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On the emancipation of materia medica studies (*honzōgaku*) in early modern Japan

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近世日本における本草学の自立について

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Abstract

Since the pioneering work by the phytopathologist and natural historian Shirai Mitsutarō (1863–1932), the beginnings of genuine native studies on Japanese herbs have been linked to Kaibara Ekiken's book "Japanese Materia Medica" (大和本草 Yamato honzō) published in 1709.[1] However, a closer look that includes Dutch source material from the second half of the 17th century reveals that there was more to this process of emancipation from Chinese herbology than the individual ingenuity of a neo-Confucian scholar. The harsh economic realities of the archipelago had a strong influence on all political decisions related to resources, imports, and exports from the very beginning of Japan's Edo period (1603-1868). During the 1650s, the adoption of Western medicine led to the introduction of herbs and drugs that were not known hitherto and were imported from the Dutch East India Company. Insufficient and highpriced supply eventually stimulated an attempt initiated by the imperial councilor Inaba Masanori to start local production of certain medical materials and to investigate local plants, while requesting seeds and plants from the Dutch East India Company and the dispatch of herb specialists. Joint Dutch-Japanese botanical investigations and instruction about imported and local plants by European physicians and pharmacists provided a reference point (tertium that enabled their Japanese comparationis) counterparts to achieve a new view of such Chinese

herbals as the "Principles and Species of Materia Medica" (本草綱目 *Běncăo gāngmù*) while heightening their awareness of the distinctive properties of indigenous Japanese flora. About five decades before Shōgun Tokugawa Yoshimune (1684–1751) implemented his famous "herb policy", almost identical attempts were made under Tokugawa Ietsuna (1641–1680). These activities faded out with the accession of his successor Tokugawa Tsunayoshi (1646–1709), but herb studies continued to be a common field of interest for Japan as well as for the Dutch East India Company throughout the Edo period.

要旨

日本独自の本草学の始まりは、これまで多く の研究において、福岡藩の本草学者・儒学者の 貝原益軒による宝永6(1709)年の『大和本草』 の出版や、第8代将軍吉宗による享保の改革の 一環としての「薬草政策」と関連づけられてき た。しかし、当時の背景を確認してみると、そ こには単に一人の儒学者の活動にとどまらない 動きが見られるし、吉宗の改革を促した苦しい 財政事情は、それ以前から歴代の政権に重くの しかかっていたことがわかる。また、日本の本 草学の誕生を語る上で、特に見過ごしてはなら ないのは西洋医学との出会いである。

いわゆる紅毛流外科が芽生えた慶安3(1650) 年以降、オランダ東インド会社への薬品、薬草、 書籍、器具類の注文が、かつてない勢いで増え、 出島商館長日誌には日本人による外科医への相 談や往診依頼に関する記述が次第に多くなる。 洋書輸入規制を緩和し、オランダ語学習を奨励 し、薬草の国産化を進めた吉宗の政策はよく知 られているが、薬学、医学及び航海術に関する 書籍の輸入はすでに寛永18(1641)年に正式 に認められており、薬草の苗や種、製薬技術の 供給を求める動きも、吉宗より約半世紀前の4 代将軍家綱の時代から活発に見られた。寛文7 (1667)年に幕府はオランダ東インド会社に対 して薬油を抽出できる専門家の派遣と、そのた めに必要な器具並びに繁殖用の薬草の種と苗の 提供を求めた。寛文11(1671)年に大型蒸留装 置を持参した薬剤師ブラウンが、幕府の経費で 建てられた「油取家」で蒸留術の訓練を開始し た。単純な蒸留法から、7日間を要する複雑な 樟脳油の製造方法までの伝習は短期間で実を結 び、3ヶ月後には日本人医師がブラウンの手を借 りずに各種薬油を製造できるようになった。

