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Vaccination and the Politics of Medical Knowledge in Nineteenth-Century Japan

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SUMMARY: The adoption of the cowpox vaccine in nineteenth-century Japan has often been seen as a more straightforward development than its introduction to other non-Western countries. However, the research leading to this conclusion has been based primarily on sources written by Japanese practitioners of Western-style medicine (*ranpō*), while the perspectives of Chinese-style (*kanpō*) practitioners, who were more numerous than ranpō practitioners but less likely to have shown immediate enthusiasm for vaccination, have been largely neglected. Kanpō doctors typically learned about vaccination from Chinese rather than European sources and often held an ambivalent attitude toward the vaccine's foreign origins. This article develops an analysis of kanpō writings on vaccination and suggests that skepticism about the vaccine remained widespread for at least a decade after its initial arrival in Japan, providing new insights into both the initial opposition and the subsequent acceptance of the technique.

KEYWORDS: smallpox, vaccine, Dutch studies (*rangaku*), *kanpō* medicine, East Asian medicine, public health, Japanese nationalism

Japan was one of the last countries to receive the cowpox vaccine, but the practice of vaccination spread with remarkable rapidity after the first vaccinations were carried out in Nagasaki during the summer of 1849.

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Twenty-five years later, when the Meiji government's newly established Bureau of Public Health (*Eisei kyoku*) began to implement a program of compulsory vaccination, the network of practitioners and the widespread acceptance of vaccination that had developed during the intervening period enabled this program to serve as a basis for a successful regime of government-sponsored public health.¹ Since the public health practices of Meiji Japan later served as models for systems of public health implemented in China and Korea, the long-term consequences of the vaccine's arrival in Nagasaki extended well beyond the Japanese archipelago, and an accurate description of the early stages of the vaccine's adoption in Japan thus has important implications for our understanding of the development of modern medicine throughout nineteenth-century East Asia.²

In her recent studies of vaccination in the late Tokugawa and early Meiji periods, Ann Jannetta has proposed two factors that were particularly important for promoting acceptance of the vaccine. First, the delayed arrival of the vaccine meant that the accumulated experience of vaccination in other countries enabled advocates to present a convincing case for its adoption even before the vaccine had become available in Japan; second, the fact that vaccination was introduced not by foreign doctors but by Japanese practitioners of Western medicine (*ranpō*, lit. "Dutch medicine") meant that the vaccine appeared less threatening than in other parts of the world where it was introduced by European colonizers.³ According

1. Important studies of vaccination in nineteenth-century Japan include Soekawa Masao 添川正夫, *Nihon tōbyōshi josetsu* 日本痘苗史序説 (Tokyo: Kindai Shuppan, 1987); Brett Walker, "The Early Modern Japanese State and Ainu Vaccinations: Redefining the Body Politic, 1799–1868," *Past & Present* 163 (1999): 121–60; Fukase Yasuaki 深瀬泰旦, *Tennentō konzetsushi: kindai igaku bokkōki no hitobito* 天然痘根絶史: 近代医学勃興期の人々 (Kyoto: Shibunkaku Shuppan, 2002); Ann Jannetta, *The Vaccinators: Smallpox, Medical Knowledge, and the "Opening" of Japan* (Stanford: Stanford University Press, 2007); Ann Jannetta, "Jennerian Vaccination and the Creation of a National Public Health Agenda in Japan, 1850–1900," *Bull. Hist. Med.* 83 (2009): 125–40.

2. Ruth Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (Berkeley: University of California Press, 2004).

3. Jannetta, "Jennerian Vaccination" (n. 1), 130, 139. The resistance to vaccination in colonial contexts has been studied most extensively by historians of colonial South Asia: David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley: University of California Press, 1993), 116–58; Sanjoy Bhattacharya, Mark Harrison, and Michael Worboys, *Fractured States: Smallpox, Public Health and Vaccination Policy in British India, 1800–1947* (New Delhi: Orient Longman, 2005). On vaccination in colonial Southeast Asia, see Annick Guénel, "Lutte contre la variole en Indochine: variolisation contre vaccination?," *Hist. Philos. Life Sci.* 17 (1995): 55–79; Atsuko Naono, *State of Vaccination: The Fight Against Smallpox in Colonial Burma* (Hyderabad: Orient Blackswan, 2009). For an overview of recent historiography on nineteenth-century vaccination around the world, see the

to this account, ranpō doctors' eagerness to implement a technique they had learned about by reading European medical treatises and conversing with visiting European doctors effectively guaranteed a positive reception for the vaccine once it had become available.

Jannetta's analysis, like the extensive body of Japanese historical scholarship on which it is based, emphasizes the positive factors that supported acceptance of vaccination and thus devotes little attention to the writings of those within Japan who were skeptical about the technique or who opposed its adoption. Nevertheless, it would be a mistake to conclude from the later success of the vaccine that skepticism and opposition were insignificant. We have no firm statistics regarding popular attitudes toward vaccination during the nineteenth century, but a number of contemporary references indicate that skepticism was widespread at the time of the vaccine's arrival and persisted for at least the first decade of its use: one vaccination advocate wrote in 1853 that because vaccination had been practiced in Japan only for a short period, many people still viewed it with suspicion; an opponent of the vaccine wrote in 1857 that only one out of ten doctors was in favor of the technique; and as late as 1861, a vaccination advocate lamented that seven out of ten still retained doubts.⁴ These scattered remarks cannot be taken literally as quantitative measures of public opinion, but they present a picture of widespread skepticism that conflicts with the notion that circumstances in Japan at the time of the vaccine's arrival were exceptionally favorable to its adoption. Neither the existence of a network of ranpō doctors nor the successes of vaccination elsewhere in the world were sufficient to persuade a majority of people to accept the technique. Convincing Japanese doctors and patients that vaccination was a reliable method of preventing smallpox required years of local familiarity with the practice.

Historians of vaccination in other contexts have highlighted the tension between simple diffusionist accounts of the vaccine's global spread and the accumulating evidence that vaccination was far from uniform in its local manifestations.⁵ Local cultures did not merely "receive" the

articles collected in the spring 2009 issue of *Bull. Hist. Med.*, in particular the introduction by Sanjoy Bhattacharya and Niels Brimnes, "Simultaneously Global and Local: Reassessing Smallpox Vaccination and Its Spread, 1789–1900," *Bull. Hist. Med.* 83, no. 1 (2009): 1–16.

4. Anon., *Hi hitō ben* 非非痘辨 (MS, 1853), Yamasaki Collection, Juntendō University, Tokyo (hereafter JUYC) 10525; Ikeda Zen'an 池田全安, *Gyūtō hi seitō ron* 牛痘非正痘論 (1857), JUYC 10532, 1a; Tōyama Ken 遠山謙, *Intō bengi* 引痘辯疑 (1861), Kyōu Shooku, Takeda Science Foundation, Osaka, *ken*-3178, preface, 1a. See also Tasaki Tetsurō 田崎哲郎, *Zaison no rangaku* 在村の蘭学 (Tokyo: Meicho shuppan, 1985), 66.

5. See the review in Bhattacharya and Brimnes, "Simultaneously Global and Local" (n. 3).

vaccine, but rather transformed it by adapting its material practices to their own circumstances and interpreting the significance of these practices in accordance with their respective outlooks. Much of this recent scholarship has been informed by the methodological insight that we can understand the reception of a new medical technology only by examining the full range of relevant contemporary discourse, paying attention to the voices of those who opposed the technique as well as those who argued in its favor.

Historians of vaccination in Japan, by contrast, have so far based their accounts primarily on sources written by the ranpō practitioners who were the most active early adopters of the new technology. They have devoted much less attention to the perspectives of the Japanese practitioners of “Chinese medicine” (*kanpō*), who were more numerous than their ranpō counterparts but were less likely to show immediate enthusiasm for the new technique. Yet as the early vaccinators themselves were aware, acceptance of the vaccine in Japan ultimately required persuading not only those who were already convinced of the value of Western medicine but also the large number of doctors and members of the general public who continued to think about health and disease in terms derived from *kanpō*.

