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History of Japanese technology

Soft Skill Text for
Japan-India Institute for Manufacturing

METI
Ministry of Economy, Trade and Industry

Japan-India Institute for Manufacturing®

AOTS
The Association for Overseas Technical Cooperation and Sustainable Partnerships

Synopsis

This text material was prepared in 2025 for students enrolled in the Japanese Institute of Manufacturing (JIM), a corporate-run school in India entrusted by the Ministry of Economy, Trade and Industry of Japan [METI].

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Text No. 4-1-1

History of Japanese technology

Soft Skill Text for
Japan-India Institute for Manufacturing

Purpose of this theme

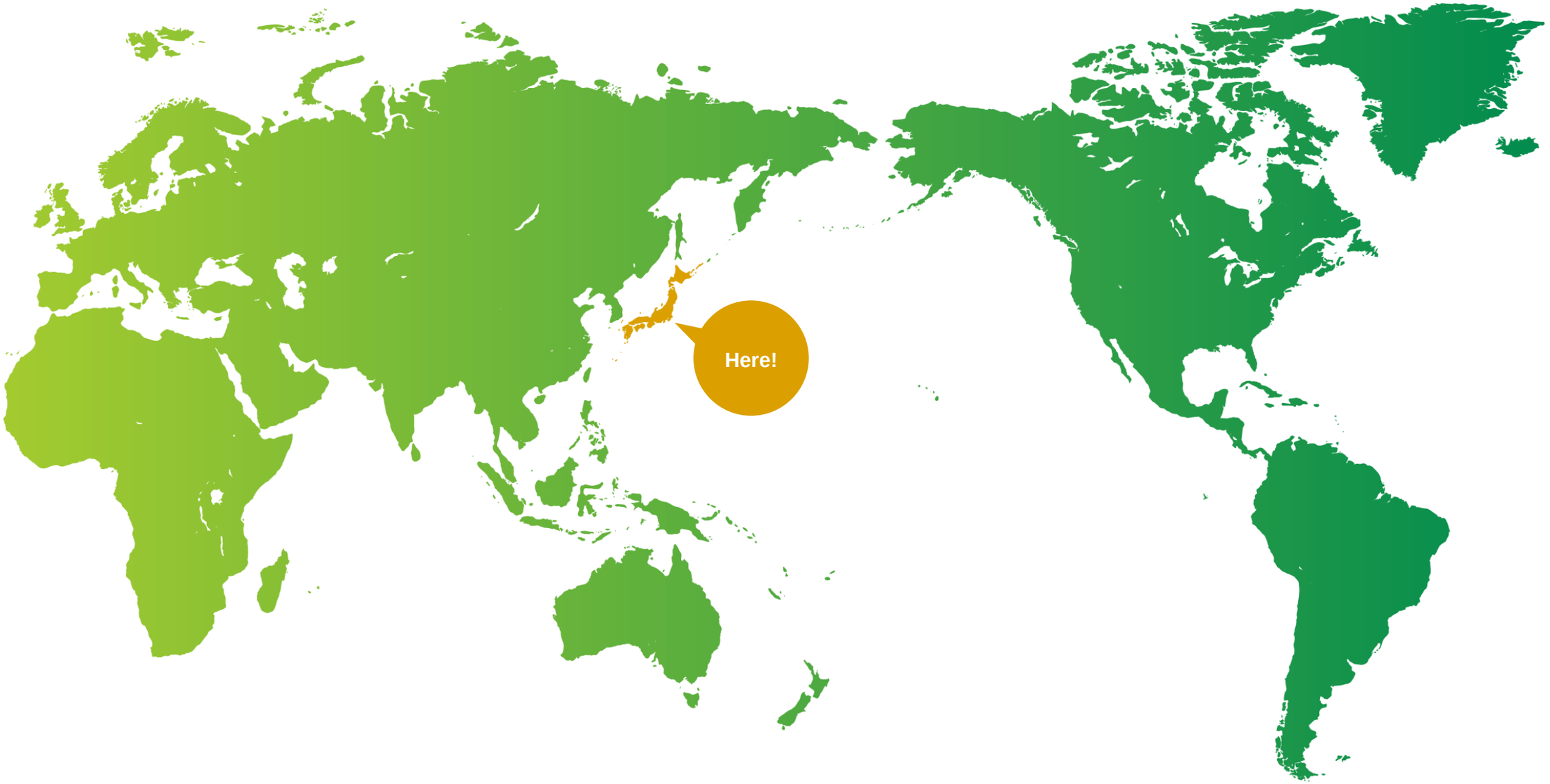
Contents

- **A brief history of Japan**
- **What is Japan?**
- **Japanese industrial history**
- **Period of isolation (17th-19th century)**
- **After the re-opening**
- **Until the end of World War II**
- **Post World War II**
- **Discussion**

