Western Medicine and Pharmaceutics in Seventeenth Century Japan

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多元文化中的科学史

第十届国际东亚科学史会议论文集

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江晓原 主编

HISTORY OF SCIENCE IN THE MULTICULTURE

PROCEEDINGS OF THE TENTH INTERNATIONAL CONFERENCE ON THE HISTORY OF SCIENCE IN EAST ASIA

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主编　江晓原

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Western Medicine and Pharmaceutics in 17th Century Japan

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This study traces the introduction of Western surgery to Japan during the second half of the 17th century, as well as its characteristics and limitations. The acceptance of Western surgery in Japan is shown to have been the result of a range of medical and non-medical factors, some of which led to increased activities in associated disciplines such as pharmaceutics and botany, while others slowed down the development of surgery into a fully-fledged medical paradigm.

(1) Faint Traces of "Southern Barbarians"

In 1587, troops of the domain of Satsuma destroyed the hospital and life work of Luis d'Almeida, S. J., and in the process put an end to a promising attempt to achieve a peaceful coexistence of Eastern traditional medicine and Western Surgery. In the decades that followed, an increasingly systematic persecution of foreign and native Christians caused all forms of medical activity by the Catholic mission in Japan to completely cease.[1] What historians call "Southern-Barbarian-Style Surgery" (nanban-ryû geka 南蛮流外科) in fact never achieved the status of a clear-cut medical paradigm. This term rather alludes to several Iberian traces to be found in 17th century sources (four plasters, usage of pork fat, olive oil) and two persons, whose medical knowledge and practice was either highly dubious (Christovão Ferreira alias Sawano Chûan, 1580～1650) or overwhelmingly points to Dutch and Chinese sources (Kurisaki Dôki, 1582-1665). Although Japan's "Christian Century" (1549～1638) indicated an impressive receptivity to Western, Chinese and other forms of foreign knowledge, political strategies and circumstantial necessities lead the new Tokugawa regime to prohibit Christianity and to confine European trade activities to one single port.

(2) "Caspar-style Surgery"

The Dutch, dubbed 'redheads' (komôjin 紅毛人) by the locals, arrived in Japan at the beginning of the 17th century. In 1609, they established a trading post in 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 eventually allowed continued access to Japan.

Interest in the Western art of healing was rekindled in Edo and Nagasaki in the mid-17th

century when a German surgeon, Caspar Schamberger, sparked a lasting interest in Western medical treatment, herbs and pharmaceutics.[2] His successors at the trading post on Dejima continued to pass on surgical knowledge, which during the 18th century, gradually merged with other western disciplines to form the so-called Dutch studies (rangaku 蘭学).[3]

The birth of Caspar-style surgery (kasuparu-ryûgeka) was influenced by a variety of factors. Schamberger, who was educated in the surgeons' guild of Leipzig and trained on the battlefields of the Thirty Years War, seems to have been a competent surgeon. Considering the formality of the court at Edo, he must also have displayed a greater mastery of etiquette than the average barber-surgeon of his time. In 1631, when Peter Stamper's skills were requested by Shimada Toshimasa, city governor of Edo, Stamper's alcoholism and an incident of theft caused considerable annoyance and distrust towards the medical staff of the Dutch East India Company.[4] The services of trading post surgeons were not requested again until 1650. Thus, Schamberger's personal qualities must be recognized as a significant influence on the subsequent renewal of interest in Western surgery.

Chance also played a part. Due to the serious illness of the shôgun Tokugawa Ietsuna in 1650, a Dutch legation, led by special envoy Andries Frisius, 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 high-level officials suffering from diseases of old age to invite Caspar Schamberger to their residences. Successful treatments brought more patients of rank and name, giving social credibility to the medical practices of the redheads. Subsequently, Schamberger was asked to stay in Edo for another six months following the departure of the Dutch legation. Without this coincidental interest and growing approval by the political elite, the teachings of 'Master Caspar' and his successors at Dejima would have been accepted less enthusiastically in the domains throughout the country.

