Medicine and Allied Sciences in the Cultural Exchange between Japan and Europe in the Seventeenth Century

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Wolfgang Michel

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Blind Spots

Until now, the introduction of Western science and technology into Japan in the Edo era has been closely linked to the emergence of »Dutch Learning« (蘭学 *rangaku*) in the early 18th century.[1] This development is generally attributed to certain political measures taken by the shogun Tokugawa Yoshimune (1684–1751). Arai Hakuseki (1657–1727), one of the leading intellectuals during the reign of Ienobu (1662–1712), proposed concepts to promote the wealth of the country. These were endorsed and enforced by Ienobu's successor, Yoshimune, who lifted import restrictions on Western books and promoted the domestic production of herbs and drugs while importing and investigating foreign medicinal materials delivered by the Dutch East India Company and Chinese merchants.[2]

In contrast, there has been little interest in the scientific interchange between Japan and the West during the 17th century. One source for this blind spot is Sugita Gempaku (1733–1817), the most prominent 18th century medical pioneer and author of *Rangaku koto hajime* [The beginning of Dutch learning]. These memoirs show that Sugita was well aware of the early transmissions of Western surgery to Japan. However, he considered these to be rudimentary when compared with the dramatic achievements of his era (Sugita 1969, 1982).

Moreover, by focusing on the activities in the Edo and Kansai areas, he drew much attention away from the groundbreaking contributions by the interpreters in Nagasaki. Sugita's writings became highly influential in later discussions on the development of Dutch Learning, and even now his views are shared at least implicitly by quite a number of scholars.

Furthermore, Japanese source material relating to the transmission of Western science in the 17th century is scarce and often corrupted by later copyists. Without collecting and comparing a great number of manuscripts and the use of Dutch trade records, it is almost impossible to sort things out. Later periods look much more promising.

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1 See, for example, Itazawa 1933; Numata *et al.* 1972–1976; Goodman 1986; their position is repeated by many other authors.

2 For Yoshimune's imports, see Endō 2003: 27–74; for an English outline of Yoshimune's policies, see Kasaya 2001.

Last but not least, after the expulsion of the last Southern Barbarians (南蛮人 *nambanjin*) in 1639, Japan seemed to have entered a phase of reduced interaction with the outside world. The term »seclusion of the country« (鎖国 *sakoku*), coined by Shizuki Tadao (1760–1806) in 1801 in his translation of Engelbert Kaempfer's famous treatise on 17th century Japan, encouraged the general idea that the country was focused on repulsion and restriction rather than on expanding its exchange with foreigners.[3] Although the majority of historians was always well aware that Japan was not hermetically sealed, this concept of seclusion had dominated historical writing from the Meiji era until the latter half of the 20th century.[4]

Then, stimulated by political and economic changes during the 1980s, Japanese and foreign historians began to reevaluate Tokugawa Japan's position within the framework of international relations, its boundaries, the influx of goods and information, and its contribution to early modern global trade. Furthermore, what is called the »Needham Question«, that is, why the scientific revolution did not occur in China, also bothers researchers dealing with the history of Japan's modernization. One of the main aims of the priority area project *Edo no monozukuri* (2002–2005) was to determine the part that the Japanese played in the interactions with foreign influences that led to the development of science and technology in Japan during the Edo period. Without a doubt, the time is now ripe to include medicine, pharmacy, and botany in these discussions.

At least in the 17th century, the policy pursued in Edo was aimed at the control of foreign trade and the flow of information rather than the closure of the country. Those at the top of the Tokugawa regime were well aware of Japan's dependence on foreign supplies. Before banishing the Portuguese and Spanish, high-ranking officials such as imperial councilor Sakai Tadakatsu Sanuki-no-kami (1587–1662) ensured in negotiations with the head of the Dutch trading post, François Caron, that the East India Company was able and willing to supply raw silk, silk textiles, and herbal drugs and medicaments (*droogen ende medecijnen*) in sufficient quantities.[5] Furthermore, imperial commissioner Inoue Masashige Chikugo-no-kami (1585–1661), many governors of Nagasaki (*Nagasaki bugyō*), and even imperial councilors such as Inaba Masanori Minō-no-kami (1623–1696) made great efforts to use foreign knowledge and goods to stabilize the country. Useful Western knowledge was never rebutted. Moreover, shortly after the establishment of the Dutch trading post in Nagasaki in 1641, there was an increase in interest

3 For more on this matter, see Oshima 2006.

4 For an outline of the related research history, see Kimura 2002: 2–14.

5 This is described in detail in the trading post diary (*dagregister*) kept by the Dutch Nationaal Archief (NA), Archief van de Nederlandse Factorij in Japan (NFJ): no. 55, 20.7.1639, 22.7.1639, and 27.7.1639.

on the part of the Japanese in European astronomy, land survey, medicine, herbs, and other practical knowledge (Michel 1999).

