

Sensai Nagayo: Pioneer of Hygienic Modernity or Heir to Legacies from the Premodern Era?

Koji OZAKI

Abstract

This paper investigates Sensai Nagayo's ideas on hygiene through examining his 1877 treatise *Eisei Iken* (An opinion on public health). Nagayo was a Japanese physician and bureaucrat who served for 18 years (1875–1892) as the director of the Central Sanitary Bureau of the Home Department. Scholars have long referred to his ideas and activities in the context of the establishment of the public health system in nineteenth-century Japan, yet they seem to have failed to correctly understand the characteristics of his achievements. Specifically, due to an emphasis on 'hygienic modernity' among scholars like Ruth Rogaski, they often discuss this aspect of Westernisation alone in Nagayo's ideas. This paper takes a different approach and demonstrates that Nagayo worked on improving pharmaceutical affairs in the early days of his directorship, mainly by relying on traditional wholesale pharmacists or through the traditional distribution system of medical chemicals, in particular wholesalers in Osaka Doshô-machi. These conclusions elucidate that the Japanese medical or hygienic system was not only an echo of those of European countries but also included traditions derived from the Japanese premodern medical system.

Keywords: Hygiene, Medicine, Pharmacy, Opium, Japan, Nineteenth Century

[**Acknowledgements**] This article is based on a paper that I presented at the Eighth Meeting of the Asian Society for the History of Medicine (30 September–1 October, 2016, Academia Sinica, Taiwan). To complete this article, I received a grant from the Japan Society for the Promotion of Science (JPPS) (Scientific Research (C), 2016); JPPS (Topic-Setting Programme to Advance Cutting-Edge Humanities and Social Sciences Research Responding to Real Society, FY2015 Project, Core-Researcher Akihito Suzuki, 2016) and Open Research Centre, Research Institute of Ōtemae University (Project 5, 2016). The author would like to thank Enago (www.enago.jp) for the English language review.

The Japanese public health system was established in the late nineteenth century, and it applied to Japan's colonies, such as Taiwan and Manchuria, and also influenced a similar system in mainland China thereafter. However, scholars seem to have failed to correctly understand the characteristics of this system, because they have neither sufficiently investigated historical documents nor taken basic historical approaches to examining it, including historical material criticism. The existing studies on Sensai Nagayo (長与専斎, 1838-1902) and his achievements are a typical case in which scholars have highly rated this man and his accomplishments without stringently examining the available materials. Nagayo was a Japanese physician and bureaucrat who served for 18 years (1875-1892) as the director of the Central Sanitary Bureau (*Eisei Kyoku*, 衛生局) of the Home Department,¹ and scholars have long referred to his ideas and activities in the context of the establishment of the public health system in nineteenth-century Japan. The historiography of Nagayo is discussed in detail in the next section, but, in a nutshell, his accomplishments have mainly been identified based on his autobiography, *Shôkô Shishi*.² However, it includes false information, and hence we must carefully review what he could accomplish.

This paper investigates the connection between the rise of modern medicine and the establishment of the modern state. Specifically, it elucidates the characteristics of the Japanese public health system in its formative years by closely examining Nagayo's ideas and methods.

¹ *Eisei Kyoku* is usually rendered 'the Sanitary Bureau', but I employ 'the Central Sanitary Bureau' as its equivalent because it was used in an official publication of the bureau, *First and Second Annual Reports of the Central Sanitary Bureau of the Home Department*, which was edited by Nagayo and issued in 1877. Besides, I render *Imu Kyoku* (医務局) 'the Bureau of Medical Affairs', and *Isei* (医制) is translated not by 'the Medical Law' or 'the Medical System' but by 'the Sanitary Code', for the same reason. See *First and Second Annual Reports of the Central Sanitary Bureau of the Home Department* (1877), 1; 2; and 7. I use a copy of this document which is in the possession of Department of Medical History, Juntendô University Graduate School of Medicine. I deeply appreciate that Professor Shizu Sakai, the director of the department, permitted me to use the valuable copy, the same of which are kept in only few other libraries or archives, for my research.

² Sensai Nagayo, *Shôkô Shishi* (a private printed book, originally published in 1902). This article uses the reprinted edition of this autobiography compiled into *Matsumoto Jun Jiden, Nagayo Sensai Jiden (An Autobiography of Jun Matsumoto and Sensai Nagayo)*, (Teizo Ogawa and Shizu Sakai eds., Tokyo: Heibonsha, 1980).

Sensai Nagayo

Sensai Nagayo was born in 1838 in the Hizen Ômura domain (an area that lies within the present Nagasaki prefecture) and was adopted into the Nagayo family in 1846. This family had served as physicians to the local lord for generations. As demonstrated by Ann Janetta, Sensai's adoptive grandfather, Shuntatsu, learned the method of inoculating people for cowpox in Nagasaki and opened a vaccination clinic in that domain.³ Sensai also began to study Dutch medicine at Kôan Ogata's Teki Juku school in Osaka at the age of 17, and continued his studies with Pompe van Meerdervoort in Nagasaki in 1861.

After the beginning of the Meiji Restoration, Nagayo served as director of the Nagasaki Medical School between 1868 and 1871, in cooperation with a Dutch medical officer of the navy named Constant George van Mansveldt. Then, he got an exciting opportunity. He was permitted to join an official embassy, Iwakura Mission, as a medical observer between 1871 and 1873. During this inspection trip, he conducted firsthand an investigation of public health systems in Western countries. After returning home, he was first installed as the director of the Bureau of Medical Affairs of the Department of Education in 1873 and then served as the director of the Central Sanitary Bureau of the Home Department between 1875 and 1892.

Due to Nagayo's long and glorious career, scholars have been convinced that many achievements of the early years of the Meiji period should be attributed to his efforts. Specifically, the fact that he was among the chosen few who experienced a tour of inspection abroad added a persuasive argument in favour of the view that he must be a pioneer who knew well the Western medical or sanitation system. Furthermore, few materials, except Nagayo's autobiography, *Shôkô Shishi*, were available to understand the process by which the medical, pharmaceutical and hygienic system was established in Japan, especially in the prewar era. Scholars, therefore, could not help but take the descriptions of this book literally, in which Nagayo explained many achievements as if he had accomplished them. As a result, an orthodox view was formed that Nagayo must have designed everything related to the essentials of the medical or hygienic system. The following two passages in particular have been

³ Ann Janetta, *The Vaccinators: Smallpox, Medical Knowledge and the 'Opening' of Japan* (Stanford: Stanford University Press, 2007), 138.

emphasised to this day. The first passage concerns the origin of the word *eisei* (衛生):

When writing the draft of the Sanitary Code (医制, *Isei*), I considered using words that were direct translations from original [Western] words—like *kenkō* (健康) or *hoken* (保健). But these words seemed too blunt and plain, and so I tried to think of other more appropriate terms. Then I recalled the word *eisei* from the ‘Kōsōso hen (庚桑楚篇)’ of Sōshi (莊子). Of course, the meaning of this term in the original text was slightly different [from Western concepts], but the characters appeared elegant and sounded tasteful, and so I chose them to signify the government administration of health protection.⁴

Nagayo said here that he was the first to employ the term *eisei* to signify such Western concepts as sanitation in English, or *Gesundheitspflege* in German. It appears that many scholars, such as William Johnston or Hoi-Eun Kim, have no doubts about this part of Nagayo’s recollections.⁵

The second passage concerns the enactment of the Sanitary Code, which was the first comprehensive code for medical, pharmaceutical and hygienic affairs, enacted in 1874:

The Bureau of Medical Affairs was set up in the Ministry of Education in March, the sixth year of Meiji (1873), and I was installed as the director of it, [and] ordered to assemble information [to enact] the Sanitary Code. This was the origin of government undertakings on public health in this country.⁶

In this passage the Sanitary Code was explained as if Nagayo himself had drawn it up. Yū Fujikawa cited this passage in nearly the original form in his 1904 work, *Nihon Igaku Shi; Isei 50 Nenshi* (The 50-year history of the Sanitary Code), which was

⁴ Nagayo, *Shōkō Shishi*, 139 (note 2). When citing this passage, I refer to the English translation of it made by Ruth Rogaski. See Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (Oakland: University of California Press, 2004), 136.

⁵ See William Johnston, *The Modern Epidemic: A History of Tuberculosis in Japan* (Harvard University Asia Center, 1995), 179–80, and Hoi-Eun Kim *Doctors of Empire: Medical and Cultural Encounters between Imperial Germany and Meiji Japan* (Tronto, Buffalo, and London: University of Toronto Press, 2014), 72.

