Rediscovering the Art of Manufacturing
A Journey through the Industrial Heritage of the Chubu Region

INTRODUCING JAPAN'S CHUBU REGION THROUGH ITS INDUSTRIAL HERITAGE
By Kotaro TANAKA, President of the Chubu Society for the Industrial Heritage

Situated geographically in East Asia, Japan is surrounded on all sides by oceans. Its neighboring countries include Russia, China and Korea. Japan is comprised of four large islands and some smaller islands, and its area of 390,000 square kilometers has a population of 120,000,000.

The Chubu region is located approximately in the center of Honshu, the largest of the four main islands. On either side of the Chubu region lie the capital city of Tokyo, the east and the cities of Osaka and Kyoto to the west.

Japan's commerce is structured around the importation of energy resources, industrial materials, and food from various countries, and the exporting of high-quality technological products such as automobiles and electrical machines.

The Chubu region as defined in this guidebook will be composed of the five prefectures of Aichi, Gifu, Mie, western Shizuoka and southern Nagano. Among these, Aichi, with a population of 6,900,000, is the largest prefecture and is the major center of industry, with automobile production leading the way. Thus, many of the places you will find in this guidebook are located in Aichi.

The major industries by prefecture are: for Aichi, automobiles, steel, aircraft, machine tools, textiles and porcelain; for Gifu, cotton and wool fabrics and porcelain; for Mie, petrochemical products and automobiles; for Shizuoka, motorcycles, musical instruments, paper, and tea; and for Nagano, precision instruments such as cameras and watches.

The Chubu region has played a pivotal role in the development of Japan's industry into what we know it to be today. The origins of this development can be traced through industrial heritage, examples of which will be introduced in this guidebook.

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The History of Chubu's Industrial
Technology as Told by its Heritage:
Rediscovering the Culture behind Manufacturing
By Shigeo ISHIDA

The origins of our present-day manufacturing can be traced back to the Bakumatsu-Meiji period. The transition from the Edo Era to the Meiji Era not only was accompanied by huge political, economic, and social changes, but also served as an important turning point in technology. Put simply, this was a period that witnessed the transition from the age of tools to the age of machines.

The technology that was developing in Japan during this time of transition to machines could be divided into the following three types: (A) The first was the kind of technology that was developed by innovative domestic Japanese inventors, exemplified by the Gamo spinning machine. (B) The second was a transplanted technology that came from the Industrial Revolution of the West, such as spinning and weaving machines, railways, and power plants. This type of "transplanted" technology comprises a major portion of Japan's modern technology. (C) The third was a combination of traditional Japanese and Western technologies, in form of a "semi-Western" style, examples of which would be thread-making machines and automated looms. The Tatami technique as employed by Japanese potters in the making of artificial stone in large-scale construction works such as breakwaters and lock gates, is an example of a "semi-Western" technique in the field of civil engineering.

In addition, there is another type of industrialization that went through not changes as much as a unique creative twist to traditional skills or techniques. Examples of this would be sake distillation and the technologies used in the traditional kites.

Transplanted Technology vs. Technology Unique to Japan

With the advent of the Meiji Era, the textile industry became the core industry. In the field of spinning, the government-run Aichi Spinning Mill (at which there is an Industrial Heritage Monument), and subsequently the Miwa Spinning, Amada Spinning, and Nagoya Spinning Companies, employed what we can say are transplantsations of Western-style spinning techniques. They used large steel machines called mule spinning machines which ran on water wheels and steam engines as their power source. All of the machines were imported.

On the other hand, Japan prides itself in having the Gamo spinning machine, invented by Tokumine Daigo, which is the only one of its kind in the entire world. Not long after the Gamo spinning machine was introduced to the public in the Domestic Industrial Exposition in 1877 and received first prize for technical achievement, it proliferated to all the cotton-manufacturing areas over the entire nation. The Yabuco River area became the center of Gamo spinning, boasting the highest production nationwide. This was partly due to the fact that the Gamo spinning machine was made of wood, and required only basic technical skills to reproduce and build. It can be said that during the interim after hand spinning and before the Western methods of spinning became completely established within Japan, this Gamo spinning technique, which was in effect an automation of hand-spinning, played an important role in this industry. We can see two interesting facts when we view the path that Gamo spinning took in terms of the history of industrial technology.

One of these facts is that immediately after Tokumine Daigo's invention, spinning technology saw an explosive development over only a few years time. If we consider the gain in popularity of these machines, it stands to reason that there was a large group of technicians capable of producing these Gamo spinning machines over this short period of time.

The other fact is that, despite its having been invented in 1877 and having experienced a decline in popularity, it still lives on to the present day. It is extremely rare for a technology that was developed in the Meiji Era to be alive today. The Gamo spinning technology makes us question ourselves as to what was about this machine that makes it so universal, and also teaches us that perhaps change should not always be equated with progress.

Visiting the Relics of Industrial Heritage

Today, the Chubu region, consisting of Aichi and the five prefectures of Nagano, Gifu, Mie, and Shizuaiki surrounding it, is number one nationwide in many areas of industrial production. For instance, according to the statistics from 1997, Aichi Prefecture's GDP was 1% of that of the entire country, surpassing even those of entire nations with middle-level GDPs, such as Australia and Sweden. We can safely call Aichi the kingdom of goods production. It is important to keep in mind, however, that this was not achieved overnight.

The transplanted technologies from the West marked the Meiji Era, and these technologies were gradually altered to suit domestic needs to become entities independent of their foreign origins. This independence led to greater significance being placed upon the field of engineering. Where was the power that drove this development in engineering coming from? This book attempts to answer this question by following the footsteps of the efforts and labors of our forefathers as we learn about our industrial heritage.

The course of Japan's industrial and technological development took in the Twentieth Century can be said to be an important event in world history. As you will see in each chapter herein, Chubu's industrial heritage eloquently tells us the historical facts behind this development. If we can elucidate Aichi Toyota's contribution and the impact of factories on the course of formation of these industrial technologies in not only the Chubu region but also the whole of Japan, we should be in better position to help other countries, especially those developing countries which view Japan as a model, in their efforts to achieve economic success.

