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Weak Men and Barren Women

Framing Beriberi/*Jiaoqi*/*Kakké* in Modern East Asia, ca. 1830–1940

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Introduction*

Beriberi, a disease "discovered" by Dutch doctors in Batavia in the nineteenth century, was key to the construction of the new "nutritional science" in the early twentieth century.[1] Defined as a potentially fatal nervous degeneration disorder due to the deficiency of vitamin B1 (thiamine), it is still believed to be prevalent in rice-eating regions where the diet is based on polished rice, from which the thiamine-rich seed coat has been removed.[2] Since its being framed in biomedical terms in the late 1920s, beriberi, curiously translated in East Asia by the names of an ancient disorder, *jiaoqi* 腳氣 in Chinese, and *kakké* in Japanese (both meaning literally "leg-*qi*," highlighting the conspicuous symptom of weak legs), indicating recognized kindship between the historical and modern ailments,[3] has been studied and analyzed

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1. Christiaan Eijkman (1858–1930) fed chicken with white rice in the East Indies in the late nineteenth century to develop the theory, and British chemist Frederick Hopkins (1861–1947) further elaborated on the chemical composition of vitamins. Both men obtained the Nobel Prize in 1929 for their study on vitamins. See Kenneth Carpenter, *Beriberi, White Rice, and Vitamin B: A Disease, a Cause, and a Cure* (Berkeley: University of California Press, 2000), 102–4.
2. See, for example, the definition of beriberi in *The Bantam Medical Dictionary*, Third Revised Edition, prepared by the editors of Market House Books Ltd. (New York: Bantam Books, 2000), 52: "A nutritional disorder due to deficiency of vitamin B1 (thiamin). It is widespread in rice-eating communities in which the diet is based on polished rice, from which the thiamine-rich seed coat has been removed."
3. There is occasional confusion about the contemporary use of the Chinese term *jiaoqi*, which is sometimes used erroneously or locally to mean athlete's foot or gout. We exclude such meanings of the term in this chapter.

mostly in terms of dietetics, especially rice eating, even in historical contexts where polished rice did not exist.[4]

This ultimate biochemical explanation of beriberi as a major milestone in the construction of nutritional science[5] was in fact juxtaposed on evolving framing processes of beriberi/*jiaoqi*/*kakké* within different medical traditions throughout the colonial period in East Asia, in different languages.[6] While European scientists were discovering, experimenting, and speculating on what they saw as a new disease in Asia that they finally linked to the consumption of a modern food product, polished white rice, Asian doctors were puzzled by the "reemergence" of an old ailment amply described in classical medical treatises as one caused by the penetration of damp in the body. Colonial governments were concerned with the disease as they saw in it a major threat to economic productivity. As an author of an early report on beriberi in Hong Kong wrote, quoting "an old resident" of the colony: "The prosperity of this Colony largely depends on the sturdy shoulders of the Hong Kong coolie."[7] For East Asian society, on the contrary, the noticeable weakening male bodies coined by the Chinese term "sick men of East Asia,"[8] in crowded, industrializing, and stressful urban centers infested with "modern" diseases such as tuberculosis, syphilis, and beriberi, accounted for its inferiority compared to the West. The modern Asian beriberi/*jiaoqi*/*kakké* epidemic fully encapsulated the anxiety on this "observable" diminished

4. Notably an article by Lu Gwei-Djen and Joseph Needham in 1951 in *Isis* 42 (1951): 13–20, "A Contribution to the History of Chinese Dietetics," based on a chapter of Lu's PhD dissertation in chemistry on beriberi submitted in 1939. The recent work on Japanese *kakké* by Alexander Bay also accepts such a kinship with beriberi. See his *Beriberi in Modern Japan: The Making of a National Disease* (Rochester, NY: University of Rochester Press, 2012).
5. Michael Worboys, "The Discovery of Colonial Malnutrition between the Wars," in *Imperial Medicine and Indigenous Societies*, ed. David Arnold (Manchester: Manchester University Press 1988), 208–25.
6. Beriberi is an excellent example of the futility of writing the "biography" of a disease, as eloquently argued by Roger Cooter in *Writing History in the Age of Biomedicine* (with Claudia Stein, New Haven: Yale University Press, 2013), chapter 7. It is impossible to do retrospective diagnosis to verify claimed cases of beriberi of which East Asian and European experts had very different conceptual tools to formulate explanations at different historical moments. The Asian epidemic emerged as mysteriously as it disappeared in the twentieth century. On the contrary, the study of the different framing processes of beriberi/*jiaoqi*/*kakké* in this period, an approach proposed by Charles Rosenberg ("Disease in History: Frames and Framers," *Milbank Quarterly* 67[1] [1989]: 1–15) reveals how the epidemic became an actor in a "complex social situation" (10), affecting personal lifestyle, therapeutic methods, and the design of public health strategies in East Asia.
7. R. M. Gibson, "Beriberi in Hong Kong, with Special Reference to the Records of the Alice Memorial and Nethersole Hospitals and with Notes on Two Years' Experience of the Disease," manuscript, March 16, 1900, p. 4.
8. For the formulation of this expression, see Yang Ruisong, "Xiangxiang minzu chiru: Jindai Zhongguo sixiang wenhua shang di 'Dongya bingfu'" [Imagined national humiliation: "Sick men of East Asia" in modern Chinese thought and culture], *Guoli Zhengzhi Daxue lishi xuebao* 23 (May 2005): 1–44.

masculinity linked especially to the military,[9] a phenomenon discussed in depth, but from another perspective, in John DiMoia's and Howard Chiang's chapters in this volume.

Doctors of competing medical traditions in colonial Asia, despite differences in approach and premises, agreed that beriberi's main victims were Asian men even though this gender difference could not be fully accounted for in physiological terms. The social framing of the epidemic thus became important for making the ailment comprehensible. Conflicting explanations proposed by experts from different medical traditions made the beriberi/*jiaoqi*/*kakké* phenomenon one of the most puzzling and elusive epidemic experiences in modern East Asia while they at the same time unraveled layers of individual and collective anxieties in a rapidly changing world, articulated most effectively in terms of the health of the gendered body.

