WORKING PAPER SERIES

Shoichiro Yasushi

A Study About What Led Japanese Pharmaceutical Industry into 20th Century

September 12, 2019

No.211

The Research Institute for Innovation Management, HOSEI UNIVERSITY

A study about what led Japanese pharmaceutical industry into 20th century

Shoichiro Yasushi
The Research Institute for Innovation Management, Hosei University, Japan

Abstract

The aim of this paper is to investigate the transition of Japanese pharmaceutical industry. The industry has been playing an important role in the healthcare business. Investigating it can clarify the history of the healthcare business through modern age. The paper explores the situation of late 19th century which had strong influences on the pharmaceutical industry's foundation. That was essential for investigate Japanese pharmaceutical industry in 20th century.

Efforts of former students educated by foreign teachers and governmental decisions about pharmaceutical industry propelled the development of western medical technology. Those led healthcare industry flourishing in 20th century in Japan.

Introduction

The aim of this paper is to investigate the transition of Japanese pharmaceutical industry. The industry has been playing an important role in the healthcare business. Investigating it can clarify the whole history of the healthcare business through modern age.

Therefore, we must explore the situation of late 19th century which had strong influence on the pharmaceutical industry's foundation. That was essential for investigate Japanese pharmaceutical industry in 20th century.

The change and growth of the pharmaceutical industry through Meiji and Taisho era were driven by external economic factors as epidemic disease, dissemination of western medical science, the war against China and Russia and World War I.

Epidemic tends to occur sporadically. Therefore, it is difficult to predict its occurrence and cease. In such situation, pharmaceutical manufacturers and merchants have to understand the condition of suppliers, importing and domestic market to adapt to price soaring. Medical merchants were using telegraph to made efforts to gather market information quickly. Despite of their effort, they could not decrease the risk of trading. It was difficult for them to make continuous profit. Those market confusions caused by

epidemic disease made medicinal merchants to choose more sustainable business scheme. Meanwhile, the government established modern medical system framework named *Isei* [Medical Systems] in 1874 and encouraged using western medical technology.

Both Sino-Japanese War and Russo-Japanese War caused disruption of international trading. The price of Chinese medicine and disinfectant soared. Especially, Russo-Japanese War increased the demand of sanitary material and camphor which provided the opportunities to pharmaceutical industry thriving.

Unlike Sino-Japanese War and Russo-Japanese War, World War I did not cause direct damages to Japan. However, it decreased the quantity of importing high quality materials severely. Especially, almost no medical items from Germany was imported during the war. Under these circumstances, some foreseeing businessperson in the pharmaceutical industry swiftly acted to influence government to solve the situation. Their act can be based on the experience in former wars and epidemic disease. Additionally, some of them tried to be manufacturer to avoid medicine shortages.

This research focuses on abovementioned circumstances within Meiji and Taisho era. The research was based on governmental document, histories of corporations and biographical writings of businessperson. Primary sources' contents in this time span were contained in Nagasaki University's Academic archives. Therefore, author mainly used their resources. Additionally, as far as author scanned, only English abstracts of Japanese papers existed about this research area.

I. The legacy of Tokugawa Shogunate

1. The foundation of *Nagasaki Kaigun Denshuujo*

From Meiji era, western medical systems established their performance in Japan. Chemical composites like quinine and morphine were extracted and used as medicines. However, studying western medical technology began before Meiji restoration. Especially, Dutch medicine doctors and pharmacists highly influenced development in Japanese chemical industry.

In 1853, Fleet of the United States led by Matthew Calbraith Perry visited to Japan and demanded opening of the country, Tokugawa Shogunate intended to prepare for coastal defense with permitting to build large ships. They also consulted Netherland to buy military assets such as warships, cannons and military drill handbooks, because of their long-term friendliness. Netherland agreed and offered to dispatch professionals of geology, surveying, naval architecture and gunnery science. The shogunate accepted

them.

These contracts led founding *Nagasaki Kaigun Denshuujo* [Nagasaki Naval Training Center] and the lectures given by Dutch teachers had begun. This made Japanese government to begin studying western technologies actively.