At the time of the vaccine’s arrival in the summer of 1849, not only the majority of Japanese doctors but also the official policy of the Tokugawa shogunal government (*bakufu*) strongly favored *kanpō* rather than ranpō medicine. Just three months before the arrival of the vaccine, the *bakufu* had instructed doctors with official appointments not to use ranpō techniques other than those related to surgery or eye medicine, and it did not officially reverse this policy until 1858.⁶ Some domains followed a policy more favorable to the adoption of Western medicine, but surveys conducted in the early Meiji period show that even in areas formerly belonging to these domains practitioners of Western medicine constituted only around half of all practicing doctors.⁷ In Japan as a whole at the beginning of the Meiji period, doctors claiming to practice Western medicine constituted fewer than one-fifth of the total.⁸ In order to understand Japanese perceptions of the cowpox vaccine at the time of its introduction, it is thus essential to look beyond the writings of the committed ranpō doc-

6. *Tokugawa kinrei kō goshū* 徳川禁令考後集 (Tokyo: Yoshikawa Kōbunkan, 1931), 2:379–80, 5:592.

7. Christian Oberländer, *Zwischen Tradition und Moderne: Die Bewegung für den Fortbestand der Kanpō-Medizin in Japan* (Stuttgart: Franz Steiner Verlag, 1995), 44–50.

8. Ellen Gardner Nakamura, *Practical Pursuits: Takano Chōei, Takahashi Keisaku, and Western Medicine in Nineteenth-Century Japan* (Cambridge, Mass.: Harvard University Asia Center, 2005), 99.

tors who have been the focus of most existing research and to examine how kanpō doctors, as well as those who adopted an eclectic combination of kanpō and ranpō ideas and therapies, understood the nature of smallpox and learned about vaccination through reading Chinese as well as European sources.

This article aims to address two neglected aspects of the early history of vaccination in Japan. First, it examines how kanpō doctors thought about smallpox and used Chinese sources to learn about the vaccine before the first successful vaccinations in Nagasaki. Second, it considers the reasons why some Japanese doctors initially opposed the adoption of the vaccine, both by examining the rationales presented in surviving antivaccination pamphlets and by analyzing evidence that early Japanese vaccination practices were not as reliable as historians have tended to represent them. I conclude by sketching an account of the subsequent path toward acceptance of the vaccine that acknowledges the continuing importance of kanpō and takes into account the widespread skepticism the vaccine encountered during its first decade of use.

The Intellectual Background of Opposition to the Vaccine

Tokugawa kanpō doctors generally explained the symptoms of smallpox as the eruption of an innate poison present in patients' bodies at the time of birth. Once the poison had erupted, triggered by causes such as improper diet, "fright," or epidemic *qi*, the normal development of the disease was thought to result in complete expulsion of the poison from the body. This understanding of the nature of smallpox thus provided a plausible explanation for the observation that most people contracted smallpox only once during their lifetimes. Techniques used for treating smallpox varied widely, ranging from the "cooling" therapies associated with the Chinese doctors Qian Yi and Zhu Zhenheng to the "warming" therapies associated with Chen Wenzhong and Nie Shangheng, but Japanese doctors typically adopted a combination of these approaches by discriminating among different types of smallpox associated with heat, cold, depletion, or repletion.⁹

9. For overviews of the history of smallpox in Japan, see Fujikawa Yū 富士川遊, *Nihon shipppeishi* 日本疾病史 (Tokyo: Heibonsha, 1969); Ann Jannetta, *Epidemics and Mortality in Early Modern Japan* (Princeton: Princeton University Press, 1987), 61–107. For overviews of the history of smallpox in China, see Chia-Feng Chang, "Aspects of Smallpox in Chinese History" (Ph.D. thesis, School of Oriental and African Studies, 1996); Xiong Bingzhen 熊秉真, *An yang: jinshi Zhongguo ertong de jibing yu jiankang* 安恙: 近世中國兒童的疾病與健康 (Taipei: Lianjing chubanshiye gongsi, 1999).

There was no effective cure for smallpox, and doctors could at most hope to bring about some alleviation of the patient's symptoms. However, they did not necessarily view this limitation as a disadvantage. Since they thought of the symptoms of smallpox as a necessary consequence of the process by which the innate poison was expelled from the body, a patient who failed to experience significant symptoms might be thought to have undergone only partial expulsion of the poison. When advocates of the vaccine claimed their technique could allow patients to avoid experiencing the symptoms of smallpox altogether, skeptical kanpō doctors were inclined to suspect that reserves of the innate poison lingered within the bodies of vaccine recipients and could potentially cause later eruptions of the disease.

The most influential Japanese authorities on smallpox medicine during the first half of the nineteenth century were the doctors of the Ikeda lineage, who served as lecturers at the bakufu-sponsored Igakukan (Medical Academy) in Edo and enjoyed the patronage of domain lords and other prominent members of the Tokugawa establishment.¹⁰ The Ikeda lineage originated from the western Honshū domain of Iwakuni, where their seventeenth-century ancestor had supposedly learned secret techniques of smallpox medicine from the Chinese doctor Dai Mangong, but their national reputation as smallpox doctors began in the late eighteenth century, when Ikeda Kinkyō moved successively to Osaka, Kyoto, and finally Edo, where he took up appointment in 1796 as the Igakukan's first specialist in smallpox medicine. Although the Ikeda lineage had a long tradition of secrecy concerning its techniques of smallpox diagnosis and therapy, Ikeda Kinkyō and his successors Ikeda Mukei and Ikeda Keisui became active in disseminating their learning, publishing books on smallpox medicine ranging from simple home care manuals to detailed specialist treatises.¹¹

Ikeda Kinkyō's first published book on smallpox medicine, *Tōshin imashimegusa* (Advice on smallpox, 1806), offers clues to the intellectual

10. The Igakukan was founded in 1761 as a private medical academy run by the Taki lineage of doctors, who retained the directorship of the academy after it became officially recognized and supported by the bakufu in 1791. Around the turn of the nineteenth century the Igakukan had included ranpō as well as kanpō doctors, but it subsequently became more narrowly focused on philological research and education in the kanpō tradition, and by the time of the vaccine's arrival the Taki doctors were actively hostile toward ranpō. For a survey of the Igakukan's history, see Machi Senjurō 町泉寿郎, "Igakukan no kiseki: kōshō igaku no kyoten keisei wo megutte" 医学館の軌跡: 考証医学の拠点形成をめぐって, *Kyōu* 7 (2004): 35–92.

11. Fujikawa Yū, *Nihon igakushi* 日本医学史 (Tokyo: Nisshin Shoin, 1941), 472–76.

origins of the Ikeda doctors' later opposition to the cowpox vaccine. Unlike many of the later publications of the Ikeda lineage, this manual was written for a popular audience and was mostly concerned with simple practical advice on matters such as foods and activities to avoid while suffering from the disease. However, Kinkyō also warned his readers not to trust the "miracle cures" for smallpox that had become fashionable during the late eighteenth century, whether these were commercially available pills for preventing smallpox or expensive products imported by Dutch merchants such as narwhal tusks, saffron, or theriac.¹²

Kinkyō also wrote of the unpromising results of his experiments with the Chinese method of variolation, which he soon abandoned because the risks seemed too great and the benefits uncertain. Variolation involved the use of infectious material derived directly from smallpox patients, and even advocates of the technique admitted that it involved the possible risk of fatal illness. The Chinese method of variolation by insertion of infectious matter into recipients' nostrils had been introduced into Japan during the middle years of the eighteenth century, when the Chinese doctor Li Renshan performed a series of variolations in Nagasaki, and it was promoted later in the eighteenth century by the Kyūshū doctor Ogata Shunsaku. The European method of variolation by the introduction of infectious matter into scratches on the skin was introduced by European doctors and ranpō practitioners toward the end of the eighteenth century. Yet although Japanese doctors were aware of their existence, these techniques never gained great popularity within Japan.¹³

When Kinkyō attempted to vaccinate a number of patients by the Chinese method of nasal insufflation, several of his patients became seriously ill and required all of his medical skill to bring them back to health, and one of the patients died despite Kinkyō's best efforts. Others survived the variolation but failed to gain protection against later eruptions of smallpox. Since Li Renshan had written that eight or nine out of ten inoculated patients would experience at most a mild case of smallpox and Kinkyō believed he could obtain similar rates of recovery by treating

12. Ikeda Kinkyō 池田錦橋, *Tōshin imashimegusa* 痘疹戒草 (1806), Fujikawa Collection, Kyoto University, Kyoto (hereafter KyFC), 1:7b–8b, 17a–b.