The Emerging Asian Pandemic: A Male Disease

It was in modern institutions with high concentrations of young men that Western medical doctors working in colonial Asia first noticed this unfamiliar "Asian" disease, in the mid-nineteenth century. The British doctor Malcolmson published one of the first books on beriberi in 1835 based on his observations on the impact of the disease on native troops in Northern Circars in the late 1820s.[10] Later in the 1860s, Dutch scientists, including C. Eijkman, began systematic study of beriberi in Batavia, with the British and the Americans getting more involved in research from the beginning of the twentieth century.[11] The first regional alert of a beriberi epidemic outbreak took place in 1860 in Sungaiselan, where one-eighth of the miners were reported to be sick and one-third of the sick died. In the following year, the disease caused 700 deaths in Belitung. In the 1890s in Bangka hundreds of workers died each year of the disease that accounted for 5 percent death rate of the total force of about 12,000 workers, many of them Chinese.[12] The situation continued to be serious in the early twentieth century in Java. The

9. The close link between beriberi and the military in East Asia is best represented by the Japan case; see Alexander Bay, "Beriberi, Military Medicine, and Medical Authority in Prewar Japan," *Japan Review* 20 (2008): 111–56.
10. He noted that in 1827, twenty-eight out of eighty-eight deaths in native troops, and twenty out of fifty-two deaths in 1830 were due to beriberi, see J. G. Malcomson, *A Practical Essay on the History and Treatment of Beriberi* (Madras: Vepery Mission Press, 1835), 11–26.
11. Carpenter, *Beriberi, White Rice, and Vitamin B*, chapters 1, 3, 5, and 6. Duan Simmons, "Beriberi, or the 'Kakké' of Japan," *China Imperial Maritime Customs Medical Reports*, Special Series no. 2, 19th issue, for the half-year ended March 31, 1880 (Shanghai: Statistical Department of the Inspectorate General), 41.
12. Mary F. S. Heidhues, *Bangka Tin and Mentok Pepper: Chinese Settlement on an Indonesian Island* (Singapore: Institute of Southeast Asian Studies, 1992), 61–65.

number of cases treated between 1901 and 1924 fluctuated between 840 and 7,719.[13]

Similar epidemics among Chinese tin miners were also observed in the Federated Malay States at the turn of the century.[14] By 1905, beriberi was reported to be the most prevailing disease in Malaya, representing one-fifth of all hospital cases, with 2,215 cases and 330 deaths (whereas there were 2,109 malaria cases with 173 deaths).[15] Leonard Braddon's (state surgeon of the Federated Malay States) famous report on the disease in 1907 in the Malay States showed that the epidemic was particularly prevalent among the Chinese male adult population with a case incidence of 40/1,000 in 1901.[16] Reports on other Southeast Asian countries, including the Philippines, Siam, and French Indochina, all recorded rapidly increasing numbers of beriberi patients.[17] Victor Heiser, director of health for the Philippine Islands in the 1910s, estimated in 1913 that there were 100,000 deaths in Asia per year due to beriberi.[18]

In Japan, despite consistent attention given to *kakké* in *kampō* texts back in the eighteenth century,[19] the ailment became globally visible only in the late nineteenth century. The American doctor Duane Simmons was one of the first Western doctors who observed the epidemic in Japan in the 1870s and wrote a report in 1880 based on his observation in the Government

13. C. D. Langen, "The International Control of Beriberi," Far Eastern Association of Tropical Medicine (FEATM) Transactions of 6th Biennial Congress, Tokyo, 1925, 70–71.
14. Hamilton Wright, "An Enquiry into the Etiology and Pathology of Beri-Beri," *Journal of Tropical Medicine* (June 1, 1905): 161–62; a more complete study of the epidemic in the Malay States is Herbert Durham's "Notes on Beriberi in the Malay Peninsula and on Christmas Island (Indian Ocean)," *Journal of Hygiene* (1904): 112–55.
15. "Malay States Medical Report for the Year 1905," *Journal of Tropical Medicine and Hygiene*, January 1, 1907, p. 9.
16. Leonard Braddon, *The Cause and Prevention of Beri-Beri* (London and New York: Rebman, 1907), 3–4.
17. Edward Vedder, captain medical corps of the US Army in Manila wrote a report in 1913 that between 1895 and 1902, there were 57,025 admissions of beriberi patients in thirty-one district hospitals, of whom 8,990 died, see E. Vedder, *Beriberi* (New York: William and Wood, 1913), 17. Siam was another epidemic region. The principle medical officer reported in 1913 that of a total of 500 conscripts in the Police School at Bangkok, 444 developed beriberi within two months and were sent home on a month's leave. He also observed an increasing epidemic trend of beriberi from 1913 to 1929, with 852 recorded cases in 1913 and 3,871 in 1929, see H. C. Highet, "The Sequelae of Beriberi," Far Eastern Association of Tropical Medicine (FEATM), Comptes rendus de travaux du 3e congrès biennal tenu à Saigon 1913, 255. Gaide (general surgeon of colonial troops in Indochina) and Bodet (deputy general inspector), "Le beriberi en Indochine," Far Eastern Association of Tropical Medicine (FEATM) Transactions of the 8th Congress held in Siam, 1930, 104.
18. Victor Heiser, "Beri-beri. An Additional Experience at Culion," Far Eastern Association of Tropical Medicine (FEATM) Comptes rendus de travaux du 3e congrès biennal tenu à Saigon 1913, 371.
19. See my chapter, "Japanese Medical Texts in Chinese on Kakké in the Tokugawa and Early Meiji Periods," in *Antiquarianism, Language, and Medical Philology*, ed. Benjamin A. Elman (Leiden: Brill, 2015), 163–85.