2. Pompe's lecture and his performance against epidemic disease

Johannes Lijdius Catharinus Pompe van Meerdervoort was one of them. He came to Japan as a member of the expedition in 1857. Pompe was ordered to research Japanese medical technology and to teach Japanese western medical technology. He found Japanese students only knew old medical technology written on old textbooks. They lacked knowledge of surgery, anatomy, physiology, physics and chemistry. Pompe built a plan in reference to the method used in Training College for Army Surgeons in Utrecht which he graduated. He told Ryojun Matsumoto, one of his students about this plan. Nagasaki magistrate founded *Igaku Denshuujo* [Medical School] according to Ryojun Matsumoto's report.

Pompe asked Nagasaki magistrate to found hospital for clinical lecture. Medical School added another facility to adapt increasing number of students including Sensai Nagayo, who played a vital role in establishing *Isei* [Medical Systems]. He was recommended by Koan Ogata of Tekijuku and became a student of *Igaku Denshuujo* approved by Matsumoto who was entrusted by Pompe. Nagayo was especially interested in concept of public health. With Pompe's guidance, he recognized the importance of governmental organization which protect people's health. In 1873, Nagayo was appointed to a medical director in Ministry of Education, Science and Culture.

Pompe carried out public vaccination in 1857. Smallpox was pandemic 1854, 1855 and 1857 respectively, caused many casualties. Pompe also lectured with collected statistical data of vaccination. When cholera was pandemic in 1858 summer, He performed various countermeasures with the aid of his students. Pompe's countermeasures were printed and distributed to all over Japan.

Since Pompe came to Nagasaki, he taught from basic medical science to clinical lecture. But most of those were focused only on theories. *Igaku Denshuujo* still lacked any of Specimen chambers, laboratories and equipment. Lecture of anatomy did not have a facility of autopsy nor given bodies for medical research. Pompe strongly insisted on the need of western style hospitals for practical training. Nagasaki magistrate accepted his demand because of his contribution against epidemic.

In 1861, Japan's first western style hospital named *Yojosho* [Medical Facility], current

Nagasaki University, School of Medicine was founded. And in same year, additional studying facility named *Igakusho* [School of western medicine] was built next to *Yojosho*. *Igakusho* belonged to *Yojosho* and was managed by Ryojun Matsumoto. *Yojosho* served not only domestic patients but also foreigners. Pompe left Japan in 1862. Number of his students reached 136.[1] Pompe's activities enhanced the educational infrastructure of western medical technology.

3. Bauduin and spreading medical education

After Pompe left, Anthonius Franciscus Bauduin who was an expertise in ophthalmology. He also taught Pompe at Training College for Army Surgeons in Utrecht. In 1863, Bauduin insisted on the need of encouraging medical education to Nagasaki magistrate. As a result of that, children of doctors and anyone between 15 years old and 35 years old were able to study medical science. Additionally, educated and well-trained students could start clinical business. In the same year, Ryojun Matsumoto, who was taught by Pompe, was appointed to the head of *Igakusho* [School of western medicine] in Edo.

In 1864, Nagasaki magistrate increased the number of officers in *Yojosho* [Medical Facility] for adapting steeply increased number of students. Bauduin was an expert of physiology as well as ophthalmology. Nevertheless, he concerned about the problem on teaching multiple subjects by himself. He assumed at least two teachers were necessary to promote medical education. Bauduin thought physics and chemistry must be separated from medical education. He told his plan which establishes a new institute with new dedicated stuff to Shogunate.

Shogunate approved his plan and established *Bunseki kyurijo* [Institute of analysis and study of natural laws]. Koenraad Wolter Gratama was introduced as a stuff recommended by Bauduin. Gratama graduated Training College for Army Surgeons in Utrecht. In 1865, *Yojosho* and *Igakusho* in Nagasaki were integrated into *Seitokukan*.

Bauduin mainly taught physiology, ophthalmology and anatomy until 1865. He recommended Constant George van Mansveldt as his successor. Spreading medical education led by Bauduin achieved nearly 1000 student.[2] He greatly contributed to

---

[1] Nakanishi, Akira, *Nagasaki Igaku Hyakunenshi* [One hundred years history of Nagasaki medical science] (Nagasaki University, School of Medicine, 1961), 42.