13. Ōba Osamu 大庭脩, "Ri Ninsan Shutōsho ni suite" 李仁山種痘書について, in *Sekkō to Nihon* 浙江と日本, ed. Fujiyoshi Masumi 藤善真澄 (Suita-shi: Kansai Daigaku Shuppanbu, 1997); Shao Pei 邵沛, "Nitchū ryōkoku ni okeru jintō sesshu hō no hikaku kenkyū" 日中両国における人痘接種法の比較研究, *Nihon ishigaku zasshi* 50, no. 2 (2004): 187–222; Tomita Hidehisa 富田英壽, *Shutō no so: Ogata Shunsaku* 種痘の祖: 緒方春朔 (Fukuoka: Nishi Nihon Shinbunsha, 2005); Jannetta, *The Vaccinators* (n. 1), 20–24.

patients who had contracted smallpox naturally, he saw no reason to adopt the practice.¹⁴ When the vaccine arrived in Japan half a century later, the Ikeda doctors' skepticism was shaped by their long familiarity with the numerous exotic remedies purporting to prevent or cure smallpox and by their knowledge of Kinkyō's experiences with variolation.

We should not assume that the Ikeda doctors' opposition to the vaccine was a foregone conclusion. Ikeda Mukei, who in 1816 had succeeded Kinkyō as the heir to the main branch of the lineage, adopted an eclectic attitude to medicine similar to that of many Igakukan doctors during the early nineteenth century, criticizing the sterile dogmatism of eighteenth-century confrontations over "ancient-style" and "recent-style" formulas, warning against excessive reliance on old books as a source of medical learning, and encouraging doctors to keep an open mind about medical techniques from unusual sources such as the orally transmitted learning of "grandmas and grandpas."¹⁵ He learned about the vaccine's existence from one of Kinkyō's disciples and read treatises on vaccination by the Chinese doctor Qiu Xi several years before these treatises became available in Japanese editions.¹⁶ The ranpō doctor Mitsukuri Genpo, who like many ranpō doctors had received training in kanpō and was familiar with kanpō ideas about smallpox, regarded Mukei as an authority on smallpox and considered asking for his opinion on the possibility of generating vaccine by inoculating cows with matter derived from human patients.¹⁷ Mukei's eventual opposition to the vaccine, like that of other kanpō doctors, should not be dismissed as a symptom of kanpō's inherent inflexibility, but rather viewed as a consequence of specific conditions at the time of the vaccine's introduction.

Nevertheless, there had perhaps been a precedent for the Ikeda doctors' opposition toward the vaccine in the attempt by Ikeda Keisui to suppress publication of Hashimoto Hakuju's *Dandokuron* (Discourse on eliminating poison, 1809), a treatise that sought to overturn the innate poison doctrine of smallpox etiology. Hashimoto proposed that smallpox and a number of similar illnesses were not the result of internal physi-

14. Ikeda Kinkyō, *Tōshin imashimegusa* (n. 12), 1:16a–b.

15. Ikeda Mukei 池田霧溪, *Kansō idan* 閑窓医談 (1813), KyFC.

16. Ikeda Mukei, *Shutō bengi* 種痘辨義 (1858), KyFC, 15b–16a. This source implies that Mukei first read Qiu Xi's *Yin dou lüe* around 1840, presumably either in an edition imported from China or in a manuscript copy made from an imported edition.

17. Asai Nobuaki 浅井允晶, "Mohnike byō juyō no zentei—Ōsaka, Sakai ni okeru Kobayashi Anseki no dōkō wo megutte" モーニッケ 苗受容の前提—大坂・堺における小林安石の動向をめぐって, in *Ronshū Nihon no yōgaku* 論集日本の洋学, ed. Arisaka Takamichi 有坂隆道 and Asai Nobuaki (Osaka: Seibundō, 1993), 1:211–50 (esp. 230).

ological processes but rather contagious diseases transmitted by contact with infected individuals.¹⁸ His argument for the transmissibility of smallpox was based in part on his observation of the custom, found in some rural areas of Japan, of isolating afflicted individuals until the disease had completed its course. The apparent success of this custom in limiting the spread of smallpox, Hashimoto argued, was more readily explained by a contagionist understanding of the disease than by the standard assumptions of the innate poison doctrine. Ikeda Keisui may have been responsible for a local official's temporary confiscation of the woodblocks used for printing Hashimoto's book, but since he made no reference to Hashimoto's ideas in his later published writings his attitude toward these ideas is difficult to evaluate.¹⁹ In any case, even after the woodblocks were released and publication was allowed to continue, Hashimoto's proposal for a new understanding of smallpox etiology won only limited acceptance. As in other parts of the world prior to the rise of germ theory in the late nineteenth century, observational evidence was always sufficiently ambiguous to be consistent with multiple theories about disease causation.²⁰ Most Japanese *kanpō* doctors continued to regard the writings of Chinese doctors who had held the innate poison doctrine as authoritative, and this doctrine was therefore crucial for early understandings of the nature and potential benefits of the cowpox vaccine.

Learning from China and Practicing in Japan

Translated European writings on vaccination helped motivate many of the doctors who were most active in distributing the vaccine after 1849, and it is therefore natural that historical accounts of how Japanese doctors learned about the vaccine have tended to emphasize these European sources of information.²¹ Yet despite the steadily rising popularity

18. Hashimoto Hakuju 橋本伯寿, *Dandokuron* 断毒論 (1809). On Hashimoto's ideas and their historical context, see Fukase Yasuaki, *Tennentō konzetsushi* (n. 1), 370–416; Hartmut Rotermund, *Hōsōgami, ou, la petite vérole aisément: matériaux pour l'étude des épidémies dans le Japon des XVIIIe, XIXe siècles* (Paris: Maisonneuve & Larose, 1991), 211–32.

19. The details of this episode are unfortunately rather poorly documented. For discussion, see Kōzai Toyoko 香西豊子, "Kinsei kōki ni okeru 'densen byō' gakusetsu: 'Ichikawa Hashimoto Hakuju cho *Dandokuron* ikken' no bunseki wo tsūjite" 近世後期における「伝染病」学説: 「市川橋本伯寿著断毒論一件」の分析を通じて, *Nihon ishigaku zasshi* 55, no. 4 (2009): 499–508.

20. Charles Rosenberg, "Explaining Epidemics," in *Explaining Epidemics and Other Studies in the History of Medicine* (Cambridge: Cambridge University Press, 1992), 293–304.

21. Jannetta, *The Vaccinators* (n. 1), 122–27.

of *ranpō* during the first half of the nineteenth century, most Japanese doctors continued to think about medicine in terms of concepts derived from *kanpō* and to place greater trust in Chinese sources of information. Books imported from China thus played an important mediating role in shaping Japanese understandings of the vaccine, and Japanese vaccination advocates adopted a variety of strategies to mitigate concerns about the European origins of the practice.²²

We can understand the attitudes of many nineteenth-century Japanese doctors toward information about the new foreign medical technique by considering the analogous situation of contemporary bakufu officials evaluating information about overseas events such as the First Opium War in China (1839–42). As Katō Yūzō has argued, bakufu officials had access to information through both Dutch and Chinese channels, but since neither of these channels could provide them with entirely reliable information the ability to read the original text of Chinese sources without need for translation and the similarities between the situations of China and Japan meant that Chinese sources of information could sometimes be more influential in determining action, despite their inaccuracies.²³ Bob Tadashi Wakabayashi has developed this argument further, showing that not only bakufu officials but also the broader Japanese public learned about such events through Japanese adaptations of Chinese accounts.²⁴ Knowing about China's problems with opium only heightened suspicions about the vaccine, which like opium was a foreign medicinal substance.²⁵ Reports concerning the cowpox vaccine reached Japan through both Dutch and Chinese sources, but because a majority of doctors were more familiar with Chinese than European medical ideas they often found information from Chinese sources more persuasive.

22. The vaccination advocate Kuwata Ryūsai felt it necessary to deflect attention away from the vaccine's foreign origins, explaining to his readers that "although those who call themselves Dutch medicine doctors (*ran'i* 蘭医) make many errors, we should not look at this and believe that the vaccine is another [error] of this sort." Kuwata Ryūsai 桑田立齋, *Gyōtō hatsumō* 牛痘発蒙 (1849), 7a–8a.

