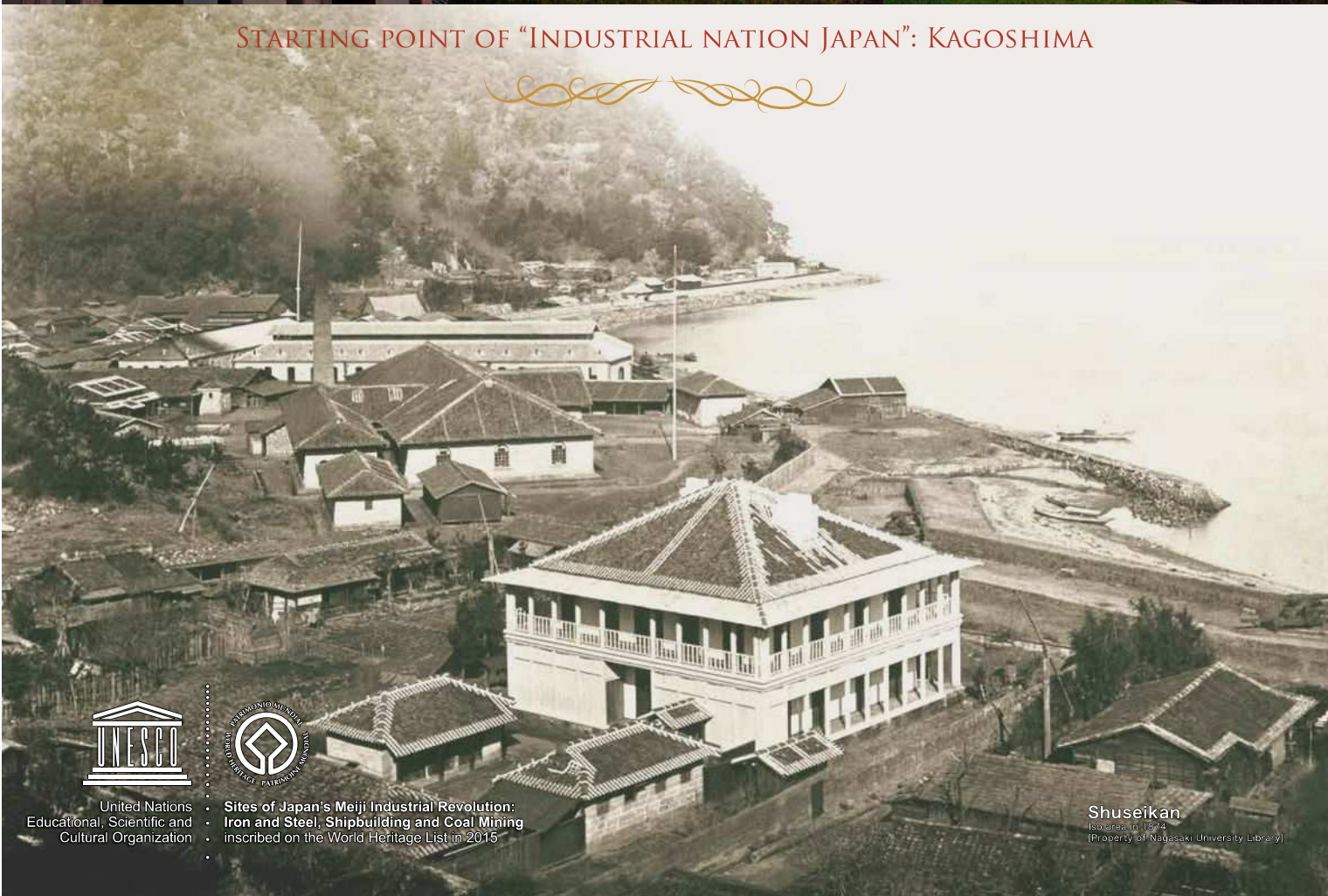


THE DAWN OF JAPAN'S MODERNIZATION

SITES OF JAPAN'S MEIJI INDUSTRIAL REVOLUTION

STARTING POINT OF "INDUSTRIAL NATION JAPAN": KAGOSHIMA

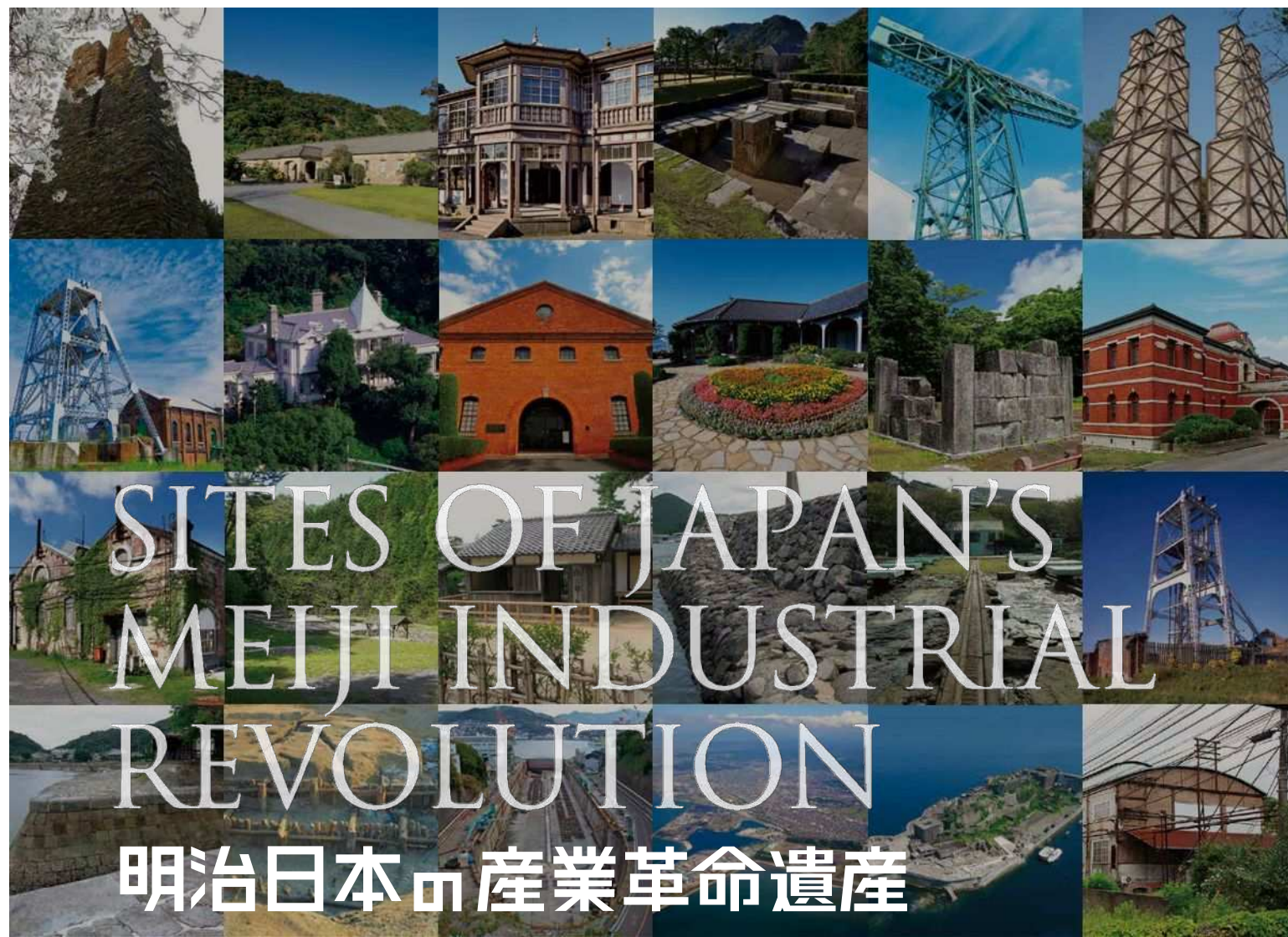


United Nations
Educational, Scientific and