[2] Nakanishi, Akira, *Nagasaki Igaku Hyakunenshi* [One hundred years history of Nagasaki medical science] (Nagasaki University, School of Medicine, 1961), 106.

spread medical education and services by his plan.

4. Contributions of Mansveldt and Gratama

Mansveldt lectured anatomy training in *Seitokukan*. He also taught surgery, bandage science and diagnostics. His strict and accurate education manner made students to work hard. Mansveldt continued his activity after Meiji restoration. Nagayoshi Nagai was one of his students. Nagai is known by the success of extracting ephedrine. He became a chief engineer in *Dainippon Seiyaku Kaisha* [Dainippon Pharmaceutical Company] which was a semi-governmental corporation. He learned chemistry from Bauduin and western medical science from Mansveldt. Later, inspired by their lecture, Nagai contributed modernization of Japanese pharmaceutical industry as well as became first head of *Tokyo Yakugakkai* [The Pharmaceutical Society of Tokyo].

After Gratama arrived, physics and chemistry education were enriched in *Seitokukan*. Physics, chemistry, pharmacology, mineralogy and botany were lectured. *Bunseki kyurijo* [Institute of analysis and study of natural laws] also assisted by Gratama, performed business activities like component analysis for Ironworks and assessing silver from *Nagasaki Kaisho* [Nagasaki Trading Post]. In 1867, Gratama moved to *Kaiseijo* [school of foreign studies] in Edo. He lectured basic chemical experiment such as gun production, gunpowder production and mineral test analysis.

II. Transition from Tokugawa Shogunate to the Meiji government

1. Activities of Willis, the English doctor

William Willis also influenced Japanese medical administration along with graduates of Training College for Army Surgeons in Utrecht. In 1862, Willis arrived in Japan as an aide and doctor of English legation after he graduated the medical department of the University of Edinburgh. Unlike doctors supported by Shogunate, Willis could not procure sufficient amount of western medicines, when he arrived in Japan. At that time, there were few pharmacies dealing western medicines. Japanese technicians lacked knowledge of formulating those materials. Therefore, Willis had to obtain western medicines from England or had to buy those through trading companies. However, they were expensive and even some of them were counterfeit products. Additionally, variety of medicines available in Japan were limited. Therefore, Willis was forced to work in difficult situation.

Griffith Jenkins, former doctor of English legation and Willis’s colleague, had same problems. Willis and Jenkins procured western medicines through Willis’s brother

who managed a clinic in England. However, the lack of medicines persisted because the required transportation time often exceeded their expectation. Then Willis noticed a pharmacy in Shanghai had a plan to open a branch in Yokohama. Willis and Jenkins were interested in managing a pharmacy. In 1864, they founded Yokohama Dispensary with joint investment within the foreign settlement.

Yokohama Dispensary started the business when Portuguese pharmacists arrived in Japan. There were plenty of orders came from Legations and Yokohama Hospital which was managed by Jenkins. Despite of early success, lack of human resources obstructed the management. In the end, Willis and Jenkins gave up Yokohama Dispensary in 1867.

In 1868, *Toba-Fushimi no tatakai* [Battle of Toba–Fushimi] broke out as the beginning of Boshin war. In that war, Harry Smith Parkes, English minister, strongly supported Satsuma clan. He accepted the request of dispatching doctors from Tomoatsu Godai and Munenori Terashima. Parkes ordered Willis to go to Kyoto. Willis arrived at a hospital in Kyoto one month after the beginning of the war. He treated over 100 injured soldiers with western medical technique. At that time, Sino-Japanese traditional medicine only paste ointment over trauma and wait for natural healing. Therefore, the method used by Willis was considered as epoch-making and was effective. He continued his work and taught Japanese doctors in the battlefield. His achievement earned Satsuma clan's trust. He was appointed to a professor of *Daigaku Toko*, the predecessor of the Faculty of Medicine, University of Tokyo. *Daigaku Toko* was based on *Igakusho* in Edo in which Ryojun Matsumoto was a head. Willis's activity and promotion were considered as an influence from English legation.