23. Katō Yūzō 加藤祐三, *Kurofune zengo no sekai* 黒船前後の世界 (Tokyo: Iwanami Shoten, 1985), 273.

24. Bob Tadashi Wakabayashi, "Opium, Expulsion, Sovereignty: China's Lessons for Bakumatsu Japan," *Monum. Nippon*, 47, no. 1 (1992): 1–25.

25. Mori Tatsuyuki 森立之, *Gyōtō hitō ben* 牛痘非痘弁 (1852), colophon by Kitamura Naohiro. Kitamura was reacting to well-known verses by the Chinese scholar Ruan Yuan that were printed as a preface to Qiu Xi's *Yin dou lüe* and which drew a contrast between the benefits brought by the vaccine and the harm brought by opium. On Ruan Yuan's poem, see Angela Ki Che Leung, "The Business of Vaccination in Nineteenth-Century Canton," *Late Imperial China* 29, no. 1 (2008): 7–39 (esp. 21–22).

The most important Chinese treatise on vaccination was the Cantonese doctor Qiu Xi's *Yin dou lüe* (Concise account of vaccination, 1817), copies of which reached Japan within a few years of its initial publication in China.²⁶ The first Japanese edition of the Chinese text was printed in Edo in 1846, and a Japanese-language adaptation was printed in 1849. Qiu Xi's treatise spread rapidly to the countryside, where it was read both in these printed editions and in manuscript copies, making it easier to win support for the vaccine among Japanese kanpō doctors who remained skeptical about the value of Western medicine in general, not only by reassuring them that vaccination had proven successful in China but also by presenting a novel account of vaccination in terms of kanpō medical ideas.²⁷

Historians have sometimes denied that ideas had any great significance for the Japanese acceptance of new ranpō techniques like vaccination, claiming that these techniques were “not accepted because they were theoretically better founded, they were accepted for their proven effectiveness.”²⁸ Yet although some early vaccination advocates were indeed content to adopt such a resolutely empirical approach, many others felt it necessary to support their claims by demonstrating their compatibility with accepted medical doctrines.²⁹ One of the benefits of Qiu Xi's treatise was that it provided the necessary link between the unfamiliar practice of vaccination and familiar medical ideas, explaining the significance of the vaccine's bovine origins in terms of traditional Chinese five-phases doctrine and suggesting a parallel between vaccination and acupuncture by indicating specific acupuncture points into which the vaccine should be inserted in order to have its effect.³⁰ It was only later, when vaccination had already come to be widely practiced in Japan, that its value could become a question of “proven effectiveness”; in the period immediately before and after the arrival of the vaccine, when local experience of this

26. Qiu Xi 邱愷, *Yin dou lüe* 引痘略 (1817), reprinted in *Xuxiu siku quanshu* 續修四庫全書, vol. 1012 (Shanghai: Shanghai Guji Chubanshe, 2002). On the history of Qiu Xi's treatise in China, see Zhang Jiafeng 張嘉鳳 [Chia-feng Chiang], “Shijiu shiji chu niudou de zaidihua—yi *Yingjiliguó xinchu zhongdōu qishu*, *Xiyang zhongdōu lun yu Yindou lüe wei taolun zhongxin*” 十九世紀初牛痘的在地化—以《英吉利國新出種痘奇書》、《西洋種痘論》與《引痘略》為討論中心, *Bull. Inst. Hist. Philol. Acad. Sin.* 78, no. 4 (2007): 755–812.

27. Tasaki, *Zaison no rangaku* (n. 4), 67.

28. Harm Beukers, “The Fight Against Smallpox in Japan: The Value of Western Medicine Proved,” in *Red-Hair Medicine: Dutch-Japanese Medical Relations*, ed. Harm Beukers et al. (Amsterdam: Rodopi, 1991), 59–77, quotation on 76; Nakamura, *Practical Pursuits* (n. 8), 151.

29. For an example of a vaccination advocate who asserted the effectiveness of vaccination while refusing to explain the “principles” (*ri*) by which it might operate, see Nishimura Haruo 西村春雄, *Gyūto kaihei* 牛痘解蔽 (1852), Waseda University Library, Tokyo, 10b–11a.

30. Qiu Xi, *Yin dou lüe* (n. 26), 1b–3a.

effectiveness was still lacking, many doctors' willingness to make use of the technique depended in part on these sorts of doctrinal justifications for its use.

The promulgation of Qiu Xi's ideas in Japan owed much to the activities of Koyama Shisei, a doctor from rural Kumano who maintained close relationships with kanpō and ranpō doctors in the nearby cities of Kyoto, Osaka, and Sakai. In 1847, Koyama arranged for the reprinting of Qiu Xi's Chinese text with *kunten* diacritic marks to improve its legibility for Japanese readers; two years later, he sought to make Qiu Xi's message still more widely accessible by publishing his own Japanese-language version, *Hon'yaku intō shinpō zensho* (Translated compendium on the new method of vaccination, 1849). The text of the latter book was not a direct translation, but rather an adaptation that eliminated some of the more technical passages of the original. Qiu Xi had entered into extensive discussions of the effects of the innate poison depending on the organs in which it lodged and had given a correspondingly elaborate justification regarding the selection of acupuncture points into which the vaccine should be introduced, but Koyama abridged these sections and omitted the finer points of Qiu Xi's doctrines.³¹ Koyama remained skeptical about certain aspects of Chinese theories on smallpox, and he may have assumed that any readers interested in such details were probably able to read the Chinese version; he may also have feared that their complexity might discourage less sophisticated readers from adopting the practice. Nevertheless, he sought to encourage acceptance of vaccination among the many Japanese doctors who remained suspicious of Western medicine by associating the technique with Qing doctors and kanpō rather than European doctors and ranpō.

Throughout the middle decades of the nineteenth century, a central paradox of Japanese nationalism was that preserving Japanese civilization from foreign powers required the adoption of foreign technologies that themselves threatened the continuity of the very civilization that nationalists sought to preserve. Before turning to consider the opponents of the vaccine, it will be worthwhile to consider two examples of the strategies by which early vaccination advocates sought to mitigate such concerns: Koyama Shisei's development of an indigenous "vaccine" by inoculating smallpox into cows and Kasahara Hakuō's framing of vaccination through the cultural language of Japanese nativism. These were two very different

31. Koyama Shisei 小山肆成, *Intō shinpō zensho furoku* 引痘新法全書附録 (1849), 1b–2a; cf. Qiu Xi, *Yin dou lüe* (n. 26), 1b–3a.

approaches to solving the problems posed by the vaccine's foreign origins, but they also revealed certain similarities of outlook. Both presumed that Chinese texts and kanpō ideas continued to provide a viable system for thinking about medicine, and both emphasized their symbolic veneration of Ōnamuchi and Sukunahikona, the native Japanese deities (kami) of medicine.³² Koyama and Kasahara's insistence on the need to reconcile the practice of vaccination with nationalistic concerns suggests how readily medical knowledge could become entangled in the turbulent cultural politics of the late Tokugawa period.

Koyama's attempts to create his own vaccine by inoculating smallpox into cows began several years before the arrival of the vaccine in Nagasaki.³³ Other doctors in the Kansai region had attempted unsuccessfully to convert human smallpox to cowpox using similar methods, but Koyama was the only doctor who claimed to have successfully developed a vaccine of his own.³⁴ Koyama went through several rounds of trials before obtaining results that convinced him he had produced true vaccine. He first offered prayers to Ōnamuchi and Sukunahikona and attempted to inoculate cows by means of nasal insufflation using smallpox scabs; however, these cows merely became feverish and failed to develop pustules on their udders similar to those described by Qiu Xi. Koyama then turned for inspiration to Li Shizhen's *Bencao gangmu* (Systematic materia medica, 1596), a classic Chinese treatise that recorded a formula for preventing smallpox with bovine lice as the main ingredient. Koyama speculated that since Chinese doctors had been able to prevent smallpox using bovine lice, bovine blood might be even more effective; to test this idea, he drew blood from a spontaneously occurring wart on a cow's udder, mixed this blood with lymph taken from the pustules of a child suffering from smallpox, and inoculated other children with this mixture. The combination of bovine blood and cowpox lymph seemed to result in a milder disease than the smallpox matter normally used for variolation, but it still caused pustules dispersed over the body rather than the

32. For the symbolic implications of Ōnamuchi and Sukunahikona in early nineteenth-century medicine, see Daniel Trambaiolo, "Native and Foreign in Tokugawa Medicine," *Journal of Japanese Studies* 39, no. 2 (2013): 299–324.