薬油蒸留と平行して、長崎湾内の合同薬草調 査も数年間にわたって行なわれた。加福吉左衛 門、楢林新右衛門(鎮山)らの阿蘭陀通詞によ ってまとめられた報告書は長崎奉行を通じて幕 府に送られ、後に『阿蘭陀外科指南』(1696年) などの医書に掲載された。とはいえ、本草学の 金字塔である『本草綱目』が軽んじられた訳で はなかった。延宝7(1679)年に成立した「阿蘭 陀草花鏡図」には、「薬草見」ブラウンの説明 した内容だけでなく、中国の知識も豊富に盛り 込まれている。当時の史料から、「西洋人の眼」 を借りて地元の植物界を観察した人々が、それ まで万能と思われていた中国の本草学の限界と、 国内外の植物の違いを認識するようになったこ とがわかる。合同薬草調査で得られた情報と 『本草綱目』との相違点を指摘する「阿蘭陀本 草図経」の序文は、このような姿勢の広まりを 裏付けている。それでも「阿蘭陀草花鏡図」に 見られる様々な用語と引用からわかるように、 紅毛人の教示を解釈、受容する際に、中国の豊 富な知識が相変わらず利用されていた。

福岡藩医だった貝原益軒は舶来の薬品にも関心 を寄せ、長崎湾の合同薬草調査に立ち会った通 詞楢林鎮山とも親交があった。日本独自の本草 学の起源とされる益軒の『大和本草』の端緒は、 その40年ほど前に行なわれた日蘭合同の薬草 調査に遡るものである。この合同薬草調査の成 果はバタビア総督府にも報告され、植物資源の 商品価値を常に意識していたオランダ商人の目 を日本の植物に向けさせることになった。それ まで紅毛人による情報収集を基本的に禁止して いた日本側が植物調査の有用性を認めるように なったことで、後のケンペル、ツンベリ、シー ボルトらによる日本の植物研究が進み、それに 関する日欧間の情報交換も含めて、本草学は日 蘭交流が大きな成果をもたらした分野の一つと なった。

1 Growing awareness of weaknesses and needs

Between 607 and 838, Japan dispatched 19 official missions to Sui and Tang China to absorb knowledge in various fields of study, including Buddhism and medicine. For centuries, Japanese monks, scholars, and physicians were busy interpreting Chinese medical teachings, but it was not easy to keep pace with the rise and decline of Chinese schools, doctrines, and therapies. When it came to pharmaceutics, many of the herbs and drugs described in Chinese books could not be produced in Japan.

Despite devastating civil wars during the 15th and 16th centuries, Japan absorbed a number of foreign innovations in smelting and forging methods and in crafts such as papermaking, silk weaving, and printing. Most of this knowledge came from China. It was not disseminated by Buddhist monks or scholars as earlier knowledge had been, but by merchants and artisans; hence, it was predominantly of a practical nature. The breakdown of Buddhist medicine and the rise of secular physicians brought more flexibility to medical thinking. Manase Dosan (曲直瀬道三, 1507-1594), one of the most influential physicians of his time, began a careful adaptation of Chinese teachings to Japanese conditions including a reassessment of the medicinal potential (nodoku 能毒) of materia medica. Nevertheless, the dominance of Chinese herbology continued for a while. Despite considerable geographical and climatic differences, Japanese

scholars were looking at local plants through Chinese spectacles and tended to choose "appropriate" names from Chinese herbals. It is not surprising that they were overwhelmed when Lǐ Shízhēn's "Principles and Species of Materia Medica" (*Běncǎo gāngmù*, 1596) arrived in Japan.[2] The outstanding Confucianist scholar Hayashi Razan (1583–1657) who had purchased the 52 volumes in Nagasaki decided to facilitate the access to the rapidly increasing corpus of Chinese writings. But his "Book of Extensive Knowledge" (*Tashikihen*, 1639) digesting the *Běncǎo gāngmù* and Wáng Zhēn's "Book of Agriculture" (*Nóngshū*, 1313) became one more example for the text-exegetical approach in Japanese herb studies.[3]