⁶ Nagayo, *Shōkō Shishi*, 136 (note 2).

published in 1925 by the Central Sanitary Bureau of the Home Department as its official opinion, shared Fujikawa's view.⁷ Hence, this came to be considered as the orthodox view regarding the enactment of the Sanitary Code thereafter. After the end of World War II, scholars such as Tasuku Yamazaki modified this view, partially because a draft of the code, *Isei Ryakusoku*, was found in Chian Sagara's papers.⁸ Namely, he said that the Sanitary Code was initially planned by Sagara, the director of the Bureau of Medical Affairs, who had been Nagayo's predecessor, and that because Sagara lost his position in June 1873, Nagayo had taken over the planning.⁹ Nevertheless, studies from the prewar and the postwar era alike shared the perspective that Nagayo finalised the draft of the code. Such a commonly accepted view developed in Japan was disseminated widely to the world by scholars, including John Z. Bowers.¹⁰

This view, however, requires careful reconsideration for the following reasons. First, the description of the Sanitary Code found in *Shōkō Shishi* was not correct. As demonstrated in my 2016 article, Sagara and his colleagues at the Tokyo Medical School took the lead in enacting the code.¹¹ To address this in a little more detail, it seems that Sagara did not have close relations with Nagayo but rather was hostile towards him. According to Hajime Sōda, a deep antagonism had developed between two groups over who would control the Ministry of Education, in particular the Bureau of Medical Affairs; some veteran members of the Bureau, including Sagara,

⁷ Yū Fujikawa, 'Nihon Iji Nenpyō (A Chronology of the Japanese Medical Affairs)', *Nihon Igaku Shi (The History of Japanese Medicine)* (Tokyo: Shōkabo, 1904), appendix, 89, and *Isei 50 Nenshi (The 50-Year History of the Sanitary Code)*, (Tokyo: The Central Sanitary Bureau of the Home Department, 1925), 18.

⁸ 'Isei Ryakusoku', (probably written in 1873), *The Sagaras' Papers*, # 相 939. *The Sagaras' Papers* is in the possession of the Saga Prefectural Library.

⁹ See Tasuku Yamazaki, 'Tokubetsu Kōen: Seiyō Igaku o Ukeireru Tameno Seido (A Key Note Speech: The System to Introduce the Western Medicine)', *Dai 13 Kai Nihon Igakukai Kaishi (Bulletin of the Japanese Association of Medical Science, No. 13)*, 1952, 151. The studies which share Yamazaki's view include *I Sei 100 Nenshi (The 100-Year History of the Sanitary Code)* (Tokyo: Medical Bureau of the Ministry of Health and Welfare, 1976), p. 12; Takeshi Kawakami, *Gendai Nihon Iryōshi (The History of Japanese Modern Medical Service)* (Tokyo: Keisō Shobō, 1965), 109–10; Hajime Sōda, 'Meiji Shoki no Ikai Jijō (Medical Situation in the Early Meiji Period)', II, *Igakushi Kenkyū*, 22 (1966), Akira Sugaya, *Nihon Iryō Seidoshi (The History of Japanese Medical Service System)* (Tokyo: Hara Shobō, 1976), 24.

¹⁰ John Z. Bowers, *When the Twain Meet: The Rise of Western Medicine in Japan* (Baltimore and London: The Johns Hopkins University Press, 1980), 79–80; Masahira Anesaki, 'History of Public Health in Modern Japan', (Milton J. Lewis, and Kerrie L. MacPherson eds., *Public Health in Asia and the Pacific: Historical and Comparative Perspectives*, Routledge, 2011), 56.

¹¹ Koji Ozaki, 'Meiji Isei Saikō (A Reconsideration of the Sanitary Code of 1874)', *ŌtemaeJournal*, 16, 2016, 43–64.

had struggled against newcomers such as Nagayo and Fujimaro Tanaka, a senior officer in the Ministry of Education. Sagara, who also held a position on the teaching staff of Tokyo Medical School, had made efforts to establish a Western-style medical education system since the beginning of the Meiji Restoration, whereas Nagayo and Tanaka were former members of the Iwakura Mission, who had just returned from the overseas inspection journey. Sagara and Nagayo became increasingly hostile to each other after Nagayo took over the directorship from Sagara in June 1873.¹² The point to be noted here is that Nagayo lost his position between 18 November 1873 and 9 January 1874. However, the final draft of the Sanitary Code was presented to the *Daijōkan* (Cabinet) on 27 December 1873, during his absence. Sagara submitted the bill in cooperation with his colleagues at Tokyo Medical School, including foreign instructors, such as Benjamin Carl Leopold Müller and Theodor Eduard Hoffmann. Nagayo began to regain power following his reinstatement to his former position in January 1874, but it was not until September of that same year that Sagara was expelled from both the bureau and the school and that Nagayo ensured an effective hegemony over them at last.¹³

As for the term *eisei*, if the relevant description in *Shōkō Shishi* were correct, the time in which the use of the word was initiated should have been after March 1873, when Nagayo returned home. Yet the word was actually used earlier than his return. Koreyoshi Ogata employed the word as an equivalent for sanitation in his 1872 treatise, *Eisei Shinron (A New Treatise on Hygiene)*.¹⁴ Ruth Rogaski should take credit for discovering this fact.¹⁵

Needless to say, Rogaski's *Hygienic Modernity* is one of the most notable studies not only on the Chinese port city Tianjin but also on Nagayo and on Japanese imperialism. However, we must review her work more carefully. While Rogaski certainly found that Ogata had preceded Nagayo in using the term *eisei*, she later said that in *Eisei Shinron* the state was entirely absent.¹⁶ Yet Nagayo, who had participated in the overseas inspection tour, was able to comprehend a mode of

¹² Hajime Sōda, 'Meiji Shoki no Ikai Jijō', I and II, *Igakushi Kenkyū*, 21 and 22 (1966) (note 9).

¹³ Koji Ozaki, 'Meiji Isei Saikō' (note 11).

¹⁴ See Koreyoshi Ogata, *Eisei Shinron (A New Treatise on Hygiene)*, March of the fifth year of Meiji (April 1872). Koreyoshi Ogata was one of sons of Nagayo's teacher Kōan Ogata.

¹⁵ Rogaski, *Hygienic Modernity*, 147–50 (note 4). Toshiyuki Takizawa has also referred to the same fact. See Takizawa, 'Meijiki Kenkō Shisō to Shakai, Kokka Ishiki (Idea of Health Formation and Ideology of Society and State in Modern Japan)', *Nihon Ishigaku Zasshi*, vol. 59, no. 1, 2013.

¹⁶ Rogaski, *Hygienic Modernity*, 148 (note 4).

preserving health that extended beyond individual responsibility to encompass the administration of a government and the construction of a society. Rogaski speaks of a way of radically transforming the society, state and nation as hygienic modernity, and Nagayo seems to her to have been the first to outline an ideal vision of hygienic modernity for Japan.¹⁷ Apart from the argument about who was the first to employ the term *eisei*, Rogaski was not at all different from other scholars in terms of emphasising Nagayo as a pioneer in the Westernisation of Japanese medical or sanitation system.

Yet, it is quite clear that this view requires reconsideration because it has been found that Sagara and his colleagues finalised the draft of the Sanitary Code, in which the word *eisei* was employed. Nagayo was thus not the sole person who was able to draw a clear picture for preserving health in those days. His experiences during the tour of the Iwakura Mission were obviously important. Nevertheless, we should not overlook the achievements of veteran staff members at the Bureau of Medical Affairs and Tokyo Medical School, including Sagara, who had consulted foreign instructors, such as Müller and Hoffman, almost every day since their arrival in Japan. What we must investigate, therefore, is the difference between them in the methods or ideas concerning the establishment of a medical or public health system for Japan.

As noted above, Nagayo's achievements should be reappraised carefully. In particular, if scholars seek to discuss his ideas on public health while at the same time including the enactment of the Sanitary Code in his achievements, they will fail to correctly appreciate the value of what he did. This paper, then, discusses his views on hygiene by examining his writings that were published after he ensured an effective hegemony over the Central Sanitary Bureau. Specifically, it focuses on his first comprehensive treatise, entitled *Eisei Iken* (An opinion on public health), which was published in 1877. By examining this work, the present study reveals the differences between Nagayo and Sagara, and, moreover, brings to light various aspects of Nagayo's ideas which cannot be seen in perspective when they are only considered as related to hygienic modernity.

¹⁷ *Ibid.*, 143-4; 147-8 (note 4).

