TRADITIONAL & KAMPO MEDICINE

REVIEW

Traditional Japanese kampo medicine – History of ideas and practice; Part 1: From ancient shamanic practice to the medical academies of Edo

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ABSTRACT

Background: 'Kampo' is an academic medical tradition that originated from the import of Chinese medical literature and the immigration of trained physicians from China and Korea to Japan between the sixth and 10th centuries AD. Understanding these roots and the subsequent historical development can contribute greatly to a better understanding of kampo today.

Historical development: Although initially developed from continental roots, the Japanese traditions underwent an independent development as kampo practitioners developed their own repertoire of pharmaceutical raw materials by integrating plant drugs from native folk medicine. Innovative independent developments by Japanese physicians over the course of the centuries resulted in an ever increasing emancipation of kampo from China. A second wave of Chinese influence in the 13th century resulted in the development of Gosei School Kampo, which has the closest ties to the continent. During the 16th century, the development of eclectic Sec-chu School Kampo was additionally influenced by European phytotherapy via Portuguese and Dutch contacts. These Europeans provided a reference point (tertium comparationis) that gave Japan a new perspective on Chinese medical practices for the first time. China – although greatly admired – was no longer perceived as the singular ideal civilization but as one civilization among several others. Thus the development of independent Japanese practices in culture and medicine became conceivable for the first time.

Conclusion: The historical developments that have led from these early roots to present day kampo practice are essential for developing a concise understanding of kampo ideas and practice.

KEY WORDS: Fudoki, Gosei School, Kadenyaku, Kojiki, Minkanyaku

PREHISTORIC ROOTS

In Japan, the prehistoric age ended in the sixth century AD when the arts of reading and writing were introduced to the Japanese isles by Buddhist missionaries from China and Korea. These culture techniques were absorbed swiftly so that Japan's native religion of Shinto also started to record its mythology in written form, even if still in Chinese translation, given that the development of a native writing system that could record the Japanese language appropriately took approximately two centuries.

Already in the *Kojiki* (712 AD), the older of the two central books of Shinto scripture, the narratives of which are mostly set in the seventh century BC, some first uses of plants as medicines are recorded. For example, one of the most famous chapters narrates how Okuninushi, among other functions the god of agriculture and medicine, cured a white hare from bites from a dragon attack by washing the open wounds with fresh water and covering them with pollen of bulrush (*Typha latifolia*/Jp. gama) [1]. All in all, however, the number of medicinal plants and applications that appear in Shinto scripture is relatively limited, and most described diseases are treated using shamanistic rituals. Thus, most information on the state of traditional medicine in Japan before its contact with Chinese civilization is derived from the later integration of native plant drugs into the framework of academic kampo medicine.

TRANSFER OF KNOWLEDGE FROM THE CONTINENT

The precursors of this tradition first reached Japan via Korea. One of the first of these transfers of knowledge

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occurred when, according to the Japanese chronicles, the Korean prince Chiso, whose domain had fallen to the invading forces of a concurrent kingdom in the chaotic time of the great Korean civil war of the sixth century instead of receiving military support by Japanese troops, took exile at the imperial court in 562 AD [2]. On his arrival in the imperial residence, he presented the emperor with 164 volumes of medical and pharmaceutical books, including central works of ancient Chinese medicine (ACM) such as the *Shanghan Lun* (Jp. Shokanron/Eng. Essay on Cold Damages), the *Huangdi Neijing* (Jp. Koteidaikei/Eng. The Yellow Emperor's Book on Internal Medicine), and first and foremost the *Shennong Bencao Jing* (Jp. Shinnohonzokyo/Eng. Herbal of the God of Agriculture), all of which would later play an important part in the development of kampo in Japan. The *Shennong Bencao Jing* is the earliest existing pharmacopoeia of China, describing 365 drugs of mostly plant origin. The value that the early Japanese ascribed to this knowledge is apparent from the fact that the young son of Prince Chiso who was brought up in Japan would later serve as the grand pharmacist of the imperial court.