2. Foreign teachers and existing educational facilities through Meiji restoration

Meiji government stated the adoption of western medical technology in 1868. It diverted educational facilities founded in Edo era. The doctors graduated from *Seitokukan* contributed curing the injured in Boshin war as Willis did. *Seitokukan* represented Sensai Nagayo as a chief of doctor and later renamed *Nagasaki Igakkou* [Nagasaki medical school] in 1871.

Meanwhile, there was still influence from Netherland. Bauduin arrived in Japan once again to fulfill a contract with Shogunate to assist establishing hospital and medical school in 1868. After Shogunate collapsed, he headed to Osaka and worked with Koreyoshi Ogata, who had been to Netherland approved by Bauduin. Bauduin, Ogata and ex-students made foundation of Faculty of Medicine, Osaka University.

Kaiseijo [School for Western Studies] directly controlled by Shogunate moved to

Osaka avoiding the damage caused by war and renamed as Osaka *Seimikyoku* [School of chemistry] in 1869. Gratama was appointed as a first principal of the school. Many lecture texts by him and other foreign teachers were published and contributed the development of Japanese chemical industry. Jokichi Takamine, later found Taka-Diastase, was one of the students.

3. German medical technology adoption and its influence

In 1869, Jun Iwasa and Tomoyasu Sagara were appointed as *Igaku Torishirabe Goyougakari* [General affairs official of medical research]. They were both students of Bauduin. They insisted on importing German medical technology which was the most advanced in Europe at that time for improving medical systems in Japan. Because a lot of German medical books were translated and used in England and Netherland.

Sagara strongly propelled the reformation based on abovementioned scheme. There were many opinions that English medical technology should be used as the base of new medical systems of Japan because of considerable contribution by William Willis and his students in the field. Willis was also supported by English minister, Harry Smith Parkes. Sagara forced to adopt German medical technology with the aid of teachers from Netherland such as Guido Herman Fridolin Verbeck who worked in *Daigaku Nanko*, which focused on foregn language education.

Inviting German teachers of surgery and internal medicine was decided. In 1871, Benjamin Carl Leopold Müller, a naval surgeon, and Theodor Eduard Hoffmann, an army surgeon, were appointed. Additionally, Duane B. Simmons, German lived in the United States, was invited as a language teacher. He taught German and Latin. Müller insisted on educating pharmacists with specialists. He and Hoffmann formed the base of pharmaceutical department of University of Tokyo. Shokei Shibata who studied in Humboldt University of Berlin joined this project.

This political decision removed the influence of Willis. He resigned a teacher of *Daigaku Toko* and moved to Kagoshima school of medicine as a principal, invited by Takamori Saigo. Willis contributed to improve local medical system condition.

4. Eastern medical technology under the *Isei*

Isei covered wide area across medical and health organization, medical education and regulations of doctor's license. Article 37 of *Isei* stated about qualification of doctors. It defined they must pass the national exam. In 1875, Ministry of Education, Science and Culture ordered each prefecture to perform the exam for opening clinic.

This system greatly influenced Sino-Japanese traditional doctors. Existing doctors with certain achievements were permitted to continue their business. However, new doctors wished to begin their clinical business must pass the exam based on western medical technology. This meant future generation of Sino-Japanese traditional doctors were hard to exist. They tried to continue Sino-Japanese traditional medicine. They requested to change subjects of the exam, to emphasize fundamental theory and to try comparison treatment.

Sino-Japanese traditional doctors persistently negotiated with government. However, their activities were weakened under the policy of medical system westernization. In 1883, rules of medical license and opening clinic examination systems were established.

Sino-Japanese traditional medicine was institutionally eliminated. Although it remained within Japanese lifestyle as folk remedies. Sino-Japanese traditional doctors later organized Japan Society for Oriental Medicine in 1950. Additionally, using some of Chinese medicine and herbal medicine were established as legit medical treatment in 1975. This change restored the authority of Sino-Japanese traditional medicine.

III. Enrichment of Japanese medical system

1. Establishment of *Shiyakujo* [drug inspection agency]

Import quantity of western medicine kept increasing as trading between foreign countries became active. At that time, knowledge of western medicine was neither widely available nor there was enough human resource in Japan despite that there were educational activities in Nagasaki, Osaka and Tokyo. That situation continued after Meiji government established. The government had to continue their effort to create framework for spreading western medical technology.