Eisei Iken

Nagayo submitted *Eisei Iken* to the home secretary, Toshimichi Ôkubo, after attending the International Medical Congress in Philadelphia in 1876.¹⁸ The treatise consisted of two sections: *Kaitatsu Eiseihô* (介達衛生法, the medical law that constituted a foundation of the government administration for public health) and *Chokutatsu Eiseihô* (直達衛生法, the government administration system for public health). The former discussed the supervision of medical practitioners and apothecaries, licensing for pharmaceutical manufacture, the inspection of medical supplies and quality checks for mineral springs, while the latter examined sanitary administrative organisation in central or local governments, disease prevention, vaccination, syphilis inspections and mortality statistics.¹⁹ Hidehiko Kasahara examined this treatise in a past study. However, convinced that Nagayo drafted the Sanitary Code and wrote the treatise in order to realise it, Kasahara failed to distinguish between Nagayo's ideas and those expressed in the code.²⁰

The first important point concerning the treatise is that Nagayo seems, if anything, to have rejected the spirit of the Sanitary Code. He held the opinion that it would be impossible to immediately introduce perfect European-style medical systems to Japan.²¹ As a matter of fact, many clauses in the first code of 1874 were amended or abolished during Nagayo's tenure, first, at the Medical Bureau and then at the Central Sanitary Bureau. When the Sanitary Code was amended in May 1875, clauses were deleted on medical education and on the role of the directors of the national medical schools in deciding the policy of local authorities. The boards of health which were put in the local areas were also abolished. Clauses 41 and 43, on the separation of the pharmacy and the clinic, which had been symbolic of the introduction of a Western-style medical system, were ultimately removed in 1884.

In addition to mentioning the lack of a sufficient number of physicians, the absence of a Japanese Pharmacopoeia and concern about the increase in cost for developing

¹⁸ Sensai Nagayo, 'Eisei Iken (An Opinion on Public Health)', October 1877, *The Ôkubo Toshimichi's Papers*, #327. *The Ôkubo Toshimichi's Papers* is in the possession of the Modern Japanese Political History Materials Room, the Japan National Diet Library.

¹⁹ *Ibid.*

²⁰ Hidehiko Kasahara, 'Kindai Nihon ni okeru Eisei Gyôsei Ron no Tenkai (The Administrative History of Public Health in Modern Japan)', *Hôgaku Kenkyu*, vol. 69, no. 1, 1996.

²¹ Nagayo, 'Eisei Iken', sheets 1-2 (note 18).

medical science, Nagayo explained it was difficult to introduce a Western medical system into Japan by saying it would be harmful for practitioners to renounce the use of herbs, the efficiency of which they knew well, in exchange for Western medicines that they did not know well.²² He seems to have appreciated the experience of traditional physicians to some degree, or at least not to have preferred such a radical change as might have wasted their past efforts, although he was obviously planning to convert qualifications for medical practitioners to standards provided by Western medicine.

A policy regarding hospitals that was applied during his tenure is noteworthy in connection with this point. Tokyo prefecture issued a regulation in 1891 stipulating that facilities with as few as ten sickbeds should also be regarded as a hospital.²³ This provision, which was disseminated throughout the country thereafter, paved the way for the development of private hospitals, each of which was owned by the family of a single physician, who was able to dispense medicines, due to the abolishment of the separation of pharmacy and clinic. Such single physician family-owned hospitals, in which ownership and management are not distinguished, are symbolic of the Japanese medical system to this day.

While participating in the International Medical Congress, Nagayo visited some hospitals in the United States. These, as elucidated by Paul Starr, were changed into 'doctors' workshops' financed through payment from patients; therefore, it is possible that Nagayo had a chance to witness such a reform.²⁴ Yet he did not manifest interest in it at all. Instead, although it was not clear whether or not he adhered to the Japanese proverb 'I wa Jin Jutsu (Medicine is a benevolent art)', he was attracted to the medical care system for the poor, which had been among the primary roles of American hospitals in the past.²⁵ The inspection journey he took abroad does not

²² *Ibid.*, 2-4.

²³ 'Shiritsu Byōin narabini San'in Setsuritsu Kisoku (The order concerning the establishment of private hospitals and maternity hospitals)', *Kanpō*, no. 2492, 19 October 1891.

²⁴ Paul Starr, *The Social Transformation of American Medicine* (Basic Books, 1984), 146.

²⁵ According to his observation about Washington D. C. or Boston, those cities appointed district medical officers, who were in charge of the poor relief. The arrangement enabled the cities to avoid bearing the cost of building hospitals in all wards. Based on this information, Nagayo emphasized the importance of introducing the similar arrangement into Japan. Namely, he said: 'this country should set up district medical officers and prefectural hospitals which should supervise the officers, and charge the both with the responsibilities for the poor relief. The primary role of hospitals seemed to Nagayo to be the poor relief. See Nagayo, 'Eisei Iken', sheets 12-3 (note 18).

seem to have been necessarily helpful for Nagayo in obtaining the latest information about the Western medical or sanitation system. In any case, the medical policy that was carried out under his leadership ultimately had, if anything, some antiquated characteristics, such as allowing physicians the privilege of dispensing medicines as before. Thus, how highly can we rate this aspect of his achievements?

Pharmaceutical Affairs: Drug Inspections

The treatise *Eisei Iken* presented a plan that Nagayo was seeking to execute more earnestly than the overseeing of medical affairs in those days, that is, how to exercise control over pharmaceutical affairs.

Since the opening of the treaty ports, first the Tokugawa shogunate and then the new Meiji government had been troubled by the importation of counterfeit medical chemicals. Nagayo recollected that it was very difficult between 1872 and 1873 to purchase good-quality quinine and potassium iodide, even in the capital, due to the widespread availability of poor-quality ones.²⁶ He proposed the tightening of drug inspections and the establishment of a certificate system of medicine manufacture on these grounds.²⁷

These were the differences between Nagayo and his predecessor and political enemy Sagara. Concerning medicine manufacture, Nagayo emphasised the importance of the domestic production of drugs, a point that is discussed in the next section. With respect to drug inspection, Sagara, during his tenure at the Medical Bureau, sought to place national pharmaceutical laboratories (*Shiyakujō*) at three treaty ports, Yokohama, Kobe and Nagasaki, as well as Tokyo, in an effort to halt the importation of counterfeit medicines at the water's edge.²⁸ As for control over the domestic distribution of medical chemicals, Sagara placed his hope in improving the quality of apothecaries. Namely, he proposed that apothecaries should qualify as healthcare professionals who practised in pharmacy, by passing a stringent national examination for the licence of dispensing pharmacy, and that they should manage

²⁶ Nagayo, '*Eisei Iken*', sheet 5 (note 18).

²⁷ *Ibid.*, sheets 4-5.

²⁸ '*Kanagawa hoka Nikō e Shiyakujō Secchi Nijō, Nochi Shiyakusho to Kaishō* (Two Articles on Putting Hygienic Laboratories at Kanagawa and Other Two Ports, which were Renamed as *Shiyakusho*)', 5 October 1873, *Daijō Ruiten*, the second section, vol. 135 between the fourth year and the tenth year of Meiji (1871-7), Homin 4, Eisei 2.

medicines, including poisons. Such qualified dispensing pharmacists had never existed in Japan up to that point. Therefore, on the one hand, due to the need to develop apothecaries who had as much knowledge of medicines as physicians, this plan required the principle of separation of pharmacy and clinic in order not to leave pharmaceutical affairs only to physicians. A proposal that Sagara submitted on Müller and Hoffmann's recommendation in 1873 even called for a restriction on the number of apothecaries in each district according to its size so as to supervise the apothecaries easily.²⁹ The boards of health in each district were to be in charge of supervising the apothecaries. These plans reveal that Sagara emphasised active intervention by the government in drug retailing. Except for a limitation on the number of apothecaries, the Sanitary Code put into statutory form many of those measures. Thus, Sagara's policy aimed at centralisation and seemed radical in the sense that he sought to rapidly establish a pharmaceutical administration system that had never existed in Japan.

In contrast, Nagayo did not pin his hopes as much on apothecaries as did Sagara. In his study *Eisei Iken*, Nagayo criticised the existing apothecaries more harshly than the physicians and said, 'Apothecaries, who have existed from of old in this country are no more than drug brokers, and some of them are inferior to humble vendors in behaviour and intelligence as well as knowledge of pharmacy'.³⁰ They seemed to him to have little knowledge that would help them distinguish real medicines from counterfeit ones.³¹ Nagayo proposed a different drug-inspection policy from Sagara on this ground. The tenets of his policy were twofold. First, he located *Shiyakujō* not at treaty ports but in the larger cities of Osaka, Kyoto and Tokyo. This was because those cities, Osaka in particular, had developed as huge trading centres for both foreign and domestic medicines before the beginning of the Meiji Restoration.³²

The Tokugawa era had witnessed an increase in commercial transactions related to medicines that was closely associated with the development of a general inclination towards health. Osaka was the greatest collection and distribution centre

²⁹ 'Yakuzai Torishirabe no Hōhō (The Methods to Inspect Medicines)', probably 1872, *The Sagaras' Papers*, # 相 939 (note 8).

³⁰ Nagayo, 'Eisei Iken', sheet 4 (note 18).

³¹ *Ibid.*, sheet 5.