In the coming decades, numerous Buddhist missionaries arrived on the Japanese islands and were welcomed as transmitters of technological and medical knowledge from the continent. Especially the imperial prince and regent Shotoku (573–621 AD) supported the establishment of monasteries in the vicinity of the imperial residence, close to the present metropolis of Osaka, advising the monks not only to cultivate medicinal plants but also to produce ready-made drugs for the people. In the year 598, the regent gave orders to the regional bureaucracy to collect the most important local medicinal plants for cultivation in special public herb gardens [2]. Already in 607, the Japanese government started to send students directly to China in order to acquire knowledge of politics, technology, and medicine. In the year 611, the reigning empress Suiko personally led an expedition of several hundred court members to Uda (approx. 60 km east of Osaka) in order to collect medicinal plants (Fig. 1).

Fudoki: The oldest information on medicinal plant cultivation in Japan

Only a few years later, a medical school was established at the imperial court that offered an extensive 9-year-long education program for training medical specialists. Its curriculum consisted mainly of literature imported from the contemporary Chinese Tang dynasty, most of which was available only in the Chinese original. It can therefore be assumed that academic medicine in Japan in this age was practically identical to the forms of Chinese medicine that were prevalent on the continent at the time. The repertoire of plant drugs used by the doctors of this age can be at least partially deduced from the so-called *Fudoki*, encyclopedic reports on the state of affairs in the Japanese provinces that were requested and collected by the central government in the eighth century. Mostly dealing with the topic of regional cultural and religious traditions as well as provincial economies, some Fudoki contain lists of agricultural products that are explicitly referred to as crude drugs for medicinal use. For example, the Fudoki for the region of Izumo in the extreme west of the Japanese northern coast list for the year 733 the following medicinal plants that are still used in kampo today: *Paeonia suffruticosa* bark (Jp. botanpi), *Paeonia lactiflora* root (Jp. shakuyaku), *Gardenia jasminoides* fruits (Jp. sanshishi), *Zanthoxylum piperitum* fruits (Jp. sansho), and *Gentiana scabra* root (Jp. ryutan) [3].

CRISIS OF CHINESE STYLE MEDICINE IN JAPAN AT THE END OF THE HEIAN ERA: DEVELOPMENT OF AN INDEPENDENT TRADITION

The system of the imperial medical academy based on Chinese models, however, was soon caught in enormous difficulties due to a series of severe planning mistakes: the doctors working in this institution as well as in the imperial hospitals at the residence were officials of the state, so that their treatments were, at least theoretically, free of charge for everyone. The patients had only to apply for an appointment and wait until a doctor was free. The waiting lines, however, were organized according to social class, so that from the imperial family down to the common worker patients were treated only when the waiting lists for patients in higher classes had emptied out. Given that both the medical school and the state hospital at the residence were chronically underfunded, the number of enrolled physicians steadily decreased so that less than a century after its foundation only family members of government ministers had any realistic chance to get an appointment. In the provinces the number of medical doctors who had studied at one of these institutions was understandably even lower. It therefore seems clear that the system of academic medicine that was imported from China never played any noticeable role for the general public, who seem to have relied exclusively on folk medicine (Jp. Minkanyaku), which was chiefly administered not by doctors but by Shinto priests and Buddhist monks. Traditionally, Minkanyaku was referred to as 'Waho' (Japanese method) – in analogy to the corresponding terms 'Kampo' (Chinese method) and 'Ranpo' (Dutch method/-Western medicine) – and was characterized by the exclusive use of 'Wayaku' (native Japanese plant drugs). The question of whether these treatments were inferior to those of the court physicians, however, is highly debatable. The fact that surviving student registers of the medical academy at the imperial court show for the eighth century an average enrolment of three students per year with vacancies of faculty positions spanning several decades, indicates that beyond the circles of sinophile princes and politicians at the court the

Figure 1 | History painting of the medicinal plant collection excursion of the Japanese Imperial court to Uda, led by female Emperor Suiko on the 5th of May 611. In memory of this event, the 5th of May was later designated as the 'day of medicine of the children' [2]. It is today an official legal holiday as 'children's day' in Japan. (Photo by K. Kuchta. The original oil painting is in the possession of the Naito Museum of Pharmaceutical Science and Industry, Kakamigahara.)

public interest of Heian age Japan (Table 1) in the imported medical system from China was relatively limited [2].