33. Koyama Shisei, *Intō shinpō zensho furoku* (n. 31), preface.

34. Asai Nobuaki, "Mohnike byō juyō no zentei" (n. 17); cf. *Intō shinpō zensho* (1846), preface, 3b–4b. Koyama's creation of "vaccine" by inoculating smallpox into cows paralleled efforts of doctors in nineteenth-century India and China who lacked access to supplies of the Jennerian vaccine. See Bhattacharya, Harrison, and Worboys, *Fractured States* (n. 3), 34–39; Leung, "Business of Vaccination" (n. 25), 17–18.

localized pustules described in Qiu Xi's treatise. In a final attempt, Koyama inoculated smallpox directly into the udders of several cows, inducing the formation of pustules from which he inoculated children and adult recipients. Since these patients developed a localized infection with no more than a very mild fever, Koyama concluded that he had finally produced "true cowpox." When the Jennerian vaccine finally arrived in Japan, he claimed not only that the imported vaccine was no different from his own but also that his native vaccine should be preferred, since it would allow Japanese people to enjoy the benefits of vaccination without exposing themselves to the humiliation and danger of allowing foreigners such a great role in preserving their health. In the end, however, Koyama found few people willing to make use of his native vaccine, and his influence on the development of vaccination in Japan occurred primarily through his role in promulgating Qiu Xi's treatise.

A very different approach to the problem of reconciling vaccination with nationalist values can be found in the writings of the Fukui doctor Kasahara Hakuō. Kasahara saw vaccination as part of a broader project to augment Japan's national dignity and strength through the improvement of medicine: his proposals for strengthening Japan through medicine also included the foundation of a medical school in Fukui for training doctors in Western techniques of military surgery, since he believed that Japanese soldiers would fight more bravely knowing that even if injured they could still be treated and return home. Kasahara thought his countrymen should pay attention to "recent books from the Qing" in order to learn about Western medical techniques, and he actively supported the use of imported vaccine.³⁵ However, he was also acutely sensitive to the symbolic implications of introducing a foreign disease into Japanese bodies and sought to frame the practice in ways consistent with Japanese nativist religion and ideology.

Kasahara insisted that doctors performing vaccinations should first undergo ritual cleansing and pay homage to the kami, and his vaccination clinic in Fukui included an altar to Ōnamuchi and Sukunahikona adorned with calligraphy by the nativist scholar Tanaka Ōhide. Early in 1850, Kasahara wrote to the prominent Osaka ranpō doctor Ogata Kōan to criticize the author of a vaccination pamphlet that had included exces-

35. Ban Isoshirō 伴五十嗣郎, "Ranpō-i to kokugaku—Fukui han'i Kasahara Hakuō no baai" 蘭法医と国学—福井藩医笠原白翁の場合, *Shintō-shi kenkyū* 24 (1976): 33–50; Ban Isoshirō, "Kasahara Hakuō no yōjōsho (ikō - seyakukan) sōritsu ni kan suru shiryō" 笠原白翁の養成所 (医齋・施薬館) 創立に関する史料, *Jitsugakushi kenkyū* 3 (1986): 275–76. For a summary of Kasahara Hakuō's contribution to the spread of vaccination, see also Jannetta, *The Vaccinators* (n. 1), 119–20, 139–43.

sive praise for the English monarch and failed to show proper respect for Japan through the honorific convention of raising the country's name to the top of each line of text.³⁶ The planned title page for Kasahara's own unpublished treatise on vaccination bore a couplet exhorting doctors to pay daily homage to Ōnamuchi and Sukunahikona and to study diligently the medical books of all lands.³⁷ For Kasahara, the promotion of useful medical knowledge alone was not sufficient to strengthen the country: doctors also needed to express their commitment to the nation in the ritual, linguistic, and textual forms through which they transmitted and applied their knowledge.

Arguments Against the Vaccine

A small number of surviving pamphlets written by kanpō doctors in the years immediately after the vaccine's arrival offer us the possibility of direct insights into these doctors' medical and political attitudes. It is somewhat surprising that these sources have not previously attracted greater attention from historians of Japanese vaccination, since their authors were not obscure or peripheral figures but rather prominent members of the kanpō medical elite, including smallpox specialists of the Ikeda lineage and other active participants in the intellectual life of the Igakukan. These pamphlets were admittedly not among their authors' most influential publications, and the use of unpunctuated classical Chinese and wooden moveable type printing technology suggests they were intended for a limited readership of highly educated doctors rather than for a broad public.³⁸ Only one of the pamphlets provoked a surviving written response

36. Ban Isoshirō, "Ranpō-i to kokugaku" (n. 35), 42–43.

37. Kasahara drafted the text of this book during the period 1849–50. He sent the text to Nakane Yukie and Nakarai Chūan asking for comment, but in the end it was never published. See Ban Isoshirō, "Ranpō-i to kokugaku" (n. 35), 45.

38. The copy of Mori Tatsuyuki's *Gyūto hitō ben* (n. 25) in KyFC contains a handwritten note by Tatsuyuki's son Mori Noriyuki referring to the receipt of ninety-five copies of the pamphlet from Kitamura Naohiro, but it is not clear whether this represented the total number printed or only a fraction. The use of moveable type generally did not permit the inclusion of phonetic glosses or *kunten* reading marks that would have made these texts more accessible to readers with intermediate levels of literacy in classical Chinese. (By contrast, the pamphlets published by vaccination advocates were typically printed from carved woodblocks.) For discussion of different registers of language in Tokugawa medical literature, see Daniel Trambaiolo, "The Languages of Medical Knowledge in Tokugawa Japan," in *Rethinking East Asian Languages, Vernaculars, and Literacies, 1000–1919*, ed. Benjamin Elman (Leiden: Brill, 2014), 147–68. For further information on the use of moveable type printing, see Peter Kornicki, *The Book in Japan: A Cultural History from the Beginnings to the Nineteenth Century* (Honolulu: University of Hawaii Press, 2001), 158–63.

from a vaccination advocate, and since this response was never printed its author presumably regarded it as a personal document rather than as a contribution to public debate.³⁹ Nevertheless, despite the limited impact these pamphlets had during their own time, they retain considerable value as some of the few surviving sources of evidence concerning the reasoning of Japanese doctors who opposed the adoption of the vaccine.

The authors of these pamphlets typically based their arguments on the incompatibility of the claims made for the vaccine's efficacy with the innate poison doctrine of smallpox etiology. Nakamura Genkei, for example, pointed out that if the severity of smallpox depended entirely on the innate poison that was present in the body at birth, it was foolish to expect that artificially stimulating its eruption could result in a less severe disease.⁴⁰ Ikeda Naoatsu conveyed the same idea in more vivid language by arguing that attempting to extract the innate poison through a few pustules on the skin would be as senseless as trying to extract ink from a cuttlefish by pricking its tentacles.⁴¹ Parents who vaccinated their children, Naoatsu warned, were unwittingly creating a risk of more serious problems that could arise later in life.⁴²

Nakamura Genkei justified a similar concern for the possibility of delayed risks arising from vaccination through an analogy with syphilis.⁴³ Tokugawa doctors were aware that the apparent disappearance of syphilitic symptoms did not necessarily indicate the end of the disease, and they attributed the subsequent reappearance of symptoms to a lingering poison that could "ferment" within the body before it erupted to the surface. Too little time had passed since the arrival of the cowpox vaccine in Japan to be confident that the newly introduced vaccine could not have similar consequences, and rumors of problems among vaccine recipients in China and Japan seemed to confirm that these concerns were justified: Ikeda Mukey and Ikeda Naoatsu cited reports of health problems arising among

39. Anon., *Hi hitō ben* (n. 4). The author of this pamphlet did not know who Mori Tatsuyuki and Kitamura Naohiro were, and it is unclear how he obtained a copy of Mori and Kitamura's pamphlet; he seems to have been favorable toward kanpō rather than ranpō medicine, but he dismissed as ridiculous Mori's argument that vaccination was originally a Chinese technique. (For further discussion of Mori's argument, see below in the section "Arguments Against the Vaccine.")