In 1869, Anton Johannes Cornelis Geerts, Dutch army drug officer, arrived in Japan. He deeply involved in the establishment of *Shiyakujo*, which played important roles in imported drug quality management. His first objectives were teaching western pharmacy through lecturing natural science such as chemistry, geometry and physics in Nagasaki Medical School.

In 1873, a Dutch trader sent a request of regulation of counterfeit products with samples of both genuine medicine and forged one to customs office in Nagasaki. According to the request, price of genuine products was almost same as it of forged one. This meant there was no advantage for trading genuine medicine for merchants.

Geerts inspected those samples and found there were lots of counterfeit and defective

products because Japanese merchants lacked knowledge of western medicine. He sent a report that these problems caused serious health hazard to Japanese people. The report also stated the necessity of drug inspection agency with introduction of cases in Europe. Customs office in Nagasaki escalated this opinion to the government. In the same year, Ministry of Education, Science and Culture planned to establish drug inspection laboratories in Yokohama, Nagasaki and Kobe with foreign specialist. Sensai Nagayo proceeded this plan with suggestion of Geerts. However, initial budget did not allow to locate three laboratories. For contingency plan, one central laboratory was established in Tokyo in 1874. First head of the drug inspection agency was Tokai Nagamatsu, who was a student of Bauduin. This agency was the origin of National Institute of Health Sciences.

Drug inspection agency in Tokyo worked not only as an inspection laboratory but also as an educating facility. Agency head Nagamatsu thought there was no choice but to educate medicine dealers for preventing counterfeit and defective imported products. Nagamatsu reinforced facilities and educated students and the young people of pharmacists.

Geerts became an adviser of Nagayo and contributed the establishment of other drug inspection agencies. In 1875, Kyoto agency was established, and he was appointed to it. He was testing medicines such as potassium iodide and quinine as well as educating people who tried to be pharmacists. He also gave a lecture, first in Japan, of opening test of drugstores. This resulted in issuing pharmacist license first through 15th. In the same year, Osaka agency was also established. B. W. Dwars from Netherland was appointed to the agency. He lectured medicine manufacturing, inspection, general physics and chemistry, toxicology, poisoning inspection, natural pharmacology and mineralogy.

Common inspected stamp was authorized used in three agencies. This stamp greatly contributed for quality assurance. Those agencies were renamed as Institute of Hygienic Sciences and collected inspection cost.

Geerts moved to Yokohama agency established in 1877 after he left Kyoto agency. He mainly inspected quinine whose counterfeit products were most spread in that time. Geerts also educated pharmacists and technicians about inspection and manufacturing. His students later exhibited their products like aspirin and carbolic acid on expositions.

As mentioned above, drug inspection agencies contributed in education as well as quality assurance. Foreign teachers in each agency left after his term of office, Japanese pharmacists and technicians inherited their work. Doctors from Netherland were considered to have strong influence on Japanese medical system development.

2. Establishment of Japanese Pharmacopoeia

In Meiji era, procuring of western medicine had to be relied on importing. Imported medicine were based on the pharmacopoeia[3] of each country. Therefore, same kind of medicine had different purity and effectiveness. That could often cause harmful effect to recipients.

In order to solve that problem, the first edition of Japanese Pharmacopoeia was established in 1886. This was the result of the report written by Sensai Nagayo, health director of the Department of Interior. Editor's committee included Tokai Nagamatsu, Shokei Shibata, Anton Johannes Cornelis Geerts, Johann Frederik Eijkmann, Alexander Langgaard and Kanehiro Takaki. Eijkmann and Langgaard were co-workers of Shibata. Takaki was a student of William Willis. The reason why Takaki was selected as a member of the committee was that Nagayo recognized the importance of pharmacopoeia and seeked appropriate members for realizing specifications. Japanese Pharmacopoeia held 468 items and formed the basis of modern Japanese pharmaceutical industry.