The subsequent Kamakura age started with a long, drawn-out and devastating civil war, in the course of which the imperial medical schools and the public hospitals were shut down. They would never open again. In this era, the professional practice of academic medicine based on imported Chinese knowledge fell almost entirely into the responsibility of Buddhist clerics. This development was of greatest importance for the development of kampo medicines because these monks spread the medical knowledge, which was previously concentrated around the few imperial and noble residences, to every monastery in Japan, thus making it available to the general public for the first time. These clerics had close contact with their parish and were more than willing to include empirical knowledge from Minkanyaku into their treatments, thus making a first step from imported Chinese practices to an independent Japanese kampo medicine. Additionally, it was Buddhist monks who were the only Japanese citizens allowed to travel abroad under the military government that was established by Samurai warrior clans, who reduced the imperial court to purely representative functions. Even if these regulations were later somewhat relaxed, it was these monks who brought a new wave of Chinese medical literature to Japan in the 12th century. The end of the Kamakura age with its relatively centralized military government was again characterized by a series of internal armed conflicts between the numerous Samurai clans whose government had fractured into a multitude of technically independent feudal states (Table 1).

ASHIKAGA MEDICAL ACADEMY

Scientific innovations in medieval Japan were mainly due to the personal engagement of individual Samurai lords. Of especial importance was the founding of an interdisciplinary institute of higher education by Lord Uesugi Norizane (1410–1466) in 1432 on the basis of a previously existing small Buddhist monastery school in the city of Ashikaga (70 km north of the present city of Tokyo). This so-called 'School of Ashikaga' dominated academic life in Japan for the next 200 years. Just like the imperial medical academy 500 years earlier, its curriculum consisted entirely of Chinese books. It had, however, a much broader scope – including among others also faculties for Confucian philosophy and politics, Buddhist philosophy, Astrology and Astronomy – and was granted by Lord Uesugi a large financial fund under the management of Buddhist monks with the provision that the dividend should be used for continued operation of the school, with the special requirement that its curriculum should be constantly kept up to date [2,4].

Another important development was the growing importance of field surgeons, who gained increasing influence in the development of medicine in Japan as a whole during the constant conflicts between the Samurai clans. This development also continued another important step away from Chinese practice, where surgical operations never became mainstream [2]. In this respect, the medical establishment at the end of medieval Japan was actually closer to its contemporary European equivalents than to the respective Chinese developments.

At the same time, medical practice in China itself slowly diverged from its historic roots into a completely different

Table 1 | Timeline of Japanese history. In this context, the term "Capital" denotes the main residence of the emperor (who - unless noted otherwise - mostly fulfilled only a ceremonial and religious role as in the present), whereas "Seat of government" denotes the actual seat of temporal political power

Years	Age		Ruler	Capital	Seat of Government
900 BC–250 AD	Antiquity	Yayoi	Local clans	—	—
250–538		Kofun	Imperial House		
538–710	Classic	Asuka		Asukakyo (now Asuka)	Asukakyo (now Asuka)
710–794		Nara		Heijokyo (now Nara)	Heijokyo (now Nara)
794–1185		Heian		Heiankyo (now Kyoto)	Heiankyo (now Kyoto)
1185–1333	Middle Ages	Kamakura	Minamoto and Hojo Clans	Kyoto	Kamakura
1333–1467		Muromachi	Ashikaga Clan		Kyoto
1467–1573			Diverse feudal lords in civil war		
1573–1603		Azuchi-Momoyama			
1603–1868	Early Modern Age	Edo	Tokugawa Clan		Edo (now Tokyo)
1868–1912	Modern Age	Meiji	Imperial House	Tokyo	Tokyo
1912–1926		Taisho			
1926–1945		Pre-war Showa			
1945–1989	Present	Post-war Showa	Parliamentary Monarchy		
1989–today		Heisei			