Cultural Organization



Sites of Japan's Meiji Industrial Revolution:
Iron and Steel, Shipbuilding and Coal Mining
inscribed on the World Heritage List in 2015

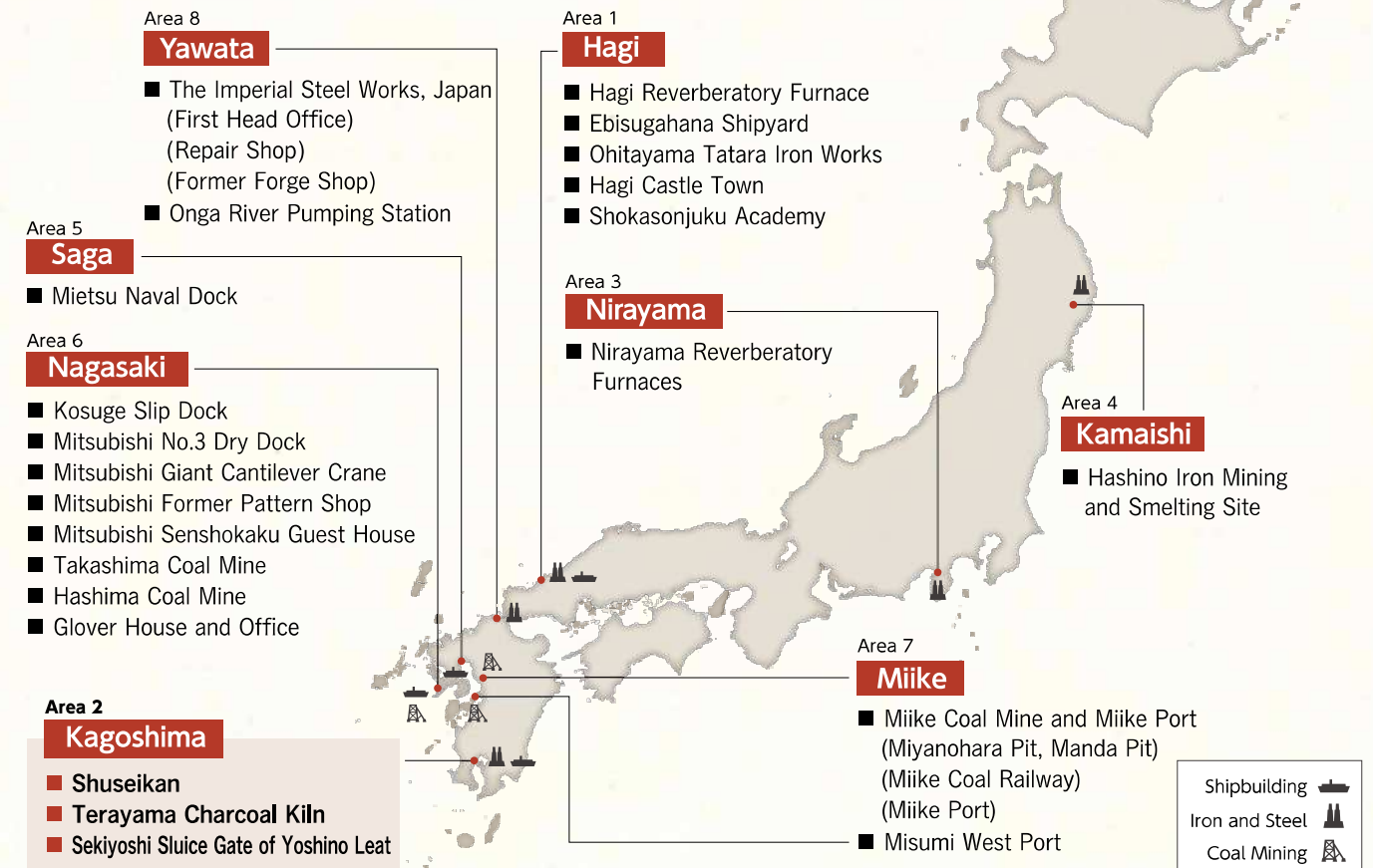
Shuseikan
Inscribed in 1974
(Property of Nagasaki University Library)