Let us learn from the past, cherish the treasures of our homeland, and use the historical facts, the teachings of industrial heritage, to help us create an ideal society for the future.
Chapter 2  Water as the Essence of Life

The modern system of waterways in Japan took its present form in 1887, the year water provision was commenced for the Yokohama Waterways, as a step taken to curb the spread of cholera. The design for this system was completed by an Englishman, Henry Spencer Palmer, with the help of Japanese engineers. Palmer was involved with the waterways in Osaka, Hakodate, Tokyo and Kobe, and he was responsible for laying the groundwork for Japan’s present-day waterways system. In the Chiba region, a forest agriculturist from Kusama, Mie Prefecture, started water supply operations in 1904. In Toyohashi City, a waterworks system for military purposes was created in 1908. Nagoya City appointed an Englishman called William K. Burton for surveillance prior to the construction of its waterways. The construction took fifteen years to complete, and in September 1914, the Kiso River began its task of supplying water to the city. The water supply and drainage systems in Handa, Gifu, and Oizumi Cities became established soon afterwards. Japan’s modern drainage system, on the other hand, took its present form for the first time in the foreigners’ residential districts of Kobe and Yokohama. Cholera was already a widespread epidemic, and sewage was becoming an important social issue in 1900, when the Drainage Act was enacted. This law obliged every city, town and village to set up a drainage/sewerage system. In 1939 Nagoya City became the first in Japan to employ the Active Sewerage Law to establish a sewerage treatment plant in Higashinozuka and Aisota. Toyohashi City followed suit in 1935 with its Noda Sewerage Treatment Plant. This plant was the first in Japan to make use of the Machine-Assisted Sewerage Treatment Act.

(Tadashi Ohashi)
Chapter 3 Origins of Biotechnology: Brewing

We have been consuming many kinds of fermented foods over a long period of time—Sake, Mirin, vinegar, Miso, soy sauce, pickles, and Natto (fermented soy beans)—to name just a few. These foods are brought to life through the actions of microorganisms that are living around us. In so doing, they provide depth and variety to the food we eat, give complexity to the tastes we experience, and are responsible for creating the distinctive cuisine flavors that differ from region to region. Fermented foods have traditionally been dependent on the producers' experience and intuition for their taste. It is only with the recent incorporation of Western scientific research into the field of brewing that various problems relating to the brewing process have been solved, making mass production possible. The Tokai region has for a long time been the leading region for brewing industries. Chita Peninsula in Aichi Prefecture, and Mino and Hida in Gifu Prefecture have long been sites of sake production, passing down their sake-making traditions from the Edo Era on to the present day. This was made possible because of the high-quality rice and plentiful underground water in these areas. In Hamura in Chita Peninsula, the by-product of sake production, known as Sake-kasu, was used to start the vinegar brewing industry in the early 19th Century. This by-product, which would have been thrown away under any other circumstances, was thus reused to make an entirely different product. Mirin production was also started around this time in Oshama Village (presently Hekinan City) in Nishi Mikawa, Aichi Prefecture. Also, Miso fermentation, which utilizes soybeans, has been conducted in Aichi Prefecture in Okazaki in the Nishi Mikawa region, and in the Takatoya region in Chita Peninsula.

(Soji TAKIMOTO)

15 The Kunizakari Sake Culture Museum of Nakano Brewery, a 200-year-old, two-storied black-boarded brewing cellar.

16 Various types of apparatus used in the Mirin-making process, on display at the Kozanze Historical Museum.

18 A view of the main cellar of Nakazato Shoton, established in 1593, restored to portray the sake- and soy sauce-making processes in the Meiji Era.

A view of the inside of the fermentation cellar for Hatcho-Miso in the North Cellar of Maruyu Company. The wooden Miso tub holds 6 tons of ingredients, for a total weight of 10 tons with the stones piled on the lid.

14 Now the Vinegar Museum, the brewing cellar of Nakano Vinegar Co., where in 1804, Matsusukeemon Nakano brewed the first vinegar from rice cake.

16 Jakan, an apparatus with a long coiled pipe that is heated to 60 degrees, and through which newly distilled sake is sent for the distilling process. Displayed in the 300-year-old Matsuyama Sake Manufacturing grounds.
Chapter 4 Soil and Flames: Ceramics and Cement

Aichi Prefecture's Tokoname and Seto regions are two of the six major "old kiln areas" of Japan. Together, they form the center of the pottery industry because of their proximity to each other and their prolific and high-quality output. Another name for pottery in Japanese is "Setoemon," which is derived directly from Seto City's name and is indicative of how productive the city was. Tokoname flourished as the producer of earthen pipes. A look at the old kilns that were being used in Seto and Tokoname reveals that over the last hundred years, many changes have occurred in oven techniques and the fuel used therein.

Furthermore, glaze production and the production of clay ingredients, which were industries that supported the pottery-making of Seto and Tokoname, were being carried out in the Sasaraki River bed region of Mizunami City, Gifu Prefecture, and in the Sanage mountain range in Toyota City, Aichi Prefecture. Numerous trommels driven by water wheels could be seen in these areas at one time, but now there are only a very few remaining in the Sasaraki River bed region.

Hekinan and Takahama Cities in Aichi Prefecture are leaders in the nation's roof tile production. The tile used to build them, called the Daima kiln, has also undergone numerous improvements throughout its long history. It was replaced after the war by the Tunnel kiln, which employed a technology that could produce a successive flow of tiles, thus leaving behind no actively working Daima kilns today.

With the advent of the Meiji Era, a new type of kiln-produced product was introduced. The large amounts of calcium ore that were available in Tabara Town in Atsumi Peninsula started to be used in the production of Portland cement. This marked the beginning of the third cement-making industry in Japan, and employed a new type of kiln called the Tokurigaoka.

The production of bricks as materials to be used in civil engineering and construction began in Kariya, Ako, Hekinan, and Toyota, with the result that Aichi Prefecture is presently responsible for producing 50% of the nation's bricks, and is the number one brick producer in Japan.

(Soji ESHIDA)
Chapter 5 Bricks

At first glance, all bricks may look alike. But as they are furnace-baked products, no two bricks are ever the same. If you look at many brick buildings, you will find numerous differences in the way the bricks are produced and piled on top of one another. Brick production in the Chubu region began in 1878 with the Kinouzai bricks, the name coming directly from the name of the kiln used by Hojo Koio, a ceramist in Tokoname, Aichi Prefecture. Hojo, famous as the inventor of earthen pipes, originally intended these bricks to be used in his own kilns. The next factory that produced bricks in this region was Toyosumi, a company established in 1882 and which had brick-making factories in Nishi and Kariya. This brick-making tradition, still extant, is responsible for making Aichi Prefecture the supplier of 30% of the nation’s bricks.

Historically significant brick buildings in the Chubu region can be seen in Chita Peninsula and Nago City in Aichi Prefecture; in Shimada City and the upstream region of the Oi River in Sizouka Prefecture; in Oga City and Sekigahara Town in Gifu Prefecture; and in Yoshida City in Mie Prefecture. These buildings are in fact factories that are involved in such industries as pottery, fermentation, chemicals, electricity, and textiles.