direction than in Japan. From the early days of Chinese civilization until the overthrow of the Song dynasty during the Mongol invasion of China, the traditional medical knowledge developed mostly undisturbed as ACM. During the Mongol rule in China and even more so under the subsequent Ming and Qing dynasties, traditional medicine in China developed away from the pure accumulation of empirical knowledge that had characterized ACM, but emphasized the organization of treatments and medicines in accordance with theoretical, philosophical considerations such as the 'five elements'. This period, which can be referred to as classical Chinese medicine (CCM), lasted until the overthrow of the Qing by the revolution of 1912, and the subsequent abandonment of traditional medicine and its replacement with modern biomedicine by the new republican government. Only after the catastrophic health crisis in the wake of the Cultural Revolution was traditional medicine rediscovered by the Chinese government and actively promoted as an alternative to the modern biomedicine of the West. Traditional Chinese medicine (TCM), which has been promoted ever since, constitutes a patchwork of practices from ACM and CCM that have been reconstructed from books and by the few surviving doctors of China's cultural catastrophe during the first four-fifths of the 20th century.

EARLY CONTACT WITH EUROPE

In addition to these developments, the long civil war that marked the end of Japan's Middle Ages also witnessed the first direct contact with Western culture and Western medicine when, in 1549, the Basque Jesuit missionary Francis Xavier opened a mission station on the northern coast of Kyushu, which also included a hospital. In 1551 the leadership of the Jesuit mission was transferred to the Portuguese padre Louis Almeida, who left most clerical functions to his assistants and instead invested more and more work into the hospital, where he treated patients together with a traditional Japanese physician known only by his Christian given name, Dr Paul. Given that this new style of foreign medicine inspired great interest with the Japanese doctors, the Jesuit hospital developed more and more into a medical school where Almeida taught European medicine to Japanese doctors while combining his treatments with native drugs that he learned about from his Japanese colleagues. In 1568, the Catholic Church managed to obtain a license to construct a cathedral in the contemporary imperial capital Kyoto, as well as a monastery with a cultivation center for European medical plants on the slopes of mount Ibuki to the east of the city. The establishment of this garden may also be rooted in one of the first setbacks that the Jesuit mission to Japan suffered at this time, due to the fact that the leadership of the order in Europe gave out an order that no member should perform surgical operations, meaning that the mission hospitals had to delegate these treatments to converted Japanese layman doctors, with the missionaries limiting themselves to drug therapy [2,5].

The Jesuit engagement in Japan came to a sudden end when, in 1600, the long civil war ended with the victory of the Tokugawa Samurai clan, who tried to reverse the religious demographics of the country and the status of

European contact back to the condition before the civil war, by starting a massive 250-year-long persecution of all traces of Christianity in the entire country, during which only a few congregations survived in hiding until the middle of the 19th century. In 1633, the last rector of the Jesuit mission in north Kyushu, Christovao Ferreira, was forced under torture to convert to Buddhism. In the following years he worked under the Japanese name Sawano Chuan as a leading translator of Portuguese books (including several volumes on medical and pharmaceutical subjects) into Japanese. Although Japan had cut almost all contact with the West in the Tokugawa age, it was possible for Ferreira's pupil Handa Junan to study medicine at the Jesuit University of Macao in Portugal's colonial possession in South China. After his return to Japan, he became a famous doctor and the line of his pupils continued until the 19th century [2,5].

Whereas the amount of actual European plant drugs and treatment practices that were absorbed into kampo remained relatively small, its overall effect on the cultural development of kampo medicine must not be underestimated: for the first time, Japanese doctors had come into regular contact with a tradition of academic medicine that had developed independently from the Chinese one. The Europeans thus provided a reference point (tertium comparationis) that gave their Japanese counterparts a new perspective on Chinese medical practices for the first time. China, although still admired, was no longer perceived as the singular ideal civilization of man but as one civilization among several others. Thus, the development of independent Japanese practices in culture and medicine, on par with the Chinese ones, became conceivable for the first time [6].