SITES OF JAPAN'S MEIJI INDUSTRIAL REVOLUTION

明治日本の産業革命遺産

□ Distribution of Component Parts



□ Phases of Development in Each Industry (1850s-1910)

| | 1850s | | 1910 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stage | Trial and Error Experimentation Based on Western textbooks and by the copying of Western-style ships by feudal clans and the Tokugawa Shougunate (before the steam engine) | Direct Importation of Western Technology Direct importation of Western technology and the expertise to operate it (Steam Engine) | Full-blown Industrialization Full-blown industrialization through newly acquired domestic expertise and more active adoption and adaptation of Western technology (Beginning of Electrification) |
| Iron and Steel | <ul style="list-style-type: none"> Area 2 Kagoshima <ul style="list-style-type: none"> 2-1 Shuseikan, 2-2 Terayama Charcoal Kiln 2-3 Sekiyoshi Sluice Gate of Yoshino Leat Area 3 Nirayama <ul style="list-style-type: none"> 3-1 Nirayama Reverberatory Furnaces Area 4 Kamaishi <ul style="list-style-type: none"> 4-1 Hashino Iron Melting and Smelting Site Area 1 Hagi <ul style="list-style-type: none"> 1-1 Hagi Reverberatory Furnace, 1-2 Ebisugahana Shipyard, 1-3 Ohitayama Tataru Iron Works, 1-4 Hagi Castle Town, 1-5 Shokasonjuku Academy | | <ul style="list-style-type: none"> Area 8 Yawata <ul style="list-style-type: none"> 8-1 The Imperial Steel Works, Japan 8-2 Onga River Pumping Station |
| Ship - building | <ul style="list-style-type: none"> Area 2 Kagoshima <ul style="list-style-type: none"> 2-1 Shuseikan, 2-3 Sekiyoshi Sluice Gate of Yoshino Leat Area 5 Saga <ul style="list-style-type: none"> 5-1 Miitsu Naval Dock | <ul style="list-style-type: none"> Area 6 Nagasaki <ul style="list-style-type: none"> 6-1 Kosuge Slip Dock 6-8 Glover House and Office Area 6 Nagasaki <ul style="list-style-type: none"> 6-6 Takashima Coal Mine Area 7 Miike <ul style="list-style-type: none"> 7-2 Misumi West Port | <ul style="list-style-type: none"> Area 6 Nagasaki <ul style="list-style-type: none"> Mitsubishi Nagasaki Shipyard 6-2 Mitsubishi No.3 Dry Dock 6-3 Mitsubishi Giant Cantilever Crane 6-4 Mitsubishi Former Pattern Shop 6-5 Mitsubishi Senshokaku Guest House |
| Coal-Mining | | <ul style="list-style-type: none"> Area 6 Nagasaki <ul style="list-style-type: none"> 6-7 Hashima Coal Mine Area 7 Miike <ul style="list-style-type: none"> 7-1 Miike Coal Mine and Miike Port | |

Japan's industrialization was realized in a mere 50 years, a unique achievement in the world.

STORY

"Sites of Japan's Meiji Industrial Revolution: Iron and Steel, Shipbuilding and Coal Mining" is composed of industrial heritage components representing the successful transfer of industrialization from the West to a non-Western nation.

Japan built the foundation of an industrial nation from the late 19th century to the beginning of the 20th century and rapidly accomplished industrialization in heavy industries such as iron and steel, shipbuilding, and coal mining, becoming a world-renowned industrial nation.

In just 50 years, traditional Japan was rapidly transformed into the first non-Western industrial nation by amalgamating its traditional culture with Western technology. The component sites demonstrate key processes exemplifying this unprecedented event in world history.

Inscribed on the World Heritage List in July 2015

Endeavors towards inscription as a cultural World Heritage Site were initiated by the Kagoshima Declaration at the symposium "The Modern Industrial Heritage Sites in Kyushu", held by Kagoshima Prefecture in 2005.

The component parts are located in 11 cities in 8 prefectures centered on Kyushu (Fukuoka, Saga, Nagasaki, Kumamoto and Kagoshima) and Yamaguchi, together with Izunokuni City in Shizuoka prefecture and Kamaishi City in Iwate prefecture. In July 2015, their close connection was recognized, and these serial properties were inscribed as a UNESCO World Heritage Site possessing a single Outstanding Universal Value.