Hospital in Yokohama and also in private and consulting native practices in both Yokohama and Tokyo. He noted 660 conscripts affected with beriberi were admitted to military and naval hospitals in Tokyo in 1875, representing 3.8 percent of the whole force of 17,000, not counting those victims whose symptoms were milder and not sent to the hospital.[20] The increasingly alarming epidemic was made known to the world after the publication of the medical report on the navy in 1901 on the First Sino-Japanese War of 1894–1895 showing that, in the 1880s, almost one-third of the navy was infected with the disease. The eventual control of the epidemic by the implementation of diet change narrated in the report was an exemplary epidemiological study in the up-and-coming Western biochemical tradition.[21]

In China, the modern *jiaoqi* epidemic was first revealed in a monograph on the ailment in 1887 by a Cantonese doctor working in British Hong Kong, Zeng Chaoran 曾超然. This work, entitled *Jiaoqi chuyan* 腳氣芻言 (Preliminary words on *jiaoqi*) was a recognized medical work in modern China,[22] and remarkable in situating the epidemic, still framed largely in classical terms, in the modern and global context of Asia. It was based on notes of the author's clinical practice during his tenure as in-house doctor and teacher at the charitable Tung Wah Hospital, opened in 1872, that provided Chinese medical treatment for the Chinese population in the British colony.[23] This work indicates an emerging *jiaoqi* epidemic since probably the 1870s among Chinese men living or transiting in Hong Kong that British doctors were not aware of. Prominent figures in tropical medicine such as Patrick Manson (1844–1922) and his protégé James Cantlie (1851–1926) working in Hong Kong did not begin to observe actual beriberi patients until 1887, when Alice Memorial Hospital, the first Western charitable hospital for the Chinese, was established.[24] In fact, British bacteriologists in Hong Kong, having little contact with Chinese patients, were totally misinformed about the situation and claimed in 1905 that the disease was not endemic in Hong Kong or in China, only to contradict themselves two years later when statistics from

20. Simmons, "Beriberi, or the 'Kakké' of Japan," 41, 70.
21. Baron Saneyoshi and Shigemichi Suzuki, *The Surgical and Medical History of the Naval War between Japan and China during 1894–1895* (Tokyo: Tokio Print, 1901), 450–78, on *kakké*.
22. This book was reedited many times subsequently, by the Cantonese army in the last years of the Qing dynasty and in the Republican period. Republican medical journals also reproduced and commented on large parts of it. Xie Guan considered the book the most important in the modern period on *jiaoqi* (see note 38).
23. Encouraged by the British colonial government, the hospital was established and financed by Chinese business elites to take care of Chinese inhabitants, who distrusted biomedicine practiced in the Civil Hospital. On its history, see Elizabeth Sinn, *Power and Charity: Chinese Merchant Elite in Colonial Hong Kong* (Hong Kong: Oxford University Press, 1989).
24. Patrick Manson said in 1888, "It was not until last year, when the Alice Memorial Hospital was opened, that the general medical practitioners of Hong Kong had a proper opportunity to see and study native diseases and that we began to learn a little definite about our endemic Beri-beri." See R. M. Gibson, "Beriberi in Hong Kong," 2.

local Chinese hospitals became accessible to them.[25] According to such data, from 1897 to 1906 the number of beriberi patients increased from 173 (with 102 deaths) to 517 (with 257 deaths).[26] The situation deteriorated with time up to the 1920s: while 562 and 736 deaths were recorded in 1907 and 1908, the numbers peaked to 1,744 and 1,192 in 1925 and 1926 for the whole of Hong Kong, amounting to about 5 percent of the colony's total deaths recorded.[27] The mortality in a Chinese hospital in Canton appeared to be lower: 76 of 701 (implying an annual figure of more than 1,000) inpatients died in the second half of year 1929, but this mortality was second only to tuberculosis.[28]

Chinese, Japanese *kampō*, and Western medical experts of the period all took note of the overwhelming proportion of male patients in this regional pandemic. Duane Simmons, who wrote for the China Imperial Maritime Customs Service, observed in 1880 that, in Japan, the few women who had the disease were pregnant.[29] Leonard Braddon in Malaysia, Gaide and Bodet, military surgeons in Indochina, C. Langen, a German doctor, and Noel Davis, assistant health officer in Shanghai, observing the beriberi epidemics respectively in Malaya, Indochina, Java, and Shanghai, also stressed that patients were predominantly young, able-bodied, and male.[30] The first British colonial doctors reporting on beriberi in Hong Kong's Alice Memorial Hospital provided more precise information on the unusual male/female ratio: the percentage of male to female beriberi cases was 95.72 percent to 4.28 percent (of a total of 1,476 patients in 1888–1889), while the usual proportion of male to female patients in attendance was 4 to 1.[31] A later survey in Shanghai in 1934 showed a similarly lopsided ratio of 8 to 1.[32] In other

25. William Hunter, "The Incidence of Disease in Hong Kong," *Journal of Tropical Medicine* (May 1, 1905): 130; Hunter, "The Prevalence of Beriberi in Hong Kong," *Journal of Tropical Medicine and Hygiene* 10(16) (August 5, 1907): 265–71.
26. Meanwhile, mortality of malaria decreased from 571 (191 deaths) to 248 (96 deaths) according to the "Report of the Inspecting Medical Officer to the Tung Wah Hospital, 1906," sessional paper (Hong Kong, 1907), 463. The medical officer was Dr. Thomson.
27. "Vital statistics," *Hong Kong Administrative Report 1908* (Hong Kong: Government Printer, 1908), 12; "Public Health," *Hong Kong Administrative Report 1927* (Hong Kong: Government Printer, 1927), 22. These figures confirmed those given to Dr. Edward Vedder of the US Army in the Philippines, see Vedder, *Beriberi*, 13–16. These works provides the most comprehensive epidemiological situation of beriberi in Asia.
28. *Fangbian Yiyuan tongji huikan* [Collection of statistics of the Expediency Hospital], 1929, section "yi'an." That year tuberculosis claimed 117 lives of the 320 inpatients.
29. Simmons, "Beriberi, or the 'Kakké' of Japan," 43.
30. Braddon, *Cause and Prevention of Beri-Beri*, 256, 278; Gaide and Bodet, "Le beriberi en Indochine"; Langen, "International Control of Beriberi"; Noel Davis, "Observations on Beriberi in Shanghai," Far Eastern Association of Tropical Medicine (FEATM) Transactions of the 2nd Biennial Congress, Hong Kong, 1912, 23–30. He observed the cases in the prison (with 33.3 percent mortality), police recruits, a tramway company, where only men were observed, and a charitable organization for young girls.
31. Gibson, "Beriberi in Hong Kong," 18.
32. B. S. Platt and S. Y. Gin, "Some Observations on a Preliminary Study of Beriberi in Shanghai," Far Eastern Association of Tropical Medicine (FEATM) Transactions of the 9th Congress, Nanking, China, October 2–8, 1934 (Nanking: National Health Administration,