TRADITIONAL MEDICAL EDUCATION IN THE TOKUGAWA AGE

The Tokugawa clan would rule Japan for the rest of the so-called Edo era (1603–1868), during which kampo medicine would finally develop its present identity. Although monasteries and shrines continued to play an important part in public health care, they started selling ready-made medication, which was now even further influenced by folk medicine, for financial profit, a practice that soon led to the development of commercial kampo physicians. In contrast to the centrally organized medical school and hospital of Heian Japan, these doctors were organized similarly to craftsman guilds, and mostly studied in a master–apprentice system. The apprentice would assist the master in treatment and therapy as well as read and copy all his books. Further education could be pursued at the numerous public schools that were joined to the residences of most of the regional Samurai lords. Of these, the medicine school of the Kishu domain (now Wakayama) was especially prestigious and had a strong focus on the education of medical doctors and pharmacists.

The Edo Igakukan, the 'hall of medical learning in Edo' has to be mentioned separately. It was a very prestigious medical school run directly by Tokugawa shogunate. At the end of the 18th century, it was equipped with an institute for the history of pharmacy and medicine, which systematically collected old literature, namely the most ancient works of ACM as well as written recipes of folk medicine, which were supposed to serve as an orientation and inspiration for contemporary doctors. The Edo Igakukan thus edited and published many classical medical texts and even rediscovered and restored several previously lost Chinese medical and pharmaceutical works from before the Tang dynasty. With the sole promotion of Western medicine in the Meiji age, the Edo Igakukan was shut down and its extensive collection of books passed into the ownership of the professors, who were forced to retire. In the following decades, these books began to circulate in antique shops. It was mainly through the engagement of the Chinese diplomat Yang Shoujing (1839–1915) that the main body of this library survived. He systematically collected medical books in Japan and spent most of the rest of his life after his return to China in issuing facsimile reprints of those books that had previously been lost on the continent. In later decades, these Japanese books would play an important role in the formation of TCM as we know it today [7].

In addition to the government institutions of medical learning, there were also numerous private medical schools, most of which were centered in either Edo or Kyoto. This enormous increase in academic activities was made possible by the introduction of printing to Japan at the end of the 16th century, both by the Jesuit mission and from Korea. Only printing allowed the multiplication of medical and pharmaceutical literature on a scale large enough to keep all of these schools working. Even rudimentary attempts at the establishment of a public health-care system were now relatively successful, leading, for example, in 1722 to the establishment of a public hospital in Edo, where treatment was free for the poor [2].

These developments produced several lines of traditions and schools of thought, which were both in continuous competition with each other but also engaged in fruitful cooperation at times. The three most important lines of tradition – namely the Gosei, Secchu and Koho schools of thought (the last of which will be a major focus of the upcoming installment of this article series) – in kampo medicine continue to this day.

KAMPO DURING THE 'CLOSED COUNTRY' ERA (1639–1854)

The Tokugawa government pursued an extremely isolationist foreign policy, severing all diplomatic and trade relations with all other nations except China, Korea, and the Dutch,

and even with these partners, all contacts were reduced as much as possible. In order to mitigate the negative effects of this policy on the production of medicines, the government initiated a large-scale research program to either cultivate medicinal plants that had previously been imported from China or via the Portuguese domestically, or to replace them with similar native Wayaku drugs from folk medicine. This medicinal plant research and cultivation program was especially vigorously supported by Tokugawa Yoshimune (1684–1751), the eighth ruler of the Tokugawa dynasty. This resulted in the compilation of a long list detailing which continental drug could best be replaced with which native species. As time passed, this governmental research program developed far beyond its original scope of resource substitution and brought forth completely new innovations for medicine and pharmacy. The Edo Igakukan developed a system of combined research and teaching, very similar to a modern university, and the aforementioned research program into the history of medicine and pharmacy was also established.