POINT 1

Satsuma, the Marine State that Promptly Captured the Nature of Contemporary Global Movements

During the Edo period, the Tokugawa shogunate gave special permission to Nagasaki and Ryukyu, a clan then under control of Satsuma, to conduct trade despite the seclusion policy which banned trading with foreign nations. As a result, the Satsuma clan was able to gain direct access to the contemporary global movement through various literature and information brought from China and other nations.



[Property of Shokoshuseikan Museum]

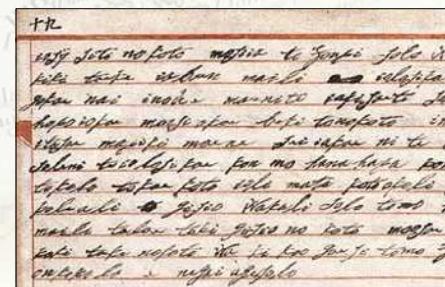
Shimadzu Nariakira: an enlightened lord known as one of the greatest lords at the end of the Edo Period

The 11th lord of the Satsuma clan (1809-1858) With a long and broad view of the entire nation, Nariakira started the Shuseikan Project, aiming to build a strong and prosperous nation under the concepts of fukoku kyōhei (Enrich the Country, Strengthen the Armed Forces) and industrial growth. When the project found itself facing great setbacks, he inspired his samurai with the words, "Western people are human beings too, just like the Satsuma people." Although Nariakira served as the lord for only seven years, his aspirations were passed down to many influential leaders. He also recruited talented people, including Saigo Takamori, who had been actively engaged in the Meiji Restoration.

Bamboo Water Pipe



The Globe and World Map which are believed to have been used by Nariakira [Property of Shokoshuseikan Museum]



Nariakira's diary written in Romanized letters [Property of Shokoshuseikan Museum]



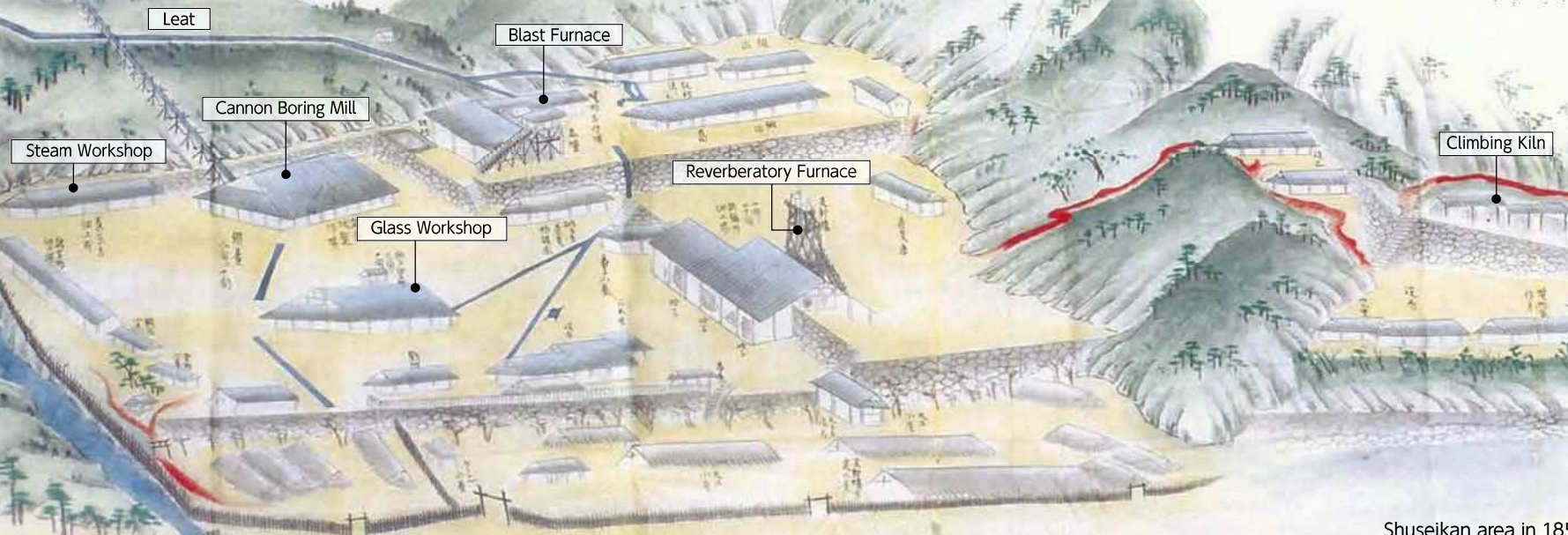
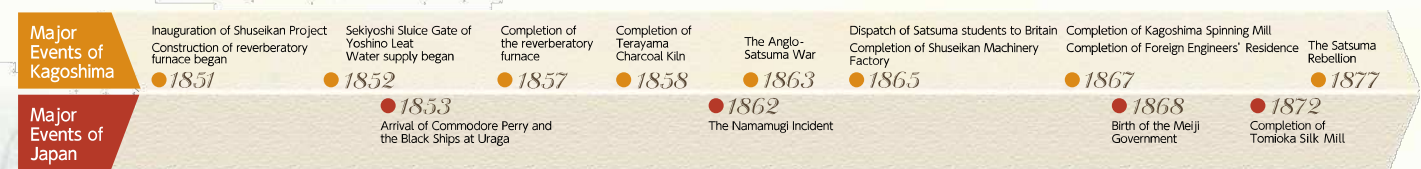
Kagoshima Port had long been an important trading port with the regular arrival of Ryukyu ships [Property of Shokoshuseikan Museum]