Assessing the age of a brick building involves learning about not only the age of the bricks used but also the method in which they are stacked together. The dimensions, colorings, condition of the finished surface, and the stamp mark are four checklist points to be covered for each brick. To assess the age of the overall building, we must learn about the following three points: the method of stacking, the color of the adhesive used to connect the bricks, and the type of materials used for reinforcement of the overall structure.

(Shintaro MEZUNO)
Chapter 6 Origins of Energy: Electric Power and Gas

The first electric company of the Chubu region, Nagoya Electric Light Company, started operations in 1889, and was one of the pioneers of Japan’s lighting industry.

The Chubu region, with its central location within Japan, has as its rooftop a vast mountainous district. With this as the source, many rivers flow down the mountains with enough water volume and speed to merit utilizing them for generation of hydroelectricity. The hydroelectricity industries that sprang up in this area have for many years been leading Japan’s hydroelectricity technology and businesses.

Also, the Chubu region was the sphere of action for Momosuke Fukuzawa (1868 – 1938) and Yasuzaemon Matsunaga (1875 – 1971), who were the most influential persons in the electric power businesses. Fukuzawa was known as the “King of Electric Power” due to his being responsible for one-quarter of the nation’s electricity. Matsunaga was known as the “Demon of Electric Power” through his efforts in developing electricity enterprises.

NGK Insulators, Ltd., famous as a leading world-class company in the field of insulators manufacturing and insulation technology of electric power systems, has its headquarters here in the Chubu region.

The Chubu region thus has greatly contributed to the nation’s development of electricity, and today industrial heritage attesting to this fact can be seen in numerous places throughout this region.

(Tensho FUJIMURA)

The Yomikai Power Station, built in 1923, has an output of 40,700 kw and utilizes water from the Kiso River. It was designated as an Important Cultural Property.

The First Miyashiro Power Station, built in 1904, is the oldest working power station today. It utilizes a century-old German water wheel and generator.

Generator house of the Nagashino Power Station, with Japan’s first vertical-axle type generator, 1912. The generator could be used in areas with very little altitude difference, and it soon spread nationwide.

Duncan Insulators, the world’s first suspension insulators. The original Duncan Insulator that was developed in the US in 1893 by Locke Insulator Mfg. Co., is displayed at the NGK Insulators Museum. Suspension Insulators are disc-type insulators that are used to insulate the steel tower and the conductor. Several may be used in a row depending on the transmission voltage. Porcelain or glass is used for the insulating part.

Rotor to steam turbine at Meiko Power Plant (1939 – 1962). The length of the driving axle is about 10 meters, and the largest diameter is about 3.7 meters.
Chapter 7 Machines—Mother of the Manufacturing Process

The major portion of what goes on in factory production is the making of small parts by the use of various machines. Machine tools are used to shape these pieces into the desired forms, such as by shaving curved edges onto metal pieces, adding grooves, and punching holes. These machine tools include lathes, planers, shapers, milling attachments, drilling machines, and grinding machines.

Without the high-precision machines to make these parts, we cannot expect to obtain high-quality products after assembly. It stands to reason, then, that an entire nation's level of machine technology is directly connected to how accurately the machine tools can do their job. The level of Japan's machine tools is now one of the highest in the world; but this was not a feat that was accomplished overnight. It happened first by learning from the machines that were imported from Germany and America, and then by developing domestically-produced machines that improved upon them.

Presently, in Aichi and Gifu Prefectures, we have three of the nation's top-level factories that manufacture machine tools: Okuma, Yamazaki Mazak, and Toyota Manufacturing Companies. These three companies are not the only machine manufacturers; for instance, Brother Company, which manufactures specialized machinery, and Toyota Automatic Looms, which manufactures operational machines, are only two of countless such companies in the Chubu region. All of these companies contribute to making the Chubu region the center of industrial production, with, of course, automobile production at the pinnacle.

(Sheji ISHIDA)
Chapter 9 On the Airwaves: Radio Communication

Japan's first radio communication took place in 1897 by Matsunosuke Matsushiro, a technician at an electricity testing center, as a communications experiment conducted between Tokyo and a ship at sea. After the First World War, the Japanese government encouraged radio communications with people overseas in an effort to promote diplomacy and commerce. Thus in 1927 the Yosami Radio Transmitting Station, a long-wave radio station, was established in Kariya City, Aichi Prefecture, and the Kaiso Receiving Station was built in Yokkaichi City, Mie Prefecture. Telecommunications with European countries was commenced in 1929, with Poland being the first country with which it took place.

As a rule, wireless communication is conducted on a person-to-person basis; however, the receiving end may be plural if there is a plural number of receivers. This type of communication, when it is transmitted to a large number of unspecified persons, is known as broadcasting. In March 1924, Tokyo Broadcasting Co. (not the present NHK) transmitted its first radio broadcast from Tokyo's Mount Ateko. As for commercial broadcasting, Chubu Nippon Broadcasting Co. (Nagoya City) was the first, starting operations in September 1926.

Sending a visual image together with the sound results in television. Television is now an indispensable medium, providing information on politics, economics, culture and daily life, and its emergence has created what we now call the culture media. The roots of television lie in the electronic television system, which was perfected in 1926 by Kenjiro Takayanagi.

(Sogo ISHIDA)
Chapter 10  Iron and Steel – the Staplefoods of Industry

Japan’s first iron manufacturing was conducted in 1909 by Chubei Tsuchihashi, who utilized the electricity from the Miyazuhiro Hydroelectric Power Plant in what is now Shimazu, Matsuura City. Although the plant was closed down during the Depression in 1929, its role as the precursor for steel production is very significant. In 1916, Nagoya Electric Light Company (presently Chubu Electric Company) started an electro-iron-making plant in Nagoya City, which made use of excess electricity produced from the Kiso River Power Plant (presently Yaotsu Power Plant). Tsumesada Sumitani, the chief engineer at this company, upon request by the president, Momonouke Fukuzawa, designed an electric arc furnace for the production of ferroalloys and alloy tool steel. This enterprise formed the base for what would today be known as the special steel manufacturers, and encouraged the development of Chubu’s heavy chemical industries. In 1940, Toyota Motor Company, having recently become independent from Toyota Automated Loom Manufacturing Company, established a company that would provide special steel material for automobiles, called Toyota Steel Company (presently Aichi Steel Company). In this way, the iron- and steel-producing industry in the Chubu region was characterized by the production of special steel through technology used in the use of electricity. In September 1964, Tokai Steel Company (presently Shin-Nittetsu Nagoya Steel Manufacturing Plant) in Tokai City, Aichi Prefecture, started operations of its Number One High Furnace, marking the beginnings of modern iron and steel production in the Chubu region. Furthermore, along the Kinugawa Coastal Industrial Sector sprang up Kawasaki Steel Company (Hana City) and Nakayama Steel Company (Tokyo City), forming what would be known as the Pacific belt of steel suppliers. The emergence of this modern form of steel production has facilitated the acquisition of the raw materials to be used in iron and steel production.