40. Nakamura Genkei 中村元敬, *Shutōben* 種痘辨 (1852), 1a.

41. Ikeda Naoatsu 池田直温, *Gyūtō benpi* 牛痘辨非 (1861), 2b. Compare the similar arguments in Mori Tatsuyuki, *Gyūtō hitō ben* (n. 25), 2a–3a; Nakamura Genkei, *Shutōben* (n. 40), 1b.

42. Ikeda Naoatsu, *Gyūtō benpi* (n. 41), 5b–6a.

43. Nakamura Genkei, *Shutōben* (n. 40), 1b–2a.

vaccine recipients in China, while Nakamura Genkei recorded the story of a Japanese noble whose child had died after receiving the vaccine.⁴⁴

The bovine origins of cowpox prompted a further set of concerns. Ikeda Zen'an, the son of Ikeda Keisui, reasoned that since smallpox was normally a human disease, cowpox must have originated from an unusual epidemic severe enough to cause disease even in cattle and that the vaccine thus ought to be considered even more dangerous than regular smallpox.⁴⁵ Ikeda Mukei, however, argued that since the pustules of human smallpox followed a predictable pattern of development and were never deep blue in color, the blue pustules Jenner was reported to have observed in cows were probably unrelated to smallpox and were more probably just some sort of boil on the udders; he dismissed as ridiculous Koyama Shisei's claim to have produced his own vaccine by inoculating human smallpox into cows.⁴⁶

Mori Tatsuyuki's *Gyūto hitō ben* (An argument that cowpox is not pox, 1852) presented a more elaborate argument about the vaccine by drawing on Mori's philological expertise as an editor of Chinese and Japanese medical classics.⁴⁷ In 1848, Mori had been invited to participate in the production of a new edition of a classic Chinese formulary, Sun Simiao's *Beiji qianjin yaofang* (Prescriptions for emergencies worth a thousand pieces of gold, ca. 652), and in the process of preparing this edition he had learned about an unusual Chinese technique for treating children's eye warts that involved cutting into the skin around the patient's eyes and introducing another patient's pus into the wounds.⁴⁸ Comparing Sun Simiao's description of this technique with Qiu Xi's description of vaccination, he came to believe that the two were "exactly the same" and concluded that vaccination produced no more than a local reaction under the skin that could not possibly result in complete release of the innate poison.⁴⁹ This argument rested on a rather dubious parallel between vaccination and the older technique for treating eye warts, and an

44. *Ibid.*, 2a; Ikeda Mukei, *Shūtō bengi* (n. 16), 21a; Ikeda Naoatsu, *Gyūto benpi* (n. 41), 3b.

45. Ikeda Zen'an, *Gyūto hi seitō ron* (n. 4), preface, 2a; cf. 6b–7a.

46. Ikeda Mukei, *Shūtō bengi* (n. 16), 17b–18b.

47. On Mori Tatsuyuki, see Kawase Kazuma 川瀬一馬, *Nihon shoshigaku no kenkyū* 日本書誌学之研究 (Tokyo: Dai Nippon Yūbenkai Kōdansha, 1943), 775–833 and Ueno Masuzō 上野益三, *Hakubutsugakusha retsuden* 博物学者列伝 (Tokyo: Yasaka Shobō, 1991), 138–44. On medical philology in nineteenth-century Japan, see Kosoto Hiroshi 小曾戸洋, *Kanpō no rekishi* 漢方の歴史 (Tokyo: Taishūkan Shoten, 1999), 162–68; Benjamin Elman, "Sinophiles and Sinophobes in Tokugawa Japan: Politics, Classicism, and Medicine During the Eighteenth Century," *EASTS* 2 (2008): 93–121 (esp. 109–12).

48. Kawase, *Nihon shoshigaku no kenkyū* (n. 47), 792–94.

49. Mori Tatsuyuki, *Gyūto hitō ben* (n. 25), 2a.

anonymous doctor who wrote a critique of Mori's pamphlet quite reasonably pointed out that the analogy was absurd.⁵⁰ In retrospect, we can see that Mori's close familiarity with ancient texts had led him to misunderstand the nature of the vaccine. He criticized the vaccine not because he saw it as an unprecedented departure from tradition, but rather because he failed to recognize its genuine novelty.⁵¹

The last of the surviving pamphlets written against vaccination, Ikeda Naoatsu's *Gyūto benpi* (Disputing the errors of cowpox, 1861), was published several years after the earlier pamphlets discussed above, and its unusually aggressive rhetoric was in part a reaction to the rapid changes in medical and political culture that occurred during the late 1850s. In 1858, the bakufu had rescinded its earlier injunction against the use of ranpō medicine, encouraging doctors to make use of effective techniques regardless of their origins and granting permission for a group of ranpō doctors to open a vaccination clinic in Edo.⁵² During the same year, foreign pressure coerced the bakufu into signing a series of treaties granting extensive new rights to foreign traders and missionaries to operate on Japanese soil, provoking the emergence of a violent political movement that sought to "revere the emperor and expel the barbarians" (*sonnō jōi*).⁵³ For Naoatsu, these changes in the bakufu's medical and foreign policies appeared as different aspects of a single crisis involving the corruption of Japan by foreign influences, of which the vaccine itself was potentially a powerful symbol.

Naoatsu's objections to vaccination were primarily practical, resembling those expressed in the earlier pamphlets discussed above, but they carried a significant moral charge. Naoatsu saw the use of the foreign cowpox vaccine as a violation of Japanese purity, both because it was foreign and because of its bovine origins—indeed, he conflated the bovine origins of the vaccine with the supposedly animalistic nature of foreigners, arguing that the vaccine was effective for Europeans precisely because Europeans

50. Anon., *Hi hitō ben* (n. 4)

51. The unusual character of Mori's argument can be seen by its contrast with the attempts of British officials in nineteenth-century India to promote vaccination by forging "ancient" descriptions of the procedure in classical languages such as Tamil and Sanskrit: see Dominik Wujastyk, "A Pious Fraud: The Indian Claims for Pre-Jennerian Smallpox Vaccination," in *Studies on Indian Medical History*, ed. G. Jan Meulenbeld and Dominik Wujastyk (Groningen: Egbert Forsten, 1987), 121–54.

52. *Tokugawa kinrei kō goshū* (n. 6), 2:379–80; Jannetta, *The Vaccinators* (n. 1), 160–72.

53. On the treaty negotiations of 1858, see Michael R. Auslin, *Negotiating with Imperialism: The Unequal Treaties and the Culture of Japanese Diplomacy* (Cambridge, Mass.: Harvard University Press, 2004), 34–50.

resembled beasts and had skins like dogs or horses, through which the poison of the cowpox vaccine could escape without causing any great harm. But Japanese bodies were different. Echoing the language of the rescinded bakufu injunction against the use of ranpō medicine, Naoatsu argued that Western medical techniques could not be used in Japan because of the distinctive character of Japanese “winds and soil” (*fūdo*), and he concluded that doctors who sought transient profit by practicing barbarian techniques would only attract divine retribution against themselves.⁵⁴

Such sentiments as these were noticeably more extreme than those expressed in earlier pamphlets against vaccination. Although they were consistent with the nativist rhetoric that had become widespread in Japan and were presumably a sincere reflection of Naoatsu’s views, it is tempting to speculate that they also reflect his increasing awareness that opponents of the vaccine were rapidly becoming marginalized. For several years after the vaccine’s arrival, it had been possible to think of the new technique as a passing fashion little different from the many useless techniques for smallpox prevention that Ikeda Kinkyō had criticized half a century earlier; but after more than a decade of its use in Japan, even those who had at first been skeptical were beginning to change their minds.