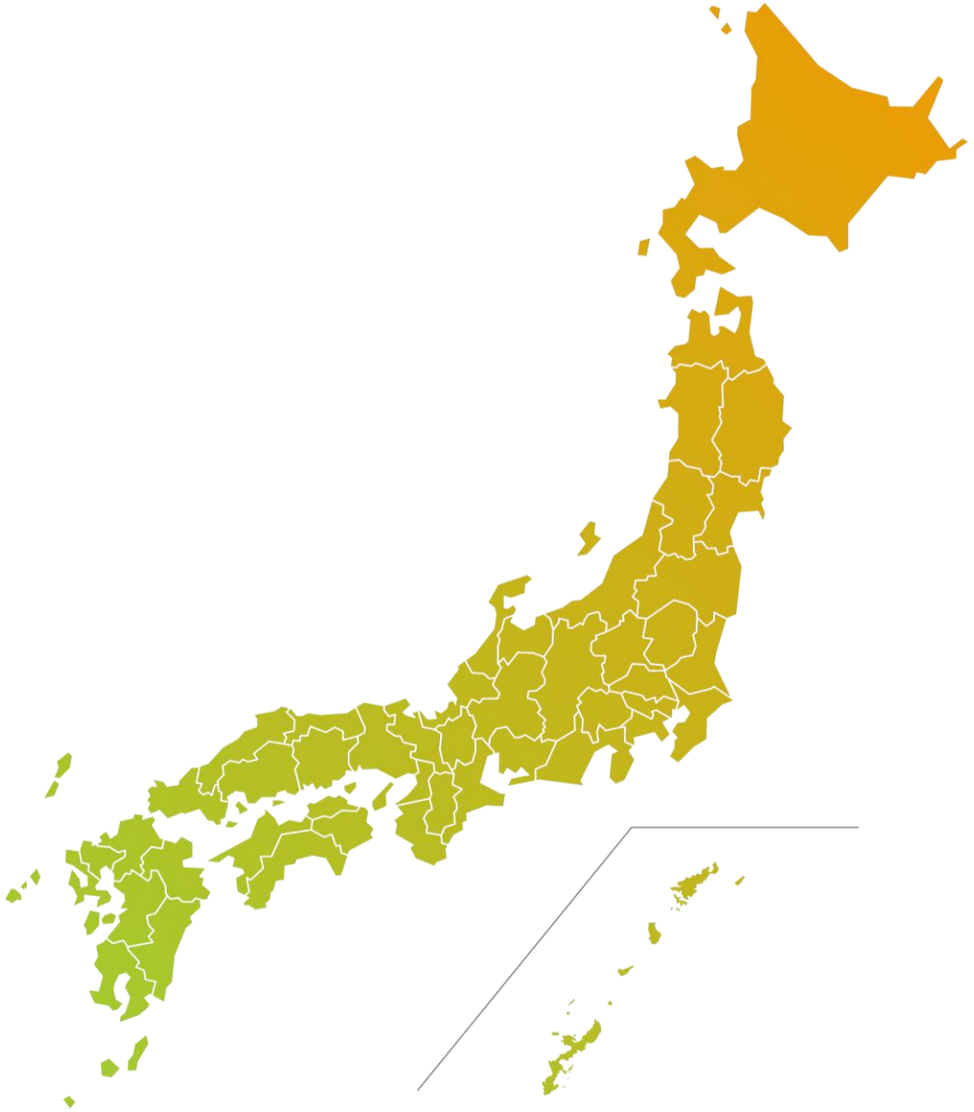
A brief history of Japan

Japan has been influenced in various fields by the Asian continent since ancient times. As for the technical field, various techniques were introduced from China by way of the Korean peninsula until 16th century. After that, new technologies were brought from Europe. From the 17th to 19th century, Japan was in a period of isolation. In the late 19th century, Japan emerged from isolation and reopened itself to the world and since then has succeeded in developing into an industrial country.

Where is Japan?



What is Japan?



Japan is a sovereign island nation in East Asia. The four largest major islands are Honshu, Hokkaido, Kyushu and Shikoku. The climate of Japan is temperate but varies from north to south. The country has a good combination of nature and industry. The capital city is Tokyo. The population