³² 'Keihan Nifuka e Shiyakusho Setsuritsu Ukagai (Inquiry about Putting Pharmaceutical Laboratories in Kyoto and Osaka Prefectures)', *Kōbunroku*, the seventh year of Meiji (1874), vol. 176, November 1874, the Ministry of Education.

in those days. Not only domestically produced medicines but also most of the ones imported from Nagasaki were sent to Osaka before being distributed throughout the country. The Tokugawa shogunate in 1722 ordered wholesale pharmacists in Osaka Doshô-machi, which numbered about 110 families at first, to organise a guild that was called the Osaka Doshô-machi Yakushu Nakagai Nakama (Guild of Wholesale Pharmacists in Osaka Doshô-machi).³³ Since that time, having exclusive authorisation for the commercial transaction of medicines, they had been in charge of drug inspection. Namely, several influential members of the guild, who were stationed as referees (*Gyôji*) at the Wayaku Aratame Kaisyo (Exchange for Japanese Medicines) in shifts of one day each, inspected samples of medicines, which were collected from various places, before distribution. The shogunate prohibited trade in medicines which had no stamp of approval by the guild.³⁴ Similar exchanges were also organised in Edo (Tokyo) and Kyoto, each of which was managed by its respective guild in Edo Hon-chô 3-chôme or in Kyoto Nijô-dôri. Medicines which were sent from Osaka to Edo were inspected again at the exchange in Edo, although the guild of Edo Hon-chô 3-chôme was quite a bit smaller than that of Doshô-machi, which comprised only 25 families.³⁵

Under the new Meiji government, Sagara had planned for authorities, such as the pharmaceutical laboratories at treaty ports or boards of health in each district, to inspect medicines. However, he did not plan the domestic distribution system of medicines. In contrast, Nagayo, who had studied at the Teki Juku school, which was located just around the corner from Doshô-machi, placed great importance on the guilds. He entrusted them with the task of maintaining a fair market in medicine. This was the second notable point in his drug-inspection policy.

As a matter of fact, the Meiji government, which adopted a free-trade policy, dissolved the guilds. For instance, the guild of Doshô-machi was disbanded in 1872.³⁶

³³ The word *Nakagai* should be rendered brokers if translated literally; but indeed, the *Nakagais* in Osaka Doshô-machi had played the role of wholesale pharmacists because *Nagasaki Karamono Ton'ya* (if rendered literally, Wholesalers of Chinese Goods in Nagasaki) had performed a simple proxy service of drug transportation from Nagasaki to Osaka alone. Hence, *Osaka Doshô-machi Yakushu Nakagai Nakama* is translated as the Guild of Wholesale Pharmacists in Osaka Doshô-machi in this paper.

³⁴ Minesaburô Iinuma, *Osaka Yakushu Gyô Shi (History of the Business of Medicines in Osaka)*, vol. 1 (The Office of the Osaka Trade Association for the Wholesale Pharmacists, 1935), 18-9; 27-8.

³⁵ See Takao Mizogami, *Tokyo Yakushu Bôekishô Dôgyô Kumiai Enkakushi* (History of the Tokyo Trade Association for Medical Chemicals) (The Tokyo Trade Association for Medical Chemicals, 1944), 12-9; 41-2, and *Osaka Yakushu Gyô Shi*, vol. 1, 18-9; 27-8 (note 34).

³⁶ *Osaka Yakushu Gyô Shi*, vol. 2 (1936), 497-503 (note 34).

Sagara had held a post in the related administrative ministry since 1872; however, he never sought to restore the guild while in charge. Ex-members of the guild submitted a petition to the government asking for permission to form a trade association (Osaka Yakushushô Kumiai), and the petition was granted in February 1874. This occurred at almost the same time as Nagayo, barely escaping the downfall, returned to the post of director of the Medical Bureau.³⁷ Several *Torishimari* (directors) of Osaka Yakushushô Kumiai came to be in charge of the same supervision of drug distribution as the referees of the guild had done. After the national pharmaceutical laboratory (*Shiyakujô*) was built in Osaka in March 1875, Osaka Yakushushô Kumiai acted in concert with it. Circular notices from the *Shiyakujô*, on the subject of the implementation of the national examination of apothecaries or of the drug inspection, were disseminated through *Torishimari* to the applicants.³⁸ The members of the association worked to improve their knowledge of Western medical chemicals, and in August 1877 created a laboratory for it in the office of the association, inviting an engineer from *Osaka Shiyakujô* to act as instructor.³⁹ Nagayo cultivated a close relationship with *Torishimari* by meeting them directly in January 1878.⁴⁰

This was the situation before and after Nagayo submitted his treatise *Eisei Iken* to the home secretary in 1877. Nagayo proposed that a system of pharmaceutical inspections should be put into place through collaboration between the government and the traditional private sector.

Medicine Manufacture

The domestic production of drugs, as mentioned in the previous section, was another important point that was emphasised in *Eisei Iken*. Nagayo sighed over the existing state of affairs of the pharmaceutical industry in Japan, saying, 'An erroneous idea is entertained by the public, that chemicals prepared in this country are necessarily and without exception inferior in quality to those imported. This prejudice has prevailed to such an extent that chemicals of home manufacture and of recognised good quality could not command as good a price as imported ones of inferior

³⁷ *Ibid.*, 567–71. See Koji Ozaki, 'Meiji Isei Saikô', (note 9).

³⁸ *Osaka Yakushu Gyô Shi*, vol. 2, 788–92 (note 34).

³⁹ *Ibid.*, 827, and *Eisei Shikensho Enkakushi* (*The History of the Hygienic Laboratories*) (The Hygienic Laboratory of Tokyo in the Home Department, 1937), 26–7.

⁴⁰ *Osaka Yakushu Gyô Shi*, vol. 3 (1937), 45 (note 34).

quality'.⁴¹ The development of domestic manufacture of medical chemicals was required in order to put an end to this situation.⁴² Notably, Nagayo explained his practice in detail, and said, 'Regulations for the issue of licences for the manufacturing of chemicals was issued in the last year [1876]. These regulations provided that chemicals, regardless of which manufacturer made them or where they were prepared, should have the stamp of *Shiyakujō* placed on the bottles as the proof of fine goods, when they can be shown to be of good quality, and that manufacturers were required to put on the labels the exact Japanese and English names of the contents, together with their own names and the word 'licensed'.⁴³ Ôkubo, the home secretary, issued to prefectures regulations for the issuance of licences for the manufacturers of chemicals (Order 54 of the Home Department) in May 1876, and these regulations seem to have corresponded to those that Nagayo mentioned.⁴⁴ Beginning the regulations with the preamble that follows, Ôkubo stated that he shared the same sense of crisis regarding the current situation as Nagayo: 'Although many good-quality medical chemicals superior to imported [ones] are prepared in this country, the public are apt to look down upon the domestic manufacture while believing blindly in the imported'.⁴⁵ This licensing system for medicine manufacture seems to have been devised through collaboration between Nagayo and his boss, Ôkubo.

What kind of effect then might this system have had on the pharmaceutical industry in Japan? Fortunately, a list of medical manufacturers who were granted a licence between 1876 and 1882 exists today, which showed the names of items, the names of manufacturers, their addresses and the names of *Shiyakujō* at which the manufacturers took examinations of their items.⁴⁶ Below, we examine this list and discuss some characteristics of pharmaceutical industry in those days, such as who dealt with what items, or in what city the most kinds of medical chemicals were produced.

This list contained 401 kinds of medical chemicals and 454 names of manufacturers.

⁴¹ Nagayo, '*Eisei Iken*', sheet 7 (note 18).

⁴² *Ibid.*, sheet 8.

⁴³ *Ibid.*, sheet 7.

⁴⁴ '*54-gō Seiyaku Menkyo Tetsuzuki* (The Procedures Related to Issuing the License of Medicine Manufacturer)', *Kōbunroku*, the ninth year of Meiji (1876), vol. 159, the Home Department, 4.

⁴⁵ *Ibid.*

⁴⁶ *Zenkoku Seiyaku Ichiran* (*A List of the Manufacturers of Medical Chemicals in the Whole Country* (Kan Yokoi ed., Eirandō, 1882).

Table 1. Summary of Number of Articles Totalised by Address of Medicine Manufacturers.

Address of Medicine Manufacturers	Number of Kinds of Handling Items	Number of Articles	%	Number of Medicine Manufacturers	%
Total	401	1488	100	454	100
Tokyo	175	378	25.4	112	24.7
Kyoto	70	82	5.5	14	3.1
Osaka	214	610	41.0	95	20.9
Kanagawa (Yokohama)	8	14	0.9	11	2.4
Hyogo (Kobe)	21	35	2.4	16	3.5
Nagasaki	14	17	1.1	4	0.9
Sub Total	—	1136	76.3	252	55.5

Notes: Zenkoku Seiyaku Ichiran (A List of the Manufacturers of Medical Chemicals in the Whole Country) (Kan Yokoi ed., Eirandō, 1882).