In 1889, procedure of licensing pharmaceutical manufacturing was issued. Pharmaceutical manufacturers had to pass their products through drug inspection agencies, and passed ones had to have the indication letters *Kankyo* [The government certified] in order to sell in the market. Although mainstream members were Netherland-based, because of lacking human resources, the government have to adopt an English influenced member to establish pharmacopoeia.

3. Transition of regulations on medicine dealers

In 1875, the system of exam for opening drugstores was established. This system prohibited opening new stores unless new dealers pass the exam. Existing medicine dealers were temporary granted to have licenses. In 1882, pharmacy and medicine material dealer regulations were established, and pharmacy could not formulate medicine without doctor's prescription.

Medicine material dealers were only permitted to buy and sell. The government unified names of medicines and made dealers to describe Japanese names on imported products.

Chemical business and chemical handling rules established systems of selling and formulating medicines. These rules greatly influenced existing medicine dealers.

---

[3] Specifications of medicines. That regulates method of testing, purity and form.

Chobei Takeda the 5th, one of the distinguished dealers in Osaka described the situation as follows “These rules might make us out of business. We dealers discussed how to solve these problems through night”.[4]

4. Transition of regulations on over-the-counter medicines

Over-the-counter medicines were widely used among people before Meiji era. New government planned to reinforce regulation on them. In 1870, the government issued a regulation on over-the-counter medicines. This defined them as formulated by traditional method and must be registered to have licenses with appropriate dosage and quality. At this point, the government recognized over-the-counter medicines as effective.

However, Sino-Chine medicines which German medical technology did not recognize their effectiveness were considered as non-effective when the government decided to adopt German medical technology. And this was not the only reason why. At this time, many over-the-counter medicines were sold as “So-called panacea”[5] without scientific proof. These two facts justified for strengthening regulation. In 1877, the rules of over-the-counter medicines were established. Over-the-counter medicines had to be reported to authorities and imposed business tax and license tag fee. In the next year, document of inspecting over-the-counter medicines was established. The document considered they were harmless and non-effective. The government concluded them as outdated relic and aimed their extinction.[6]

Despite of the attitude of the government, over-the-counter medicines continued to be used among people, and their number of items and sales increased. Then the government established the rules of stamp duty for over-the-counter medicines in 1882. This defined list price of them and 10% of it to be taxed as stamp duty. The stamp duty was used for public hygiene project. This increased medicine dealer’s burden and caused raising price. This political background was based on severe economic condition of the government in addition to extinction policy about over-the-counter medicines.

---

[4] Editors of Reminiscence of Elder Kazunori, *Kazunori Ou Tsuisou* [Reminiscence of Elder Kazunori] (Editors of Reminiscence of Elder Kazunori, 1960), 11.

[5] Ministry of Health and Welfare, *Isei Hyakunen Shi* [100 years of medical system] (Gyosei, 1976), 108.

[6] The Japanese Society for History of Pharmacy, *Nihon Iyakuhin Sangyoushi* [History of Japanese Pharmaceutical Industry] (Yakuji Nipposha, 1995), 33.

This political decision made medicine dealers to improve their products for sales promotion. Nishikawa (2010) calculated back to sales of over-the-counter medicines from the amount of stamp duty. That described "About 5 million yen from 1887 to 1896, about 10 million yen from 1897 to 1906, and about 20 million yen from 1907 to 1916, respectively", [7] which indicated the steady increase of demand of over-the-counter medicines. Additionally, the government was criticized with contradiction in the regulation policy about over-the-counter medicines, and it responded with new policy.

In 1909, the government changed the regulation policy of over-the-counter medicines from "No effectiveness and no harm" to "Effective and no harm" and a statement was issued that it was prohibited to sell products without scientific proof of effectiveness. Additionally, the law of over-the-counter medicines was established in 1914. This law regulated medicine dealer's qualification, prohibited extravagant advertisement and obliged quality inspection to products. The law made dealers to increase their cost for quality improvement and proof of products. This situation allowed only effective products licensed by the government. Under these circumstances, people kept demanding over-the-counter medicines, therefore, more business opportunity increased.