Political and economic factors played their parts as well. By limiting its external contacts, Japan became heavily dependent on a limited number of trading partners for certain imported goods. Talks on the possible consequences of expelling the Portuguese, held in 1639 between the inspector general, Inoue Masashige, and the imperial councillor, Sakai Tadakatsu, with the Dutch chief of the 'factory' or trading house (opperhoofd) François Caron, show the government's concern for an uninterrupted supply of raw silk, textiles, herbal drugs and medicaments. The adoption of Western medical knowledge during the 1650s is neatly explained within this context of encouraging activities beneficial to the further development of the country, and incidentally to the consolidation of the Tokugawa regime. In addition to medicine and pharmacy, historical sources reveal a similar strong interest of government officials in armaments, astronomy and cartography. As revealed in the loading lists of Dutch ships destined for Japan, throughout the 17th century the supply of medical goods, books and information was never threatened-despite numerous prohibitions, scrupulous controls and severe punishments for transgressing them.[5]

Furthermore, the outstanding contributions of members of the Japanese political elite

should not be ignored. Acceptance of Western knowledge was due largely to the foresight and influence of these particular individuals. Many events and decisions made during the decades before and after Schamberger's stay in Japan cannot be adequately explained without taking into account the influence of imperial inspector general Inoue Masashige, Chikugo-no-kami.[6] Governors of Nagasaki like Matsudaira Jinsaburô, Ushigome Chûzaemon or Kawano Gon'emon and some of the feudal lords like Inaba Masanori, imperial councillor and lord of Odawara also played important roles during the second half of the century.

Therefore, despite the growing restrictions on the flow of goods and information under the first Tokugawa shôguns, the social and political conditions for the introduction of Western surgery were not as bad as they appeared. This small but new wave of change was induced at the top of the Japanese society. From Edo and Nagasaki, cities administrated by the central government, it found its way into the regional fiefdoms. As titles of old handwritings like "secret tradition" (hiden 秘传) and "secret prescriptions" (hihô 秘方) show, initially the new knowledge was kept secret and was handed down only from father to son or favourite disciple. Nevertheless, it spread with amazing speed. For example, one single physician, Kawaguchi Ryôan, the most outstanding adherent of Schamberger's surgery, carried Master Caspar's teaching from Nagasaki to Kyôto, to northern Honshû and even to Shikoku within less than twenty years.[7] Very soon, the growing interest in Dutch treatment methods tore away the veils of secrecy. The "Good Recipes of Dutch Surgery" (Oranda geka ryôhô, 1661) contains only a few Dutch elements. However, a few decades later, the "Collection of secretly Transmitted Surgical Healing Methods of the Redheads" (Kômô hiden geka ryôjishû, 1684) and the "Compass of Dutch Surgery" (Oranda geka shinan, 1696) offered significant teachings of several factory surgeons to the public.[8]

(3) Effects on Other Fields of Study

Schamberger had changed the life of his successors at Dejima. Many factory chiefs at Dejima mention the growing number of inquisitive visitors. Because the short stay of the Dutch in Edo during their annual journey to the court did not allow any systematic instruction, during the late 1650s the feudal lords began to send their personal physicians to Nagasaki[9] Such prolonged visits were difficult, considering the working and living conditions of the European surgeons. Nevertheless, a number of Japanese received instruction for several months, while others with good connections were allowed more or less regular visits to the trading post, even for periods as long as one or two years.

In the old days of Ibero-Japanese intercourse, the catholic missionaries spoke Japanese and many Japanese were versatile in Portuguese, some even in Latin. However, now the Dutch East India Company was not allowed to train its own European interpreters and the abilities of Japanese "Holland-interpreters" (oranda tsûji 阿蘭陀通词) in respect to Western sciences were insufficient. Lacking the necessary medico-pharmaceutical knowledge, the interpreters used to transliterate most of the new terms (Fig. 1). Who among the readers of

熱　エンフラストガラサデイヤ		Emplastrvm Gratia Dei
― セイラ	四十目	R_x Cerae novae,
― コルホウニヤ	四十目	Resinae,
― セイベヱルジネ	四十目	Sevi hircini, ana Vncias quatuor.
― テレメンテイナ	二十目	Terebinthinae Vncias duas.
― メイラ	三匁	Aeruginis,
― マステキス	三匁	Mastiches,
― ヘルテ	三匁	Olibani, ana Drachmas tres.
右煉合ル時ホルトカルノ油少入ル		F[iat] l[ege] a[rtis] Emplastrum

Fig. 1　The wound plaster "Gracia Dei" in a Japanese manuscript (Oranda geka inōhiden, 17th c.) and its original form in the Pharmacopoeia Amselredamensis (1636 edition).

their notes was able to understand such monstrosities as unguentodearuteiya or imagine the properties of a plant called kurokusuorientarisu? Thus, it is not coincidental that the rise of interest in redhead-style surgery was accompanied by the appearance of glossaries[10] and orders for Western herbal books.[11]