Paradoxically, the aforementioned contact of large parts of the Japanese medical profession with European ideas – which continued even during the centuries of seclusion under Tokugawa rule due to the constant translation of Dutch books – is another important difference to TCM, which never integrated foreign ideas on a significant scale, although the Chinese emperors constantly kept diplomatic contacts with the rest of the world. Tokugawa Japan even imported some drugs that could neither be domestically cultivated nor replaced directly from traders of the Dutch United East India Company, who were for most of the time allowed to live only on the artificial island of Dejima in Nagasaki Harbor. A surviving list from the late 18th and early 19th century lists among others theriac, opium, palm oil, *Strychnos nux-vomica* seeds (Jp. machinshi), *Crocus sativus* stigmata (Jp. bankoka), *Cactus grandiflorus* whole plant, *Cinchona pubescens* bark, *Cephaelis ipecacuanha* rhizome (Jp. tokon), *Ferula assa-foetida* root, and *Digitalis purpurea* leaves [2]. The Tokugawa government hired numerous scientists as so-called Rangakusha, 'researchers of Dutch sciences', who systematically translated books on science, technology, and especially medicine into Japanese.

This age also saw the first influx of medical knowledge from kampo into Europe: in 1678, the Dutch doctor Willem ten Rhijne, who had spent a long time on Dejima as the resident physician, published a book on the medical use of camphor and green tea in Japan. In 1683 he also gave a lecture and demonstration of the practice of acupuncture and moxibustion to physicians in London. The knowledge he brought to Europe from Japan, however, did unfortunately not catch on [2].

GOSEI SCHOOL KAMPO

The oldest line of tradition in Kampo is the so-called Gosei School, which was founded by Manase Dosan (1507–1594; Fig. 2). Given that both his parents had died in his infancy, he was raised by Buddhist monks in the orphanage of a Zen monastery and later became a monk himself. In this function he enrolled in the aforementioned Ashikaga academy as a student of Buddhist philosophy in 1528. In this highly interdisciplinary institution, however, he became more and more interested in medicine and soon changed over to this faculty. After a long time of studying and research work at the academy, he opened a clinic in Kyoto in 1546 that soon became famous throughout the entire country. His patients included several of the most influential samurai lords of his era and even some of the Jesuit missionaries active in Japan at this time. He educated several hundred apprentices and authored several books on drugs, diseases, and therapy.

The name 'Gosei School' can be freely translated as 'school of thought of the later ages'. This name is derived from the large amount of Chinese medical books from the 16th century that Manase Dosan used to develop his teachings at Ashikaga Academy. Consequently, Gosei School Kampo is philosophically relatively close to CCM, also including the concepts of Ying/Yang, Chi, and so on, in the same sense and meaning as its continental counterpart.

Nevertheless, Gosei School Kampo already constitutes the first genuine Japanese form of an academic medicine

Figure 2 | Manase Dosan (1507–1594), Zen monk, medical doctor, and founder of Gosei School Kampo. (This is a photographic reproduction of a 2-D, public domain work of art. The original painting is in the possession of the Takeda Science Foundation, Osaka.)

tradition, because Manase did not merely copy Chinese books but wrote an academic canon of his own, in which he combined diverse source material from previous Chinese and Japanese books into one much more systematic body of texts, which should stay the standard for medical education in Japan for the next 200 years, superseding the earlier Chinese books. His most prominent individual work was the Keiteki Shu, in which he introduced the system of 'Sassho Benchi', the systematic and highly individualized combination of plant drugs for the therapy of individual patients based on contemporary CCM, to Japan. He preferred to systematically select each raw drug one by one, instead of relying upon a standardized basic prescription for later individual modification, although the latter method was common in CCM at the time. This system is close to 'pattern identification/syndrome differentiation and treatment', the diagnostic system of current standard TCM. Gosei School Kampo also made use of an exceptionally large body of pharmaceutical raw materials including many native drugs never used in China. He also contributed to the cultural foundations of many later developments in Kampo medicine, and his own life story can be seen as symbolic of the departure of medicine from the monasteries to commercially working doctors and the establishment of the master–apprentice system. Last but not least, it was mainly Manase Dosan who founded the tradition of systematically collecting case reports as guidelines for the use of drugs for future generations. This practice should be a guiding principle for all further schools of kampo thought that followed.