The Problems of Practice

In addition to cultural barriers arising from the vaccine’s foreign origins and its apparent incompatibility with the innate poison doctrine, the early Japanese vaccinators encountered numerous practical problems that made it more difficult to win acceptance for their technique. Historians of vaccination in other nineteenth-century contexts have drawn attention to the many practical problems associated with vaccination before the existence of reliable methods for production, transport, and use, and

54. Ikeda Naoatsu, *Gyūto benpi* (n. 41), 2a–3a. The details of Naoatsu’s argument were original, but broad notions about the animalistic character of foreigners had a long history. Naoatsu’s argument may have been inspired by the writings of the influential nativist ideologue Hirata Atsutane, who had compared the bodily form and habits of the Dutch to those of dogs: see Donald Keene, *The Japanese Discovery of Europe, 1720–1830*, rev. ed. (Stanford: Stanford University Press, 1969), 170. For a comparable derogatory reference to vaccinators as “dogs and pigs,” see Maki Fukuoka, *The Premise of Fidelity: Science, Visuality and Representing the Real in Nineteenth-Century Japan* (Stanford: Stanford University Press, 2012), 32. The pamphlet’s reference to “winds and soil” echoed the wording of the earlier bakufu injunction against the use of Western medicine that had been rescinded in 1858; for various versions of this notion from the mid-nineteenth century, see Trambaiolo, “Native and Foreign in Tokugawa Medicine” (n. 32), 322–23.

have emphasized the need for a thorough critique of the “influential, yet presentist, presumption in the historiography that vaccinations were always able to offer immunity against smallpox.”⁵⁵ It is difficult to provide a quantitative assessment of how frequently these sorts of practical problems arose in Japan, but qualitative evidence in the writings of foreign and Japanese observers suggests they may have been common enough to detract from public acceptance of the technique. To vaccination advocates, such practical problems appeared merely as obstacles needing to be overcome before the Japanese people could enjoy the vaccine’s benefits, but to those who remained skeptical such problems could easily nourish the suspicion that there was something fundamentally wrong with the vaccine itself.

In the period immediately after the vaccine’s arrival, most Japanese doctors lacked the necessary expertise to correctly distinguish between “true pox” (*shintō*) and “false pox” (*gitō*, *katō*) as possible outcomes of a vaccination. The early vaccinator Kuwata Ryūsai recorded 37 cases of false pox among the 1,028 individuals he vaccinated during a thirteen-month period soon after the arrival of the vaccine, and he showed a particular concern for the need to revaccinate such individuals.⁵⁶ Another doctor noted that many of his contemporaries were unable to distinguish between true and false pox and often believed their patients had been successfully vaccinated when in fact they were still vulnerable to smallpox.⁵⁷ If Kuwata’s statistics indicate the approximate rate of false pox obtained by one of Japan’s most prominent vaccinators, it is likely that other vaccinators would have encountered similar rates of false pox and that many of these cases may have gone unidentified; a small but significant number of patients would not have been protected against subsequent infection, and this failure rate would have contributed to rumors about the vaccine’s lack of efficacy.

Problems with efficacy persisted or worsened during the first few years after its arrival. The Dutch naval medical officer J. L. C. Pompe van Meerdervoort, who spent five years in Nagasaki and established a Western-style hospital and medical school during his time there between 1857

55. Bhattacharya, Harrison, and Worboys, *Fractured States* (n. 3), 235.

56. Kuwata Ryūsai, *Gyūtō hatsumō* (n. 22), 18a–b. Kuwata distinguished between patients who showed the appearance of “false pox” (*katō*), which somewhat resembled those of a successful vaccination, and those patients who showed no reaction to the vaccine (*hassezaru mono* 発せざる者), of whom he encountered six. Four patients from this latter group had no reaction to the vaccine even when the vaccination was attempted a second time.

57. Anonymous handwritten marginal note in Itō Keisuke 伊藤圭介, *Igirisu-koku shutō kisho* 英咭喇国種痘奇書 (1841), International Research Center for Japanese Studies (Nichi-bunken), Kyoto (hereafter IRCJS).

and 1863, wrote in his memoirs that vaccine stocks in Nagasaki had been allowed to decline in quality since the departure of Otto Mohnike in 1851 and that many people had subsequently lost faith in the vaccine's efficacy.⁵⁸ In 1858, Pompe imported fresh vaccine from China and distributed it to local physicians so that they could report back to him on their rates of success, but even then the results were disappointing, with around one-third of the vaccinations ending in failure. The fact that Pompe was forced to reimport vaccine from China suggests that it had proven impossible to maintain effective stocks of the vaccine in the Nagasaki region, but local vaccinators had apparently continued to practice despite the diminished efficacy of their vaccine stocks.

If even the most well-meaning vaccinators could not guarantee that their vaccinations would be effective, less scrupulous vaccinators seeking to make a profit from the technique may have adopted unsafe or ineffective practices that further undermined public confidence.⁵⁹ Many of the most famous vaccinators recognized and sought to avoid these sorts of abuses: Ogata Kōan, for example, insisted that doctors at his Osaka vaccination clinic refuse to take fees, and he even extended payment to poor families willing to allow their children to act as lymph donors.⁶⁰ But during the same period, Koyama Shisei complained of people with no family tradition of medical learning who were taking up vaccination as a path to quick profit, obtaining their vaccine through cruel and dishonest means, “extracting the juice from pustules before they are ripe, tearing off the scabs before they have fallen, making off with them in the darkness and leaving the children ill.”⁶¹ Similarly, Kuwata Ryūsai warned his readers to avoid vaccinators who had taken up the technique purely to earn money.⁶² Nishimura Haruo criticized vaccinators who used stored lymph or scabs, which were less costly but also less reliable than vaccinating arm to arm; he claimed that some “vaccinators” even performed false vaccinations

58. J. L. C. Pompe van Meerdervoort, *Vijf jaren in Japan, 1857–1863* (Leiden: Van de Heuvel & Van Santen, 1867–68), 2:222–23; cf. Jannetta, *The Vaccinators* (n. 1), 172–73.

59. Tōyama Ken, *Intō bengi* (n. 4), appendix, 4b–5a.

60. Ogata Kōan 緒方洪庵, *Jotōkan kiroku* 除痘館記録 (Noma Collection, IRCJS). Similar systems of payment to parents who were willing to let their children act as vaccinifers were used by nineteenth-century vaccinators in other places around the world, such as Canton, Indochina, and India. See Leung, “Business of Vaccination” (n. 25); Guénel, “Lutte contre la variole en Indochine” (n. 3), 65; Lauren Minsky, “Pursuing Protection from Disease: The Making of Smallpox Prophylactic Practice in Colonial Punjab,” *Bull. Hist. Med.* 83, no. 1 (2009): 167–90.

61. Koyama Shisei, *Intō shinpō zensho furoku* (n. 31), 25a–27a.

62. Kuwata Ryūsai, *Gyūtō hatsumō* (n. 22), 16a–b.

using needles tipped with nothing but croton seeds, producing a local inflammation that recipients mistook for a genuine vaccination.⁶³

Most troubling of all, vaccination could cause the inadvertent transmission of other diseases. Kuwata Ryūsai noted that many people delayed vaccination until after the beginning of a smallpox epidemic, despite the fact that vaccinating during periods of epidemic smallpox risked spreading the disease itself.⁶⁴ Qiu Xi and other Chinese doctors had warned about the possibility of transmitting syphilis and leprosy along with the vaccine, and although many Japanese vaccinators would have taken care to select healthy donors, others may have been less careful.⁶⁵ The vaccination skeptics discussed above tended to raise theoretical objections to vaccination more often than they cited specific cases of its failure, but the reasonableness of their objections should be understood in the context of the acknowledged practical problems of applying the new technique in a safe and effective manner.

From Opposition to Acceptance

Despite these continuing practical problems, by the second half of the 1860s many doctors who had initially been skeptical about the vaccine were beginning to change their minds. Kitamura Naohiro, an Igakukan doctor who had contributed a preface for Mori Tatsuyuki's *Gyūto hitō ben*, wrote in 1867 that he had revised his opinions about Western medicine in general after reading the medical treatises recently published in China by the protestant missionary Benjamin Hobson.⁶⁶ Kitamura admired Hobson's books for the fluency of their classical Chinese prose and for their refined discussions of medical ideas, and he judged them far superior to the translations produced by Japanese ranpō doctors; reading them

63. Nishimura Haruo, *Gyūto kaihei* (n. 29), 3b–5a.

64. Kuwata Ryūsai, *Gyūto hatsumō* (n. 22), 16b.

65. Leung, "Business of Vaccination" (n. 25), 18–20. On the risks of disease transmission through vaccination in other nineteenth-century contexts, see Bhattacharya, Harrison, and Worboys, *Fractured States* (n. 3), 58–59; Thomas G. Benedek, "Vaccination-Induced Syphilis and the Hübner Malpractice Litigation," *Persp. Biol. Med.* 55 (2012): 92–113.