words, even considering the sociological factors accounting for the higher number of male patients in hospitals observed for any disease, the male/female proportion for beriberi in this period was still unusually high. At the same time, medical experts of the different traditions also noted the relation between the pandemic and a rapidly urbanizing, industrializing, and globalizing Asia.

Jiaoqi/Kakké Modern: A New Old Ailment?

Kampō doctors of Tokugawa Japan were probably the first to consciously explain *kakké* in the context of a profoundly transformed human ecology brought about by a changing political economy. Despite the claimed affinity of the modern Japanese epidemic with early medieval *jiaoqi* recorded in Chinese medical classics, *kakké* was considered not exactly the same as *jiaoqi* but a "modern" version of the old disease. Taki Motokata 多紀元堅 (1795–1857) stressed in 1853 the mutative character of *kakké* by highlighting the possibility that, just as modern *kakké* was different from what it was in the past, *kakké* in the future might very well be different again.[33] The elusiveness of *kakké* was further elaborated by Nakano Yasuaki 淺田昌春 (1813–1894) and Asada Sōhaku 淺田惟常, director of the Hakusai byōin in 1878, who published the *General Treatise on Kakké* (*Kakké gairon* 腳氣概論) in 1879, where they developed the idea that *kakké* changed with time and place:

> In our country, the disease had existed for a thousand years. . . . In later time, when the four seas were in great turmoil with incessant warfare, we rarely heard of the disease again. In recent years, [this illness] re-emerges. The clinical patterns are similar to those described in Jin/Tang medical classics. The analyses are also similar. This is due to changing time and customs. We are in a different era.[34]

The authors seemed to imply here that *kakké* was a disease of prosperity and peace as it disappeared during wars and political turmoil and reappeared in modern Japan just as real *jiaoqi* was endemic in prosperous Tang China. Moreover, these *kampō* doctors highlighted the fact that the *kakké* in modern times was characterized by its prevalence in the warmer seasons between summer and autumn, affecting mostly the young and able-bodied male, features that were not noted in medieval Chinese classics on *jiaoqi*.[35]

1935), 407–8. This study was based on the fifty thousand outpatients of the Lester Chinese Hospital.

33. Taki Motokata, *Zatsubyō Kōyō* [Broad essentials on various diseases], 1853 (Beijing: Renmin weisheng chubanshe, 1983), 120.
34. Nakano Yasuaki and Asada Sōhaku, *Kakké gairon* [General treatise on *kakké*], 1879, Huanghan yixue congshu 1936. (Shanghai: Zhongyi xueyuan chubanshe, 1993), 5.
35. Ibid., 5–6.

The connection between *kakké* and Japanese modern urbanity was spelled out most strongly by Imamura Ryō 今村亮 in his 1878 work *Kakké shinron* 腳氣新論 (A new discussion on *kakké*) where he explained the notion of "wind-toxin," *fūdoku* 風毒, by evoking a new element: toxic air buried beneath urban ground:

> Wherever the land is lowly and damp, with dense populations and overwhelming human activities, where people do not even have enough place to stand on, the *ki* of the ground, not being able to dissipate freely, would cause this disease. Why then does it emerge only in the spring and summer? It is because [during this season] the *ki* of the ground is on the rise and as it gets blocked [by human masses and activities on the ground], the obstructed steaming process would produce a toxic *ki*.

In this toxic urban environment, he thought, "[d]iseases are complex, their changes are multiple. There are modern diseases that did not exist in the past, such as cholera. And those that became more prominent than in the past, such as *kakké*."[36]

Chinese doctors' writing on *jiaoqi* in the nineteenth and early twentieth centuries did not articulate as precisely as *kampō* authors on the modern characteristics of the ailment, but they did not fail to explain the disease in a changing global context. Chinese doctors were sensitive to the living environment of their patients, mostly male migrants working in coastal metropolises such as Shanghai and Hong Kong, or in Southeast Asia.[37] Xie Guan 謝觀 (1885–1950), an influential doctor in the Shanghai district, like many of his contemporaries, was convinced that the "reemergence" of this old disease was in fact the "reintroduction" of the ailment to China from Southeast Asia.[38] This point was statistically supported by a 1928 list of patients to be repatriated to Canton showing that more than one-third were transients having stayed in Hong Kong for less than two years, many from Southeast Asia.[39] While Hong Kong was already considered a place with bad "water and soil," Southeast Asia was worse. A Chinese doctor residing in Hong

36. Imamura Ryō, *Kakké shinron* [New treatise on *kakké*] (Edo: Keigyōkan edition, 1878), preface, 2a, 3a.
37. The above-mentioned Zeng Chaoran of the Hong Kong Tung Wah Hospital noted the prevalence of the disease in South China and Southeast Asia in the 1880s. See his *Jiaoqi chuyan*, 11b–13a; Ding Fubao, the famous popular medical writer at the turn of the century highlighted the epidemic in Japan, Shanghai, and the Guangdong regions in his 1910 edited volume on beriberi. See his 1910 work, *Jiaoqi bing zhi yuanyin ji liaofa* [Causes and treatment of the *jiaoqi* ailment] (Shanghai: Wenming shuju, 1910), preface, 3.
38. Xie Guan, *Zhongguo yixue yuanliu lun* [On the root of Chinese medicine] (Shanghai: Chengzhai yishe, 1935), 47. Xie, commenting on Zeng Chaoran's 1887 book, stated that the disease disappeared in China after the Song dynasty and was "reintroduced" in China from overseas, a view already implied in Zeng's book.
39. Donghua Hospital Archives (DHA). Letter from the Donghua Hospital to the Colony's Medical Officer, February 16, 1933, 432–38. Out of seventy-five listed, twenty-nine were either passing through Hong Kong or were residing in Hong Kong for less than two years.