The total number of articles recorded in the list was 1,488. Table 1 gives the summary of the number of articles concerning medicine manufacturers who lived in the six prefectures, which included the three metropolises of Tokyo, Kyoto and Osaka, and the three seaport cities of Yokohama, Kobe and Nagasaki. The number of manufacturers who produced chemicals in those prefectures totalled 252, comprising 55.5 per cent of the trade of the whole country. Particularly in Tokyo and Osaka, the greater number of manufacturers resided and produced far more kinds of medical chemicals than did those who lived in the prefectures, including in the three treaty-port cities.

We discuss the characteristics of the medicine manufacturers of Tokyo in detail, initially. Needless to say, the list included some items which were derived from Chinese herbal medicine, such as *kanzō* (glycyrrhiza) or *daiō* (rhubarb). This fact can also be applied to the case of Osaka, which will be discussed later. Our discussion, hence, should focus on the manufacturers who produced Western medical chemicals, such as quinine or iodides, the fake forms of which the Central Sanitary Bureau took stringent precautions against.

Table 2. List of Manufacturers Who Prepared Main Western Medical Chemicals in Tokyo and Osaka. (1)

	Name	Products
Tokyo	Kumeta Tateno	potassium iodide, potassium dichromate, calomel, ether, hydrochloric acid, corrosive sublimate, nitric acid, silver nitrate, silver (I) nitrate, sulfuric acid, potassium bromide
	Daizō Ioka	potassium iodide, potassium dichromate, ether, potassium bromide, sodium carbonate, persodium carbonate
	Toyotarō Kawai	crude hydrochloric acid, crude nitric acid, crystallised silver nitrate, sodium carbonate, yellow mercurous iodide
	Chikayoshi (?) Kodama	crude hydrochloric acid, hydrochloric acid, nitric acid, high-purity sulfuric acid
	Keichirō Sugita	opium Hannō tincture (?), mercury (I) iodide, Hiseki Sui (solution of arsenious anhydride?),
Osaka	Rokuhei Kayō	opium tincture, opium dryobalanops aromatica tincture, tincture of quinine, compound tincture of quinine, mercury (I) iodide, mercury (II) iodide, hydrochloric acid, crystallised silver nitrate, iron (II) chloride, ferric chloride liquid, Hiseki Sui (solution of arsenious anhydride?), arsenic iodide
	Ryōzō Nishiyama	yellow quinine tincture, mercury (I) iodide, mercury (II) iodide, hydrochloric acid, crystallised silver nitrate, silver nitrate ingot, iron (II) chloride, ferric chloride liquid, phosphoric acid, phosphoric acid dilute, hydrocyanic acid dilute, Hiseki Sui (solution of arsenious anhydride?), arsenic iodide
	Seiji Suda	opium dryobalanops aromatica tincture, tincture of quinine, mercury (I) iodide, mercury (II) iodide, calomel, hydrochloric acid, corrosive sublimate, iron (II) chloride, ferric chloride liquid, phosphoric acid dilute, hydrocyanic acid dilute, Hiseki Sui (solution of arsenious anhydride?).
	Sukejirō Ojirō	compound tincture of quinine, mercury (I) iodide, mercury (II) iodide, crystallised silver nitrate, silver nitrate ingot, phosphoric acid dilute, tincture of nux vomica
	Kōzaburo Katsuta	mercury (I) iodide, mercury (II) iodide, hydrochloric acid, nitric acid, silver nitrate, extract of nux vomica
	Kyūbei Yamada	opium, mercury (I) iodide, mercury (II) iodide, ether, silver nitrate, silver nitrate ingot, Hiseki Sui (solution of arsenious anhydride?),
	Kozō Kubo	mercury (I) iodide, powder of mercury iodide, calomel, corrosive sublimate, croton oil, croton oil (II) (?)
	Seisuke Sichiri	opium tincture, opium dryobalanops aromatica tincture, tincture of quinine, compound tincture of quinine, dilute nitric acid, phosphoric acid dilute,
	Kiyotarō Yajima	tincture of quinine, mercury (I) iodide, calomel, nitric acid, crystallised silver nitrate, silver nitrate ingot,
	Motosaburō Tanabe	mercury (I) iodide, mercury (II) iodide, crystallised silver nitrate, silver nitrate ingot, ammonium bromide
	Gohei Tanabe	tincture of quinine, mercury (I) iodide, hydrocyanic acid dilute, Hiseki Sui (solution of arsenious anhydride?),
	Komazō Toyoura	mercury (I) iodide, mercury (II) iodide, silver nitrate, silver nitrate ingot,
	Hyakutarō Toyohara	tobiirō sulfuric acid (?), concentrated sulfuric acid, dilute sulfuric acid

Table 2. List of Manufacturers Who Prepared Main Western Medical Chemicals in Tokyo and Osaka. (2)

	Name	Products
Osaka	Mizusima Yatarō	mercury (II) iodide, corrosive sublimate, crystallised silver nitrate,
	Yūshichi Michida	mercury (I) iodide, mercury (II) iodide, ferric chloride liquid
	Ryōzō Yabashi	mercury (I) iodide, crude hydrochloric acid, nitric acid,

Notes: Zenkoku Seiyaku Ichiran. The medical chemicals listed in this table are selected by referring to the 30 kinds of those against which the government announced the necessity of the constant monitoring when they established penalties for the trade of counterfeit drugs in September 1874. See 'Yakuhin Torishimari ni tsuki Bassoku Ukagai (Inquiry on the Penalties Necessary for Medicine Control)', *Kōbunroku*, the seventh year of Meiji (1874), vol. 177, December of the seventh year of Meiji, the Ministry of Education.

In the case of Tokyo, the manufacturers who led the pharmaceutical industry in the city in the early Meiji era were graduates of the Tokyo Kaisei School, which included the Department of Chemistry, or those from the University of Tokyo, which was established in 1877 by uniting the Kaisei School and the Tokyo Medical School into one institution. For instance, Kumeta Tateno, whom the list recorded as the maker who produced the most (33) kinds of chemicals in total, and Taizō Ioka, who prepared 27 kinds of items, following directly after Tateno, had served initially as research assistants in the chemical department of the Kaisei School until 1877, and then were installed as the same in the Faculty of Science of the University of Tokyo in 1877.⁴⁷ Tateno and Ioka produced the chemicals which Nagayo had sighed over the difficulty in purchasing, such as potassium iodide (Table 2).⁴⁸ Keiichirō Sugita, who produced items such as mercury (I) iodide, calomel and corrosive sublimate (ditto), graduated from the Department of Pharmacy of the Faculty of Medicine, University of Tokyo.⁴⁹

Sagara had been president of the Tokyo Medical School until he was expelled from the Ministry of Education in September 1874, whereas the presidency of the Kaisei School was offered to Yoshinari Hatakeyama, who came from the same province of Satsuma as Ōkubo.⁵⁰ Sagara, as already mentioned, had rather emphasised the

⁴⁷ 'Nagata Ginzō hōka Jū-meī Zōkyū no Ken', 3 February 1876, *Monbushō Ōfuku Meiji Kyū-nen Kōgō*, 250-1, *Tokutei Rekishi Kōbunsho (The Special Collection of Historical Archives)*, S0001/Mo017, and 'Yamaoka Seishō hōka Kyū-meī Kaiko no Ken', 17 April 1877, *Monbushō Ōfuku Meiji Jū-nen Kō-go*, 572-3, ditto, S0001/Mo019. *Tokutei Rekishi Kōbunsho* is in the possession of the University of Tokyo Archives (URL: <http://www.u-tokyo.ac.jp/history/S0001.html>).

⁴⁸ Nagayo, 'Eisei Iken', sheet 5 (note 18).

⁴⁹ *Tokyo Mohan Shōkōhin Roku* (Yasuta Nakayama ed., Tokyo: The Editorial Office of Tokyo Mohan Shōkōhin Roku, 1907), 66.

⁵⁰ *Tokyo Daigaku Hyaku-nen Shi (A Hundred Year History of the University of Tokyo)*, the Overview 1 (Tokyo: University of Tokyo Press, 1984), 289.

importance of the importation of medical chemicals and sought to strengthen customs enforcement against the bringing in of counterfeit medicines at the water's edge; therefore, home preparation of medical chemicals had not been advanced during the tenure of Sagara at the Tokyo Medical School, although *Tokyo Shiyakujō* was established as an annex to the school in March 1874, in which Tōkai Nagamatsu and a German pharmacologist, Georg Martin, had served as instructors for the course of pharmacy since then. In contrast, as soon as the president, Hatakeyama, was installed, he worked on improving the Kaisei School. Specifically, regarding the Department of Chemistry, he advanced domestic production of medical chemicals by inviting a British instructor, Robert William Atkinson, to the school in September 1874.⁵¹ Tateno and Ioka studied the cutting-edge technology related to medicine manufacture with Atkinson. In the Tokyo Medical School, Nagayo, who had taken over the post from Sagara after the latter stepped down, established the Department of Pharmacy by inviting Shōkei Shibata, who had just returned home from studying in Germany, as an instructor of pharmacy. The directorship of *Tokyo Shiyakujō* was at the same time taken over from Nagamatsu and given to Shibata. Nagayo served as dean in the Faculty of Medicine at the University of Tokyo, successively after the unification of the Tokyo Medical School and the Kaisei School. Sugita graduated from this faculty.