Most of the plasters and ointments required ingredients that were not available in Japan. They had to be procured by the Dutch, but the East India Company faced considerable difficulties in securing sufficient deliveries of European materia medica at reasonable prices for its own healthcare system in Batavia. Seawater and tropical temperatures took their toll as well, and the time between order and delivery was at least ten months. Therefore, many years before the manager of the Batavian pharmacy, Andreas Cleyer proposed to use certain Asian drugs instead of expensive European shipments,[12] the Japanese started to look for local herbs as cheap substitutes for imports. Once a year, the factory staff were allowed a day trip through the town of Nagasaki and the surrounding mountains. On many of these occasions, the Japanese companions tried to identify new herbs or learn more about the properties of useful local plants. Gradually the collecting of herbs became the official reason for these annual excursions.

Possibly because most of the factory surgeons turned out to be non-experts on botany, in 1667 the Nagasaki governors Matsudaira and Kawano conveyed an official request for seeds and seedlings and for the dispatch of a person experienced in medical herbs and the distillation of medical oils.[13] They pointed out that this was the wish of the shōgun and imperial counsellors.[14] Successively, two pharmacists, Godefried Haeck and Frans Braun, came to Japan in 1668 and 1671. Both gave extensive instructions on local and imported plants. Reports drawn up by the interpreters show Latin and Dutch names, botanical properties, information of growing techniques and their usage in medicine. Eventually some of these reports also found their way into printed books (Fig. 2). In 1671, the East India Company delivered a Western still. At the expense of the Japanese government, a small

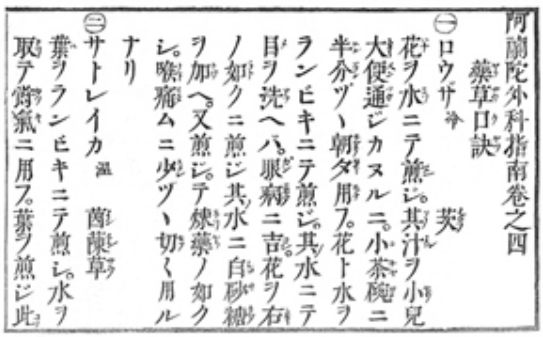


Fig. 2 Description of herbs going back to the instructions of pharmacist Godefried Haek in 1669 (Oranda geka shinan, 1696. Collection W. Michel).

house was built in a corner of Dejima and the distillery was set up.[15] Six interpreters translated the instructions given by Braun in spring 1672 and sketched the equipment (Fig. 3). Their report was copied so frequently it must have become known throughout the country.[16]

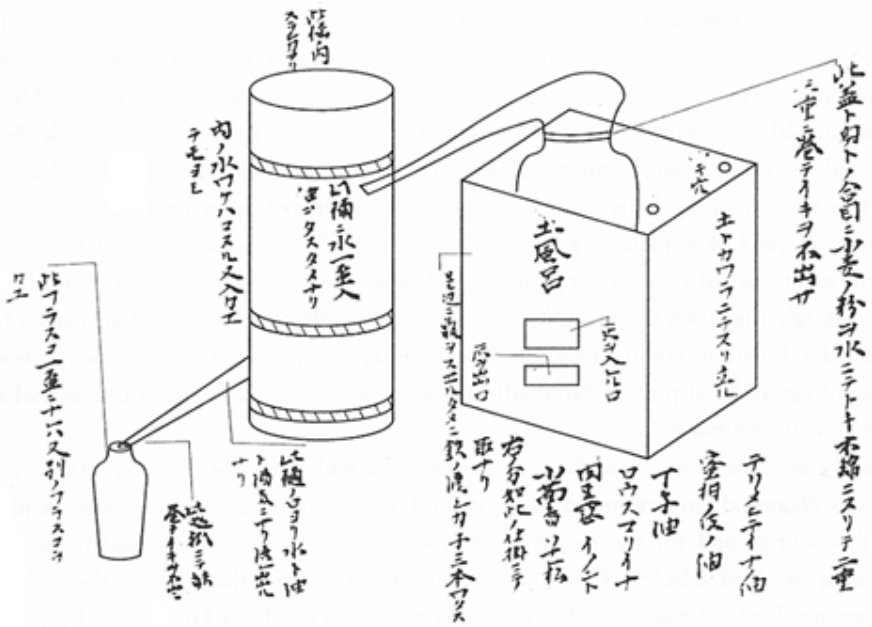
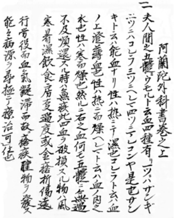


Fig. 3 Japanese sketch of a still used on Dejima during the 1670s to produce pharmaceutical oils (Oranda-ryû abura torihô, 17th c. manuscript. Collection W. Michel).