By then at the latest, Japanese rulers, who had tried to control foreign trade and the flow of information, became aware of their country's dependence on imports of certain products and raw materials. Before banishing all "Southern Barbarians" (Portuguese and Spaniards), high-ranking officials such as imperial councilor Sakai Tadakatsu (酒井忠勝, 1587-1662) and imperial inspector general Inoue Masashige (井上 政重, 1585-1662), ensured through 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 and cotton textiles, and herbal medicines in sufficient quantities.[3] Furthermore, Inoue, many governors of the shogunal demesne of Nagasaki, and later the mighty councilor Inaba Masanori (稲葉正則, 1623-1696) made great efforts to use foreign knowledge and goods to stabilize the country. Despite Japan's so-called "seclusion policy" (sakoku seisaku), useful Western knowledge was never excluded.[5]

2 Changing conditions for medical encounters

The Dutch East India Company (Verenigde Oostindische Compagnie, VOC) was founded in 1602 as the first stock holding company in Western history. Only seven years later, it established a trading post on the Japanese island of Hirado. During the early years, company employees in Japan were treated by local physicians or European surgeons from anchoring Dutch ships. Gradually, a health care system was established with Batavia at its center; however, for decades, the company faced considerable difficulties in securing qualified medical personnel and medicinal supplies that met the standards of the *Pharmacopoeia Amstelredamensis*.

After the expulsion of their Iberian rivals in 1639, although the Dutch were the only Europeans allowed continued access to Japan, in 1641 they were required to move to the small man-made island of Dejima in the Bay of Nagasaki. It was then that the East India Company installed a resident physician, who took care of the trading post personnel and accompanied his superior on the annual journey to the court in Edo. For the first time, a continuous exchange between European and Japanese physicians was possible. Furthermore, high-ranking officials were involved in all matters concerning the trading post, and the effects soon became visible.

Physicians working at Dejima enjoyed greater freedom than merchants, and because they were called to the residences of Japanese officials and other influential residents of Nagasaki and Edo, they had many opportunities to meet highly trained local physicians. On the other hand, the company was not allowed to train its own interpreters. So, even if they managed to stay in Japan for several years, Westerners were always supported in any communication with local associates by official interpreters.[6]

Until the first half of the 18th century, the Western medical presence in Japan was dominated by barber surgeons who had received their education in guilds. Later, the number of graduates from military medical schools and universities increased. The diaries and other documents from Dejima show about 90 names of surgeons, physicians, and pharmacists.

3 Birth of a new paradigm

A figure of significant influence in early interactions was the surgeon Caspar Schamberger (1623–1706), who sparked a lasting interest in Western medical treatments, herbs, and pharmaceutics and whose work led to the birth of "Caspar-style external medicine" (*kasuparu-ryū geka*) in Japan.[7]

The acceptance of his teachings and treatment methods was influenced by a variety of factors. Schamberger came to Edo in December 1649 as a member of a special Dutch delegation from Batavia. He was educated in the surgeons' guild of Leipzig and trained on the battlefields of the Thirty Years War. Considering the formality of the Japanese court, he must have displayed a greater mastery of etiquette than the average barber surgeon of his time. Chance also played a part. Because Shogun Tokugawa Iemitsu contracted a serious illness that eventually led to his death in 1651, the Dutch delegation was forced to stay in Edo for several months. The extraordinarily long wait and the constant presence of an unengaged foreign surgeon at the delegation's inn stimulated some officials suffering age-related illnesses to invite Schamberger to their residences. Precious medicines and successful treatments brought more patients of rank and name, giving social credibility to his medical practice. Subsequently, Schamberger was asked to stay in Edo for a further six months following the departure of the Dutch envoy. Without this coincidental interest and approval of the political elite, the teachings of "Master Caspar" might not have taken root in Japan.