Kong refused to take up a position offered by a Kuala Lumpur hospital in 1920 because, as he explained in the letter to the hospital, "The 'water and soil' of the Southern Ocean [Malaya] is not as stable as that in Hong Kong[;] most [who go to Malaya] will develop *jiaoqi* and bone pain."[40] This concern underlies the great anxiety vividly expressed in popular songs and ballads lamenting Chinese migrants' wretched lives in Southeast Asia.[41] The sick Chinese migrant worker at that time usually sought repatriation—that is, leaving the place where he fell ill—as a preferred therapeutic move.

The repatriation of sick Chinese migrants in the colonial period was thus not simply a colonial policy to get rid of nonproductive workers, but a medical strategy based on the belief shared by Europeans, Japanese, and Chinese of the time that the patient should leave the location where he fell sick. While the Japanese therapeutic strategy of *tenchi* 轉地 (to change site) meant moving patients to higher, dryer ground, the Chinese version, sometimes expressed as *zhuan shuitu* 轉水土 (to change "water and soil") implied being repatriated to their native place. Four patients of the ten cases described by Zeng in his 1887 book returned to their native towns in Guangdong in the late nineteenth century upon the recommendation of the doctor. Beginning no later than 1903–1904 and until the early 1940s, the Tung Wah Hospital in Hong Kong where Zeng had worked began to organize regular shipments of repatriated migrants sick with *jiaoqi* from Southeast Asia, Latin America and Hong Kong itself to Canton to be treated in charitable hospitals, the most important of which was the Fangbian Hospital 方便醫院 (Expediency Hospital, established in 1899).[42] News on these public health strategies derived from the modern understanding of *jiaoqi* in Chinese East Asia, was frequently covered by public printed media in the early twentieth century.[43]

40. DHA, 1919–1920 Waijie laihan [Letters received], 130-B19/20-214, pp.172–73, Doctor Yu Baochu to the Tung Wah Hospital refusing to take the position in Tongshan Hospital in Kuala Lumpur as arranged by the two hospitals.
41. I would like to thank Wilt Idema for drawing my attention to a genre of modern Hakka and Minnanese Songs and Ballads about Overseas Migration (*Guofan ge* 過番歌) from late imperial and early Republican China that highlight the dread of catching all kinds of strange diseases in the southern seas.
42. DHA, Minutes of the Board Meeting of the Tung Wah Hospital on January 26, 1904, recorded board members' appreciation of sending *jiaoqi* patients back to Guangdong as they thought that the sick would have a better chance of cure or survival, notably the Guangji and Fangbian Hospitals. Patients were first shipped to Canton via the West River and, later in the twentieth century, taken by the Canton-Kowloon train. The Tung Wah Hospital, as a major charitable organization for Hong Kong and overseas Chinese since 1871, paid the Fangbian Hospital for accommodating patients repatriated by the Tung Wah. See also *Xianggang Donghua Sanyuan bainian shilüe* [One hundred years of history of the three Tung Wah Hospitals in Hong Kong] (Hong Kong: Tung Wah Hospital, 1970), 58.
43. Some Shanghai medical journals reported such operations as early as the 1910s, e.g., *Medical World* (*Yixue shijie* 醫學世界), no. 22, 1913, p. 62, reported the shipment of forty-seven patients from Tung Wah Hospital to the Fangbian Hospital in Canton. A major Chinese newspaper in Hong Kong, *Huazi ribao* 華字日報, for example, reported in 1928 that "[s]ome of the immigrants in Hong Kong could not adjust to the local 'water and soil' (*shuitu* 水土)

At the same time, white rice was being proposed by Western scientists as the main culprit of this modern Asian disease. Being the traditional Asian staple transformed by modern technology and spread by global trade that accentuated rural-urban dichotomy, rice was a natural suspect when the disease was linked to a bad food.[44] Dr. C. D. de Langen of the Medical School in Batavia noted in his article for the 1925 Congress of the Far Eastern Association of Tropical Medicine (FEATM) that beriberi there "rarely occurs in the interior, but is chiefly confined to the large towns, the plantations, industrial centres, prisons[,] etc." He explained that as only rice for export from British India, French Saigon, and Siam in the region was mechanically and thoroughly milled for easier transportation, storage, and good market value, it was natural that the epidemic mainly occurred in urbanized, coastal Java where such rice was consumed.[45] Similarly, the *jiaoqi* and *kakké* epidemics in China and Japan were reported by Chinese and Japanese experts to concentrate first in Westernized coastal metropolises such as Hong Kong, Canton, Shanghai, Tokyo, Kyoto, and Osaka from the nineteenth century onward. With the improvement in transportation that facilitated human migration, circulation of goods, and colonization, the disease was described to be spreading inland and to places where it was believed to have been nonexistent, such as Taiwan, Korea, Australia, and even Manchuria, in the twentieth century.[46] The movement of beriberi/*jiaoqi*/*kakké* simply followed the trajectories of polished rice as a modern commodity.