Another strong indication of the breakthrough of redhead-style surgery can be observed

in the late 1650s, when a physician Hatano Gentô who was leaving for Edo, asked for a certificate to prove that he had been educated by a Dutch surgeon.[17] Several such certificates were issued until the mid-eighties, some of which still survive.[18] They usually consist of the Dutch certificate itself, written and signed by the Dejima surgeon and an appended Japanese translation together with a Japanese outline of the acquired knowledge and the sealed signatures of six to eight reputed "Holland interpreters" (Fig. 4).


阿蘭陀外科書巻之上

二 夫人間之五體ニウモルト云血四種有リ一ツニハサンギ

ニツニハコレラ三ツニヘレマ四ツニメランコリヤ是也サン

キトスハ能血ナリ性ハ熱ニテ濕也コレラト云ハ血

ノ上澄薄血也性ハ熱ニ而燥ヘレマト云ハ血ノ肉之

水也性ハ寒ニ而燥也然ルニ右之血何モ五體ニ無過

不及順還スル時ハ無疾此四血ヲ破損スル物ハ風

寒暑濕飲食房事過度或金瘡折傷遠

行苦役而血氣凝滞而故ニ痛疾腫物ヲ發ス

能々病源ヲ尋極テ療治可仕也

Fig. 4 Outline of humoural pathology in a text on Caspar-style surgery (Oranda gekasho, 17th c. manuscript. Collection W. Michel).

In 1673, the central government appointed Nishi Genpo alias Kichibei, a Dejima interpreter as Portuguese interpreter and Western-style surgeon at the court in Edo.[19] This was the first appointment of its kind and no doubt an excellent choice. In 1650, the young and promising Nishi had come to know Schamberger and in the following decades, while making a career as a talented interpreter, he had dealt with Western surgery under many of Schamberger's successors. His surgical certificate, issued in 1668 by Arnout Dircksz, states that he "had participated for long years in the medical practice of Portuguese padres and the Dutch" and "exceeds all other Japanese doctors".[20] By this time, Japanese physicians in all regions had set up redhead-style schools, and began to grant certificates to qualified disciples in their own right.

Throughout the 17th century, it was always the Japanese who took the initiative,

requested information, placed orders, and selected, accepted or rejected what the East India Company had to offer. Thus, it is surprising that the developments that characterized the 18th and 19th century did not occur earlier. However, closer scrutiny shows that the Japanese still had a number of reservations about Western medicine.

(4) Limits of 'Redhead-Style Surgery'

Western surgery in 17th century Japan did not go beyond low-level or minor surgery (chirurgica minora). This is not surprising in view of the limited professional training of the East India Company surgeons, although, even in this small field, the Japanese confined themselves to specific tasks.

The same subjects are dealt with repeatedly in the manuscripts from the period: plasters, ointments and the treatment of wounds and fractures. 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, still practised in the West in the early 19th century, were abhorred by the Japanese.

In addition, there is no evidence of human anatomy studies, which were considered very important not only at European universities but also in the training of apprentices by the guilds. When Cornelisz Herls wrote an Examen der Chyrurgie (Middelburgh, 1645, 1663) for young surgeons aspiring to an appointment with the East Indian Company, he used more than two thirds of his book to discuss human anatomy. Any European surgeon on Dejima asked for instructions must have started in the way he was taught, namely describing the fabric of the body. However, Japanese manuscripts based on the teachings of Caspar Schamberger and his successors contain only a few names of bones and a small number of minor remarks on nerves, arteries and veins on a "thin skin around the brain" and the "skin between the chest and abdomen."[21]

In his study on popular imagery in later Edo Japan, T. Screech demonstrates how exposure to Western optical equipment, such as lenses, mirrors, and magnifying glasses, had a profound impact on Japanese notions regarding the faculty of sight. The growing interest in human anatomy is regarded as closely related to this process.[22] A similar exposure to optical instruments can already be observed during the second half of the 17th century too. The invoices of Dutch ships heading for Japan show the delivery of mirrors, magnifying glasses, spectacles, and telescopes.[23] These should have had some influence at least on physicians. Nonetheless, there is almost nothing in the old manuscripts that indicates a changed attitude towards the human body.