The situation of medicine manufacture in Osaka was more noteworthy than that of Tokyo. First, the sizes of the manufacturers in Osaka were, on average, larger than those in Tokyo, although the 112 manufacturers in Tokyo exceeded the 95 in Osaka. That is to say, in the case of Tokyo, Tateno and Ioka dealt with many kinds of items. However, 73 of the 112 manufacturers traded no more than one item (Table 3). As a result, the manufacturers in Tokyo dealt with an average of only 3.33 kinds of items per maker. In the case of Osaka, Sukejirō Ojirō⁵² produced the most kinds of items, with 65. Besides Ojirō, Seiji Suda (62 items), Rokuhei Kayō (54 items) and Ryōzō Nishiyama (52 items) prepared more than 50 kinds of medical chemicals. The manufacturers in Osaka dealt with an average of 6.43 kinds of medical chemicals per maker, which far exceeded the number in Tokyo.⁵³ The Osaka medicine

⁵¹ *Ibid.*, 302.

⁵² This paper refers to his family name as Ojirō, but indeed, the Japanese reading of the Chinese characters of it (尾伯) has not been known certainly. Some read it as Obaku. See Kanzaburō Morimoto, *Takeda Hyaku Hachijū-nen Shi (A Hundred Eighty-year History of Takeda)* (1962), 91.

⁵³ *Zenkoku Seiyaku Ichiran* (note 46).

Table 3. Distribution Chart of Number of Manufacturers for Each Total Number of Kinds of Medical Chemicals Produced by Each Manufacturer.

Total Number of Kinds of Items Prepared by Each Manufacturer	Tokyo	Kyoto	Osaka	Kanagawa (Yokohama)	Hyogo (Kobe)	Nagasaki
Over 60			2			
50-59			2			
40-49		1	1			
30-39	1		2			
20-29	1		2			
10-19	9	1	4		1	1
5-9	11	1	11			
2-4	17	4	15	1	1	1
1	73	7	56	10	14	2
Total	112	14	95	11	16	4
Average	3.33	5.86	6.43	1.27	2.19	4.25

Notes: *Zenkoku Seiyaku Ichiran*.

manufacturers seem to have done business on a larger scale than did those in Tokyo.

In the case of Osaka, many wholesale pharmacists who were the members of Osaka Yakushushō Kumiai had not yet entered the pharmaceutical business in those days. This was also seen in Tokyo. Among the influential members who had served as referees in the Guild of Wholesale Pharmacists in Osaka Doshō-machi in the Tokugawa era, the Tanabe family (specifically, Gohei Tanabe and his younger brother Motosaburō Tanabe; their store name was Tanabe-ya), who had been engaged in the trade of both domestic and foreign medicines, especially early launched into producing Western medical chemicals (Table 2) as well as traditional medicines, such as liquorice extract.⁵⁴ However, as regarding influential wholesalers in Doshō-machi, Ichibei Ono (Fushimi-ya) produced only one traditional item, *Tan* (cinnabar), and Chōbei Takeda (Ōmi-ya) and Sōzaburō Shiono (Shiono-ya) had not yet entered the pharmaceutical business in person, although they were engaged in the foreign trade of medical chemicals.⁵⁵

⁵⁴ *Ibid.*, 21; 29; 30; 58; 60 and *Tanabe Seiyaku Sanbyaku Go-nen Shi (Three Hundred Five-year History of Tanabe Seiyaku)* (1983), 41-51.

⁵⁵ *Zenkoku Seiyaku Ichiran*, 28. The Takeda family themselves launched out into the pharmaceutical business by inviting a Bachelor of Pharmacy, Naokichi Uchibayashi, in 1895; the Shiono family did the same in the 1890s, putting an in-house developed anti-indigestion drug, Antacidin, on sale in 1909. See *Takeda Hyaku Hachiju-nen Shi*, 264-6 (note 52), and Shionogi & Co., Ltd., *Shionogi Hyaku-nen (A Hundred Years of Shionogi)* (1978), 80-86.

Osaka seemed to be in a similar situation to that of Tokyo, in that the persons who studied the manufacture of medicine at the government-established institutes pulled the pharmaceutical industry. The engineers of *Osaka Shiyakujō* contributed to the development of domestic manufacture of medical chemicals. Nishiyama, who was recorded in the aforementioned list as a medicine manufacturer who produced 52 kinds of medical chemicals, was among the engineers of *Osaka Shiyakujō* when it was set up.⁵⁶

In discussing the relation between *Osaka Shiyakujō* and the development of the pharmaceutical industry in that city, we cannot overlook the achievements that a Dutch teacher named B. W. Dwars accomplished. Dwars came to Osaka and taught methods of medicine manufacture and drug inspection to Japanese pupils initially at Seisei-sha, a private school for pharmacy which was established in 1874.⁵⁷ Having had his contribution to pharmacopoeics at the school recognised, he was then elected as a foreign instructor at *Osaka Shiyakujō* in 1875. Nagayo signed an employment contract with Dwars on behalf of the Japanese government.⁵⁸ Nagayo ordered Dwars and A. J. C. Geerts, a Dutch teacher of *Kyoto Shinakujō*, to write a draft of the Japanese Pharmacopoeia. The draft ultimately failed to become law, and Dwars returned home to the Netherlands in 1879; however, these events demonstrate the great trust Nagayo placed in him before and after 1877, when he submitted his study *Eisei Iken*.

Some of Dwars's pupils became medicine manufacturers. Nishiyama was among them.⁵⁹ Dwars's pupils also included Kayō, who, according to the aforementioned list, prepared 54 kinds of medical chemicals (see Table 2).⁶⁰ *Osaka Yakushu Gyō Shi* (*History of the Business of Medicines in Osaka*) revealed that Kayō, who came from Kayō county in Okayama prefecture, resided at Suda's house, which was located at Osaka Imahashi 2-chōme, contiguous with Seisei-sha school.⁶¹ Suda, a medicine

⁵⁶ *Eisei Shikensho Enkakushi*, 26-7 (note 39).

⁵⁷ *Takeda Hyaku Hachiju-nen Shi*, 80 (note 52).

⁵⁸ 'Keihan Shiyakujō Kyōshi Ran-jin Dwars Yatoigae Todoke (A Report as to the Renewal of the Employment Contract with a Dutch Teacher of Kyoto and Osaka National Pharmaceutical Laboratories, Dwars)', September 1875, *Kōbunroku*, the eighth year of Meiji (1875), vol. 145, the ninth month of the eighth year of Meiji, the Home Department, 4.

⁵⁹ Hisao Yamada, 'The Development of Modern Japan's Pharmaceutical Industry (Part 2): The Circumstances of Medical Science and Pharmacology Viewed Historically from the Early Meiji Era till the 19th Year of Meiji (1886) When the Pharmacopoeia of Japan Was Established', *Yakushigaku Zasshi*, 25(1), 55-69, 1990.

⁶⁰ Hajme Sōda, 'Meiji no Eibei kei Yakugaku (dai 2 hou): Yakubutsusho o Chuusin to site (The British and American Pharmacy, Report No. 2: Mainly on the Studies on Medicines)', *Historical English Studies in Japan*, 1966(61), 9-14.

⁶¹ *Osaka Yakushu Gyō Shi*, vol. 3, 6 (note 34).

manufacturer who produced 62 kinds of medicines, also seems to have been on familiar terms with Kayô or with Dwars.

The pharmaceutical industry in Osaka was not only pulled by the engineers of the *Shiyakujô* but also ran one step ahead of that of Tokyo in the sense that those engineers began to collaborate with traditional wholesalers. First, the role that Kôbei Bessho played should be noted regarding this point. Bessho, who had originally been a retailer of medicines in Dosyô-machi, studied pharmacy with Dwars in 1874, and was installed as an engineer and an assistant inspector at *Osaka Shiyakujô* when Dwars was selected as an instructor for that laboratory.⁶² Bessho seems to have acted as an intermediary between the newcomer pharmaceutical engineers, such as Kayô, and traditional wholesalers in Dosyô-machi. He performed such a role of intermediary when he submitted some medical chemicals of his own production to the First National Industrial Exhibition. The exhibition was held in August 1877, under the leadership of Ôkubo. Tokyo Ueno-yama was selected as the venue for the exhibition, which was the place where Sagara had failed to build the National Medical School due to opposition from Ôkubo and others.⁶³ The purpose of the exhibition was to encourage domestic industry, and hence domestic entrepreneurs were invited to submit their products to it. Medicine manufacturers were obviously included among them. Bessho submitted to this exhibition diethyl ether, ammonium hydroxide and alcohol, all of which he got Kayô to prepare. Bessho, on behalf of one of the traditional wholesalers of Dosyô-machi, named Jûbei Tsuda (Yamato-ya), also submitted calomel and nine other medical chemicals to the same exhibition, along with other wholesalers, namely Ichibei Ono, Toichi Konishi, Rihei Tabata and Sajiro Yasukawa. Those items they submitted received an award.⁶⁴ Bessho propelled the pharmaceutical industry in Osaka forward by encouraging both traditional wholesalers and newcomer pharmacists to join the exhibition.