(Kenjiro NAKAZUMI)
The major mineral mines developed in the Chubu region are the Kamioka Mine in Gifu Prefecture and the Kure and Toi Mines in Shizuoka Prefecture. Also, it was in Sagara Town, Shizuoka Prefecture, that the single oil field on the Pacific Coast was located.

During the Meiji Era, Japan boasted a high level of domestic production of copper, gold, and silver, and these formed the major portion of its exports. The mineral mines in the Izu region, as represented by the Toi Mine, were responsible for supplying these metals. At present, a part of the Toi Mine can be accessed as a tunnel for tourists.

The Kamioka Mine produced zinc, lead, and copper, and was one of Japan’s major mines. The relics remaining include the mine entrance, built in the Meiji Era, the ore dressing site, and the mine railway, as well as a power plant as a related facility.

The Kure Mine was an important copper mine. Today, its relics include its mine entrance and ore dressing grounds.

The Sagara Oil Field was the first machine-dig oil field in Japan. It ceased operations in the late 1950's, leaving behind one oil well.

(Takakito AMANO)
Chapter 12 Stone Made by Man: Artificial Stone

Tateki is a traditional Japanese plastering technique. The materials used are Masa soil and slaked lime (calcium hydroxide), which are mixed with water and kneaded well. The material thus produced is administered with sticks, pounded, and layered, one on top of another. It was a technique often seen in old houses’ entranceways and foyers. Artificial stone is Tateki embedded with natural stones on the surface (these are called “Boating stones”); this provides added strength to the overall structure. Large-scale civil engineering projects make use of this artificial stone technique.

Artificial stone absorbs carbon dioxide and becomes as hard as the limestone it came from. In the years before cement became popular, it was widely used as a civil engineering technique.

The man who devised this scheme of artificial stone was Choshichi Hattori of Aichi Prefecture, who was responsible for creating the display areas and fountain in the 1881 Exposition. Construction employing artificial stone was conducted all over Japan, in places such as breakwaters for ports, seawalls, sluiceways, and water gates.

At present, it has been confirmed that there are 64 civil engineering sites throughout the nation in which the artificial stone technique has been employed. Among these, many of them are found in Aichi, Gifu, and Mie Prefectures. There are 26 structures still existing in this area which employ this technique.

Artificial stone blends well with natural pieces of broken stone, and in seawater it becomes even stronger. One hundred years after its perfection, the technique can still be seen in its original form all over Japan.

(Tateki OHA SHI)

Weir of the old head works of the Meiji-Yosui irrigation channel (presently Yabachi River in Toyota City), built by Choshichi Hattori in 1909 and completed with artificial stone techniques.

Designated as an Important Cultural Asset in 1998, the old Yokkaichi Port’s breakwater was constructed in 1894 by Choshichi Hattori and is characterized by small holes from which water is allowed to spout.

The Shonaiyosui-Mochizuki Sluiceway, built in 1910, made use of Sanno-Tataki techniques which have remained the sluice virtually undamaged to the present day.

The No. 5 Watergate of Muro Sluiceway, made from artificial stone in 1894.

The Otsuki Sluiceway, built in 1907. It is composed of two arches and steel doors that closed automatically when the water level at the downstream region became higher than that on the other side of the doors.
Chapter 13 Bridges and Canals between Land Masses

The construction of railways was indispensable for the modernization of industry. The first railroad was opened in 1872 using English technology; it connected Shinbashi and Yokohama. In 1889, the Tokaido Line, connecting Tokyo and Kobe, was completed. The major points of difficulty in the construction of this railway were the bridges that needed to be built over the three Kiso rivers, the Tenryu, the Ooi, and the Fuji Rivers.

The bridges constructed over the Ibi, Nagara, and Kiso Rivers employed long pillars that were placed 200 feet apart and made of wrought iron double Warren trusses. The original bridge that was constructed over the Ibi River is still being used today as a road bridge. Afterwards, the nation's first steel bridges were constructed over the Fuji, Ooi, and Tenryu Rivers.

Modernization of industry was closely linked with the development of hydroelectricity. The Chubu region, being blessed with large rivers, prided itself in being number one nationwide in terms of electric output. Hydroelectricity generation required the construction of structures such as dams, aqueducts, and electricity transmission facilities. In the mountain ranges there are still bridges remaining that are made of concrete and steel that had been used to carry raw materials during the construction of the hydroelectric power stations.

There are three canals in Nagoya City. The Nakagawa Canal was opened in 1930 as a water route connecting Nagoya Station and the port. Railways were constructed in the port in order to transport cargo. Ships and railways were allowed to coexist by means of railway drawbridges; one was built in Nagoya Port and another in Yokkaichi Port. The drawbridge in Yokkaichi Port is still working today.

(Tadashi Ohashi)

The Ibi River Bridge, built in 1887 with the help of Englishmen, was transformed from a railway bridge to a road bridge. It has 5 trusses and 61 meters between the pillars.

The Matsuura Bridge was completed in 1932 to connect the Nakagawa Canal and the river Horikawa. Since the water level in Horikawa is higher than that in the Nakagawa Canal, ships were passed through the gateway while adjustments in water level were being conducted. Two of the towers support the winding apparatus that is used to open and close the 40-ton doors to the gateway. At one time, the gateway passed 90,000 ships per year, but with the increase in truck transportation, it was forced to cease operations in 1968.

The old Yokkaichi Port Railway Bridge, built in 1931, is the oldest working drawbridge in Japan. The 26.8-meter movable portion is drawn up through a system of ropes and pulleys over a period of one minute 20 seconds.

The entrance to the Nakagawa Canal and the lock gate at the mouth of the Naka River. The canal, with a length of 8.2 km, was completed after four years in 1930. The peak of commerce along the canal was in 1964.
Chapter 14 Man's Control of Water

The Mino region is an area whose altitude is exactly sea level; it is where the three rivers of Kiso, Nagara, and Ibi meet to flow into Ina Bay. Plentiful water nourishes the rice paddies and provides numerous gifts to people's lives. Yet, too much rain and floods can cause tremendous damage to crops and threaten the livelihood of the people. There is a history of battles between water and the people who try to control it. "Man's control of water" is in itself an important enterprise directly connected to preserving the lives of people.