5. World War I and revitalization of pharmaceutical industry

War was the primary force to revitalize the pharmaceutical industry in Japan. Both Sino-Japanese War and Russo-Japanese War caused soaring the price of imported medicines and chemicals, and shortage of sanitary materials. World War I brought larger impact than previous two wars did.

When World War I began in July 1914, Japan declared war against Germany based on Anglo-Japanese Alliance. At that time, Japanese pharmaceutical industry was premature yet, and many pharmaceutical materials were imported from Europe. In the same year, the government issued exporting restriction law on pharmaceutical materials. This action was based on the fact that similar restrictions in England, France, Netherland and Italy. However, a criticism from Japan Federal Medical Association was also the reason why the law was issued. This criticism blamed medicine dealers that they made unfair advantage over the product shortage.

Medicine dealers insisted that this was a misunderstanding. Their representative, Chobei Takeda, Gohei Tanabe and Gisaburo Shiono visited Tokyo and met major

---

[7] Nishikawa, Takashi, *Kusuri no Shakaishi* [Social History of Medicine] (Yakuji Nipposha, 2010), 29.

scientists, Nagayoshi Nagai, Keizo Tamba, Ryojun Tahara and Keizo Ikeguchi. Dealers in Tokyo, Matasaku Shiobara, Kahei Tomoda and Tokube Torii joined this meeting. They visited Nozomu Nakagawa, health director in Department of the Interior and expressed their opinion about relationship between the situation and price of pharmaceutical materials.[8] This meeting concluded that the core of the problem was severe difficulty of domestic production because of the shortage of human resources and facilities. Table 1 shows the members of the committee.

Table 1: Extraordinary Pharmaceutical Research Committee

Chairman	Secretary of State, Tadaharu Shimooka
Secretary	Department of the Interior, engineer Tadahiro Noda
Committee members	
Doctor of engineering, Jinkichi Inoue	Matasaku Shiobara
Doctor of Pharmacy, Saburo Takahashi	Doctor of engineering, Toyokichi Takamatsu
Doctor of Medical Science, Haruo Hayashi	Doctor of Pharmacy, Heizaburo Kondo
Doctor of Medical Science, Shu Miyake	Ministry of Agriculture and Commerce, Director, Minoru Oka
Doctor of Pharmacy, Tokichiro Niwa	Ministry of Finance, Chief Tax Bureau, Michitaka Sugawara
Doctor of Medical Science, Akira Uno	Kahei Tomoda
Director of Trade Bureau, Ministry of Foreign Affairs, Jujiro Sakata	Doctor of Pharmacy, Keizo Tamba
Doctor of Medical Science, Doctor of Pharmacy, Nagayoshi Nagai	Doctor of Medical Science, Takanosuke Suzuki
Department of the Interior, Counselor, Junjiro Yamada	Doctor of Pharmacy, Keizo Ikeguchi
Gohei Tanabe	Institute of Health Sciences, Engineer, Doctor of Pharmacy, Matsuji Hirayama
Gisaburo Shiono	Kurobei Hino
Doctor of Pharmacy, Yasuhiko Asahina	Chobei Takeda
Institute of Health Sciences, Engineer, Doctor of Pharmacy, Yoshizumi Tahara	Department of the Interior, Director, Nozomu Nakagawa
Arinobu Fukuhara	Department of the Interior, engineer Tadahiro Noda

Source: Created based on Eiseikyoku Nenpou [the annual report of The Central Sanitary Bureau]

Above situations resulted in establishing temporal research committee for

[8] Publication committee of Osaka Seiyaku Dougyoukumiai, *Osaka Seiyaku Gyoushi* [The history of pharmaceutical manufacturing in Osaka] Vol.2(Osaka Seiyaku Dougyoukumiai, 1943), 6.

pharmaceutical industry. This committee greatly contributed to assist pharmaceutical manufacturers in Japan.

The government largely influenced the industry by encouraging manufacturing. Table 2 and 3 show excerpts from *Kojo Tokeihyo* [the statistics table of factories] integrated by Ministry of Agriculture and Commerce. These tables show production value of chemical factory products in 1914 was 19,902,000 yen. This amount greatly increased to 51,226,000 yen in 1920. Included prescription medicine production value was 15,809,000 yen in 1919, which grew to 20,007,000 yen in 1920. Over-the-counter medicine production value was 23,566,000 yen in 1919, which grew to 31,219,000 yen in 1920.