Another pupil of Dwars, named Motosaburô Tanabe, also contributed to the development of collaboration between the engineers and the wholesalers. Motosaburô, who was a member of a traditional wholesaler family, named Tanabe-ya, first studied physics and chemistry at Seisei-sha school with Dwars, and then, continued his study of medicine manufacture and drug inspection at the training

⁶² *Ibid.*, vol. 2, 600; vol. 3, 5-6 (note 34).

⁶³ See Koji Ozaki, *Meiji Isei Saikô* (note 11).

⁶⁴ *Osaka Yakushu Gyô Shi*, vol. 3, 3-12 (note 34).

institute of *Osaka Shiyakujō*. He set up a pharmacy in 1877 by receiving support from his elder brother, Gohei Tanabe, who had already taken over their family business.⁶⁵ These brothers, as already mentioned, launched into the manufacture of Western medical chemicals earlier than did other influential families in Doshō-machi. Tanabe's case seems to have supplied one of the typical models for the development of medicine manufacturers in Osaka. Namely, pupils who studied Western cutting-edge technologies related to the production of medical chemicals at *Osaka Shiyakujō* entered the pharmaceutical business under the patronage of traditional wholesalers in Doshō-machi.

Nagayo, as previously mentioned, scrapped Sagara's policy, putting *Shiyakujō* not at the treaty ports but in Osaka, Kyoto and Tokyo, because the trade of medicines had already developed in those cities. He emphasised the importance of Osaka and Tokyo in particular.⁶⁶ The licence system for medicine manufacture granted most of the licenses to the manufacturers who resided in those cities. In the case of Osaka, one of the noticeable effects those policies exercised on the city was that engineers of *Osaka Shiyakujō* or former students who studied at the institute related to it collaborated with traditional wholesalers in Doshō-machi and entered into medicine manufacture. Nagayo described the leadership of the engineers of the governmental institutes in *Eisei Iken*, and said that the government should support this industry in order to develop it in Japan, and that *Shiyakujō* should have its own pharmacy that was in charge of medicine manufacture and teach the producers the methods of preparing medical chemicals as well as of covering the shortage of supply in the chemical market.⁶⁷ Such ideas of Nagayo were put into practice initially in Osaka.

⁶⁵ *Tanabe Seiyaku Sanbyaku Go-nen Shi*, 49–51 (note 54).

⁶⁶ *Kyoto Shiyakujō* was closed in August 1876; instead of it, *Shiyakujos* were put in two seaport cities, Yokohama and Nagasaki. See '32-gō: *Kyoto Shiyakujō o haishi, Yokohama Nagasaki Nikō e secchi* (Order 32: Disuse of Kyoto Pharmaceutical Laboratory and Establishment of the Laboratories in Two Port Cities, Yokohama and Nagasaki)', *Kōbunroku*, the ninth year of Meiji (1876), vol. 157, Orders of the Home Department, 2.

⁶⁷ Nagayo, 'Eisei Iken', sheet 9 (note 18).

Opium

We have hitherto discussed the main points from Nagayo's work *Eisei Iken*. Below, we consider the social situation before and after 1877 when it was submitted and explain how urgent the execution of Nagayo's proposals was.

In 1877, the whole of Japan was both in the grip of cholera and in the middle of a civil war called the *Seinan Sensō*, which started from a rebellion led by an ex-vice minister named Takamori Saigō. Both incidents led the government to secure certain kinds of medical chemicals.

First, phenol became necessary for disinfection. Phenol was considered one of the most effective disinfectants for cholera in that period. Yet its price demonstrated a tendency to rise in times of cholera outbreak, because the imported one alone filled a growing demand. Traders raised the market price. In the case of the 1877 cholera epidemic, the price seems to have temporarily risen to nine yen per pound, although it usually sold at about 0.7 yen per pound.⁶⁸ Hence, the Central Sanitary Bureau had to launch domestic production of phenol. Shunrei Murata, an engineer at *Tokyo Shiyakujō*, succeeded in synthesising phenol: 5,058 pounds of phenol liquid were produced.⁶⁹ The Central Sanitary Bureau was thereby able to distribute phenol throughout the country at half the market price.⁷⁰

The second and more arduous problem Nagayo and other government members had to tackle was opium smuggling. The commerce treaties which the Tokugawa shogunate concluded with the treaty powers in 1858 had prohibited the bringing of opium into the country as a rule. Nevertheless, the prohibition remained somewhat ambiguous. Regulation II, which was appended to the treaty with the United Kingdom, for instance, provided that a British vessel was able to have up to three cattles weight of opium (about 2,268 pounds) only inboard, although the importation of it for the purposes of trade was prohibited (paragraph 8).⁷¹ Added to this, the growth in the demand for opium, not for recreational purposes but for medicinal uses,

⁶⁸ 'Sekitansan Seizō Hikin Juyō Ukagai (Inquiry on the Necessary Expenses of Production of Phenol)', January 1878, *Kōbunroku*, the eleventh year of Meiji (1878), vol. 23. The first month of the eleventh year of Meiji, the Home Department, 2.

⁶⁹ *Ibid.*, and *Eisei Sikensho Enkakushi*, 50-1 (note 39).

⁷⁰ 'Sekitansan Seizō Hikin Juyō Ukagai' (note 68).

⁷¹ 'Regulations under Which British Trade is to be Conducted in Japan', Regulation II, 1858, *Treaties, &c., Great Britain, France, America, Russia, the Netherlands, & Portugal with China & Japan* (Shanghai: The North-China Herald Office, 1861).

forced the government to admit its importation to some degree. Morphine made from opium was necessary as an analgesic for the wounded in the civil war, and opium tinctures, which originally were used as an antidiarrhoeal, were still also considered to be effective in soothing the symptoms of diarrhoea due to cholera. Specifically, Nagayo and other members of the Central Sanitary Bureau seem to have believed in the effectiveness of laudanum and added its use to instructions for the prevention of cholera because a foreign teacher at the University of Tokyo, named Erwin von Baelz, endorsed the chemical.⁷²

Here arose a problem. Foreign residents in particular refused to accept the domestically produced opium. This then gave foreign traders a chance to challenge the strict prohibition. For instance, a British trader named John Hartley repeatedly smuggled opium and had it confiscated on purpose, thereby pressuring the government to liberalise its trade.⁷³ In December 1877, Hartley attempted to bring 20 pounds of opium into the port of Yokohama, in expectation of the rapid growth of demand for medicinal opium due to the cholera outbreak and to Saigō's rebellion. The quantity on this occasion was far beyond what he had ever brought before. The Japanese government, thus, had to hasten to cope with this problem, and Nagayo was charged with solving it.

The distribution network of medical chemicals that Osaka Yakushushō Kumiai had created played a critical role in resisting foreign pressure for free trade at that time.

As a matter of fact, opium, the importation of which was prohibited, had been produced domestically since the late Tokugawa era. Otozō Nitanchō (1875–1951) was notorious as the agricultural engineer who got the nickname of Opium King in the twentieth century, because he produced a huge amount of opium in the Japanese colonies, Korea and Manchuria. He also knew the history of opium production in Japan well. 'About a hundred years ago,' according to him, 'the people of Fukui village in Mishima county, Settsu province (the region that falls within the present Osaka prefecture) were taught by the wholesale pharmacists in Osaka Doshō-machi that it was beneficial for them to produce opium, and they entered this business by relying on those wholesalers for supplying seeds of poppy. This was the origin of

⁷² See *Naimushō Eiseikyoku Hōkokusho (The Report of the Sanitary Bureau in the Home Department)*, vol. 6 (September 1877), 5–6. This report is compiled into *Korerabyō Hōkokusho (The Report on the Cholera Epidemic)* (September 1877).

