

The *oyatoi gaikokujin* (御雇い外国人) and the scientific modernization of Japan

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A peculiar aspect of the history of Japan in the Nineteenth century is the government's employment of thousands of foreigners to aid its modernization. While Japan's leadership drew heavily on the resources of other nations, at the same time they marshaled indigenous resources, selected from among the successful Nineteenth-century Western models of modern development, adhered firmly to a policy of Japanese control and management, assumed total responsibility for the cost of modernizing, and carried their decision to replace foreigners with trained Japanese as soon as possible. The use of foreign instructors and the sending of Japanese students abroad were two important modernization factors in Meiji Japan's experience.

The number of foreigners employed in Japan during the Meiji period is difficult to ascertain. Umetani Noboru estimates it as no less than 800. But Ogata Hiroyasu finds about 800 persons who served as teachers alone. Saigusa Hiroto gives the names of 1377 foreigners who contributed to the technical and industrial development of the country. It would be conservative to estimate the total number of *oyatoi* as somewhere in the range from 1500 to 2000.

Most of the *oyatoi* were drawn from the four countries that played the most important part in Japan's foreign relations at that time: Great Britain, France, the United States and Germany.

The research presented in this paper specifically focuses on the contribution of the *oyatoi* to the scientific modernization of Japan with particular reference to the medical science and to the role of Leopold Mueller (1822-1893), Theodor Hoffmann (1837-1894) and Erwin von Baelz (1849-1913).

In March 1870, the Japanese government decided to adopt formally the German medicine. The first German experts arrived in Tōkyō in September 1871 and for twenty years they dominated the school that then became the prestigious Faculty of Medicine of the Tokyo Imperial University. From that moment on, all the Japanese medical faculties began to adopt the spirit and the practices of the German medical schools until the middle of the XX century.

As we shall see, at the basis of the decision to adopt the German model there are various reasons. In accordance with its modernization work, also in the medical field, Japan tried to adopt the model of the country they considered preeminent, and at that time Germany was really preeminent. Another factor that affect the decision was the shadow of Siebold. A third element that we need to take into account is that the main part of the texts on which the Japanese concentrated their medical studies were of German origin, often in Dutch translation.

However, the presence of German physicians and scholars in Japan is to be traced back at least two centuries earlier. The first Germans arrived in Japan mostly through the Dutch East India Company.¹

The first physician based in Deshima was the German Caspar Schamberggen arrived in Japan in 1641.² In September 1690, the famous German physician Engelbert Kaempfer arrived in Japan with the Dutch company and remained until October 1692. During these two years, he treated patients, but he was also highly committed in the formation of Japanese physicians.³ In addition to his medical activities, Kaempfer conducted also a comprehensive survey on Japan, and its results will be published after his death in 1727 in the work entitled *The History of Japan*, that remains one of the most consulted sources on Japan for the first part of the Tokugawa era.⁴

Then we can skip to the second decade of the XIX century that is marked by important changes, especially with regard to a more and more regular teaching of the medical sciences. And in this context we find the person who is considered the most important European scientist and physician ever arrived in Japan: the German Philipp Franz von Siebold.

As a medical officer based on Deshima, Siebold stayed in Japan for the first time from August 1823 to September 1829, and during his stay he contributed to the formation of numerous physicians, who later became famous in the field of the Japanese and the world medicine.⁵

It's important to remember that Siebold made also the first steps towards the introduction of the Jennerian vaccination in Japan. The vaccination will be introduced finally only later by another German physician, Otto Mohnike in 1848.⁶

¹ Kreiner, 1984.

² Michel, 1995, pp. 3-28.

³ Haberlandt, 1993.

⁴ Massarella, 1995.

⁵ Borriello, 1999, pp. 1-14.

⁶ Borriello, 2005, pp. 101-102.

After that in 1863 among the various European and American legations settled in Japan, Great Britain assumed immediately a leadership role. During the crucial decade 1861-1871, that corresponds to the collapse of the Tokugawa shogunate and to the imperial restoration, the British medicine also became the most influential in the country, mainly thanks to William Willis, chief medical officer at the service of the British Legation and leader of the Restoration movement.⁷

Then with the Restoration Japanese missions visited America and Europe, and foreign advisors (*oyatoi gaikokujin*) arrived in Japan.

Of course, even in the medical field there was the necessity to make a choice and in 1869, the Imperial Court sought advice from two physicians, Iwasa Jun and Sagara Chuan, who studied western medicine in Nagasaki. Both preferred the German medicine, but they were also fascinated by the figure and the preparation of Willis. So they, in turn, asked for advice the Protestant missionary Guido Verbeck, who became the decisive voice.⁸

Also he thought that the German medicine was the best choice. So, at the end of 1869, Iwasa Jun and Sagara Chuan recommended to the government to invite teachers of medicine from Germany.