Political and economic factors also played their part. The determined adoption of Western medical knowledge is neatly explained within a context of the government's encouragement of activities that were beneficial to the further development of the country, and incidentally to the consolidation of the Tokugawa regime. In addition to medicine and pharmacy,

エンプラストガラサデイヤ		Emplastrum Gratia Dei
セイラ	四十目	Cerae novae,
コルホウニヤ	四十目	Resinae,
セイベエルジネ	四十目	Sevi hircini, ana Uncias
		quator.
テレメンデイナ	廿目	Terebinthinae Uncias duas.
ヘルテ	三匁	Aeruginis,
マセクス	三匁	Mastiches,
メイラ	三匁	Olibani, ana Drachmas tres.
右煉合ル時ポルトガルノ油少		F[iat] l[ege] a[rtis]
入ル		Emplastrum

historical sources reveal a similar strong interest in military technology, astronomy, and cartography.[8]

Fig. 1 "Caspar-style plaster" as seen in the manuscript *Orandageka ihō hiden*, (阿蘭陀外科 醫 方 秘 傳, 1650) and the *Pharmacopoeia Amstelredamensis* (1636)

Furthermore, the personal contributions of members of the political elite should not be ignored. The developments since the 1630s cannot be adequately explained without taking into account the influence of imperial inspector general Inoue Masashige.[9] Therefore, despite various restrictions on the flow of goods and information, the social and political conditions for the introduction of Western medicine, especially surgery, were actually not as bad as has sometimes been supposed. The introduction of central European medicine commenced at the top of Japanese society. From Edo and Nagasaki—cities under central government administration—this new knowledge quickly spread to the regional fiefdoms.

Schamberger had changed life for his successors at Dejima. In their official diaries, many trading post chiefs mention the growing number of inquisitive visitors. During the 1650s, feudal lords began to send their personal physicians to Nagasaki. Some with good connections were allowed more or less regular visits to the trading post, even for periods as long as one or two years. Only two decades after Schamberger left Japan, licenses from the "Dutch surgeon" boosted careers in feudal domains and at the court. However, the continued success of "redheadstyle external medicine" (*kōmōryū-geka* 紅毛流外科) was not merely the result of its perceived usefulness. Japanese physicians were less subject to the prevailing rigid social restrictions, and thus were in a better position than most of their countrymen to travel and to seek and spread new knowledge.

4 Unknown herbs and drugs

Many scholars link the beginning of concerted Japanese efforts to absorb Western medicine and pharmacology to Shogun Tokugawa Yoshimune (1684–1751), pointing out his lifting of import restrictions on nonreligious Western books, the imports of foreign medicinal materials, and the promotion of domestic production of herbs and drugs between 1716 and 1736.[10] However, books on nautical and medical matters were explicitly exempted from the list of banned import items as early as 1641,[11] and in a country with limited export commodities and insufficient natural resources, economic factors played an important role from the beginning of the Tokugawa regime. This was also the case when Japanese physicians began to absorb Western surgery.

Soon after Schamberger left Japan, Dutch documents show a sudden rise in orders for a variety of drugs and herbs, pharmaceutical oils, books, lancets, and other medical equipment. These orders indicate a high level of medical exchange:

"10 picols black mummy; 2 picols black *billili* like the one that was brought recently by the honorable Coyett; 2 picols black or real unicorn if it can be provided; [...] 5 cupping glasses; [...] 2 small bandage boxes or ointment boxes nicely

decorated with copper bands; 2 mermaid teeth; 1 catty elephant fat; 1 elephant gall bladder; 2 alembics with heads for the distillation of Oleum vitrioli, Oleum Sulphuris, nitric acid, etc.; [...] 4 iron hands with screws made like natural ones in order to hold a saber for fighting or a pen for writing, being two left and two right hands, one pair made more laboriously and lavishly; 2 artificial legs made in the same way for use in case of losing a leg as well as for mere curiosity; several pieces of hematite to stop bleeding; [...] an illustrated book in Portuguese dealing with human anatomy; a herbal with illustrations made after live plants; [...] a human model made of copper, wood or other material showing all parts of the body and internal organs in as much detail as possible"[12]

Most of the new pharmaceutical formulas required ingredients that were not identified yet or not available in Japan (Fig.1). However, as the Dutch East India Company was still struggling to organize its own medical supply system, deliveries to Japan were irregular and highly prized. Soon, Japanese officials started to turn their attention to local resources. During a joint day-trip with local physicians to the outskirts of Nagasaki in May 1652, the Dutch identified a number of plants, such as great plantain (Plantago major), viola (Viola tricolor), mugwort (Artemisia), agrimony, and prunella.[13] In 1656, Mukai Genshō (向井元升/玄松, 1609-1677), a wellknown Confucian scholar and physician, took the German surgeon Hans Juriaen Hancke to local drug merchants where they found 34 usable items, such as hematite, borax, asbestos, hippocampus, opium, cardamon, saffron, styrax, fennel seed, fire hemp seed, linseed, mulberry fruit, plantago seed, lotus leaves, catnip, and dragon's blood resin (Fig. 2).