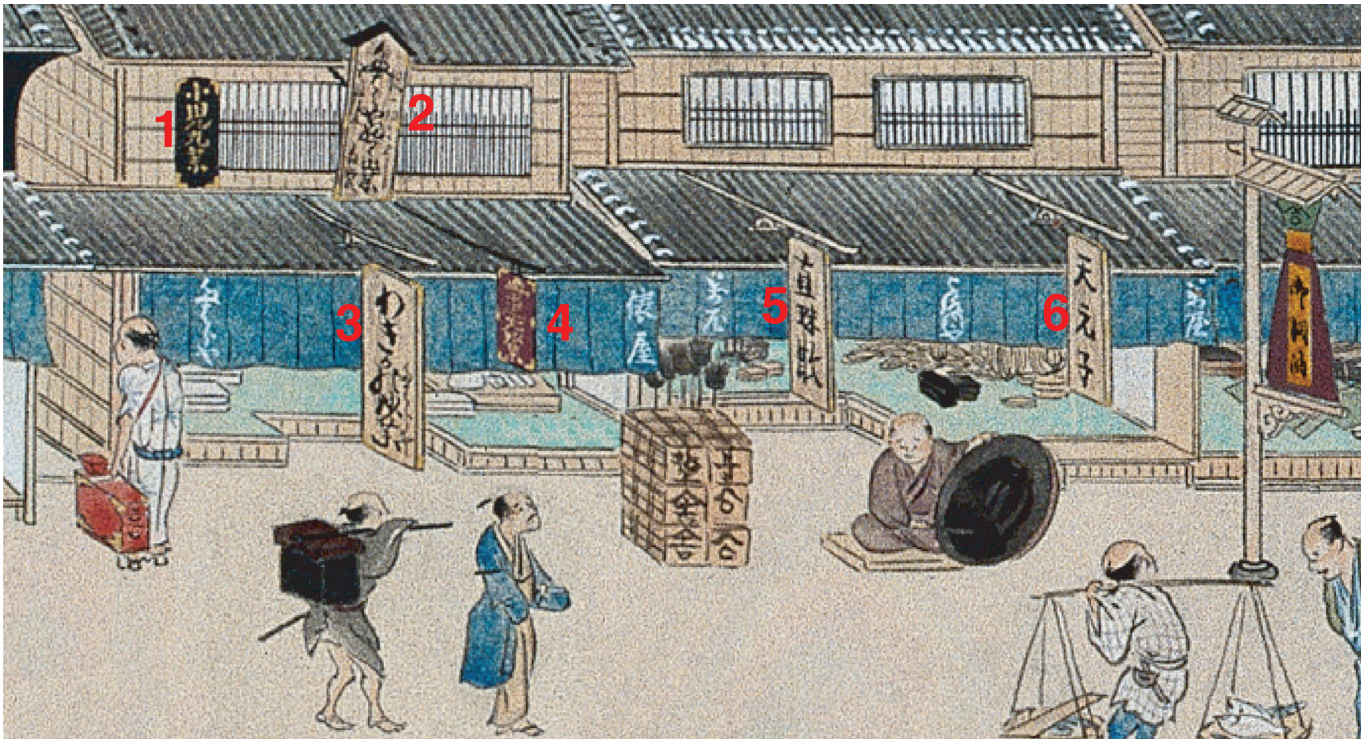

Figure 3 | The contemporary painting *Kidai Shoran – A Splendid View of Our Prosperous Age*, housed in the Asian Art Museum (Berlin State Museums), depicting a shopping street in Edo (now Tokyo) in the year 1805. It gives us a direct view of the state of pharmacy and medicine in Japan during this period. In the background on the left we see the Pharmacy Tawaraya with the following advertising signs: (1) Shonin ganyaku →'Pills for Children (designates a specialized pediatric pharmacy); (2) Kaze issai ni yoshi → Good Against the Common Cold; Tawaraya furidashigusuri → Tawaraya's Medicinal Herbal Tea in Tea Bags for Infusion in Hot Water; Ganso Tawaraya Morinoshi → Founded by Tawaraya Morinoshi; (3) Tawaraya's wakiga no myoyaku → Tawaraya's Special Medication Against Underarm Perspiration; (4) Chinomichi daimyoyaku → Great Special Medication Against Problems During Pregnancy, Menstruations, and Menopause. On the right side of the picture, we see the general store Yorozuya. Next to brooms, tableware and wooden sandals it also offers some medicinal preparations in competition with the pharmacy next door: (5) Shinjusan → An Ophthalmological Preparation; (6) Tengenshi → A Medication Against Stomach Pain. On the left in the foreground of the picture, we can see a medical doctor (wearing a blue kimono) with his apprentice. One of the duties of a medical apprentice in the historical Kampo education system was to carry the doctor's case. Although each doctor could fill the doctor's case with his own medical equipment, the outside appearance was standardized in order to serve as an easy way to identify a medical doctor on the road in case of an emergency. (Modified screenshot from Ehmcke [8]. The original painting *Kidai Shoran* is in the possession of the Asian Art Museum (Berlin State Museums).)

For the two centuries after the life of Manase Dosan, Gosei School Kampo remained the dominant style of medicine in Japan. As time went by, however, growing opposition arose among doctors and pharmacists. This critique focused on two points: first, many of them perceived conflicts between the medical theories that Manase Dosan copied from his Chinese contemporaries at Ashikaga Academy and those that had been imported 1000 years earlier with ACM books from Korea, first and foremost the Shanghan Lun (Jp. Shokanron). Given that these had already been firmly established in Japan with close to a millennium of native experience with the corresponding form of therapy, the new, partially conflicting cultural import from China was greeted with increasing suspicion and rejection. The second and much more fundamental point of critique concerned the nature of the differences between the old and the new texts. The old texts mainly