Faint Traces of »Southern-Barbarian-Style Surgery«

From the beginning of medical history (医史学 *ishigaku*) as a scientific discipline, numerous authors have referred to »southern-barbarian-style surgery« (南蛮流外科 *namban-ryū geka*) as the first response to Western medicine in 16th century Japan. There are undoubtedly good reasons to make such an assumption. Communication between Japanese and Westerners then was much easier than in the following two centuries, and the social and intellectual conditions were quite favorable for the reception of new knowledge and thought. Many scholars had parted with Buddhism. Furthermore, the efforts of regional rulers to bolster their domains through overseas trade led to the adoption of a number of foreign innovations, many of which stemmed from China. These included improvements in smelting and forging, papermaking, silk weaving, book printing, as well as in ship building and navigation. Most of this knowledge was not disseminated by Buddhist monks or scholars, as it was in the past, but by merchants and artisans; hence it was predominantly of a practical nature.[6] Medical know-how obtained from the Portuguese and Spaniards should have taken firm root in Japan, but there is no source material to prove that it did – with the exception of some remarks in Jesuit letters on a promising but short-lived mission hospital in Funai (1557–1587).[7] Given the tiny number of Western surgeons in Japan, the mounting persecution of Christians after the 1580s, and the resistance to such bloody activities as surgery within the Society of Jesus (*ecclesia abhorret a sanguine*), there was no stable basis for an effective and lasting interchange. Thus, in early 17th century Japan we find little of any Portuguese medical knowledge that could be passed on or handed down to succeeding generations (Michel 1997–2001). The *Mangai shūyō* [Anthology of everything for the outside] by Yamamoto Gensen, which dates from 1619, is considered the oldest book on southern-barbarian-style medicine. However, the book's mention of five plasters, washing wounds with spirits, and a few instruments like scissors and scalpel goes to show that, even after seven decades of interchange, a writer such as Yamamoto Gensen knew nearly nothing about Western surgery.

The Rise of »Read-Head-Style Surgery«

The Dutch, dubbed »redheads« (*komōjin*) by the locals reached Japan at the beginning of the 17th century. In 1609, they established a trading post on

6 Sugimoto and Swain call this the »Chinese Wave II«; see Sugimoto and Swain 1989: 148–156.

7 For more on these activities, see Schilling 1931 and 1937.

the western island of Hirado, but in 1641 were forced to move to the small man-made island of Dejima (Deshima) in the Bay of Nagasaki. Because they displayed tactical acumen and did not proselytize, they were the only Europeans allowed continued access to Japan. It is not by mere chance that the introduction of their medicine began during the 1640s, shortly after the East India Company (VOC) established a permanent position for a surgeon at its trading post at Nagasaki. This action laid the groundwork for continuous medical interchange between Japanese and Europeans.

At this time, Caspar Schamberger (1623-1706), a surgeon trained in the battlefields of the Thirty Years War, accompanied a Dutch legation to Edo. While special envoy Andries Frisius conducted his complicated negotiations in the spring of 1650, imperial commissioner Inoue and other officials who were suffering from diseases of old age sought out the foreign surgeon, lending credibility to the professional skills of the Dutch. After three months, Schamberger was asked to remain in Edo for another six months following the departure of the Dutch legation. The impression he made on leading government figures led to the rise of »redhead-style surgery« (紅毛流外科 *kōmō-ryū geka*) as a new medical paradigm, although this did not go beyond low-level surgery (*chirurgica minora*). There are no references to cataract operations, extraction of bladder stones, bone surgery, or amputations – operations that were routine for any ambitious surgeon in the West. Cauterization and phlebotomy were abhorred by the Japanese. In addition, there is not a word about anatomy, which was considered very important not only at European universities but also in the training of apprentices by the guilds. Indeed, the early manuscripts contain only a few names of bones and a couple of minor remarks on arteries and veins, on a »thin skin around the brain«, and the »skin between the chest and abdomen«. Due to the language barrier, the theoretical bases of Western medicine remained inaccessible. But knowledge of treatments of fractures, wounds, and various »swellings« (腫物 *shumotsu*, *haremono*) spread throughout the country, and high-ranking officials and feudal lords began to send their physicians to be instructed by the Dutch trading-post surgeons.[8] The social acceptance of this new art of healing is demonstrated by the licenses Western barber-surgeons and issued between 1658 and 1685 at the request of their Japanese apprentices.[9]

Growing Needs for New Medicines

It is almost impossible to transplant entities from one complex context to another in an isolated manner. Even if they ignored the etiological background of the Western treatment methods, Japanese physicians inevitably had to use herbs, medicines and instruments that were not readily available. Thus,

8 For more on this matter, see Sōda 1989; Michel 1996 a, 1996b, and 1999.

9 For more on these certificates, see Michel and Sugitatsu 2003.

Dutch trade papers after 1651 show numerous orders for drugs, herbs, pharmaceutical oils, books, lancets, and other medical equipment. But their problems were not solved by these Dutch deliveries.

At his request, imperial commissioner Inoue Masashige[10] received two volumes of Rembert Dodoens's famous herbal book *Cruijdeboek* as early as 1652 and 1655, respectively.[11] But no one at the trading post was able to translate such a specialized text into Portuguese, still the *lingua franca* in Dutch-Japanese negotiations.[12] In the old days of Ibero-Japanese intercourse, the missionaries spoke Japanese and many Japanese were versatile in Portuguese, some even in Latin. Now, however, the Dutch East India Company was not allowed to train its own European interpreters, and the abilities of Japanese interpreters (阿蘭陀通事（通詞） *oranda tsūji*) in respect to Western sciences were insufficient. Lacking the necessary medico-pharmaceutical knowledge, the interpreters used *katakana* characters to transliterate the new terms. But who among the readers of their notes was able to understand such language monstrosities as *unguentodearuteiya* (Unguentum de Altheae) or *kurokusuorientarisu* (Crocus Orientalis)? Thus, it is not coincidental that the rise of »redhead-style surgery« was accompanied by the advent of private glossaries.[13] There is no doubt that instructions by Western specialists and Western herbal books were needed to sort out the new nomenclature. Nonetheless, considering the language problems, this must have been a daunting task. The crude woodcut illustrations in Western books soon also turned out to be a source of annoyance. When a volume of Rembert Dodoens's herbal was presented to the imperial councilor Inaba in 1659, he rejected it, asking for a print with larger illustrations.[14]

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10 For more on Inoue, see Hasegawa 1979; Nagazumi 1975; Michel 1999: 113–116.