is 127 million. Japan has a unique traditional culture that includes such elements as the tea ceremony, Kabuki theatrical dramas, Zen meditation, etc.

Japanese industrial history-1

As Japan is not rich in natural resources, it has to be a technology oriented country. According to one theory, wet-paddy rice agriculture was introduced from overseas in the 10th century BC. Likewise, Japan has learnt many technologies from other countries and developed them to suit the Japanese way of thinking and environment.

Japanese industrial history-2

In the 16th century, a matchlock musket was introduced at Tanegashima island from Portugal. This was the epoch-making event for Japan, the first direct introduction of western technology.

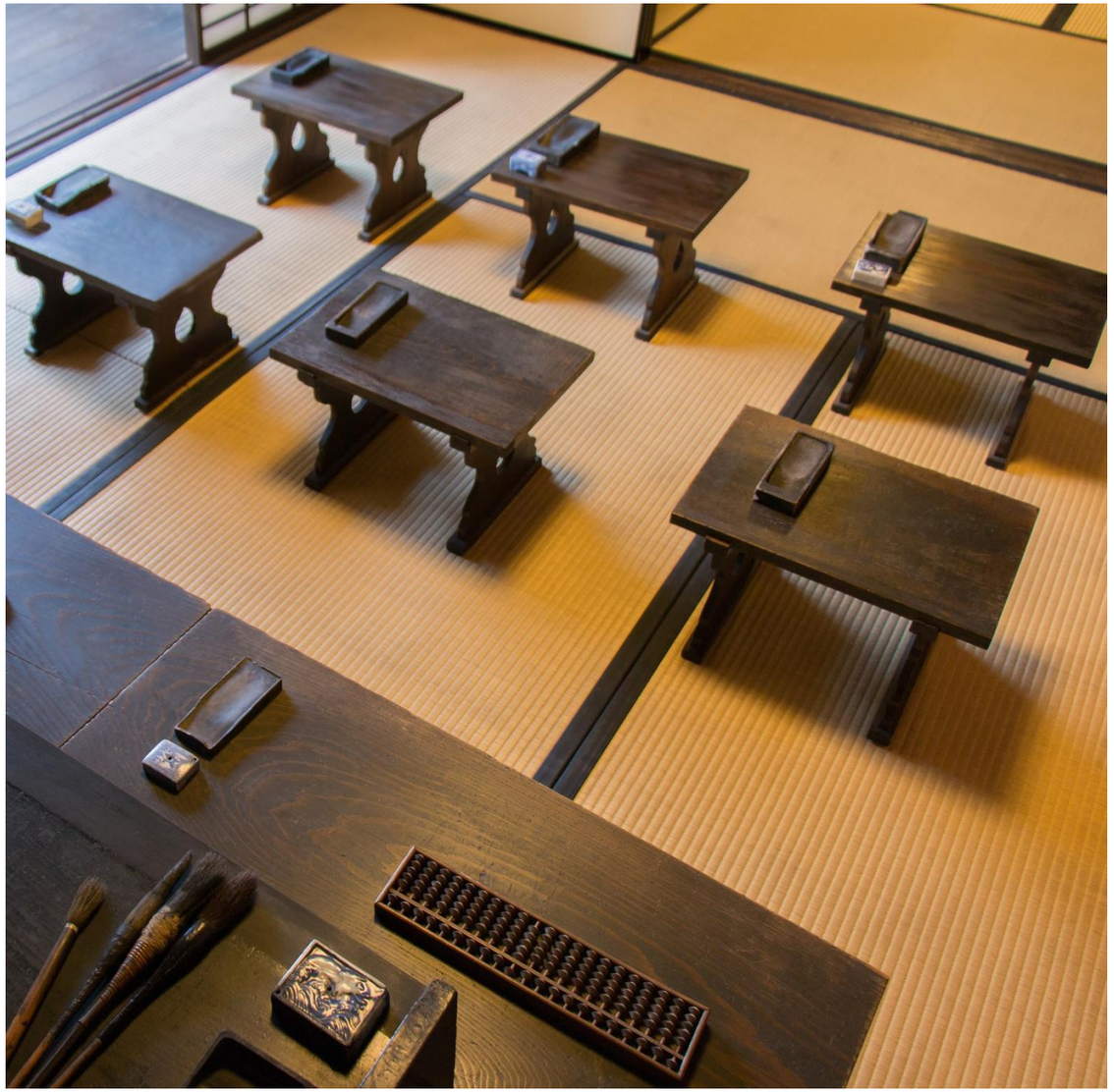
Soap, glass, woollen fabric, printing technology, etc., were also transferred to Japan around this period.