The first water-controlling method devised by the residents of the Chubu area involved the construction of small dikes around each cluster of domiciles, which would prevent the intrusion of water from the large rivers on the outside. However, there were constant disputes among the clusters of domiciles regarding how to drain out the water that tended to accumulate inside. In the Meiji Era, a system was put into effect wherein the three major rivers were separated from each other by means of large dikes, thus preventing water-related damages. This water-controlling enterprise was successful in the sense that damages caused by water were greatly reduced in the Mino region. However, separating the three rivers posed a paradox in terms of water transport of cargo over the existing canals versus the drainage methods used from the inside of the dikes.

To combat the problem regarding water transport of cargo, a canal was built at Sendohira to let ships through; and to alleviate the problem of the accumulation of water on the inside of the dikes, the natural drainage system was changed to a mechanized system that employed pumps.

(iro TAKAHASHI)
Chapter 15 Fruits of the Oceans and Mountains

The coasts of Aichi Prefecture’s Mikawa Bay and Ise Bay produced a large portion of the nation’s seaweed. Seaweed production, which began in the latter half of the Edo Era, was mechanized in the late 1950’s and early 1960’s, but in the ensuing decade it reached its demise due to the landfill projects that were carried out. The tools from the manual-harvesting age as well as the machines that were used subsequently are preserved in museums in these areas.

The mountainous regions of Chubu, with their plentiful forests, have from long ago been the sites for lumber production. Museums in the valleys house the tools and machinery that were used to cut the wood, carry it down the rivers (rafts), process it, and shape it. Also, along the rivers in several places, we can see the remains of sawmills that had been run on the power generated by waterwheels.

From the Edo Era onward, this region saw the avid production of Washi, or Japanese paper. Western paper production that used wood pulp began around the mid-Meiji Era. In Hanno-cho, Shizuoka Prefecture, there are the remains of Japan’s first Western paper factory. The old office building of this company, a brick structure, is now being used as a museum. In Fuji City, Shizuoka Prefecture, where a large cluster of paper-manufacturing factories sprang up soon afterwards, there are museums and other facilities that preserve the early paper-manufacturing machines and tools.

(Takehiro AMANO)

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36. The "Fuji-Maru," the only remaining Utase whaling ship that is of the Aichi-Prefecture type, in use from 1955 for twenty years.

37. Diagram depicting the method of Utase fishing, in which the net is thrown into the water to catch a large number of fish. After 1962, it was no longer the mainstream fishing method.

38. Semi-automatic seaweed thinning machine, built in 1955 and displayed at the Toyohashi Folklore Museum.

39. Oshi Paper Manufacturing Co.'s Keta factory, which started to make chemical pulp by treating wood with chemicals in 1889. The office for the factory is this "red brick building," as it is fondly called. It is now the Hirono-cho Historical Folk Museum.

40. The American-made cutter, made in 1990, for cutting rolled paper into sheets, used at the Hiyamizu factory of Fuji Paper Manufacturing Co.

41. Japanese fishing boats displayed at the Sea-Folk Museum. There are 51 ships displayed, including 13 that are important Cultural Assets.
**GIFU Prefecture**
- Crystal Sugar Museum
- Forestry Museum of Hida
- Hashima City Film Museum
- Katsuo Town History and Folklore Museum
- Kakamigahara Aerospace Museum
- Mabo Village Museum
- Meitetsu Museum
- Mining Museum
- Mizunami Ceramic Museum
- Naito Museum of Pharmaceutical Science and Industry
- Ookayama Company's Kani Factory Display of Excellent Machines
- The Old Yoatsu Power Station Collection

**SHIZUOKA Prefecture**
- Full Municipal Museum
- Hamamatsu Municipal Museum
- Daiozu railways Steam Locomotive Museum
- Sokumo Rail Park
- Shizuoka Bay Museum (Verkohri Museum)
- Takayanagi Memorial Museum
- The Iwasa Collection
- Yamaha Engine Communication Plaza

**NAGANO Prefecture**
- Forest Railways Museum
- Horonane Village History and Folklore Museum
- Okaya Municipal Cocccon Museum
- Oshikawa Village History and Folklore Museum
- Domachi Energy Museum
- The Kansai Electric Power Co., Kisoawa Electric Power Museum

**MIE Prefecture**
- Harari no Yakata (Gozens Museum)
- Iga Braid Center
- Komono-cho Local History Archives
- Matsuura Municipal Folk History Archives
- Sase-Poly Museum
- The Kina-cho Mining Museum
AICHI Prefecture

1. Nagoya Aerospace Systems Manufacturing Company Museum of Mitsubishi Heavy Industries

Located adjacent to Nagoa Airport and on the grounds of the (formerly) Konishi Factory of Mitsubishi Heavy Industries, this museum takes us through the technological changes that were made in Mitsubishi aircraft from 1910 by means of displays of machinery, engines, addresses, and models to help us experience scientific technology firsthand. As for industrial heritage, this museum also features high-quality replicas of aircraft, including the F-14 Tomcat. Even the F-11 tanker used at the U.S. Power Plant, and Jeppes first sailplane. The third floor has a single tape recorder that is displayed in the open, within the confines of the park.

- 2-1-71, Sakae, Naka-ku, Nagoya
- Tel: 052-201-4468
- FAX: 052-201-7688
- Hours: Mondays 09:00 AM - 12:00 PM
- Closed Mondays (unless the first Monday is a holiday), the third Friday of every month, and the third Saturday in November.
- Admission: Free
- Access: From Sakuyama Station on the Nagoya Subway Line, take the Toyo Line, and then the Toei Line to Sakae Station.

2. Okuyama Pumped Storage Power Station Museum

Situated in the upstream region of the Kuwana River, a tributary of the Yagihata River, the pumped storage plant located adjacent to this museum has a maximum output of 1,260,000 kw. The museum not only teaches the theory behind hydroelectric power generation, but also displays the historical (1818) Francis-type water turbine from England, generator, and sanitation blocks, which were in fact used by Otsuka (Osaka) Hydroelectric Power around 1967.

- 2-17-1, Sakae, Naka-ku, Nagoya
- Tel: 052-640-5109
- Hours: 09:00 AM - 12:00 PM, 13:00 PM - 17:00 PM
- Closed Mondays (unless the first Monday is a holiday), New Year's holidays, and Children's Day
- Admission: Free
- Access: From the entrance on the Higashiyama Line, A 5-min walk to the walkway.
- The open-air display can be viewed at all times.
- URL: http://www.noc.go.jp/kyoto/traffic.html

3. Tokyogawa City Science Museum

Situated in Shenokawa Park in central Nagoya, this science museum utilizes experimental exhibitions and models to help us experience scientific technology firsthand. As for industrial heritage, this museum also features high-quality replicas of aircraft, including the F-14 Tomcat. Even the F-11 tanker used at the U.S. Power Plant, and Jeppes first sailplane. The third floor has a single tape recorder that is displayed in the open, within the confines of the park.