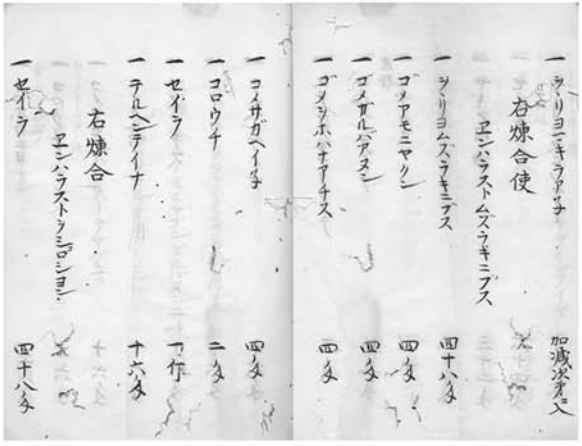
11 NA, NFJ 776, Faktuur, Casteel Batavia, 11.7.1652; NFJ 779, Faktuur, Casteel Batavia, 7.7.1655.

12 NA, NFJ 66, dagregister Dejima 17.1.1653: »tzickingodo liet vragen off de niet ijmand onder onsen ware, die dodoneus cruijtbouck hem in't Portugees conde vertalen, neen hebbende op g'antwoort, en dat sulcken geheelen werck met geen cleijne kennisse inde tale, als gemeenelick onder ons is, te verrichten sij«.

13 One of the first glossaries was compiled by Schamberger's adherent Kawaguchi Ryōan in 1660; see Kawashima 1992.

14 NA, NFJ 72, dagregister Dejima, 24.4.1659: »wat aengaet 't voorschreven g'eijste boeck 't selve was wel maer de kruijden daerin afgebeelt waren te kleijn, en niet wel geschildert, souden sien off hem in 't aenstaende een grooter boeck, daerinne oock grooter figuren stonden, konden beschicken, och arme menschen! hoe weijnigh weetje vande voortreffelijckheijt van sulcke of diergelijcke wercken te oordeelen, want meenen dat sulcke boecken van allerleij soort (gelijck in een schoenmakers winckel de schoen) te becomen zijn«.

Figure 1. Plaster (Emplastrum Mucilaginibus) taught by Hans Jurian Hancke at Dejima in 1657



Source: *Oranda geka ihō*. 17th century manuscript by Mukai Genshō, copied by Kawaguchi Ryōan. Collection of the author.

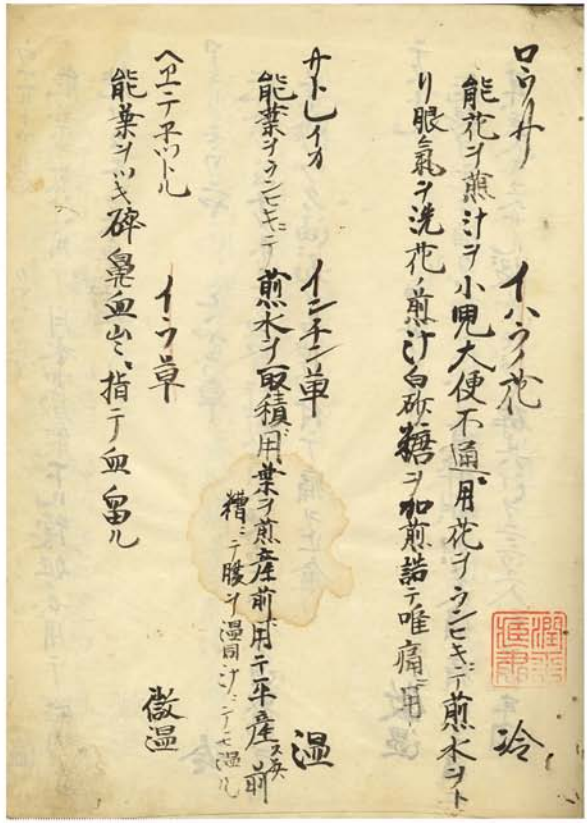
An Official Request

Only once a year did a fleet of about half a dozen Dutch ships sail from Batavia to Nagasaki. As the East India Company was still struggling to organize its own medical supply system in southeast Asia, deliveries to Japan were irregular and highly prized (Kraft 1985: 36–44). This must have caused some irritation among Japanese officials. As we can see from the following events, government circles began thinking about the local production of pharmaceutical oils while surveying the indigenous flora and introducing new useful plants with the help of the Dutch. In November 1667, the Company received a request from the Nagasaki governor, Kawano Gon'emon Michisada, who was leaving for Edo, and his co-governor Matsudaira Jinzaburō Takami, who was preparing to take over the office in Nagasaki.[15] During their audience with Daniel Six, the departing head of the trading post, and his successor, Constantin Ranst, they conveyed a message from Edo, carefully recorded in the trading post's diary:

15 Kawano Gon'emon Michisada (河野権右衛門通定) and Matsudaira Jinzaburō Takami (松平甚三郎隆見); both governors were newly appointed in April 1666. In 1671, Matsudaira Jinzaburō asked to be dismissed and Ushigome Chūzaemon Shigenori (牛込忠左衛門重恭) was appointed in his place. Kawano Gon'emon was replaced in 1672 by Okano Magokurō Sadaaki (岡野孫九郎貞明). Usually one governor resided in Edo and the other in Nagasaki. Each year in autumn they exchanged residences.