When the Prussian Ambassador in Japan, Max von Brandt, received on 14 February 1870 the request of two teachers of German medicine, he urged Berlin to choose between the medical officers of the Army.⁹

On 17 March 1870, Von Brandt sent a series of letters to the Japanese Ministers of Foreign Affairs and of Education:

Your Excellencies,

I've got the honor of receiving on the 14th day of February your requests and I declare myself ready to cooperate willingly with your government in order to satisfy your desire to receive two German physicians who can contribute to the development of the medical school of Edo.

Expressing my complete availability, I indicate as only condition the fact that the sent German physicians will have relationships

⁷ Ishibashi - Ogawa, 1969, pp. 71-84.

⁸ Whitney, 1885, p. 331.

⁹ Müller, 1888, p. 316.

exclusively with the Ministry and will be completely independent in their actions from any other foreign physician.

I urge, also, to establish the travel expenses and the costs for the equipments for both physicians on the charge of the imperial government.

Best regards, the Prussian Ambassador, Brandt.¹⁰

In May 1870, the Prussian government sent in Japan the major Leopold Müller, *Oberarzt*, who had successfully conducted a similar mission in Haiti. As his assistant Müller chose Theodor Hoffmann, chief medical officer of the Navy. The details and conditions of their contract, lasting three years, were defined during a preliminary meeting held in Tōkyō in the presence of Von Brandt, Sawa Moriyoshi, the Minister of Foreign Affairs and Matsudaira Yoshinaga, the Japanese director of the existing medical school on 11 July 1870.

Müller and Hoffmann were assigned to the German legation and depended directly from the Monbushō (Ministry of Education). In fact, in his diary Müller emphasizes:

One of the main aspects of the contract was that, at the service of the German legation in Japan, we depended exclusively from the Ministry of Education and from no other institution in Japan. ...No one could be employed at the school without our consent. This great degree of independence was crucial for our success¹¹.

Therefore, they had complete autonomy and authority in all areas of training, including the selection of the students, and they would have been the direct superior of all the Japanese and foreign staff of the school. This independence was considered by Müller essential to the success of the mission.

However, this clause on the absolute independence of the two physicians will be something unique, that would not occur later. In fact, it wasn't included in the contracts that were signed later with other physicians that arrived in the country.

With the arrival of the two German physicians began a new era in the history of Japanese medicine.

¹⁰ Von Brandt, 1906, p. 8.

¹¹ Müller, p. 316.

About the early years of their activities in Japan, we are informed by various sources, among which some papers that Müller published in 1888 in the journal *Deutschen Rundschau*. The *Shutōjo* (Institute for vaccinations), the school that Müller and Hoffmann reorganized was founded in Tōkyō in 1858 by five Japanese physicians who had studied Western medicine. In 1860, the *Shutōjo* became the *Seiyō Igakujo* (Institute for Western Medical Education) and obtained the financial support of the military government. In 1868, the Meiji government took control of the school and renamed it *Igakujo* (Institute of medicine). In 1869, the medical school became officially known as *Tōkō* (Oriental school).¹²

At their first visit, after the ritual thanks from the Japanese authorities, Müller gave a short speech on the nature of their mission.

Considering the staff at the disposal of the school, the role of the interpreters was very important.

The educational material that Müller found at the *yashiki* wasn't of great interest and usefulness. Many medical texts were old and almost all in Dutch and English. So the only usable texts were those that the two German physicians had brought with them.

Before the access to the *Igakujo* usually the students spent a few years as apprentices with the physicians, so the school was seen also as a further stage of learning.

So eight days after his arrival in Yokohama, Müller examined the nineteen students that the Japanese considered the best among the three hundred who had participated in the selections for the access to the school. The result was the following:

No one had a background in anatomy and physiology, no one was able to describe the circulation of blood (although many had already studied cardiology), no one was able to distinguish the right from the left leg and justify the choice.¹³

For this reason Müller would have preferred to postpone his lessons after that the students completed their first step of training, however he accepted the fact that, for practical reasons, he was obliged to start the course without any delay in order to

¹² Borriello, 2002, p. 62.

¹³ Müller, 1888, p. 442.

maintain good relations with the Japanese and above all to continue to have their support.

In addition to the traditional medical lectures, Müller and Hoffmann, in an attempt to speed up the training program, added also lessons on the bandage, pharmacology and on how to visit the patients. But the students were not able to deal with these additional courses, and so they became more and more discontinuous.

The language in which they held the lessons depended on the language spoken by the interpreters and usually it was German or English.