By the late 1920s, Chinese doctors increasingly internalized the biochemical framing of *jiaoqi* to articulate the difficulty of living in a modern world. Jiang Zhenxun 姜振勛, a doctor practicing in Shanghai in the 1920s and 1930s and a popular medical writer, took up the new vitamin B1 theory and concluded that "the prevalence of *jiaoqi* in recent years is a result of progress in material civilization," meaning fine food processing with modern engineering. However, the way to prevent the disease, he continued, was not to give up modern civilization, as this was neither feasible nor reasonable, but to modify the lifestyle so that material progress would not go against the body. He did not prescribe giving up consuming white rice but picked up recommendations from classical medical and life-nourishing texts such as moderation in sex, work, and diet, and sanitary living environments. Like

and develop *jiaoqi*. Recently the ship Daxing travelling between the colony and Wuzhou had taken more than ten patients" (June 27, 1928). The destination of the passengers was normally Canton via Wuzhou.

44. On this problem in Canton, see Seung-Joon Lee's recent study, "Taste in Numbers: Science and the Food Problem in Republican Guangzhou, 1927–1937," *Twentieth-Century China* 35(2) (April 2010): 81–105.

45. Langen, "International Control of Beriberi," 69–71.

46. This narrative of the spread of beriberi was quite commonly given in popular medical periodicals in the 1930s in China. For example, Chi Zheng, "Jiaoqi bing" [The *jiaoqi* ailment], *Minzong yibao* (1931): 12, especially p. 13.

Ding Fubao 丁福保 (1874–1952), the popular medical writer in Shanghai with Japanese training and editor and translator of a 1910 text on *jiaoqi* originally in Japanese, Jiang recommended moderation, restraint, and discipline of the old "life-nourishing" tradition to counter the challenge of a modern world of excess, overabundance, overexertion, and great stress.[47]

A Disease of Asian Male: Decadent or Deprived?

As a disease thought to be brought about by modern technology in a new global economy, beriberi/*jiaoqi*/*kakké* was not considered one of deprivation at the beginning. The epidemic was associated for several decades with wealth, new opportunities, and urban lifestyle, and with them, all the stress, decadence, and immorality in a "poisonous" urban environment. Traditional *jiaoqi*/*kakké* etiology in East Asia readily underpinned this framing.

Kampō doctors were the first to articulate the link between affluence, urban men, and *kakké*. Imamura's emphasis on the toxic environment of new urbanized centers made the point most clearly. In his 1861 text, he noted the prevalence of the epidemic especially in metropolitan centers such as Edo, Kyoto, and Naniwa (Osaka), concluding that the epidemic was the result of the hedonistic and decadent lifestyle of wealthy urban men. He further explained that the main cause for the wealthy to fall ill was essentially internal: excessive food and sex depleted the body of its primodial *ki* (*genki* 元氣), making it receptive to external pathogens[48] that he now called *utsudoku* 鬱毒, a compressed severe toxin buried deep underground, especially in crowded urban centers.[49] Imamura pushed the "internal" cause argument further to highlight the moral aspect of *kakké* etiology. In modern Japanese metropolises, urban men in their prime indulging in excessive sex and lavish lifestyles were the main victims of the illness, while women, children, and the elderly, not being able to enjoy such excessive bodily pleasures, were spared. He provided statistics to prove his point: urban well-to-do males made up 80–90 percent of *kakké* patients.[50]

Modern Chinese doctors were also sensitive to this characteristic of *jiaoqi* patients. The above-mentioned Zeng Chaoran writing in Hong Kong in the 1880s, and Zhou Xiaonong 周小農 (1876–1942), a famous practitioner in Wuxi in the first decades of the twentieth century, presented cases uniquely of men. Zeng provided the age and native place of all of his ten male patients, all from the Pearl River Delta, ranging from age eighteen to thirty.

47. Jiang Zhenxun, "Jiaoqi qian shuo" [Brief note on *jiaoqi*], *Xinyi yu shehui huikan* 1 (1928): 208–11.
48. Imamura Ryō, *Kakké kōyō* [Essentials on *kakké*] (Edo: Keigyōkan edition, 1861), 3b.
49. Ibid., 1b–2b.
50. Ibid., 3b–4a. Imamura also stressed that roughly half of the victims (50–60 percent) were attacked by *kakké* while suffering from other diseases.

He also provided information on their background or occupations, lifestyle, and physical appearance that were considered to have some bearing on the disorder: two students who rarely left their desk, one accountant who never exercised, one without occupation but leading a leisurely life. Three of his patients were described as "robust," or even opulent (*zhuangsheng* 壯盛), one of whom being a good drinker and eater. Two of them were returning emigrants from Southeast Asia. In other words, the typical patient was a young man of comfortable situation, physically inactive in some white-collar occupation, living or arriving in Hong Kong from Southeast Asia, often with a deceptively sturdy appearance.

Zhou Xiaonong's nine cases were about Shanghai men traveling to Wuxi to get treatment from him. Other than a fireman, the patients were either intellectuals (students, writers) or merchants (one in the iron business, a couple of shopmen, including one in the hotel business). Except for an older patient aged fifty-six, all the patients were young. Like Zeng's patients, quite a few of these Shanghai dwellers were described as excessively indulgent in food and drink. One was observed to be masturbating too much. For both Zeng and Zhou, the typical *jiaoqi* patient was an urban young male with an unhealthy lifestyle, undisciplined in diet and sex. Zhou, however, put more weight on the bad natural environment (*shuitu*) of Shanghai, city par excellence of new immigrants, as a cause:

> The coastal areas of Shanghai are damp . . . causing the disease. People from other provinces are not aware of this and do not pay attention. I have worked in the police bureau for three years as a doctor . . . and know that in the lowly areas of Pudong and Jiangwan, policemen . . . often contracted this disease. Then many young men in the commercial sector also fell ill and did not understand why.[51]

Similarly, all the five *jiaoqi* cases included in a compilation of medical cases by "renowned national [traditional] doctors" (1929) involved male patients; two fell sick because of too much food, alcohol, and sex, the others were victims of an overly damp, toxic environment. The compiler of the book, He Lianchen 何廉臣 (1861–1929), like Zhou, made a special comment on Shanghai as a lethal place for new settlers.[52] Popular medical writings in the early twentieth century generally stressed the vulnerability of healthy young men to different epidemiological hazards, including *jiaoqi*, in big cities where they recently settled. During the war, Chongqing, a city for refugees