> [...] an order was given to send to Japan a mature person, well-versed and experienced in the extraction of oils and waters from various fresh medicinal herbs, together with the necessary instruments and a variety of young plants [...] This request for a distiller and herbalist, by order of the emperor and his senior councilors, has already been discussed at length in Edo and has been once again brought explicitly to our attention by the governors. Therefore, we are considering it very seriously and report it to the Governor General at Batavia. (Translated from NA, NFJ 81, dagregister, 6.11.1667)

Figure 2. Report on Haeck's investigation of Japanese plants



Source: *Rampō sōki nōdoku-shū.* Manuscript, Edo era. Collection of the author.

There can be no doubt about the nature of this request, which was reiterated several times in the following years. Obviously, it aimed at technology transfer and the establishment of a full-fledged production cycle of pharmaceutical plants and oils while reassessing local resources with the help of

Dutch specialists. Goodwill in such matters considerably facilitated trade negotiations. Therefore, as a first response, the Dutch shipped medicinal herbs to Nagasaki in the summer of 1668, with a promise of more in the future.[16]

Godefried Haeck, First Western Pharmacist in Japan

In July 1669, a young pharmacist, Godefried (Gottfried) Haeck, arrived at Dejima. While he was not the mature specialist that the Japanese authorities had in mind,[17] on several occasions between August 1669 and June 1671, he was ordered to search for useful plants in the vicinity of Nagasaki. His interpreters (Kafuku Kichizaemon 加福吉左衛門, Nakajima Seizaemon 中嶋清左衛門, Tominaga Ichirōbei 富永市郎兵衛, and Narabayashi Shin'emon[18]) noted the Western and Japanese names as well as the medicinal properties of the herbs he was able to identify.

The results of his first two excursions are preserved in the manuscript »Medicinal Herbs and Their Japanese Descriptions« (*Yakusō no na narabi ni wabun no hikae*).[19] Dates and contents are consistent with the diary kept at the Dutch trading post. Later manuscripts, such as »Medicinal Effects of Herbs and Trees in the Dutch Tradition« (*Rampō sōki nōdoku shū*, Fig. 2), include further herbs from other field trips. These descriptions of local Japanese plants seen through European eyes eventually found their way into the influential *Oranda geka shinan* [Compass of Dutch surgery], printed in 1696.[20]

Much to the irritation of the Japanese authorities, the Dutch never delivered the spice plants they wanted. Although the trading-post heads did not explain explicitly the reasons for this refusal, the Japanese interpreters were well aware of the obstacles. Once, after conveying another request, they made a proposal to save face on both sides:

> [...] it would not matter if the ordered young trees of clove, nutmeg, and cinnamon did not survive the trip. At least it would show that the Dutch respect the emperor's orders. (NA, NFJ 82, dagregister, 29.8.1670; letter by de Haas, 19.10.1670)

16 NA, NFJ 299 (register van ingekomen brieven), letter from the Governor General at Batavia, dated 29.6.1668.

17 His abilities were strongly doubted, even among the Dutch. NA, NFJ 300 (register van ingekomen brieven), letter from the Governor General at Batavia, dated 20.5.1669.

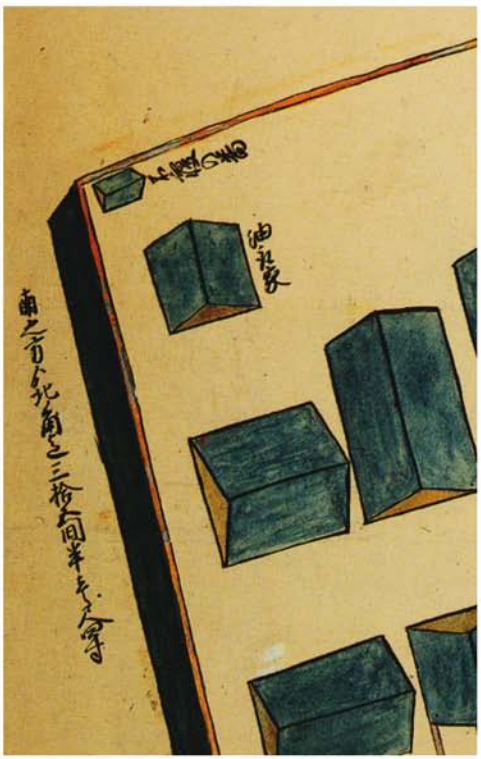
18 Narabayashi Shin'emon alias Narabayashi Chinzan (楢林新右衛門・鎮山, 1648–1711) was the first to try to render parts of Ambroise Paré's *Chirurgie* into Japanese.

19 *Yakusō no na narabi ni wabun no hikae* (薬草ノ名並和文扣). Manuscript, Edo era, Kyoto University Library, Fujikawa Collection.

20 *Oranda geka shinan*. Kyoto: Uemura Hirazaemon, 1696. Book 4: *Yakusō kuketsu*.

Obviously they knew very well that the East India Company protected its dominance in the global spice trade. Only a few years earlier, in 1667, the Dutch had finally captured the clove monopoly by destroying the trees on various islands of the Moluccas and concentrating the crop on Ambon.