consisted of matter-of-fact descriptions of plants and diseases, and lists naming the drugs and drug combinations that could be used against a specific disease, but without explaining the effects. In contrast, the new books contained large sections of explanations for pharmacological activities in the philosophical framework of Ying/Yang, Chi, and so on, which were rejected by rationalist academics. The practice of Sassho Benchi also proved very complicated in clinical practice, which led to the adoption of a 'basic prescription with modifications' approach by more and more Gosei School doctors over time.

WORK OF THE KAMPO PHARMACIST IN TOKUGAWA JAPAN

The pharmacists of Tokugawa Japan were organized as guilds (Jp. kumi), which were responsible to the government for internal quality control of their products. Pharmacies in Japan prospered under this system, and on the most famous shopping streets of Edo one in 10 shops was a pharmacy. Even this high number still underestimates the trade volume in medicines, because many of the general stores also sold medicines as a side business (Fig. 3). In order to set their own enterprise apart for the masses, many pharmacists started to specialize. For example, 20% of all Edo pharmacies were pediatric pharmacies, concentrating only on special prescriptions and dosages for babies and young children. Many preparations were produced as 'Nostra' (Jp. myoyaku/secret preparations) according to family recipes in the 'Kadenyaku' tradition [8]. These were also sold by priests at many shrines and temples, mostly combining a significant amount of Japanese folk medicine (Jp. Minkanyaku) with the more Chinese-influenced forms of kampo. One of the inventions of this age that would later spread worldwide is the tea bag, which enables the production of a decoction from a previously exactly weighed amount of plant drugs without the need to filter the rest of the drug materials out of the resulting liquid extract (Fig. 3).

These developments clearly demonstrate that the medical doctors and pharmacists of the Edo age were very innovative and productive, laying the groundwork for many further developments that will be discussed in the following installment of this article series.

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I wish to express my gratitude to the picture copyright holders, who allowed me to use these illustrations, especially also in the context of my earlier publications [9,10]. The copyright and the original painting *Kidai Shoran – A Splendid View of Our Prosperous Age* are in the possession of the Asian Art Museum (Berlin State Museums). Permission for publication is gratefully acknowledged.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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