- 2-1-71, Sakae, Naka-ku, Nagoya
- Tel: 052-201-4468
- FAX: 052-201-7688
- Hours: Mondays 09:00 AM - 12:00 PM
- Closed Mondays (unless the first Monday is a holiday), the third Friday of every month, and the third Saturday in November.
- Admission: Free
- Access: From Sakuyama Station on the Nagoya Subway Line, take the Toyo Line, and then the Toei Line to Sakae Station.

4. Tokyogawa City Folk Museum

The folk story known as Tokyo-yaki has a history of 900 years. This museum, founded in 1981, displays the finished products as well as the various tools used to make them, such as those for preparing the rice, molding, and firing. Videos and slides assist in the understanding of the processes involved in making the folk story of the Tokyo-yaki. Archaeological findings from various sites, the earliest Tokyo-yaki examples, are also exhibited.

- 4-2-30, Sagi-cho, Tokyogawa City, Aichi Prefecture
- Tel: 050-54-620161
- Hours: 09:00 AM - 17:00 PM
- Closed Mondays, 4th Tuesday, New Year's holidays
- Admission: Free
- Access: From Tokyogawa Station on the Tokyogawa Line, take a five-minute walk for the museum entrance.

5. Takayama Local History Resource Museum

This museum displays the commercial development of Takayama Town by introducing the work of the blacksmith, stonemason, printer, and goldsmith. Tools and agricultural equipment are also displayed, such as the tools used to make rice, namely Miso and koji soy sauce, embroidery tubs dating back to the Takayama family, and the tools used to make rice. Also on display here are Historical materials on Takayama Takayama and Takayama Port.

- 5-2-7, Kominka, Takayama Town, Gifu Prefecture
- Tel: 0569-41-1201
- Hours: 09:00 AM - 12:00 PM, 13:30 PM - 16:30 PM
- Closed Mondays, 4th Tuesday of every month, and New Year's holidays
- Admission: Free
- Access: From Sakuyama Station on the Takayama Line, take the 10-min walk to the museum.
- URL: http://www.kks.gifu.pref.jp/takayama/index.html
AICHI Prefecture

Toyohashi Museum of Natural Resources

Established in 1980 to educate kids about underwear resources and energy conservation, this museum houses 130 raw and new silk scarves, 200distance machines used in coppper and oil mining in Ms. Prefecture, and a battery-operated locomotive (produced by Nickel) in 1968 to transport people within the museum. The museum is open from 9:30 AM to 4:00 PM on weekdays and from 9:30 AM to 3:00 PM on Saturdays. Admission is free.

Toshiba Toshihiro Ch: Aichi Prefecture

GIFU Prefecture

Crystal Sugar Museum

Since its opening in 1995, the facility has been educating visitors about the history and production processes of crystal sugar. The museum also houses the oldest sugar factory in Japan, and a daily demonstration of the production process is held in the factory. Admission is free.

Haashima City Film Museum

In 1896, the Takehara AkChi Movie Theater was converted into a museum dedicated to the history of film. The museum is open from 9:00 AM to 5:00 PM on weekdays, and from 9:00 AM to 4:00 PM on Saturdays. Admission is free.

Tokyo Automobile Museum

The 1930s American and foreign cars housed in this museum help us to look at cars not only as machines but also as high-end products of our automotive industry. Each spring, the museum invites fine artists to paint on cars. The exhibition last year included works by 17 artists. This year's exhibition is scheduled to run from April 1 to May 31. The exhibition is open from 10:00 AM to 6:00 PM on weekdays, and from 10:00 AM to 5:00 PM on Saturdays. Admission is free.

Kazuo Town History and Folklore Museum

This museum displays artifacts and people related to the history of Kazuo Town. The museum is open from 9:30 AM to 5:00 PM on weekdays. Admission is free.

Toyota Commemorative Museum of Industry and Technology

Situated in the birthplace of the famous Toyota Group, this museum is comprised of three historical buildings. The exhibits, which are diverse, include textiles, mechanical manufacturing, and "Technical skills" with a focus on the structure and production processes of machines. Most of the machines on exhibit have been restored to operate, providing a firsthand experience in manufacturing. The brick building in which the museum is housed was built in 1911 as a factory for the Toyota automated loom, and was initially used as a Toyoda Shouten Yarn Factory.

Kamakura Aerospace Museum

In 1917, Kamakura became the second place in the country to have an airport. Over 70 different types of aircraft took off from this airport, including the Mitsubishi A5M and Ki-44. The museum houses the first generation of Japanese aircraft, the A5M and Ki-44, as well as instructions on aviation and spaceflight. The museum is open from 9:30 AM to 5:00 PM on weekdays. Admission is free.

Meitetsu Museum

This museum was opened in commemoration of Meitetsu Railways' 70th anniversary in 1989. The museum is divided into three sections, each of which is dedicated to the development of transportation facilities. Building has two rooms, one of which deals with history, and the other with modern trains and machinery. A diorama in an auditorium for the history of transportation, and displays that have been used at stations is just a few of the many attractions here.

Mie Prefecture

Nishigahara Aquarium

Opened in 1977, this museum is located in the old Nishigahara Elementary School building. It features a tree-shaped wooden building with a total length of 54 meters. The main attraction is a tank relating to marine life. Of particular interest is a tank containing the largest stock of scallops in Japan, and an extremely rare lion-fish-shark ledge for dry display of pigeon tooth, which the sea-gull intended to become the world's largest."
**GIFU** Prefecture

**Naito Museum of Pharmaceutical Science and Industry**

Naito, the founder of Naito Pharmaceutical Company, established the unique museum in 1971 in hopes that it would offer the public field experiences in pharmaceutical sciences and the history of pharmacy.

- **Address:** 1, Naito-machi, Furuichi-cho, Velia City, Velia Prefecture
- **Tel:** 0563-88-4601
- **Hours:** 9:00 AM - 5:00 PM
- **Admission:** Free

**MIE** Prefecture

**Hekari no Yakata (Scales Museum)**

The core of this museum is a unique and highly collection of 40 scales and 2000 related items displayed here after he became interested in a silver scale from the Edo period. It is a very special piece and is one of the finest examples of the traditional scales on the plateau and the weight. Another scale here is 9 meters long, designed to weigh cannon balls during the Bakumatsu Period. A 1940 scale famous by Tezuka and Cassanola is kept in a glass case and is of considerable interest.