51. Zhou Xiaonong, *Zhou Xiaonong yi'an* [Medical cases of Zhou Xiaonong] (Hong Kong: Commercial Press, 1971), 198.
52. He Lianchen, ed., *Quanguo ming yi yan'an leibian* [Selected medical cases (showing medical efficiency) by famous doctors in the nation], 1929 (Taipei: Xuanfeng chubanshe 1971), *juan* 4: 36a–41b, his comment on p. 38a.

including civil servants, students, workers, and soldiers, also became endemic with *jiaoqi*.[53]

Deprivation, however, gradually displaced affluence as the leading explanation of the disease, even though men remained as main victims. With this shift, the issue of class differences took a new turn. Chinese and Japanese doctors began to produce epidemiological studies that showed the vulnerability of laboring men. Omori in a paper presented at the 1925 Congress of Far Eastern Association of Tropical Medicine stated that *kakké* spread from students and merchants to the lower working classes, particularly afflicting hard physical workers such as soldiers and other laborers. The disease targeted the young, "especially those whose lymphatic systems are enlarged."[54] In China, the above-mentioned Shanghai doctor Jiang Zhenxun made the observation in the 1930s that most victims were factory workers, soldiers, and students who were new arrivals in the city, some of whom sometimes mistook their illness to be syphilis.[55] Wu Lien-teh (1879–1960), director of the Manchurian Plague Prevention Service, reported in 1925 based on information from a Shanghai hospital that of the 28 patients treated, more than half (15) were soldiers, the others including shopmen, a cook, a detective, a tailor, a clothier, an actor, and a penmaker, apparently all males of the working classes.[56] Benjamin S. Platt (1903–1969), an English physiologist working at the Henry Lester Institute in Shanghai in the early 1930s, had a much larger database. He reported in 1934 that the Lester Chinese Hospital treated some 50,000 beriberi patients, with a male/female ratio of 8 to 1, of whom half were artisans, one-third laborers, and the rest sailors, students, and shop assistants.[57] In the 1930s, biomedical nutritionists in China did a series of studies on industrial health in Shanghai to show the deficient diets of workers. A 1936 report, for instance, showed that vitamin B was deficient in 80 percent in juvenile factory workers and recommended the consumption of brown unpolished rice and an increase in the use of animal fats.[58]

53. Chao Yafeng, in "Jiaoqi laza" [Miscellaneous comments on *jiaoqi*], *Fuxing Zhongyi* 2(4) (1941), noted that many businessmen, workers, shop apprentices, and employees freshly arriving in Shanghai from the countryside easily fell victim to the disease. See Zhang and Wu, "Chongqing zhongyang yiyuan jiaoqi bing ershiba li zhi linchuang baogao" [Clinical report on the 28 *jiaoqi* cases at the Central Hospital of Chongqing], *Huaxi yixun* 5(1) (1948): 19.
54. Kenta Omori, "Studies on the Cause and Treatment of Beri-Beri in Japan," Far Eastern Association of Tropical Medicine (FEATM) Transactions of 6th Biennial Congress, Tokyo, 1925: 183, 186, 200.
55. Jiang Zhenxun, "Er ge jiaoqi bingli" [Two cases of *jiaoqi*], *Xinyi yu shehui huikan* 2 (1934): 257–58.
56. J. W. H. Chun and Lien Teh Wu, "Beri-Beri Control from an Administrative Standpoint," Far Eastern Association of Tropical Medicine (FEATM) Transactions of 6th Biennial Congress, Tokyo, 1925, 157.
57. Platt and Gin, "Some Observations on a Preliminary Study of Beriberi in Shanghai," 407.
58. Lee Wei Yung, Eric Reid, and Bernard Read, "Industrial Health in Shanghai, China, III: Shanghai Factory Diets Compared with Those of Institutional Workers," *Chinese Medical*

In Republican China, as in Japan since the late nineteenth century, *jiaoqi* as a symbol of weak male bodies was increasingly considered a serious national security problem, especially in the South. In the 1920s and 1930s observations and studies on *jiaoqi* began to be done in military units and published in military medical journals, increasingly with biomedical theory and methodology.[59] Throughout the 1930s, *jiaoqi* patients treated in the Guangdong Military Hospital represented already more than 15 percent of hospitalized soldiers in the internal medicine section. In the immediate prewar years, one of the first full-length biomedical monographs on *jiaoqi*/beriberi in China by Yang Shen 楊紳, a Japan-trained doctor working in the hospital of the Nanking Military Police, was published, based on the epidemiological study on the disease in the hospital, where 58 percent of patients, all young males, naturally, suffered from *jiaoqi*.[60] By 1937 when the war broke out, the military hospital in Shaoguan of Guangdong Province was reorganized into one specialized in *jiaoqi* treatment.[61] By this time *jiaoqi* was increasingly described in the media to be a disease of young men having to work excessively hard as soldiers, workers, and laborers in shops, plantations, factories, schools, and other modern institutions.[62] After the war, excessive physical exertion that burned more thiamine than ingested, rather than the consumption of white rice, had become the main explanation for the high morbidity of Guangdong soldiers with beriberi.[63]

Racial differences in beriberi, unexplained in the early period, also became accountable with deprivation as the main cause. In the nineteenth century, British colonial doctors in South Asia shared the observation but did not explain the fact that it was mostly Asian males who fell victim to the disease, while Westerners seemed to be spared.[64] By the late 1910s, when

Association Special Report Series 7 (1936): 21–22.