Imminent threat of powerful Western nations

In the 19th century, Western power nations such as Britain, France and the US began to advance towards Asia. The Satsuma clan, located at the southern tip of Japan, came in contact with these nations first and always feared their power. When the Qing Dynasty (China) was defeated by Britain in the Opium War in 1842, the sense of crisis rising vis-à-vis Western powers started to spread among the Tokugawa shogunate and other clans. It was within this environment that Shimadzu Nariakira became the lord of the Satsuma clan in 1851. Nariakira had shown an interest in overseas cultures from an early age. As he believed that Japan needed to become rich and strong, he started to promote the modernization of various industries such as cannon casting and shipbuilding.

Satsuma Begins Interactions with Foreign Countries

During the Edo period, the Satsuma clan not only governed present-day Kagoshima prefecture, but also a part of Miyazaki prefecture and the entirety of Okinawa prefecture. It was the Satsuma clan that first interacted with foreign ships arriving from the south.



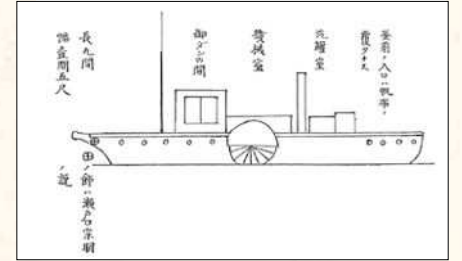
Shuseikan area in 1857 "Sasshu-Kagoshima-mitori-ezu" [Collection of the Takeo Nabeshima clan, Property of Takeo City]

POINT 2

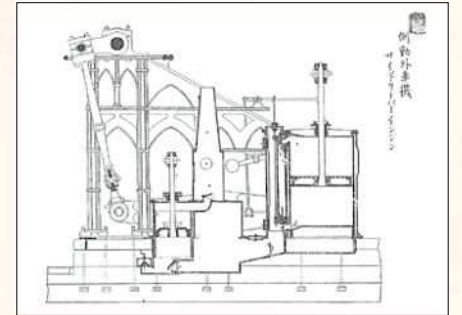
The Shuseikan Project, the Predecessor of Japan's Industrialization

Shimadzu Nariakira, after having become the feudal lord of the Satsuma clan in 1851, thought it necessary not only to enforce military power but also to allow the general public to lead a good life in order to build a wealthy and strong Japan. Guided by this concept, Nariakira constructed Japan's first Western-style factory complex known as the "Shuseikan" in Iso area in Kagoshima City. Based on Western literature and traditional technology, he succeeded in constructing a reverberatory furnace through a self-determined strategy in order to produce iron cannons. The Shuseikan Project covered various areas including iron manufacturing, shipbuilding, spinning, gas lights, printing and development of Satsuma pottery for export and Satsuma kiriko cut glass. At its peak, as many as 1,200 people were working there. However, following the sudden death of Shimadzu Nariakira, the project was temporarily reduced in scale.

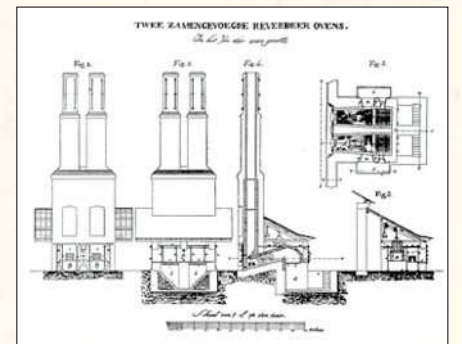
Japan's first steamship "Unko-Maru" (upper right) [History of Satsuma Clan Navy]



Drawing of "Unko-Maru" (lower right) [History of Satsuma Clan Navy] When seeing the Unko-Maru, Kattendijke, an officer of the Royal Dutch Navy, praised the work by saying "I must take my hat off to the talent of those who built this without actually having seen the real ship but only with simple drawings."



Satsuma kiriko cut glass [Property of Shokoshuseikan Museum]



Drawing of a reverberatory furnace made by a Dutch army general, Huguenin [Property of Shokoshuseikan Museum]

A reverberatory furnace produces cannons by melting the iron. Before the furnace was finally completed, experimentations with reference to translated Western books were repeated and improved upon through trial and error.



Western Frigate "Shohei-Maru" [Property of Shokoshuseikan Museum]



Restored 150-pound cannon [Property of Shokoshuseikan Museum]

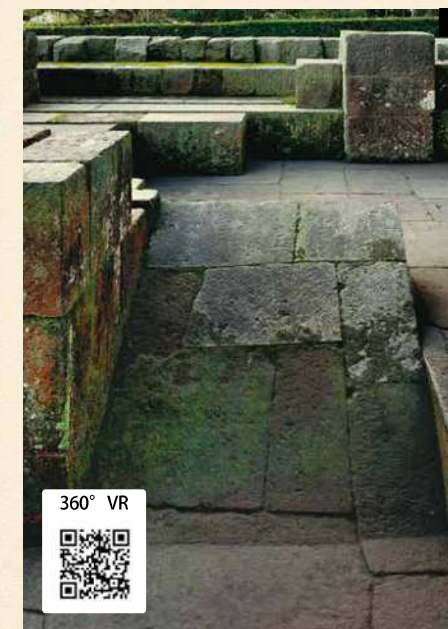


Satsuma pottery [Property of Shokoshuseikan Museum]

CHECK POINT

The Satsuma craftsmanship which supported the Shuseikan Project

- 1 Exquisitely precise masonry technology which would not even allow a razor blade to pass through the linked stones.
- 2 Ventilation holes located in the central part to prevent moisture
- 3 Fireproof bricks used for the reverberatory furnace (technology used for Satsuma pottery)



[Property of Shokoshuseikan Museum]

*You can see a 360-degree VR image of the site through smart phones and other devices. No entry into the reverberatory furnace is allowed.