Furthermore, Western books were ordered and Japanese physicians, equipped with the famous herbal *Cruijdboek* by Rembertus Dodonaeus, tried to find the

plants in question or plants with similar properties that could serve as substitutes. There is no doubt that these studies heightened their awareness of plant properties, but the clumsy and crude woodblock print illustrations in Western herbals turned out not to be of much use and trading post physicians did not have much expertise in herbology.

Fig. 2 First page of the report on useful herbs and drugs in Nagasaki drug stores found by Mukai Genshō and Hans Juriaen Hancke in 1656 (*Oranda geka ihō* 阿蘭陀外科醫方, collection of the author)[14]

During the 1660s, Japan's economic situation became precarious once again. In 1663, the government imposed price limits for kimonos to curb imports of expensive silk. Three years later, the empire's primary economic center Osaka experienced a disastrous fire, followed by another one in Edo in 1668, triggering the prohibition of silver exports. In 1667, the Dutch were given a long list of luxury commodities such as certain textiles, musical instruments, clocks, animals, and even some medical materials such as Spanish flies (Cantharides) that should not be brought to Japan.[15] Only a few months before, the Company had received a request from the Nagasaki governor, Kawano Gon'emon, who was leaving for Edo, and his cogovernor, Matsudaira Jinzaburō, who was preparing to take over the office in Nagasaki. During their audience with Daniel Six (Sicx), the departing head of the trading post, and his successor, Constantin Ranst (1635 – 1714), they conveyed a message from Edo, carefully recorded in the trading post diary:

"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 [Nagasaki] governors. Therefore, we are considering it very seriously and report it to His Excellency the Governor General [at Batavia]."[16]

5 Western pharmacists in Japan

During the following years, various live plants and seeds arrived in Nagasaki to be cultivated in the socalled Emperor's garden ('s keizers tuin). To meet the high expectations of the Japanese government, two pharmacists, Godefried (Gottfried) Haeck[17] and Frans (Franz) Braun, were successively dispatched to Japan in 1669 and 1671, followed in 1674 by the gifted physician Willem ten Rhijne (1647–1700). The diary of the Dutch trading post describes him as "a doctor of medicine, herb specialist, distillation specialist and chemist, who was sent in great hurry by our masters from the Netherlands to serve the emperor and the country of Japan".[18] All of them were asked to participate in joint planthunting excursions in and around Nagasaki. On various occasions, they were also required to provide instruction on the plants sent to Japan by the company. In 1670 when the Japanese interpreters tried to translate the Dutch delivery papers, Haeck explained that many of these specimens did not come from the Netherlands, but from Italy, Turkey, Egypt, Java, and other parts of East India.[19]

Reports drawn up by the Japanese interpreters show Latin and Dutch names for about 50 herbs, their botanical properties, information on growing techniques, and their usage in medicine.(Fig. 3) Eventually some of Haeck's and Braun's explanations found their way into the "Compass of Dutch External Medicine" (*Oranda geka shinan*, 1696[20]) and became available to the general public as an "oral outline of pharmaceutical herbs".(Fig. 5)



Fig. 3 Report on Haeck's investigation of Japanese plants (*Ranpō sōki nōdoku-shū* 蘭方草 木能毒集, collection of the author)

6 Transfer of Western distillation techniques

Braun had brought a European distillation unit and various vessels to Japan. At the government's expense,

a hut called the "oil extraction house" (*abura-tori ie* 油取家) was built in a corner of the trading post (Fig. 4), and in April 1672 Braun demonstrated the production of oils from fennel, aniseed, clove, rosemary, camphor, and juniper berry in the presence of Japanese officials. These oils were presented to the imperial councilors and to the Shōgun. After a month of instruction, Japanese physicians were able to produce clove oil and turpentine oil by themselves.