- **Address:** 1 Naito-machi, Takaoka City, Mie Prefecture
- **Tel:** 0593-88-6061
- **Hours:** 9:30 AM - 4:00 PM
- **Closed:** Mondays and Wednesdays
- **Admission:** Free

**Osaka Museum of Industrial Science and Technology**

The Osaka Museum of Industrial Science and Technology is a comprehensive, modern science and technology museum located in Osaka, Japan. It features exhibits covering a wide range of scientific and technological fields, from the early days of industrialization to the latest technologies. The museum is housed in a building designed to resemble a futuristic city, and it includes interactive exhibits and hands-on activities to engage visitors of all ages.

- **Address:** 3-10-1, Chuo-ku, Osaka City, Osaka Prefecture
- **Tel:** 06-6396-3000
- **Hours:** 9:30 AM - 5:00 PM
- **Closed:** Mondays and Wednesdays
- **Admission:** 3,390 yen (inclusive of all fees)

**SOKUZO** Prefecture

**Marugoto Chiku (Local History Archives)**

Established in 1979, this museum houses a vast amount of local historical materials, including the famous "Gion Eisa," a model of the final stage of the Gion Festival. The museum is housed in the former residence of the Matsusaka Municipal Public Relations Association, which was once the town's main post office.

- **Address:** 1-1, Marugoto-machi, Matsusaka City, Mie Prefecture
- **Tel:** 0593-22-2400
- **Hours:** 9:30 AM - 5:00 PM
- **Closed:** Mondays and Wednesdays
- **Admission:** 500 yen

**Sea-Folk Museum**

This museum is located on the island of Donna Island, and it features a variety of exhibits and displays related to the history and culture of the local fishing community. The museum is housed in a traditional fisherman's house, and it includes interactive exhibits and hands-on activities to engage visitors.

- **Address:** 1-1, Marugoto-machi, Matsusaka City, Mie Prefecture
- **Tel:** 0593-22-2400
- **Hours:** 9:30 AM - 5:00 PM
- **Closed:** Mondays and Wednesdays
- **Admission:** 500 yen

**IKEBANYU** Prefecture

**Iga Braid Center**

Japanese braiding, or Kanto-ko, is a traditional craft that has been practiced for centuries in the Iga region. The Iga Braid Center is a museum that showcases the history and traditions of Japanese braiding, as well as the contemporary techniques used by modern artisans. The museum features exhibits, workshops, and demonstrations to engage visitors of all ages.

- **Address:** 1-1, Marugoto-machi, Matsusaka City, Mie Prefecture
- **Tel:** 0593-22-2400
- **Hours:** 9:30 AM - 5:00 PM
- **Closed:** Mondays and Wednesdays
- **Admission:** 500 yen

**OIEGWARS Railways Steam Locomotive Museum**

Located in the city of Oie, the Oie Railway Museum is a unique museum that celebrates the history and heritage of the Oie Railway. The museum features a large collection of steam locomotives, as well as other railway artifacts and memorabilia. Visitors can explore the museum's exhibits and learn about the rich history of rail transportation in the region.

- **Address:** 1-1, Marugoto-machi, Matsusaka City, Mie Prefecture
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- **Address:** 1-1, Marugoto-machi, Matsusaka City, Mie Prefecture
- **Tel:** 0593-22-2400
- **Hours:** 9:30 AM - 5:00 PM
- **Closed:** Mondays and Wednesdays
- **Admission:** Free
SHIZUOKA Prefecture

Sakuma Rail Park
This museum opened on the train depot grounds of Chubu Tenyu Station on the JR Tako Line in 1991. The only railroad museum run by JR, it displays 18 locomotives, 52 cars, and 10 electric locomotives made by SEJ and imported from the U.S. in 1923. Unlike railroad parks, models, photographs, and other resources are abundant in this museum, as well as electric locomotive simulations and drones for children to enjoy. Visitors can ride a train pulled by the electric locomotive simulations or plates during the peak season.
    - 153-3 Hatsukaichi, Shizuoka Prefecture, Japan
    - Tel: 054-260-0300
    - Hours: 10:00 AM - 4:00 PM
    - Closed: Mondays, Tuesdays, and holidays
    - Admission: Free
    - Access: Take the Chiku-Tenji Line to the Chiku Line, then take a bus to the museum

Shimizu Bay Museum (Verkehr Museum)
The theme on display in this museum is mostly related to Shimizu Port, such as locks for canal wonks, toys used for the production of wooden barges, diving suits used by workers during repairs and hand pumps to supply oil to these suits, ocean-going vessels, and other first-hand resources that tell the history of this port. There is an open-air display located 1.5 km to the west, with trains that ran on the now closed Port Line, and the areas that crossed the Atlantic Ocean from here to San Francisco.
    - 5-8-1 Minato, Shimizu City, Shizuoka Prefecture, Japan
    - Tel: 054-832-8000
    - Hours: 9:00 AM - 4:30 PM
    - Closed: Mondays (open on holidays)
    - Admission: Adults ¥600, Free for elementary school students
    - Access: Take the Chiku Line to Shimizu Station, then take a bus to the museum

Yamaha Engine Communication Plaza
The museum is located in the Head Office of Yamaha Motors in Iwata City, Shizuoka. A wide range of vehicles is displayed, such as motorcycles, boats, and radio-controlled helicopters. Yamaha's first motorcycle, the YA-1, and Japan's first sport car sold in Japan were manufactured in this facility (2000). Two of the vehicles on display that can be seen in operation are a car and a motorcycle.
    - 2500 Shinko, Iwata City, Shizuoka Prefecture, Japan
    - Tel: 0542-24-0300
    - Hours: 10:00 AM - 4:00 PM
    - Closed: Mondays, Tuesdays, and holidays
    - Access: Take the Chiku Line to Iwata Station, then take a bus to the museum

Takasaganyi Memorial Museum
Kakito Takasaganyi developed the world's first electronic television technique in 1926 here, on what is now Shizuoka University's Technology Department campus, and on which this museum was built in 1961 to commemorate his work. Although only a handful of his works were lost during the war, those that remain in this museum include the original electronic television camera tubes and oscilloscopes, and image orthicon, items that illustrate Takasaganyi's techniques and equipment.
    - Technology Department, Shizuoka University, 3-5-1, Johoku, Hamamatsu City, Shizuoka Prefecture, Japan
    - Tel: 053-479-7000
    - Hours: 10:00 AM - 4:00 PM
    - Closed: Saturdays, Mondays, and holidays
    - Admission: Free
    - Access: Take the Chiku Line to the Takao Station, then take a bus to the museum