Figure 3. The »oil extraction house« (*abura tori ie*[21]) on Dejima



Source: From a map by Motoki Shōdayu, 17c., Motoki-Collection, Nagasaki Municipal Museum.

Franz Braun's Distillation at Dejima

In the summer of 1671, Frans (Franz) Braun, an experienced German pharmacist, arrived with distillation instruments, various seeds, and living

21 The term *abura tori-ie* (油取家) is found on a map of Dejima drawn by Motoki Shōdayu (本木庄太夫), one of the interpreters who assembled the report on Braun's activities in 1672. The map is part of the Motoki-Collection in the Nagasaki Municipal Museum. It was printed in Nagasaki-shi Dejima shiseki seibi junbi shingi-kai (ed.) 1990: 94f.

plants.[22] He, too, had to look for useful herbs in the vicinity of Nagasaki and to give advice on the cultivation and qualities of medicinal plants. At least parts of these efforts are preserved in an illustrated scroll (»Pictorial Mirror of Dutch Plants«).[23] There were even plans to translate the most famous herbal book of its time, *Hortus Eystettensis* [Garden of Eichstaedt], which contained details of over a thousand plants.[24]

Braun had taken along a European distillation unit and various vessels. At the shogun's expense, a hut was built in a corner of the trading post, and in April 1672 he demonstrated the production of pharmaceutical oils in the presence of Japanese officials. A few days later, samples were taken to the court in Edo by the trading-post head. During the following weeks, Braun produced oil from fennel, aniseed, clove, rosemary, camphor, and juniper berry. These oils were also presented to the imperial councilors and to the shogun himself.

Six Japanese interpreters translated the instructions given by Braun, whom they call an *abuteikiru* (apothecary). They also sketched the oven, the vessels, the cooling pipes, and barrel etc. and even took measurements (Fig. 4). After a month of instructions, Japanese physicians were able to produce clove oil and turpentine oil without any help:

> Place seven to eight *shō* [1 *shō* (升) = 1.8 litres] of water in a copper vessel, then add six *kin* [1 *kin* (斤) = 600 grams] of turpentine fat and one *gō* [1 *gō* (合) = 0.180 liters] of salt. Cover the vessel with a lid, add wheat flour to the water, put this on cotton, and wrap it twice around the juncture of the vessel and lid. When boiling over a charcoal fire, oil and water become steam, which rises up to the lid, enters into the pipe and comes down into the flask. Its mouth is wrapped with cotton to avoid evaporation. When the flask is full, it is replaced with another one and left for awhile. The oil comes up and the water goes down. A small bottle is attached to it, and one end of a cotton wick is inserted into the bottle and the other into the flask containing the oil. Then the oil moves into the small bottle.[25]

The transfer of technical knowledge went smoothly. For about a decade, heads of the trading post left notes on the distillation performed at Dejima, most of which was of clove oil. When, in 1668, Arashiyama Hoan received

22 NFJ 865, journal held by the bookkeeper of the Dutch East India Company at the Dejima trading post, 1670–1671.

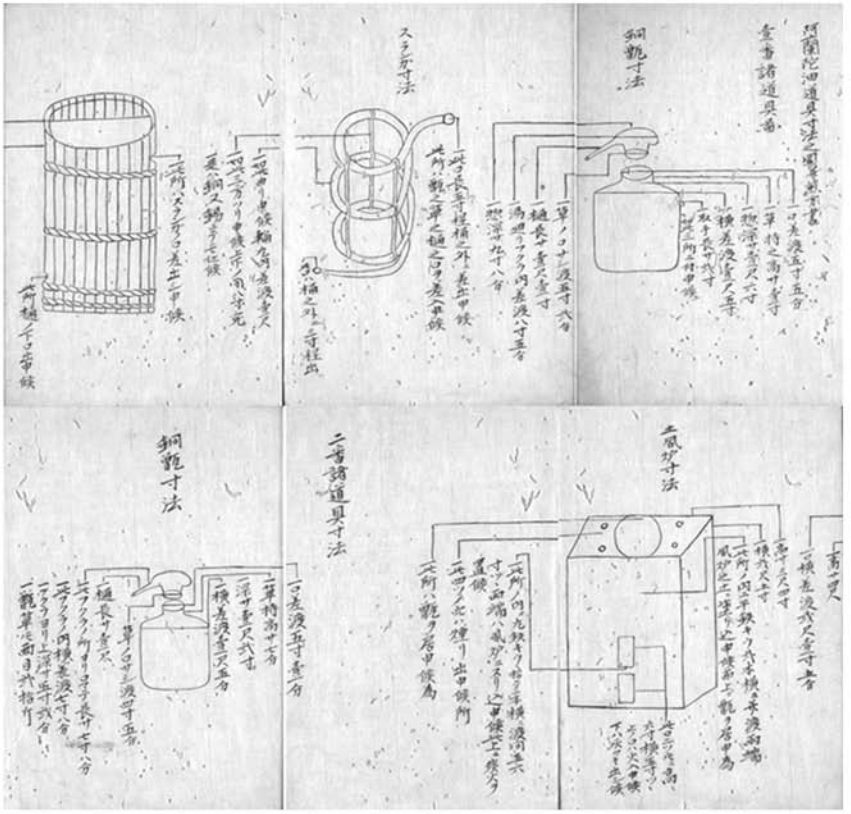
23 *Oranda sōka kyōzu*. Pictorial scroll, Edo Era, Siebold Museum, Nagasaki.