Fig. 4 The distillation hut on a 17th-century ground plan of Dejima (Part of the pictorial collection *Shoga ezushū*)[21]

The transfer of technical knowledge went smoothly. For about a decade, trading post chiefs left remarks about distillations by the Japanese performed at Dejima, most of which were of oil produced from cloves. In 1668, when Arashiyama Hoan received one of the rare licenses issued by the trading post surgeon, he had learned about distillation only from illustrations.[22] However, physicians who were sent to Nagasaki now had the chance to acquire practical skills. At the request of the authorities, Narabayashi Chinzan (楢林鎭山, 1648–1711), Motoki Ryōi (本木 良意, 1628 – 1697), and three other interpreters compiled a detailed report including sketches of the oven, the vessels, the cooling pipes, and receptacles. Soon these papers circulated throughout the country and were copied repeatedly until the mid-19th century.[23]

Ĕ 1 用 ち 7 用 7. 12 卷 Vr テ 南小 煎 四 煎 ジ 75 此; ヨ IL 1 糖

Fig. 5 Haeck's report on Japanese plants in the "Compass of Dutch External Medicine" (Orandageka shinan 阿蘭陀外科指南, 1696)

7 Effects on indigenous plant studies

During the 1680s, these activities eventually faded out with the accession of the fifth Shōgun Tokugawa Tsunayoshi, who was less interested in Western know-how and paid more attention to Chinese culture and Confucianism. Problems with cultivating the imported seeds and plants may also have played a role. When the Dutch gardener was allowed to visit the emperor's garden 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.[24] Other seeds were delivered later, but again few survived. Furthermore, as spice plants and spice seeds were never brought to Japan, the dependence on Dutch deliveries of such spices as cinnamon oil, fennel oil, and clove oil continued.

However, the joint plant-hunting excursions of the late 1660s and early 1670s had a long-lasting effect on Japanese plant studies. Among the various related manuscripts, one was written by an unidentified physician, and using a pen name suggesting old age, he explains in his epilogue:

"In my young days, I was living in Nagasaki in Hizen Province when I received an order from the authorities to become the disciple of a famous physician from the land of the Redheads [=Dutch] and studied external treatments for some years. This Dutch style [external medicine] uses medicinal oils from all kinds of plants for the treatment of diseases and pain or for the preparation of plasters. These are achievements that have not been gained by other [treatment] styles. If one wants to practice this kind of therapy, one must know the names [of the plants], their main indications, and [therapeutic] effects. I followed [the Dutch physician] into the mountains and fields and for many days we inspected countless herbs and trees. As for the properties and effects of more than fifty species among these, there was nothing identical in the [Chinese] "Book of Materia Medica" (Honzō kōmoku). Although these [plants] are not used [yet], I have unselfishly made up my mind and humbly convey what my teacher told me. To this aim, I have stitched together this booklet called Dutch *Herbs*."[25]

There is no doubt that European physicians and pharmacists provided a reference point that enabled their Japanese counterparts to discover the limitations of Chinese and Western herbals in a Japanese environment. Joint investigations were also helpful in accumulating and comparing knowledge about the distinctive properties of indigenous plants.

The absorption of Western botanical knowledge did not herald the end of Chinese wisdom. Franz Braun's name is preserved in a large Japanese scroll entitled "Illustrated Mirror of Dutch Plants" (阿蘭陀草花鏡 圖 Oranda sōka kyōzu, dated 1679). It contains plants such as Viola, Ebulus, Apium aquae, Bursa pastoris, Taraxacon, Saturegia, Cichorium, Urtica mortua, Hypericum, Malus Persica, Persicaria, Calamintha, Sabina, Radix Gingiberis, Erica, Papaveris, and Calmus. The author made great efforts to add Sino– Japanese names and Japanese colloquial names. Most descriptions begin with pharmaceutical temperaments (such as warm, cold, cool, normal, and hot), followed by botanical properties such as the time of germination, bloom season, and some instructions about the plant's medical usage.(Fig. 6)