Period of isolation (17th-19th century) -1

From the 17th to 19th century, Japan closed its door to other countries and only had relations with Holland via a trading post at Nagasaki in Kyushu island. During this period, although technological information was very limited, Japan domestically developed its own technology.

One of the typical Japanese technologies of the period was sword forging. This resulted in very beautiful and elaborate swords that can be said to be works of art.

Period of isolation (17th-19th century) -2



The Japanese educational level in this period was very high, because many children went to school, called “terakoya”, where they learnt reading, writing, arithmetic, etc. “Tera” of “terakoya” in Japanese means “temple”. As this name implies, schooling was originally conducted in a temple.

After the re-opening -1

In the late 19th century, Japan reopened to the world. Since then, Japan has made great effort to catch up with major western countries, and tried to introduce many leading technologies.

One of the typical examples is the “Tomioka Silk Mill”, which established in 1872 by introducing technology from France.

After the re-opening -2

In 1886, the first ironworks was established at Kamaishi in Iwate pref., in the northern part of Honshu. This is the origin of Japan’s current-day largest iron and steel company, Nippon Steel & Sumitomo Metal Corporation.

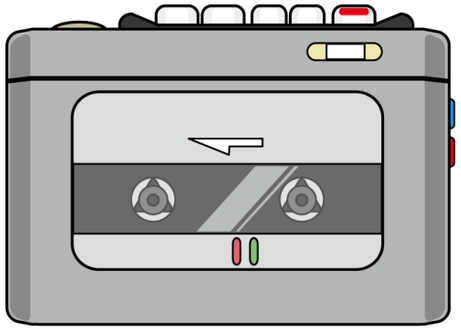
Until the end of World War II

Japan continued making efforts to develop unique technologies. For example, Kenjiro Takayanagi built the world's first all-electronic television receiver in 1926. As the world entered a period of military expansion, Japan also developed its military technology. Japan was soon among the top military ship and plane building countries.

Post World War II -1

After the defeat at the end of WWⅡ, Japan was reborn as a peace seeking country. Since then, it has made great efforts to create unique technologies. For example, Japan started the operation of its high-speed railway system in 1964, which is well known as Shinkansen in Japanese.