24 NFJ 85, dagregister, 11.9.1672. Basilius Besler: *Hortus Eystettensis*. 1613. Following an order of the imperial councilor Inaba Masanori, the Dutch brought a copy to Japan in 1669, probably the second edition of 1640.

25 Translated from the manuscript *Seiyu kōnō zuki* [Illustrated notes on the production and properties of oils] in: Katsuragawa Hochiku: *Zenseishitsu iwa*, vol. 3, fol. 2, Kyoto University Library, Fujikawa Collection.

one of the rare licences issued by the trading-post surgeon, he had learned about distillation only from illustrations (MICHEL and SUGITATSU 2003: 462). However, physicians who were sent to Nagasaki now had the chance to acquire practical skills in the »oil extracting house« (Fig. 3).[26]

Figure 4. Distillation apparatus used on Dejima in 1672



Source: *Oranda yudōgu sumpō no zu narabini zempō sho*. Kyūshū University Medical Library.

Fading Interest at the Court in Edo

During the 1670s some oils produced at Dejima were sent to Edo as part of the annual gifts to the shogun. The famous diplomatic records of Tokugawa Shogunate (*Tsūkō-ichiran*) state the names of things considered to be of

26 Cf. NA, NFJ 87, dagregister, 26.11.1673, 17.12.1673.

some importance. Clove oil (丁子油 *chōjiyu*) appeared sometime in 1677 and in 1679, and from 1680 to 1689 it is registered annually (HAYASHI 1967). However, in 1682 the head of the Dutch trading post was told by the Japanese authorities that henceforth clove oil for the emperor and his councilors should be sent in bottles from Batavia, packed in cases made especially for this purpose.[27]

The fading interest of government officials in the activities at Dejima may have been related to a change in attitude brought about by Tokugawa Tsunayoshi (1646–1709). Unfortunately, there is no Japanese source material directly related to this question. Problems with cultivating the imported seeds and plants also played a role. When the Dutch gardener inspected the emperor's garden (*'s keizers tuin*) in the spring of 1672, the seeds had not germinated and all but three or four plants brought to Japan on the ship *Tulpenburgh* had withered.[28] Other seeds were delivered later, but again almost none survived. Furthermore, as spice plants and spice seeds were never brought to Japan, the dependence on Dutch deliveries of cinnamon oil, fennel oil, clove oil, etc. continued.

Growing Dutch Interest in Japanese Plants

It had always been the Japanese who took the initiative in this affair, but the Dutch East India Company soon began to pursue its own interests. Since 1667 Andreas Cleyer (1634–1697/98),[29] a German physician who ran the two pharmacies and the herb garden in Batavia, had been responsible for the Company's internal supply of drugs and medicines. He turned to the East Asian *Materia Medica* to find suitable substitutes for the expensive and sometimes damaged goods delivered from the Netherlands (Kraft 1985: 42, 200–201). Cleyer took care of the Japanese orders for seeds and herbs, for the distillation equipment, and for the dispatch of pharmacists to Nagasaki. Thus, the investigations of Japanese plants by his employees Haeck and Braun

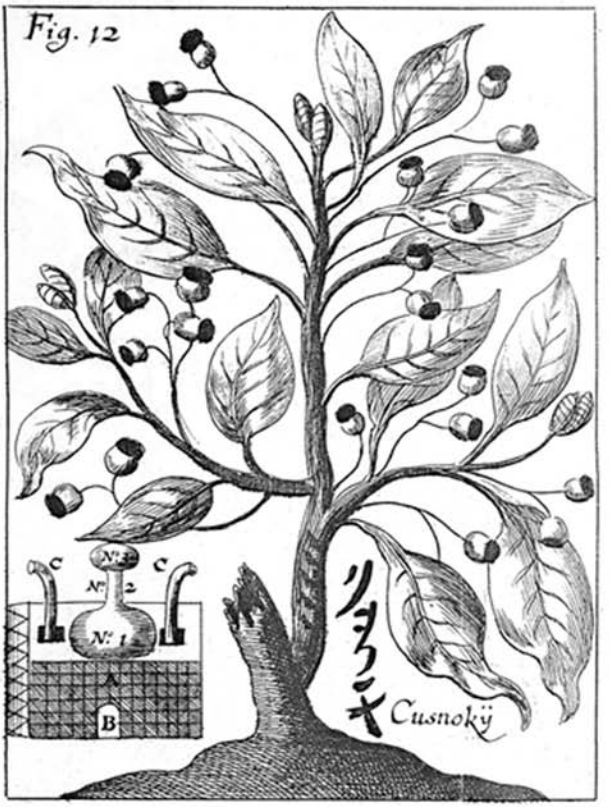
27 »Voortaan [zoude] geen nagelolij meer door Comp^{s} chirurgijn tot Nangasacky mogen gedistileert werden, gelijck nu eenigen tijt herwaards geschiet en aan den Keyser en rijxraden verschoncken was, op voorgeven dat voorsz. olij, aldaar toegemaackt zijnde, de agting van zijn waardye omtrent de schenckagie verminderde, zulx deselve voortaan weder jaarlijx in flessjes en een daartoe net gemaackt cassje van Batavia souden moeten gesonden werden.« Generale Missive deel IV: 1675–1685, Rijks Geschiedkundige Publicatiën, Grote Serie 134: 19.3.1683, p. 547.

28 NA, NFJ 85, dagregister, May 1672 (entry by Cornelis van Heyningen on events between February and May, during the absence of the head factor, Joannes Camphuys).