There is only one single exception. Presumably during the 1670s or 1680s, Motoki Ryôi (1624～1697), an interpreter with a strong interest in Western surgery made a Japanese version of a Dutch edition of Johann Remmelin's Pinax Micro-cosmographicus. The text itself mainly consists of the names of the body parts to be seen in the illustrations. Here we can observe the considerable efforts of Motoki to grasp unknown or unfamiliar objects.

Remmelin's illustrations are unique, with layers of paper pasted at one end to form a sequence of doors that allows the reader to open up the body and look at its inner organs. Hara Sanshin, a physician to the feudal lord in Fukuoka, who had received a Dutch certificate in 1685, made copies of Motoki's version,[24] and perhaps one or two of the existing manuscript copies date from the 17th century. Nevertheless, Motoki's translation had no impact during this period. One cannot rule out that he himself did this purely out of curiosity. It took more than nine decades for the time to become ripe for understanding the scientific value of Motoki's manuscript, which was finally printed in 1772.[25]

Despite the basic flexibility and openness of the Japanese mind, the impact of Western medicine remained limited for many reasons. One is the dramatic deterioration of Euro-Japanese communication since the expulsion of the Iberians. Until the end of the 17th century, the language skills of most of the Japanese interpreters were adequate only for business negotiations, not for reading scientific books. This meant that everything had to be explained and demonstrated by the surgeons. As remarks in the factory diary show, such instructions required the presence of all interpreters and were a nightmare for everyone involved.[26] Even concrete terms depicting drugs, plants or medicines had to be noted in Katakana syllables conveying merely their pronunciation. Sometimes it took decades until these names were substituted by "real" Japanese translations. Thus, it is no wonder that the more abstract fields of aetiology and pathology remained inaccessible.

In an isolated instance, based on Caspar Schamberger's teachings, a brief outline was written on the subject of humoural theory (Fig. 5),[27] using terms like umoru, sangi, korera, malenkonya (humour, sanguis, cholera, melancholia) to describe the disequilibrium of bodily humours as the cause of "swellings" (ulcers, etc.). Short annotations to be found between the lines were integrated into the text in later manuscript copies and mixed with Chinese Buddhist terms like tan (痰) that go back to the Indian tridosa.[28] While Schamberger's seventeen plasters and ointments even found their way into late Edo-era texts, his theoretical outline was copied only a few times. For more than half a century, it remained the only text of its kind.

The philosophical foundations of Western medicine remained inaccessible. Ultimately, its reception was limited to a few points, and it failed to diminish the importance of Sino-Japanese medicine. Since educated Japanese could read the literature from China, and Japanese thought had evolved throughout centuries of interaction with China, Chinese ideas could be more readily assimilated. Moreover, to consolidate its power, the new Tokugawa regime actively promoted the adoption of Confucianism, as interpreted by the twelfth-century Chinese scholar Zhuzi or Zhuxi (Shushi) and further developed in Korea, which strongly emphasized submission to authority. The establishment and expansion of libraries and a number of private and feudal clan schools, which created a kind of academic infrastructure, fostered the acceptance of this philosophy.[29] This enhanced the prestige of Chinese medicine, particularly as many Confucian scholars earned their living as physicians.