After a few months Müller and Hoffman became convinced that it was extremely necessary to organize an initial training program. The weaknesses of the students in the field of chemistry, biology, physics, and German were almost high. The Ambassador Von Brandt received the request to ask Berlin to recruit a staff to teach these subjects. So in this way arrived in Japan other German experts to teach mathematics, physics, chemistry, geography, history, Greek, Latin and foreign languages.

With the preparatory school properly organized, Müller established a curriculum of seven years with an eighth year of practical activities in a hospital. The first three years were dedicated to premedical courses followed by four years of clinical training. At the end of each year there was an exam.

If the students completed successfully the course of study, they received a certificate declaring that they were qualified to hold any medical position in Japan.

Important were also the periods of training in Germany. Already in 1870, the same year in which the German medicine was officially adopted, twelve Japanese were sent to Germany for post-graduate studies at the government expense. Among them we remember Ōsawa Kenji, who studied neurophysiology with Hermann von Helmholtz. He returned to Tōkyō after four years and was appointed assistant of Ernest Tiegel, professor of physiology. In 1878, Ōsawa made a second, four years stay in Germany to study medicinal chemistry with Felix Hoppe-Selyer. He returned to Japan in 1882 and he was appointed professor of physiology and medical chemistry. Ōsawa is considered “the father of the Japanese physiology”.

From 1888 all the professors of the school were Japanese, except from, as we shall see, Erwin Baelz, professor of internal medicine and Julius Scriba, professor of surgery.

In August 1874, the date of expiration of their contract, the Japanese realized that they had no one to replace them, so they asked Müller and Hoffmann to continue their work renewing their contract for one more year. They were also appointed personal physicians of the Emperor.

At the end of 1874, Albrecht Wernich came to Japan to replace Hoffmann and Emil Schultze to replace Müller. They ended their charge at the *Igakujō* at Easter 1875, but they continued to be the physicians of the Emperor till 23 November.

From this moment we have a steady arrival of new German physicians and professor in Japan.

The successor of Müller, Emil Schultze, was an assistant at the department of surgery of the Charité Hospital in Berlin. Highly appreciated by his students, he renewed his contract for another three years. Albrecht Wernich, substitute of Hoffmann, was, instead, a professor of the Technical University of Berlin and expert in the field of gynecology and obstetrics. He returned from Japan in 1878. In 1876, Hans Giercke replaced Doenitz with a three-year contract in Tōkyō, where he gave the first lessons of comparative anatomy. Johann Tiegel, appointed professor of physiology in 1877, taught also pathology, hygiene and forensic medicine. He remained in Tōkyō till 1883.

In 1876, Erwin Baelz was sent to Tōkyō by the Japanese representatives in Berlin. In addition to the internal medicine, he also taught obstetrics and gynecology. Later he was the first to teach psychiatry. In 1880, his contract was renewed for another 4 years, and then again till 1902. From 1890 Baelz was also the private physician of the imperial family.

Thus we can say that all the medical experts who were invited to Japan had both a general education in the medical field and were also specialized in particular areas. Furthermore, all had also external interests respect to the medicine, and were involved in the solution of the problems of the country and especially in the training of the young students.

As the Japanese universities began to grow, the German professors were replaced by Japanese ones. In this way began the third and final period of relationships between Japan and Germany in the field of medicine.

Many Japanese physicians who had studied with the German teachers continued their training in Germany, in particular with Robert Koch, Emil von Behring and Paul Ehrlich.

One of the best students of Baelz was Shibasaburō Kitasato who came to Germany in 1885 and was the assistant of Koch for five years. Together they succeeded in preparing the pure culture of the *tetanus bacilli*, opening a new era in the serum therapy of the diphtheria and the tetanus. In 1890 Kitasato had the chance to extend his stay in Germany and start working at the laboratory of Behring on the vaccination against tetanus. This work was the basis for the production of the tetanus and diphtheria serum, and in 1901 Behring received the Nobel Prize for his scientific contribution. In 1892 Kitasato returned to Japan where he founded a private laboratory with German equipment.

Rintarō Mori, better known as Ōgai Mori, was one of the first generation Japanese physicians to study in Germany. After beginning his medical training in 1877, he became medical officer of the Army and was sent to Germany to study hygiene, especially in the military field. From 1884 to 1888, he worked in the laboratories of the leading German experts in the field, Franz Hoffmann, Max von Pettenkofer and Robert Koch.¹⁴

The outbreak of the First World War marked the end of this period of great cooperation between the two countries.

In the middle of the '20s, the relationship between the Japanese and the Germans returned to be somewhat normal in the medical field till 1941.

After the military defeat of 1945, the forces of the American occupation introduced the system of their medical school in the country. However, the evidences of the previous German influence were still evident.

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¹⁴ Borriello, 2004, pp. 113-134.

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