29 For more on Cleyer, see Kraft 1985.

provided useful information for his own research. But the governor of Nagasaki rejected all Dutch requests for the export of Japanese plants.

Figure 5. Japanese camphor tree (*kusu-no-ki*) and a distillation apparatus to produce camphor depicted in Andreas Cleyer's *Observatio De Arbore Camphorifera Japonensium Kusnoky dicta*«.[30]



Nevertheless, botanical studies on both sides continued. During the 1680s Cleyer applied to be head of the trading post in Nagasaki for two terms. During his stays in Japan in 1682–1683 and 1684–1685, he and his ambitious gardener Georg Meister (1653–1713) collected numerous specimens of the local flora as well as Japanese plant drawings (MICHEL 1991). In 1689 physician and traveler Engelbert Kaempfer (1651–1713) arrived in Batavia after many years of extensive botanical research in Persia. Cleyer and others in

30 Andreas Cleyer: Observatio de Arbore Camphorifera Japonensium Kusnoky dicta. *Miscellanea curiosa medico-physica Academiae naturae curiosorum,* Decuria II, Annus X (1692), pp. 79 (collection of the author).

Batavia drew his attention to the scientific harvest he could gain by conducting comprehensive research into Japanese plants (MICHEL 2001).

When Kaempfer left Batavia for Japan in the summer of 1689, he was well prepared for this task. As they had told him in Batavia, the Japanese did not like foreign research on their country – with one exception. Since the 1670s, plant collection was one of the few activities in which foreigners could participate with the consent of local officials.

> I had for my own private use a very large Javan box, which I had brought with me from Batavia. In this box I privately kept a large mariner's compass, in order to measure the directions of the roads, mountains, and coasts, but openly, and exposed to every body's view, was an inkhorn, and I usually fill'd it with plants, flowers, and branches of trees which I figur'd and described, (nay under this pretext, whatever occur'd to me remarkable:) Doing this, as I did it free and unhindred, to every bodies knowledge, I should be wrongly accus'd to have done any thing which might have proved disadvantageous to the company's trade in this country, or to have thereby thrown any ill suspicion upon our conduct from so jealous and circumspect a nation. Nay, far from it, I must own, that from the very first day of our setting out, till our return to Nagasaki, all the Japanese companions of our voyage, and particularly the Bugjo, or commander in chief, were extreamly forward to communicate to me, what uncommon plants they met with, together with their true names, characters and uses which they diligently enquired into among the natives. The Japanese a very reasonable and sensible People, and themselves great lovers of plants, look upon Botany, as a study both useful and innocent, which pursuant to the very dictates of reason and the law of nature, ought to be encourag'd by every body. Thus much I know by my own experience, that of all the nations I saw and convers'd with in my long and tedious travels, those the least favour'd botanical learning, who ought to have encourag'd it most. Upon my return to Nagasaki, Tonnemon,[31] secretary and chief counsellor to the Governors, being once at Desima, sent for me, and made me by the chief Interpreter Sinkobe,[32] the following compliment: That he had heard with great pleasure from Asagina Sindaanosin,[33] our late Bugio, how agreeably I had spent my time, and what diversion I had taken upon our Journey in that excellent and most commendable study of Botany, whereof he, Tonnemon, himself, was a great lover and encourager. (Kaempfer 1727: 399–400)

31 Miyagi Tonomo Masazumi (宮城主殿和燈), the governor of Nagasaki from 1687 until 1696. Kaempfer's usage of the term »Bugio« is misleading.

32 Narabayashi Shingobē alias Chinzan (楢林新五兵衛、鎮山). This was one of the interpreters who assembled the reports on Haeck's and Braun's activities.

33 Asahina Sadanoshin (朝比奈定之進), an employee of governor Miyagi.

Some Implications

The import of a distillation apparatus in 1671 and the introduction of distillation techniques in the following years is a remarkable example of the early transfer of Western technological knowledge. It did not happen by chance or as the result of individual ambitions by someone with the right connections. It was an initiative of the Tokugawa government that aimed at an independent domestic production cycle. Nagasaki governors and other officials frequently referred to the shōgun as the source of their request and stressed its importance. All sources related to the events during the late 1660s and early 1670s show that a variety of seed plants were imported by Japan in order to procure the raw material for the distillation of pharmaceutical oils.

At the same time, Westerners were asked to investigate the flora in the vicinity of Nagasaki. This is a remarkable request, revealing that the authority of traditional Chinese botany in Japan (本草学 *honzōgaku*) had already begun to crumble. Clearly some Japanese were aware of the abundance of plants inside and outside Japan and the limits of the once almighty Chinese herbal book *Bencao Gangmu* (『本草綱目』 *Honzōkōmoku*). This occurred about four decades before Kaibara Ekiken (1630–1714) published his *Yamato Honzō* (Japanese Plants), a herbal that led to him being named the »father of Japanese botany« (Kaibara 1709).

The introduction of Western-style surgical treatment methods provides an interesting example of the numerous consequences that occur during intercultural transfer, even when it is confined to knowledge of a more practical nature. These activities and events took place many decades before Yoshimune's policy of promoting the domestic production of herbs while importing and investigating foreign medicinal materials. Our findings suggest strongly that Western science and technology in 17th century Japan as well as the history and concept of Dutch Learning (*rangaku*) deserve a thorough review.

References Cited

ENDŌ, Shōji (2003): *Honzōgaku to Yōgaku – Ono Ranzan gakutō no kenkyū*. Kyoto: Shibunkaku Shuppan.