66. Kitamura Naohiro 喜多村直寛, *Heishoku idan* 柄燭医談 (1867), KyFC, preface. Hobson's treatises had been reprinted in Japan a few years after their original publication in China during the 1850s; their elegant Chinese prose owed much to the efforts of his Chinese collaborators: see Chan Man Sing, "Sinicizing Western Science: The Case of *Quantixinlun* 全體新論," *T'oung Pao* 98 (2012): 528–56. On Kitamura Naohiro, see Ishida Hidemi 石田秀実, "Tōhoku daigaku fuzoku toshokan Kanō bunko zō 'Kitamura Naohiro jihitsubon *Kōtei daikei* wo megutte" 東北大学付属図書館狩野文庫蔵「喜多村直寛自筆本『黄帝内経素問講義』」をめぐって, *Bunka* 45 (1981): 70–79.

finally persuaded him that Chinese and Western medicine could be seen not as opposed systems but rather as based on a common set of principles. Kitamura's own observations of vaccine recipients during the same period had also convinced him of the effectiveness of the vaccine, leading him to believe that the technique might one day eliminate smallpox altogether.⁶⁷

Another early skeptic who eventually changed his mind about vaccination was Asada Sōhaku, a younger Igakukan doctor who later played a leading role in the Meiji period movement for the preservation of kanpō medicine.⁶⁸ Like Mori Tatsuyuki and Kitamura Naohiro, Asada Sōhaku had initially been suspicious of the foreign technique, but he gradually came to accept it; writing around the time of the Meiji Restoration, he suggested that the principle of vaccination could be understood as analogous to the grafting of branches onto fruit trees, but in the end concluded that it was an extraordinary procedure that could not be evaluated by "ordinary standards." He predicted that public opinion would eventually settle in favor of vaccination only after tens of thousands of successful vaccinations had demonstrated its value.⁶⁹

The growing number of successfully vaccinated individuals would certainly have made it increasingly difficult to believe that the vaccine was useless as a preventive measure, but a comparison with the prolonged period of opposition faced by the vaccine in other parts of the world suggests that experience of the vaccine's efficacy was often only partially effective in gaining acceptance for the new technique. A comparative analysis of the Japanese trajectory toward acceptance of the vaccine must take into account the specific factors that caused opposition to diminish more rapidly in Japan than elsewhere. I have suggested in this article that standard accounts of the history of vaccination in Japan have overstated the level of enthusiasm for the vaccine at the time of its initial arrival, and argued that many Japanese doctors came to accept its value only gradually. If this argument is correct, we must consider the success of later vaccination programs not in terms of conditions at the time of the vaccine's arrival but rather in terms of changes in Japanese medical culture during the decades that followed.

One very rapid change was the abandonment of older practices of variolation after the arrival of the Jennerian vaccine, contrasting with the pattern

67. Kitamura Naohiro, *Heishoku idan* (n. 66), 9b–10a.

68. On Asada's role in the Meiji kanpō movement, see Oberländer, *Zwischen Tradition und Moderne* (n. 7).

69. Asada Sōhaku 浅田宗伯, *Kikkō nenpu* 橘黄年譜 (1869), reprinted in Fujikawa Yū, ed. *Kyōrin sōsho* (Tokyo: Tohōdō Shoten, 1924), 3:126–27.

of continuing use of traditional variolation methods for many years after the vaccine's introduction in China, India, and Southeast Asia. Historians who have studied the relationship between variolation and vaccination in various parts of the world have found that the preference for one or the other method depended on subtle conjunctions of local factors: in some areas, the prior presence of variolators hindered adoption of the vaccine, but in other areas local variolators rapidly adopted the cowpox vaccine and helped promote its spread.⁷⁰ In Japan, where variolation had never been a routine practice, many of the early vaccinators were drawn from the ranks of former variolators. None of the doctors who wrote pamphlets against vaccination proposed variolation as a suitable alternative, and the relatively rapid decline in opposition to the vaccine can be explained in part by the limited use of alternative methods of prevention.

A more important factor in the decline of opposition to the vaccine was the broader shift during the middle years of the nineteenth century toward adoption of Western technologies in general and Western medicine in particular. This shift had begun to take place gradually as early as the late eighteenth century, and without the sustained efforts of doctors who took an early interest in Western medicine the vaccine could never have been brought to Japan in the first place. However, the adoption of Western technologies accelerated rapidly in the years immediately after the introduction of the vaccine. This was in part simply because knowledge about such technologies was becoming more widely diffused, but it was also because the threat of foreign aggression made imitation of Western technologies seem inevitable if Japan was to retain its own identity and strength.

To understand the role of the cowpox vaccine within this broader shift, it is essential to acknowledge the extent to which vaccination was a contested practice during the initial years after its arrival. Chinese sources of information helped convince some kanpō doctors of the value of the technique, but many remained skeptical until the claims of vaccination advocates had been confirmed by local experience. To a degree that is difficult to determine from surviving sources, opposition to the vaccine may also have been sustained by real problems in the material practices of vaccination during the early years after its introduction. It was only

70. Peter Baldwin, *Contagion and the State in Europe, 1830–1930* (Cambridge: Cambridge University Press, 1999), 250–58; Niels Brimnes, “Variolation, Vaccination and Popular Resistance in Early Colonial South India,” *Med. Hist.* 48, no. 2 (2004): 199–228; Guénel, “Lutte contre la variole en Indochine” (n. 3); Leung, “Business of Vaccination” (n. 25), 7–8; Arnold, *Colonizing the Body* (n. 3), 125–33; Bhattacharya, Harrison, and Worboys, *Fractured States* (n. 3), 52–57; Minsky, “Pursuing Protection from Disease” (n. 60).

after almost a decade of local experience and a broader transition toward acceptance of Western medicine that the vaccine began retrospectively to assume its status as a symbol of Western medicine's promising future in Japan.



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Glossary

- Asada Sōhaku 浅田宗伯 (1815–94)
Beiji qianjin yaofang 備急千金要方
Bencao gangmu 本草綱目
 Chen Wenzhong 陳文中
 Dai Mangong 戴曼公
Dandokuron 斷毒論
 fūdo 風土
 gitō, katō 偽痘, 假痘
Gyūtō hi seitō ron 牛痘非正痘論
Gyūtō hitō ben 牛痘非痘辨
 Hashimoto Hakuju 橋本伯寿 (d. 1831)
Hi hitō ben 非非痘辨
Hon'yaku into shinpō zensho 翻譯引痘新法全書
 Igakukan 医学館
 Ikeda Keisui 池田京水 (1786–1836)
 Ikeda Kinkyō 池田錦橋 (1735–1816)
 Ikeda Masanao 池田正直
 Ikeda Mukei 池田霧溪 (1784–1857)
 Ikeda Naoatsu 池田直温 (1819–75)
 Ikeda Zen'an 池田全安 (1825–81)
Intō bengi 引痘辨疑
 Itō Keisuke 伊藤圭介 (1803–1901)
 kami 神
 kanpō 漢方
 Kasahara Hakuō 笠原白翁 (1809–80)
 Kitamura Naohiro 喜多村直弘 (1804–76)
 kokugaku 国学
 Koyama Shisei 小山肆成 (1807–62)
 kunten 訓点

Kuwata Ryūsai 桑田立齋 (1811–68)
Li Renshan 李仁山
Mitsukuri Genpo 箕作阮甫 (1799–1863)
Miyamoto Shūan 宮本周庵
Mori Tatsuyuki 森立之 (1807–85)
Nakamura Genkei 中村元敬
Nie Shangheng 聶尚恆
Nishimura Haruo 西村春雄
Ogata Kōan 緒方洪庵 (1810–63)
Ogata Shunsaku 尾形春朔 (1748–1810)
Qian Yi 錢乙
Qiu Xi 邱愷
ranpō 蘭方
shintō 真痘
sonnō jōi 尊王攘夷
Sun Simiao 孫思邈
Tanaka Ōhide 田中大秀 (1777–1847)
Tōshin imashimegusa 痘疹戒草
Yin dou lüe 引痘略
Zhu Zhenheng 朱震亨 (1281–1358)