Table 2: Production value of chemical factories (prescription, medicine, over the counter (OTC) medicine and medical supply)

(UNIT: 1,000 yen)

	Prescription	OTC	Prescription and OTC	Medical supply
1909	NA	NA	7,166	398
1914	NA	NA	19,902	1,424
1919	15,809	23,566	39,375	3,207
1920	20,007	31,219	51,226	4,262

Source: Created based on *Kojo Tokeihyo* [the statistics table of factories]

Number of pharmaceutical factories was 89 in 1909, which increased to 145 in 1919. This shows the impact of World War I. However, this number decreased by resuming import activity after the war.

Table 3: Development of pharmaceutical industry through number of factories

	Chemical factory	Medicine factory	Medicine factory with motor	Medicine factory without motor
1909	3,485	89	22	67
1914	3,225	109	34	75
1919	5,426	145	75	70
1920	5,509	131	64	67

Source: Created based on *Kojo Tokeihyo* [the statistics table of factories]

IV. Conclusion

Tokugawa Shogunate imported western medical technology with the aid from the government of Netherland. Doctors from Training College for Army Surgeons in Utrecht played major roles in establishing Japanese medical system. Then, the Japanese students who were educated by them realized new medical policy under the Meiji government. They created medical system's principle, doctor's qualification system and concept of public health in Japan. This means the Meiji government inherited the achievement of Tokugawa Shogunate in the area of healthcare. There were some influences from English doctors. However, they could not have initiative about medical system and policy in the end.

Dutch doctors and their students also influenced the government to decide to import German medical technology. This decision included the establishment of inspection agency, medicine regulating rules to control distributor and pharmacist and issuing Japanese Pharmacopoeia.

Nevertheless, these efforts could not replace existing medical treatment completely. In Meiji era, western medical technology heavily costed. Many of Japanese people relied on traditional treatment which imitated Sino-Japanese traditional medicine or shamanism. Additionally, the government had to adapt the policy about traditional over-the-counter medicine business instead of exterminating those.

Despite of above setback, governmental decisions about pharmaceutical industry propelled the development of western medical technology. The decisions led healthcare industry flourishing in 20th century.

Bibliography

Editors of Central Sanitary Bureau, *Eiseikyoku Nenpou* [the annual report of The Central Sanitary Bureau](Editors of Central Sanitary Bureau, 1917)

Editors of Reminiscence of Elder Kazunori, *Kazunori Ou Tsuisou* [Reminiscence of Elder Kazunori] (Editors of Reminiscence of Elder Kazunori, 1960)

Ministry of Health and Welfare, *Isei Hyakunen Shi* [100 years of medical system] (Gyosei, 1976)

Nakanishi, Akira, *Nagasaki Igaku Hyakunenshi* [One hundred years history of Nagasaki medical science] (Nagasaki University, School of Medicine, 1961)

Nishikawa, Takashi, *Kusuri no Shakaishi* [Social History of Medicine] (Yakuji Nipposha, 2010)

Publication committee of Osaka Seiyaku Dougyoukumiai, *Osaka Seiyaku Gyoushi* [The

history of pharmaceutical manufacturing in Osaka] Vol.2(Osaka Seiyaku Dougyoukumiai, 1943)

Ministry of Economy, Trade and Industry, kojo tokei sohyo [the statistics table of factories], http://www.meti.go.jp/statistics/tyo/kougyo/archives/index.html (accessed 26th May 2017)

The Japanese Society for History of Pharmacy, *Nihon Iyakuhin Sangyoushi* [History of Japanese Pharmaceutical Industry] (Yakuji Nipposha, 1995)

法政大学イノベーション・マネジメント研究センター
The Research Institute for Innovation Management, HOSEI UNIVERSITY

〒102-8160 東京都千代田区富士見 2-17-1
TEL: 03(3264)9420　FAX: 03(3264)4690
URL: http://riim.ws.hosei.ac.jp
E-mail: cbir@adm.hosei.ac.jp