GOODMAN, Grant K. (1986): *Japan: The Dutch Experience*. London: Athlone Press. [Revised version published as *Japan and the Dutch, 1600–1853*. Richmond: Curzon, 2000.]

HASEGAWA, Kazuo (1979): Ōmetsuke Inoue Chikugo-no-kami Masashige no seiyō igaku e no kanshin. In: Sei'ichi IWAO (ed.): *Kinsei no yōgaku to kaigai kōshō*. Tokyo: Gannandō Shoten, pp. 196–238.

HAYASHI, Fukusai (ed.) (1967): *Tsūkō-ichiran*. Osaka: Seibundō. [Originally published in 1913.]

ITAZAWA, Takeo (1933): *Rangaku no hattatsu*. Tokyo: Iwanami Shoten.

KAEMPFER, Engelbert (1727): *The History of Japan*. London: Woodward.

KAIBARA, Ekiken (1709): *Yamato honzō*. Kyoto: Nagata Chōbei.

KASAYA, Kazuhiko (2001): The Tokugawa Bakufu's Policies for the National Production of Medicines and Dodonaeus' *Cruijdboek*. In: W.F. VANDE WALLE (ed.): *Dodonaeus in Japan*. Leuven: Leuven University Press; Kyoto: International Research Center for Japanese Studies.

KAWASHIMA, Junji (1992): Kawaguchi Ryōan-cho Orandago-chō kara. In: *Koga-shi ishikaihō* 24, pp. 1–9.

KIMURA, Naoya (2002): Sōsetsu – kaikin to sakoku. In: Nobuyuki Kamiya and Naoya KIMURA (eds.): *Kaikin to sakoku*. Tokyo: Tokyo Shuppan, pp. 2–14.

KRAFT, Eva (1985): *Andreas Cleyer. Tagebuch des Kontors zu Nagasaki auf der Insel Deshima 20. Oktober 1682–5. November 1683*. Bonn: Förderverein »Bonner Zeitschrift für Japanologie« (= Bonner Zeitschrift für Japanologie; 6), pp. 36–44.

MICHEL, Wolfgang (1991): Ein »Ostindianisches Sendschreiben«. Andreas Cleyers Brief an Sebastian Scheffer vom 20. Dezember 1683. In: *Dokufutsu bungaku kenkyū* 41, pp. 15–98.

MICHEL, Wolfgang (1996a): Kasuparu Shamberugeru to Kasuparu-ryū geka I. In: *Nihon ishigaku zasshi* 42, 3, pp. 41–65.

MICHEL, Wolfgang (1996b): Kasuparu Shamberugeru to Kasuparu-ryū geka II. In: *Nihon ishigaku zasshi* 42, 4, pp. 23–48.

MICHEL, Wolfgang (1997–2001): Kōmōryū geka no tanjō ni tsuite. In: Keiji YAMADA and Shigehisa KURIYAMA (eds.): *Rekishi no naka no yamai to igaku*. Kyoto: Shibunkaku Shuppan, pp. 231–164.

MICHEL, Wolfgang (1999): *Von Leipzig nach Japan. Der Chirurg und Handelsmann Caspar Schamberger (1623–1706)*. München: Iudicium.

MICHEL, Wolfgang (2001): Europäische Fernostreisende im Um- und Vorfeld Kaempfers. In: Wolfgang MICHEL und Barend J. TERWIEL (eds.): *Engelbert Kaempfer. Heutiges Japan*. Vol. 1, part 2. München: Iudicium, pp. 90–142.

MICHEL, Wolfgang and SUGITATSU Yoshikazu (2003): Ōtaguro Gentan no Orandageka menkyojō to sono haikei ni tsuite. In: *Nihon ishigaku zasshi* 49, 3, pp. 455–477.

NAGASAKI-SHI DEJIMA SHISEKI SEIBI JUNBI SHINGI-KAI (ed.) (1990): *Dejima-zu – sono keikan to hensen*. Tokyo: Chūō Kōron Bijutsu Shuppan.

NAGAZUMI, Yōko (1975): Orandajin no hogosha toshite no Inoue Chikugo-no-kami Masashige. In: *Nihon rekishi* 327, pp. 1–17.

NUMATA, Jirō *et al.* (1972–1976): *Yōgaku*. Tokyo: Iwanami Shoten.

OSHIMA, Akihide (2006): Kinsei-kōki Nihon ni okeru Shizuki Tadao yaku Sakoku-ron no juyō. In: *Yōgaku* 14.

SCHILLING, Dorotheus (1931): *Das Schulwesen der Jesuiten in Japan (1551–1614)*. Münster: Regensberg.

SCHILLING, Dorotheus (1937): Os Portugueses e a introducão da medicina no Japão. In: *Boletim do Instituto Alemão da Faculdade de Letras da Universidade de Coimbra* 6–7, pp. 172–208.

SŌDA, Hajime (1989): *Nihon iryō bunkashi*. Kyoto: Shibunkaku Shuppan.

SUGIMOTO, Masayoshi and David L. SWAIN (1989): *Science and Culture in Traditional Japan*. Tokyo: Tuttle.

SUGITA, Genpaku (1969): *Dawn of Western Science in Japan*. Translated by Ryozo Matsumoto, Eiichi Kiyooka. Tokyo: Hokuseido Press.

SUGITA, Genpaku (1982): *Rangaku goto hajime*. Tokyo: Iwanami Shoten.