Fig. 6 Japanese description of the "Persicaboom" (Prunus persica) based on Franz Braun's explanations (*Oranda sōka kyōzu*, illustrated scroll, 1679, Siebold Memorial Museum, Nagasaki)[26]

Occasional remarks on Italy and the Netherlands definitely came from Braun, but for some plants, the country of origin is given as China or Korea. Moreover, the use of a bamboo knife when harvesting certain herbs and the appropriate date of harvesting (e.g., third day of the third month, the fifth day of the fifth month, seventh day of the seventh month) reflect Chinese traditions. A few phrases in the descriptions were taken from the *Běncǎo gāngmù*. In one case, the author mentions one of the most important herbals of the Song Dynasty, the "Medical Matters in Confirmed Categories" (*Zhènglèi běncǎo* 證類本草).[26]

8 Kaibara Ekiken and Nagasaki

There are some connections between the events in Nagasaki and the botanical writings of Kaibara Ekiken (1630–1714), who is given credit for the first genuine native studies on Japanese *materia medica*.

Ekiken's father served as a secretary in Fukuoka, northern Kyushu. Because this domain, together with the neighboring domain Saga, was responsible for safety in the area of Nagasaki, it ran a small settlement there and kept an eye on locals and foreigners in close cooperation with the Nagasaki governor. In 1648, young Ekiken was employed by the domain, but he soon incurred the wrath of Lord Kuroda Tadayuki and was expelled from Fukuoka until Tadayuki's successor Kuroda Mitsuyuki reemployed him as a domain physician in 1656. For most of Kaibara's seven years in exile, he studied in Nagasaki where he established close relations with the Confucian scholar and physician Mukai Genshō. There can be no doubt that he was also on good terms with Narabayashi Chinzan and other interpreters and accumulated firsthand knowledge about their activities. Decades later, when Narabayashi had become a well-known expert in Western medicine, Kaibara wrote the introduction to Narabayashi's manuscript "Basic Tradition of the Redheads' External Medicine" (Koi geka soden, 1706).[27]

Nagasaki was a place where information from Asia and Europe was collected, compared, assimilated or rejected. From the 1630s on, Japan became increasingly integrated into the global exchange of plant resources.[28] Local merchants, interpreters, officials, and scholars had accumulated a rich knowledge about the properties of foreign herbs and drugs and all kinds of fakes. It is not by accident that European herbology was tested here through joint investigations of local plant resources. Kaibara's extensive field work and his systematic observations as the approach to knowledge about nature are closely linked to the intellectual environment of this cross-cultural trading place.



Fig. 7 Japanese camphor tree (*kusunoki*) and a distillation apparatus to produce camphor depicted in Andreas Cleyer's "Observatio de Arbore Camphorifera Japonensium *Kusnoky* dicta" (1692) (*Miscellanea curiosa medico-physica*, Decuria II, Annus X. Collection of the author).

During his stay in Nagasaki, he also must have visited the garden of Suetsugu Heizō Shigetomo (π

次平蔵茂朝), government supervisor (*daikan*) of the area around Nagasaki and one of the wealthiest local merchants.[26] For generations, the Suetsugu family engaged in overseas trade and maintained a garden with foreign plants until Shigetomo was stripped of all his possessions in 1676. Kaibara's "Japanese *materia medica*" (*Yamato honzō*, 1709) includes a considerable number of plants that had found their way into the archipelago in the recent past. Obviously, he used the old term *Yamato* only to indicate that the items in question could be found in Japan.

9 Repercussions

While helping to introduce Western medical knowledge to Japan, the physicians at the trading post at Dejima did not ignore Japanese medicine. Until the early 19th century, about 70% of European writings on Far Eastern Medicine were based on observations made in Japan and materials collected there.[29] Western research on Japanese plants too has deep roots. Here especially, Andreas Cleyer (1634–1697/98) and Engelbert Kaempfer (1651–1716) made significant contributions.