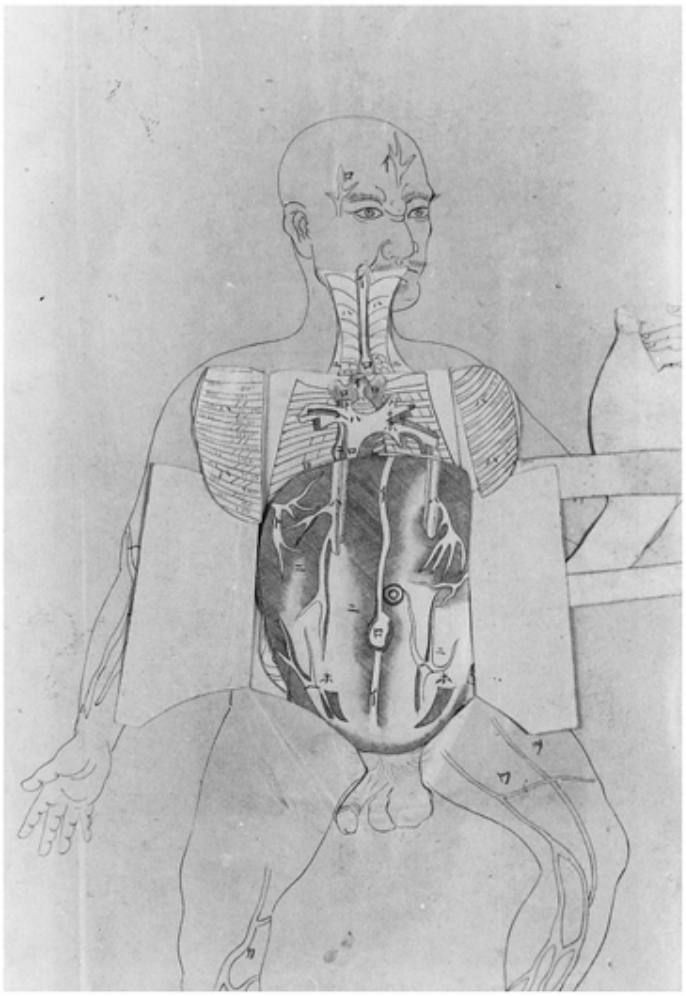


Fig. 5 Japanese Version of Johann Remmelin's Rinax Microcosmographicus. Copy made by Hara Sanshin, 17c. (Courtesy Dr. Keijiro Hara, Fukuoka).

Inevitably, the theoretical basis of Sino-Japanese medicine was accepted even by those open to Western therapies. However, Sino-Japanese medicine attached great importance to cosmic harmony and freedom from bodily harm, leaving little room for invasive surgical measures. Presumably, like elsewhere, Japanese doctors too had the opportunity to look at the internal organs of the seriously injured, but they still ignored such things as the form, colour, composition and position of the stomach, liver or heart, etc. It is not surprising, therefore, that they took little interest in the European surgeons' explanations of human anatomy, which held only a minor place in their theory and day-to-day practise. It would be another hundred years before a Japanese opened up a human cadaver to take a closer look at

its "inner landscapes".[30]

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[26] Michel, Wolfgang: Hans Juriaen Hancko, Zacharias Wagener und Mukai Genshô - Aspekte einer "lehrreichen" Begegnung im 17. Jahrhundert. Hikaku shakai-bunka kenkyû, No. 1 (1995), P109～114. Michel, Wolfgang: Dejima-rankan-i Ansu Yurian Hanko ni tsuite. Gengo bunka ronkyû, No. 7 (1996), P83～96.

[27] Michel, Wolfgang: Von Leipzig nach Japan, P161. Michel, Wolfgang: Kasuparu Shamberugeru to Kasuparu-ryû geka (Ⅰ), P54～59.

[28] Tan first appeared in Shanghan Zabing Lun (伤寒杂病论) to depict a disorder of the cold. The oldest traces of present day usage go back at least to Zhouhou Baiyi Fang (肘后百一方), published in the Liang dynasty. For more on that matter, see Endô, Jirô / Nakamura, Teruko / Yamaki, Hidehiko / Miyamoto, Hirokazu: Tan no kigen Ⅰ. Nihon Ishigaku Zasshi - Journal of the Japan Society of Medical History, Vol. 39

(1993), No. 3, P45～57. Endô, Jirô / Nakamura, Teruko / Yamaki, Hidehiko/ Miyamoto, Hirokazu: Tan no kigen Ⅱ. Nihon Ishigaku Zasshi - Journal of the Japan Society of Medical History, Vol. 39 (1993), No. 4, P83～93.

[29] Cf. Sugimoto, Masayoshi / David L. Swain: Science & Culture in Traditional Japan, P243f.

[30] Jap. 内景 (naikei). For more on that subject, see Yoshida, Tadashi: Anatomy in Rangaku. In: The Japan-Netherlands Institute (ed.): Papers of the Workshop of the Medical exchange Between Japan and the Netherlands, P21～38. Sakai, Shizu: 18-seiki no nihonjin no shintaikan. Yamada, Keiji / Kuriyama Shigehisa (ed.): Rekishi no naka no yamai to igaku. Shibunkaku shuppan, Kyôto 1997, P431～455. Yamada, Keiji: Igaku ni oite kogaku to iu no wa nan deatta ka. Yamawaki Tôyô no kaibôgaku to shokugyô oyobi gakumon toshite no i no jiritsu. Yamada, Keiji / Kuriyama Shigehisa (ed.): Rekishi no naka no yamai to igaku, P457～486. Sugitatsu Yoshikazu: Edo-jidai kaibô no jiseki to sono hankyô. Yamada, Keiji / Kuriyama Shigehisa (ed.): Rekishi no naka no yamai to igaku, P503～544.