⁷³ *Yokohama Zeikan Enkaku (The History of the Yokohama Customs House)*, (1902), 420–1.

opium production'.⁷⁴ Fukui village was his birthplace. According to another source, since that time, the greatest quantity of domestically produced opium had been made in Fukui and some other villages of Mishima county, which is located within the present Ibaraki city in Osaka prefecture.⁷⁵ Some wholesalers who were members of Osaka Yakushushô Kumiai, such as Sukejirô Ojiro, Kan'ichirô Hattori, Kyûbei Yosida, Kahei Wayaku and Shôroku Arioka, collected opium through the hands of some brokers who lived in those villages, such as Jihei Nakada-ya, distributing it to physicians, hospitals or manufacturers of laudanum or morphine.⁷⁶ Sukejirô Ojiro, whose early life is not certain, not only conducted a wholesale business of opium but also launched the medicine manufacture in person, producing the most (65) kinds of medical chemicals in the trade in Osaka (see Table 2).⁷⁷ Engineers, such as Kayô or Suda, seem to have gone into the manufacture of laudanum through the use of opium that Ojiro or other wholesalers purchased from Mishima county.⁷⁸ The collection and distribution of opium had been supported by those three parties: farmers in the suburbs of Osaka city who cultivated poppy and produced opium, wholesale pharmacists in Osaka city and engineers who promoted a knowledge of medicine manufacture at *Osaka Shiyakujô*. They and wholesale pharmacists in particular, had been well informed of the magnitude of the demand for opium on this ground.

In the case of the year 1877, when foreign residents refused to use domestically produced opium, the Japanese government decided to purchase about 900 pounds of Turkish opium.⁷⁹ This quantity was estimated based on the sales records of opium in 1875 in the three large cities of Tokyo, Kyoto and Osaka: namely, 3,333 pounds of opium were sold in those cities, comprising 2,933 pounds of domestically produced opium and 400 pounds of imported opium. The following three items were added to

⁷⁴ Otozô Nitanchô, *Keshi Saibai oyobi Ahen Seizôhō* (*The Methods of Poppy Cultivation and Opium Production*) (Osaka: Dôsaigô Shobô, 1915), 1-2.

⁷⁵ *Osaka Yakushu Gyô Shi*, vol. 2, 793-801 (note 34). It was said that opium had been produced in some other prefectures, such as Aomori, Yamanashi and Gifu, besides Osaka (ditto).

⁷⁶ *Ibid.*, vol. 2, 793-801 (note 34).

⁷⁷ See *Zenkoku Seiyaku Ichiran* (note 46). Ojiro's name was recorded in the list of the members of *Osaka Yakushushô Kumiai* which was compiled in April 1874, whereas it was not found in the list of the members of the Guild of Wholesale Pharmacists in Osaka Doshô-machi which was drawn up in 1872; therefore, he might not have been among traditional wholesalers of Doshô-machi (*Osaka Yakushu Gyô Shi*, vol. 2, 473-495; 577-715, note 34).

⁷⁸ *Zenkoku Seiyaku Ichiran*, 54 (note 46).

⁷⁹ This section is based on 'Meiji Hachinenchû Sanfu ni oite Yakushô Toriatsukaitaru Naigaiokusan Ahen no Gaisû (An Approximate Figure of the Domestic and Foreign Opium that was Dealt by the Pharmacists in the Three Cities in the Eighth Year of Meiji)'. August 1877, *Dainihon Gaikô Bunsho*, vol. 12, 509-10.

this. First, the quantity of opium that would be consumed in the five treaty ports was estimated to be one-third of the amount shown in the record. Second, an extra 270 pounds of opium needed to be imported, because it was expected that the same amount of domestic opium would fail to meet inspection standards. Third, 100 pounds of opium, which foreign residents were originally allowed to have for private use, were added to the aforesaid amount. Thus, the demand in 1877 was forecast to be 4,813 pounds in total, of which, while most of it would be produced domestically, the remaining part to be obtained by import was calculated to be 903 pounds. This demand forecast shows that the Japanese government was ready to fill the demand for opium among foreigners with domestically produced opium and a quantity of Turkish opium, both of which were secured by the government. There was no need to accept the free trade of medicinal opium. Wholesale pharmacists of Osaka provided the government with these sales records, which paved the way to establishing a state monopoly on medicinal opium.⁸⁰

The Japanese government enacted two regulations related to the opium trade in 1878, *Yakuyō Ahen Baibai Narabini Seizō Kisoku* (Regulations for Dealing in and the Production of Medicinal Opium) and *Ahen Uriwatashi Kisoku* (Regulations for the Sale of Opium). The former, which was applied to both native and foreign people, was proclaimed on 9 August 1878, by the *Daijōdaijin* (the old name for the prime minister), and then enforced on 23 October; whereas the latter was enacted on 14 October by the Central Sanitary Bureau at the Home Department, and it applied mainly to foreign people.⁸¹

By providing in clause 1 that the dealing and producing of opium should be restricted to medicinal opium, *Yakuyō Ahen Baibai Narabini Seizō Kisoku* was intended to modify and clarify the wording of the Treaty of 1858. Clause 2 stipulated a state monopoly. Namely, the Japanese Home Department would initially purchase all medicinal opium used in Japan, regardless of whether it had been made domestically or imported, and then the department would supply the opium to hospitals or licensed apothecaries through *Shiyakujō*. The regulations entitled the prefectures to supervise the licensed apothecaries. Clause 9 stipulated that any person, whether a Japanese or a foreigner, must not obtain a supply of medicinal

⁸⁰ *Osaka Yakushu Gyō Shi*, vol. 2, 794-5 (note 34).

⁸¹ *Dai Nihon Gaikō Bunsho*, vol. 11, 511-4.

opium without a doctor's prescription. An offender against this regulation would have the opium confiscated and be fined between 150 and 500 Japanese *yen* (clause 16).

Ahen Uriwatashi Kisoku provided in its preamble that 'Permission to foreigners for obtaining opium for medicinal purposes only, will hereafter be granted by the Japanese Government in accordance with the following Regulations'.⁸² The regulations stipulated that supplies of opium could be obtained only at open ports and cities in Japan, on application to *Shiyakujō* or, where no *Shiyakujō* existed, to the concerned prefecture (clause 1). In addition, *Ahen Uriwatashi Kisoku* provided that medicinal opium should contain from eight to twelve per cent morphine (clause 3), and clause 6 stipulated that apothecaries should keep the prescriptions of physicians and statements describing the quantity of opium sold by him or used by him in preparing and compounding medicines, and that those documents should be examined by officials of the Japanese government whenever required. Both of the regulations revealed the intent of the Japanese government to establish an independent opium control system. These municipal laws and regulations were still not altogether effective for foreigners due to opposition from the treaty powers; however, they marked the first milestone in the struggle of the Japanese government to establish an independent administration system of medical, pharmaceutical and hygienic affairs.

Conclusion

The present paper discussed Nagayo's ideas and achievements, focusing on the early period of his directorship of the Central Sanitary Bureau. It has demonstrated that, when revising an incorrect image of Nagayo and seeking to present a truer one, we can find that he no doubt made efforts in modernising the Japanese medical, pharmaceutical or hygienic system; however, to boot up the system, he relied on the traditional structure or the persons who had been engaged in medical or pharmaceutical affairs since the Tokugawa era, such as wholesale pharmacists in Osaka Doshō-machi and their distribution network of medicines.

⁸² *Dai Nihon Gaikō Bunsho*, vol. 11, 513, and 'Regulations for the Sale of Opium', 24 October, 1878. 'Regulations for the Sale of Opium' is attached to 'Sir Harry Parkes: No. 56 of 20 March 1879', *Case of Mr. J. Hartley. Opium Smuggling*, FO 46/360. This document is in the possession of the National Archives of the United Kingdom.

Scholars such as Manabu Tsukamoto, Toshiyuki Aoki, Ellen Gardner Nakamura and Ann Jannetta have investigated medical affairs in the Tokugawa era in detail, finding a rapid growth in the demand for medicine from the eighteenth century.⁸³ Yet, due to the emphasis on 'hygienic modernity' among scholars like Rogaski, we are quite likely to overlook the continuity that existed before and after the Meiji Restoration. From such a perspective, we can definitely end up considering modern Japan or the development of medical, pharmaceutical or hygienic affairs there simply as an echo of Germany or other Western countries. Moreover, if we consider the Japanese sanitation system in these terms, we may entertain a concern only for the problems that were caused by a 'modernity' derived from Europe even when we discuss the transplantation of the system to Taiwan, Manchuria or other colonies. However, something traditional in Japan, which was combined with modern elements, may be overlooked. We must discuss history by investigating its multilayered structure which is derived from both the modern and the premodern era. Sensai Nagayo's view, as shown in his work *Eisei Iken*, was a multilayered structure and was composed of a combination of Western and traditional Japanese elements. It was very gradual, not radical.

⁸³ See Manabu Tsukamoto, *Ikiru Koto no Kinseishi (A History of Living in Early Modern Japan)* (Tokyo: Heibonsha, 2001); Toshiyuki Aoki, *Zaison Rangaku no Kenkyū (A Study on Dutch Studies in Rural Areas)* (Kyoto: Shibunkaku, 1998), 123-57; Ellen Gardner Nakamura, *Practical Pursuits: Takano Choei, Takahashi Keisaku and Western Medicine in Nineteenth-Century Japan* (Massachusetts: Harvard University Asia Centre, 2005); and Ann Jannetta, *The Vaccinators* (note 3).