Horiezane History and Folklore Museum
Located in 1930, the museum is an extension of an elementary school social studies project in which members relate to the local way of life and history. The research materials have now reached 10,000 items, the main part of which are local folk tales and agricultural, ocean industry, and forestry equipment. As this is the birthplace of Ichinose Sei, the father of the Gannai spinning machine, there are also displayed here several spinning frames and threshing machines in his house.
    - 27231-1 Katsugahara, Horiezane-mura, Minami Atsumi-cho, Atsumi Prefecture, Japan
    - Tel: 0552-24-2700
    - Hours: 9:00 AM - 4:00 PM
    - Closed: Mondays, Wednesdays, and holidays
    - Admission: ¥150
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum

Okawa Municipal Cocoon Museum
Okawa City was redone worldwide for its booming silk thread export and was called the "Silk City" until the Second World War. This museum, which began operations in 1984 through the efforts of the local cocoon association, tells the socioeconomic and technological history behind Okawa's silk production. Inside, there is a 1670 French open-reel machine that was in use in the Tomikita plant from the very start, as well as a modern high-speed measuring device for raw silk thread imported from France.
    - Okawa City, Shizuoka Prefecture, Japan
    - Hours: 9:00 AM - 4:00 PM
    - Closed: Mondays, Tuesdays, and holidays
    - Admission: ¥150
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum

NAGANO Prefecture

Forest Railways Museum
This museum, which opened in 1974, is located in the forest at the edge of the forest. In the forest, there is a forest railway that runs from the starting point in the forest, through the forest, and ends at the forest. The railway is open to the public, and visitors can ride the train and enjoy the natural environment of the forest.
    - Nagano Prefecture, Japan
    - Hours: 9:00 AM - 4:30 PM
    - Closed: Mondays and holidays
    - Admission: ¥250
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum

Ochino Village Museum
This museum is located along the banks of the Kiso River, and it is built out of embossed cypress and uses the local black pine as the main material. Inside, there are the forestry coming, hydroelectric power generation, and the natural environment of the forest. The museum displays the stops for the Kiso River's Nishihara Bridge and the river, as well as the local people's life in the forest from the early Shokou Era. Each room in each corner was a means of livelihood for the people of the Kiso region.
    - Ochino Village, Shuzenjii, Nagano Prefecture, Japan
    - Hours: 9:00 AM - 4:30 PM
    - Closed: Mondays and holidays
    - Admission: ¥300
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum

Domachi Energy Museum
Built in 1982 as a place to explain understanding of the harmony between energy, nature, and environment, this museum looks at various types of energy such as solar energy, but hydroelectricity is the central theme of the exhibition. The robot, Francis, and other robots are displayed for your comparison. Outdoors, there are Francis turbines and AC aleatoric turbines that were used in different parts of the country, a rotary converter, and concrete buckets used during the Kurobe Dam construction.
    - 4-10-6 Kiyosumi, Domachi City, Nagano Prefecture, Japan
    - Hours: 9:00 AM - 4:00 PM
    - Closed: Mondays and holidays
    - Admission: ¥300
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum

The Kasai Electric Power Co. Kisagawa Electric Power Museum
This museum, situated on the site of the Osumi Power Plant, displays items related to the history of the Kiso River, including the beginning of the construction of the Yatsukawa power plant in 1916 and the first floor is dedicated to turbines, generators, a transformer and maintenance tools. The second floor has documents, photographs, and other historical materials. On the third floor is a model of the "Kisagawa Dam", which is the heart of the Kisagawa Dam, and is dedicated to the Kisagawa Dam. The museum is open on Saturdays and holidays.
    - Kisagawa Electric Power Museum, 1-4-1-30 Kinshicho, Minami Atsumi-cho, Atsumi Prefecture, Japan
    - Hours: 9:00 AM - 4:00 PM
    - Closed: Sundays, holidays
    - Admission: ¥300
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum

Ouchijima Energy Museum
This museum is located at the foot of the Kisagawa Dam, and is dedicated to the history of the Ouchijima Power Plant. It displays various types of energy such as solar energy, but water energy is the central theme of the exhibition. The robot, Francis, and other robots are displayed for your comparison. Outdoors, there are Francis turbines and AC aleatoric turbines that were used in different parts of the country, a rotary converter, and concrete buckets used during the Kurobe Dam construction.
    - Ouchijima Energy Museum, 1-4-1-30 Kinshicho, Minami Atsumi-cho, Atsumi Prefecture, Japan
    - Hours: 9:00 AM - 4:00 PM
    - Closed: Sundays, holidays
    - Admission: ¥300
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum

Toyota Museum
This museum is located at the foot of the Kisagawa Dam, and is dedicated to the history of the Ouchijima Power Plant. It displays various types of energy such as solar energy, but water energy is the central theme of the exhibition. The robot, Francis, and other robots are displayed for your comparison. Outdoors, there are Francis turbines and AC aleatoric turbines that were used in different parts of the country, a rotary converter, and concrete buckets used during the Kurobe Dam construction.
    - Toyota Museum, 1-4-1-30 Kinshicho, Minami Atsumi-cho, Atsumi Prefecture, Japan
    - Hours: 9:00 AM - 4:00 PM
    - Closed: Sundays, holidays
    - Admission: ¥300
    - Access: Take the Chiku Line to the Chiku Line, then take a bus to the museum
Rediscovering the Art of Manufacturing

A Journey through the Industrial Heritage of the Chubu Region

English Guidebook Version

Price: 1,000 yen (plus tax and postage)

This book is an abridged version of the Japanese book "Rediscovering the Art of Manufacturing: A Journey through the Industrial Heritage of the Chubu Region" and has been redesigned into the form of an English guidebook.

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14-2 Mutsuyoshi, Yosokubo-cho Toyohashi, Aichi, Japan 440-0083
Administrative office: 03 Stoll hokai
Tel / fax 0532-31-8285
http://www.tcp-of.or.jp/~ishida98/
E-mail: ishida98@tcp-ip.jp

Photographs and assistance provided by:

Shin-ichi ASANO
Takemoto AMANO
Shi BIKADO
Kiyomori CHINO
Yusuke UEDA
Takashi OHASHI
Mitsuharu OINA
Tomohiro KAKITA
Ichihiko KONO
Haruhiko SAKI

Yaushi SUGIOKA
Issyo TAKAHASHI
Saji TAKIMOTO
Noboru TSUGI
Kazuo TAKANO
Yasunori TSUKUYAMA
Tatsuo NAGAI
Hirosi NAGATA
Kazuyoshi NAKAZUMI
Sakura NAKAYAMA

Hidemitsu NOGUCHI
Yasuyuki FUKUSHIMA
Tetsuo FUMURAMA
Shigeru MATSUSHITA
Koichi MABUCHI
Shin’ichi MIZUNO
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