Column 01

The steelmaking technology of the Shuseikan Project which was later transferred to Kamaishi

Takeshita Seiemon was an engineer who learned Dutch studies and was involved in the construction of the reverberatory furnace and the machinery factory of the Shuseikan. During his study period in Edo, he was dispatched to Mito under the order of Nariakira where he contributed to the construction of the Nakaminato reverberatory furnace. He was joined during the construction of the Nakaminato furnace by Oshima Takato, who later constructed the Hashino blast furnace. In this way, the technology used for the reverberatory furnace and Western-style blast furnace of the Shuseikan was transferred to Nakaminato in Mito and to Hashino in Kamaishi.

Satsuma retainer

Takeshita Seiemon

Seiemon Takeshita

1821-1898
Born in Kagoshima, he transferred the steelmaking technology to Mito and Kamaishi.



Site of Hashino Blast Furnace
The site of the Western-style blast furnace where successful, continuous tapping of molten pig iron was made for the first time in Japan. (A component of this site)

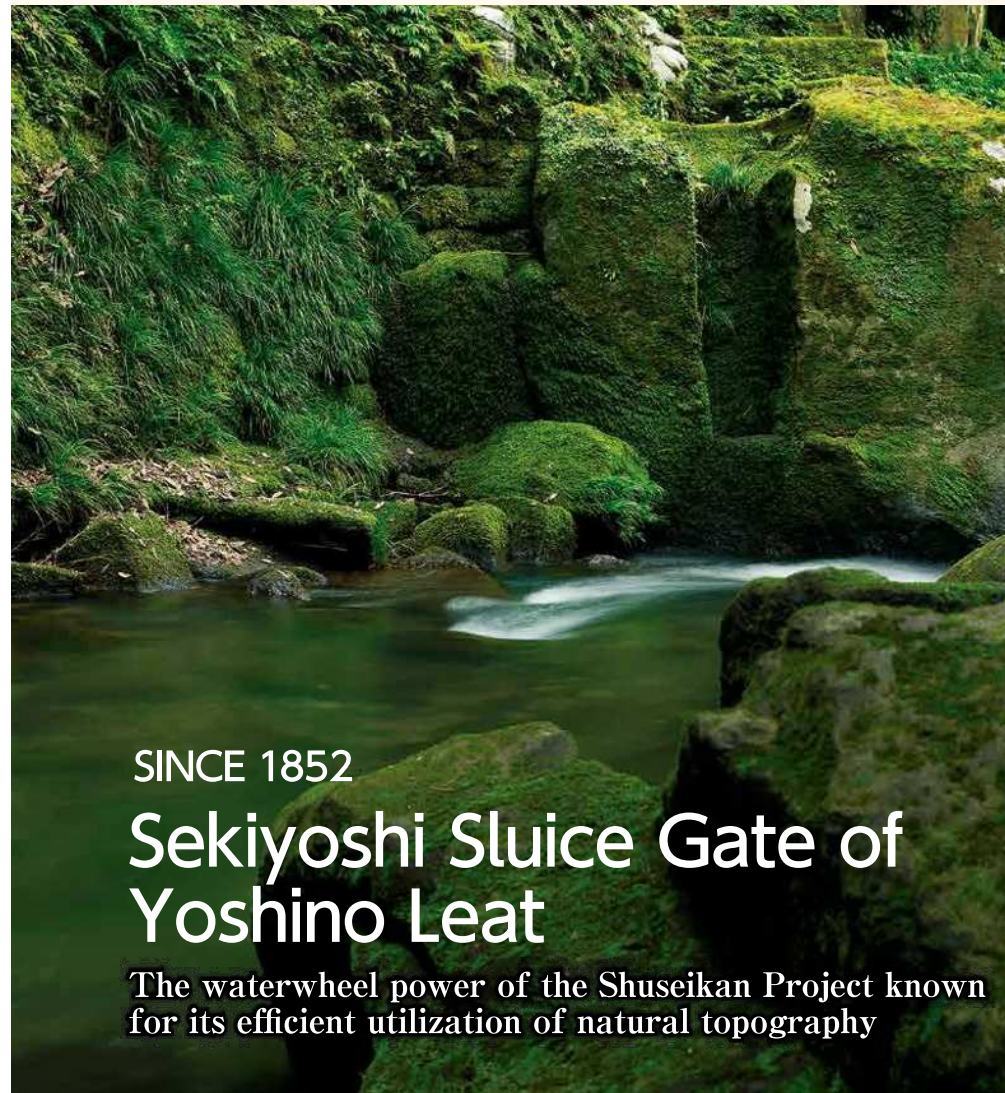


SINCE 1851

Shuseikan Reverberatory Furnace

Located within Sengan-en

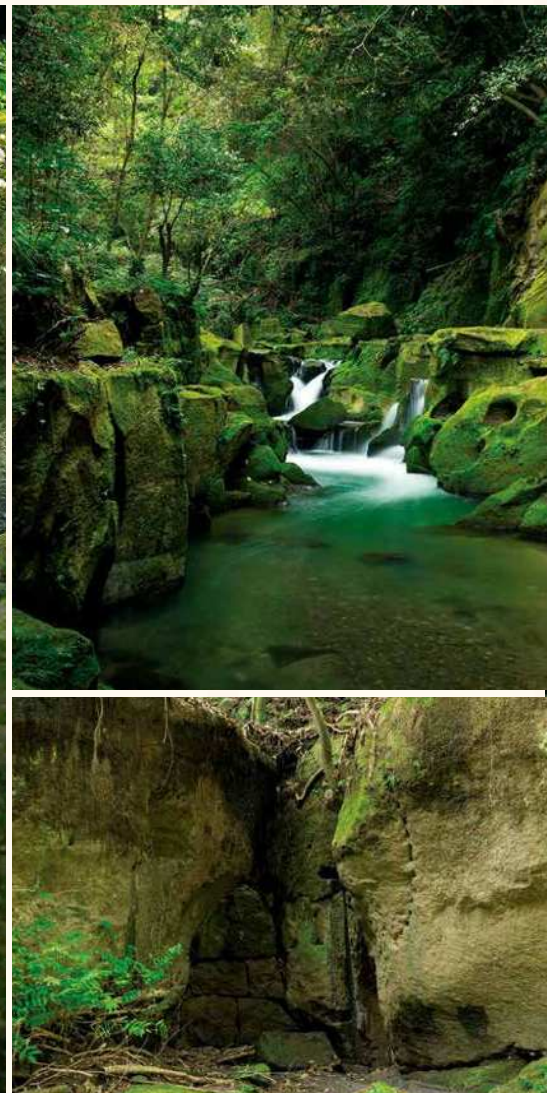
Shuseikan, the birthplace of Japan's modern industries



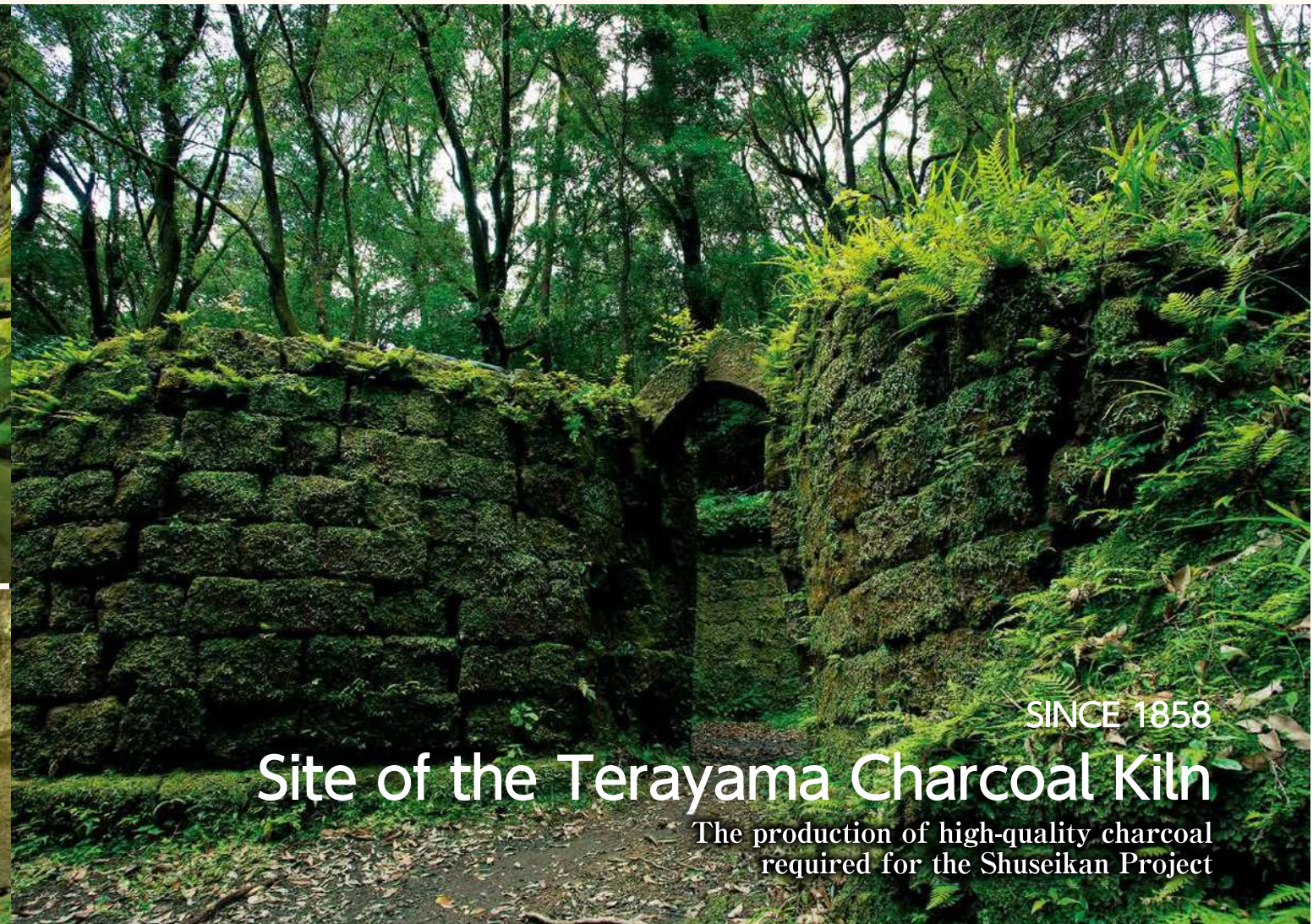
SINCE 1852

Sekiyoshi Sluice Gate of Yoshino Leat

The waterwheel power of the Shuseikan Project known for its efficient utilization of natural topography



[Photo: below] Site of the sluice gate on the right bank of the river. Currently plugged by a stone wall. Wedge marks are visible in the surrounding area.