Clever, a German physician who ran the two pharmacies and the herb garden in Batavia, had been responsible for the Company's internal supply of medicinal products since 1667. He took care of the Japanese orders for seeds and herbs, for the distillation equipment, and for the dispatch of the two pharmacists to Nagasaki. Thus, the investigations of local plants by his employees Haeck and Braun provided useful information for his own research on useful drugs. A couple of years later, Cleyer served in Nagasaki as trading post chief. During his two terms in Japan (1682-83 and 1684-85), he and his gardener George Meister (1653–1713) conducted intensive research on Japanese materia medica. Clever had become a member of the German Academia Naturae Curiosorum (Academy of Those Inquisitive of Nature) in 1678 and subsequently, he continually sent letters, sketches, and botanical samples to renowned scholars throughout Europe including Simon Paulli, Nicolaas Witsen, Jacob Breyn, and Michael Bernhard Valentini.[30]



Fig. 8 Illustration made by a Japanese artist sent to the court in Berlin by Andreas Cleyer (Staatsbibliothek zu Berlin, *Libri Picturati*, A41/42).

One of his correspondents was Christian Mentzel (1622-1701), botanist and personal physician to the Elector of Brandenburg. Between 1683 and 1700, Mentzel translated and published 43 excerpts from Cleyer's letters, together with numerous illustrations in the Miscellanea Curiosa Medico-Physica, a scientific journal dedicated to medical and natural science. Here, we find the first Western illustrated articles on Japanese plants materia medica such as Ginseng, Camphor (Fig. 7), Moxa, Catechu and Ambergris. A set of 600 Japanese watercolors Clever had acquired in Japan and sent to Berlin was added to the Elector's collection under the title Flora Japonica.[30] Long before the central government and regional rulers started to register natural local resources in so-called "Product Inventories" (sanbutsucho 産物帳), an unknown Japanese artist, drew pictures of more than 1200

plants to which the colloquial Japanese names were added. (Fig. 8)

10 Herbal studies as a field of common interest

In 1689, the German physician Engelbert Kaempfer (1651–1716) arrived in Batavia. While he was looking for his next position in the service of the Dutch East India Company, he stayed at Cleyer's house. Soon the small community of educated people in Batavia knew about his long journey from Sweden via Persia and India to the East and the materials he had collected during these years. As there was an urgent need for comprehensive, up-to-date data about Japan, they drew Kaempfer's attention to the trading post in Nagasaki and to the scientific harvest he could gain by conducting comprehensive research into Japanese plants.[31] Before leaving for Nagasaki in the summer of 1689, he received careful instructions and a list of books, plant samples, and objects to be collected in Japan. Among the travelers to Japan during the seventeenth century, Kaempfer was the most experienced observer, with a rich knowledge of non-European cultures that enabled him to make comparisons and to put his knowledge into a broader perspective.

Like many of his predecessors, Kaempfer developed close relations with Japanese counterparts interested in medicine and other Western scientific disciplines. Without his personal servant Imamura Gen'emon Eisei (1671–1736), he would not have been able to carry out his plans. Since the 1680s, the interpreter Narabayashi Chinzan, who had been involved in all the medicobotanical interactions described above, had gained a reputation as a specialist in Western medicine. He also was a valuable source of information and, like the young interpreter Bada Ichirōbē, provided plant samples on various occasions. As Kaempfer had been told in Batavia, the Japanese officials did not like foreign research into their country, especially during their annual journey to Edo – with one exception:

"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 extremely 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 are a very reasonable and sensible people, and are themselves great lovers of plants and 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 encouraged by everybody."[32]

Kaempfer was a little naive in his judgment. For the Dutch East India Company as well as for Japanese officials, the study of potentially lucrative plants was anything but innocent. Until the mid-19th century, Japanese authorities took all kinds of measures to prevent Western foreigners from gathering information on their country. However, from the late 1660s onward, collecting and studying plants continued to be one of the few activities in which foreigners could indulge with official consentprovided they were willing to share their expertise and discoveries.

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