Post World War II -2



Another example is the “WALKMAN” made by Sony Corporation. It was a portable type audio player that became a great hit all over the world in 1979.

Discussion

- **Was there any new information for you about Japan?**
- **Why did Japan become a technology oriented country?**
- **Can you give some examples of Japanese products?**

Text No. 4-2-1

Remarkable features of Japanese technology

Soft Skill Text for
Japan-India Institute for Manufacturing

Purpose of this theme

Contents

- **Technological strength**
- **Feature of Japanese technology**
- **Supporting factors**
- **Discussion**

Technological strength

- When we talk about the technology of a country, we must clarify the definition of “technological strength”.
- There are a variety of viewpoints on technology, such as “quality and quantity”, “big or small”, “product development”, “design”, “manufacturing process”, “cost” and “performance”.
- The remarkable features of Japanese technology will be discussed along with these items.

Features of Japanese technology

It is true that there are few products that have been invented by the Japanese. Automobiles, airplanes, computers, etc., were all invented by the Americans or Europeans, and not by the Japanese. This means that the Japanese technological strength is not necessarily the ability of invention but the ability of improvement, such as adding easy-to-use functions to a product, reducing defects, minimising the variation of quality, increasing the precision, etc.

Example

Ford model T (USA)

First affordable automobile (1908-27）

Japanese hybrid car

Hybrid car with outstanding low fuel consumption

Supporting factors

Here, let’s focus on the mental and spiritual characteristics of the Japanese. Historically, Japan has been an agricultural country where farmers work diligently and patiently for a good harvest. For this reason Japanese people have the nature to work hard and continue working monotonously and patiently. These characteristics are now transferred to manufacturing industries and contribute to making high quality products.

Discussion

- What are the features of Japanese technological strength?
- Do most of these unique and excellent Japanese technologies belong to big businesses?
- What is the key to manufacturing quality goods?

Text No. 4-3-1

Japanese manufacturing spirit

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Purpose of this theme

Contents

- **“Takumi”, the craftsman**
- **Why is “Takumi” respected?**
- **“Takumi” is ever progressing**
- **Spiritual value**
- **Japanese cultural background**
- **Discussion**

“Takumi”, the craftsman

Traditionally, the Japanese pay respect to those who have attained a very high level in some skill or technique and are still pursuing an even higher level in a stoic and self-disciplined manner. Such people are called “Takumi”, or craftsmen.

Why “Takumi” is respected?

Apprenticeships in Japan were very severe. They needed patience to continue training for a long period of time. An apprentice was usually not given systematic instruction about how to do things. He had to watch what his master was doing very carefully, and build up his skill by his own efforts. This meant that the apprentice could not make progress and reach the level of “Takumi” unless he was diligent, patient and wise enough. Therefore, “Takumi” was highly respected.