SINCE 1858

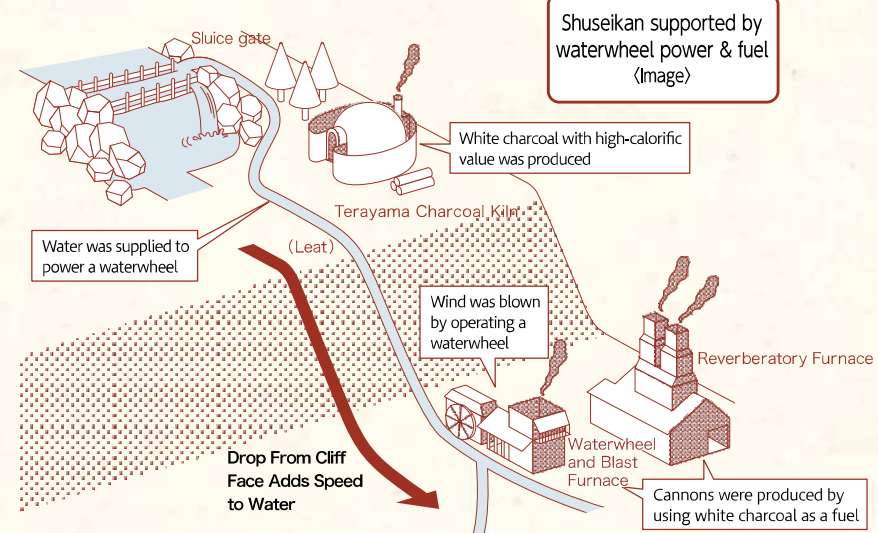
Site of the Terayama Charcoal Kiln

The production of high-quality charcoal required for the Shuseikan Project

The high-level civil engineering technology of the Satsuma clan which built the leat (waterway) running approximately 7 km

Waterwheels were used as power to drive the blast furnace of the Shuseikan Project. As there are no big rivers in the Iso area, water was drawn through the leat by blocking water in the upstream of the Inari River running through the Yoshino plateau located at the back of Iso area. Using the geological gradient, the leat runs for approximately 7 km from the Sekiyoshi sluice gate.

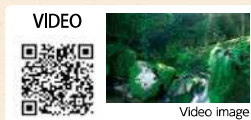
The waterway continues to play an important role in supplying agricultural water to this day.



CHECK POINT

The water wheel was the power source before the introduction of a steam engine.

During the early phase of the Shuseikan Project, waterwheels were mainly used as mechanical power due to the lack of large steam engine. The long furrow remaining on the bedrock on the left bank of the lower reaches is considered to have been part of the dam. The water dammed there was supplied from the sluice gate on its left.



*The video can be viewed using smart phones and other devices. No entry is allowed beyond the sluice gate.



Image of the restored status

A huge charcoal kiln that supplied quality charcoal

The Satsuma clan, which did not produce coal, needed a large amount of charcoal as fuel for the reverberatory furnace. A large charcoal masonry kiln was made at Terayama near Iso where there are abundant shii (Japanese chinquapin) and oak trees highly suited for charcoal production. White charcoal, with its higher calorific value, was used.



The kiln walls were made of welded tuff
*The area surrounding the Terayama Charcoal Kiln is off limits due to disaster recovery work.

CHECK POINT

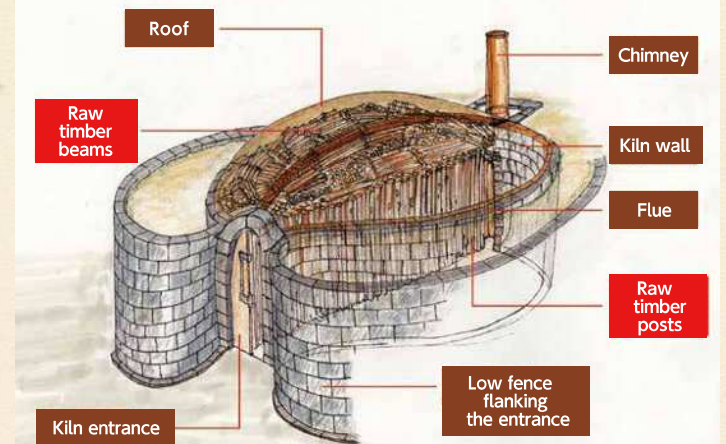
The charcoal kiln was built with reference to those in Kumano (present day Wakayama).

This is the site of an extraordinarily large charcoal kiln built by scraping the slope of Terayama mountain. The kiln features a 6-by-5 meter fig-shaped masonry formed of welded tuff. When building this charcoal kiln, contemporary ones in Kumano (present day Wakayama) were used as reference.

360° VR



*You can see a 360 degree VR image of the site through smart phones and other devices. No entry is allowed inside the charcoal kiln.



Creative sketch reconstruction of the charcoal kiln in operation (perspective view)
*This illustration represents current assumptions.

Illustration by Koki Sunada