“Takumi” is ever progressing-1

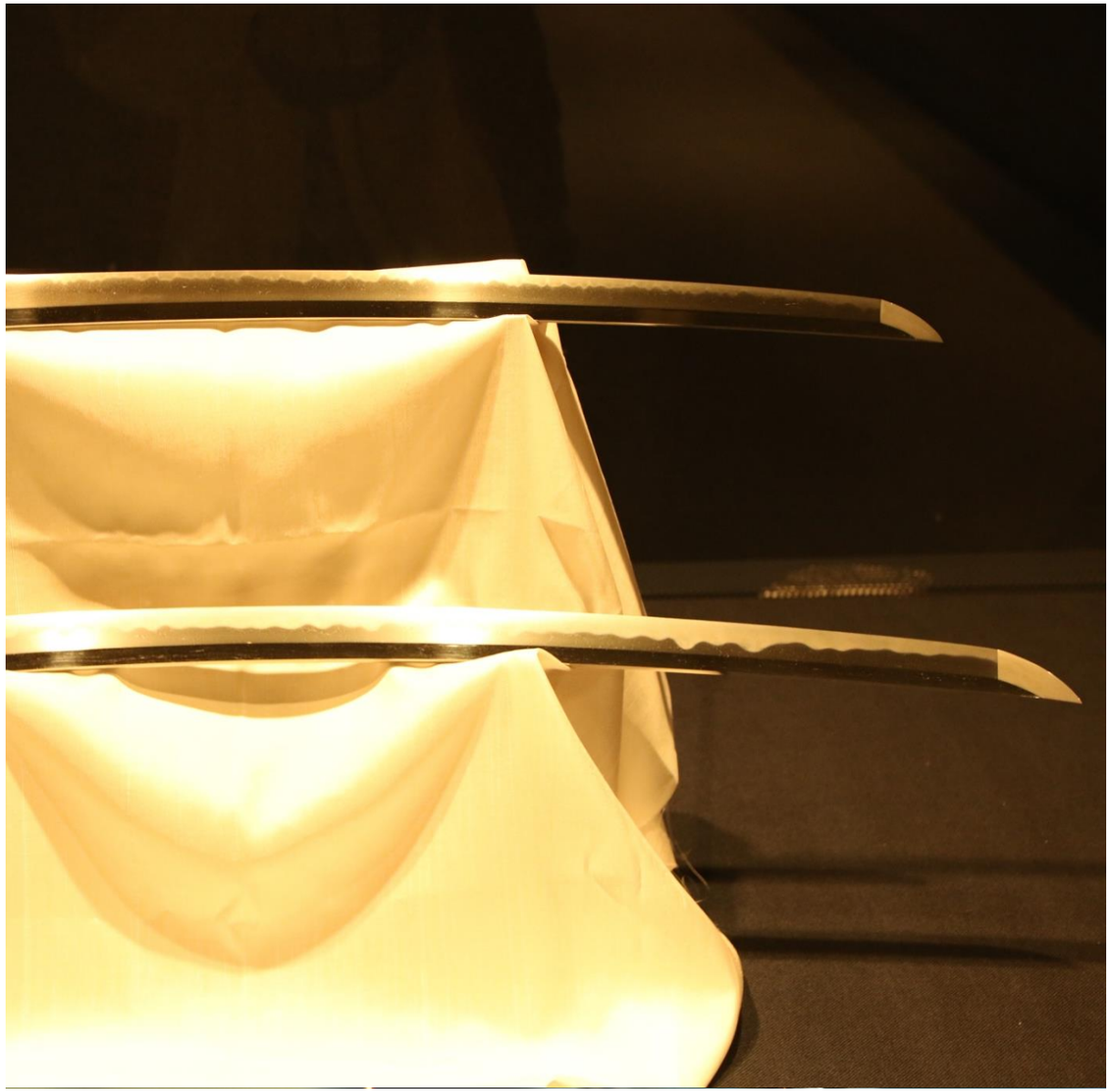
Today also, an apprentice begins his training at his master’s place. After years of training he makes progress in his skills to be as close as possible to the master’s level.

Here one big question is, if an apprentice can surpass his master or not. The answer is that he should.

“Takumi” is ever progressing-2

The master expects his apprentice to surpass him, because he wants the traditional crafts to be developed further hopefully by his apprentice. An apprentice feels his master’s expectation naturally and works hard to live up to it. He tries to develop not only his work skills but also his personality to be a next generation Takumi.

Spiritual value



In his work, a Takumi always tries to concentrate greatly on creating the best products. He tries to totally eliminate idle thoughts from his work. Accordingly, the finished products are quite elaborate and close to being works of art. Japanese swords are a typical example of a Takumi’s work.

Discussion

- Why are “Takumi” respected in Japan?
- Why are “Takumi” ever progressing?
- Why do “Takumi” seek such ultimate perfection?

References: Chapter 4

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Website of TDC Corporation	http://mirror-polish.com/company/
Website of YS Tech Co., Ltd.	http://www.ys-tech.jp/
World's Highest Literacy of Japan Amazed the World (World's No. 1s of Japan)	http://www.nipponnosekaiichi.com/mind_culture/literacy_rate.html