59. There were a number of articles on the disease in the army of Zhejiang province in the 1920s, especially in *Guangji yikan* 廣濟醫刊 in Hangzhou; in the 1930s, the military medical journals of the Guangxi military school, *Guangxi jianshe yixue yuekan* 廣西健社醫學月刊, and of the Guangdong military, *Guangdong junyi zazhi* 廣東軍醫雜誌, and the journal of the Zhongshan Medical School in Guangzhou, *Zhongshan yibao* 中山醫報, published a number of research articles on the *jiaoqi* problem in the provincial armies in southern China.
60. Yang Shen, *Jiaoqi lun* [On *jiaoqi*] (Nanking: Military Police Hospital, 1933).
61. Li Zhaoshi, "Jiaoqi bing zhi guofang guan" [Looking at *jiaoqi* from the national defense point of view], *Guangxi Jianshe yixue yuekan* 1(3) (1937): 33–34; "Zu jiaoqi yiyuan" [Organizing a *jiaoqi* hospital], *Huazi ribao* [Chinese Mail], April 17, 1937.
62. Chi, "Jiaoqi bing," 11–13.
63. Zhu Shihui and Chen Airen, "Guangzhou jundui zhi jiaoqi bing" [The *jiaoqi* disease in the Cantonese army], *Zhongshan yibao* 3 (5–6) (1948): 10.
64. This view was held by the Europeans since John Malcomson's book in 1835. In this early text on beriberi, Malcomson, assistant surgeon in Madras, reported that the ethnic groups most vulnerable to beriberi were the "Mussulmauns (Indian Muslims). The next amongst the Gentoos (Hindus) and Malabars (Southern Indians); the next amongst the Rajpoots (Indian warrior classes); and lastly of all amongst the Parrias (the untouchables). . . . The Mussulmauns are, of all the natives, the most addicted to luxurious living on the coast; and have been accustomed to the use of much animal food and spices." He also noted

the deficient white rice theory was emerging,[65] European doctors and scientists found an explanation for racial difference, or for the "Asian-ness" of beriberi: deficiency diseases are practically nonexistent among modern civilized Europeans, for, when living on the ordinary mixed diet of civilization, it is difficult to avoid getting an adequate amount of each separate vitamin. It is where the diet is more simple, as is the case with those of many Eastern races, that the risk of deficiency disease becomes proportionately greater.[66] The view that rice-based Asian diets were universally "more simple" and thus deficient gradually took hold among many Western nutritionists in the twentieth century.[67] By the mid-1920s, in popular biomedical writings in China, this explanation was gradually internalized. It was falling in line with the idea that the disease was prevalent mostly among the darker races, while Westerners, whose diets were believed to be superior, with greater diversity of foods, were spared.[68] One Chinese article published in a serious medical journal in 1939 listed ten characteristics of modern *jiaoqi* and the first was that "it is rare among Westerners, but common among East Asians." Without providing statistics and admitting that the real cause of beriberi remained obscure, the same article continued to emphasize the vulnerability also of the laboring classes, of people living in collectives, and those emigrating out of China. This popular framing of beriberi reflected the rapidly growing currency of the deficiency theory that targeted the socially and economically deprived and racially inferior.[69]

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reports showing that Europeans troops were only rare and occasional victims of the disease, though he conceded that "I have reason to believe that some cases occurred in the European regiment, but if so, they are returned under other names [dropsies and palsies]." Malcolmson, *Practical Essay on the History and Treatment of Beriberi*, 41–42, 26.

65. Casimir Funk's contribution to the deficiency theory in the period was critical; see his "The Etiology of the Deficiency Diseases," *Journal of State Medicine* 20 (1912) where he states that "[t]he deficiency diseases break out in countries where a certain unvarying diet is partaken of for long periods" (341).
66. H. Click and E. Hume (Lister Institute of Preventive Medicine), "The Distribution among Foodstuffs of the Substances Required for the Prevention of Beriberi and Scurvy," *Journal of the Royal Army Medical Corps* 29 (July–December 1917): 123.
67. See Worboys, "Discovery of Colonial Malnutrition between the Wars."
68. David Arnold shows with the Indian example how rice, associated with nutritional poverty, was to account for negative racial stereotypes, even though beriberi was not a serious epidemic there. See his "British India and the 'Beriberi Problem' 1798–1942," *Medical History* 54 (2010): 312.
69. Liu Shusen, "Jiaoqi zhi yanjiu" [The study of *jiaoqi*], *Xin yiyao kan* 74 (1939): 16. In an earlier article, the author Min Yuquan categorically noted that the disease was rare among Europeans and Americans but more common among the yellow and dark races. See his "Jiaoqi bing yufang fa" [Preventive measures against *jiaoqi*], *Yiyao pinglun* 54 (1931): 19. See also Wu Zhiming, "Jiaoqi zai Yuandong" [Beriberi in the Far East], *Xiandai yulin* 19 (1939): 41.

What Women Got Sick: The Mother and the Whore?

Considered socially inactive by nature, Asian women originally were thought to have been spared in the modern beriberi epidemic. Just like traditional Chinese and Japanese *kampō* experts, biomedical doctors began by considering women vulnerable only when their bodies were under the stress of reproduction, their main social duty. Simmons noted that, in Japan in the 1870s, few women had beriberi, "except during pregnancy and a short time after confinement. It shows itself soon after the middle of gestation, in the wet form of the disease, and culminates at its completion. . . . Dr. Stuart Eldridge informs me that in Hokodadi, while he had charge of the Government Hospital there, *kakké* was very prevalent and fatal among pregnant women." This seemed to fit Simmons's belief that beriberi is "distinctly a specific disease related to the condition of anemia" that British doctors had noted in India.[70] This explanation was highly compatible with the classical one for female *jiaoqi* or *kakké* in China and Japan, established no later than the twelfth century when medicine for women became a separate field of study. The ailment was described as not only affecting reproducing women but especially a serious cause of infertility.[71] This classical explanation for female *jiaoqi* centering on women's reproductive functions remained valid throughout the premodern period in East Asia.[72]

Later, at the turn of the century, when eating polished white rice was emerging as the cause, the reasons for women affected by beriberi required a different set of explanations, first to satisfy the "decadent" assumption. W. L. Braddon, pointing out in his influential 1907 text the "special incidence of beriberi" on the well-fed, suggested that the vigorous and strong naturally ate rice in "quantities absolutely greater" than did the lean, explaining why they more easily contracted the disease. Based on this observation, he

70. Simmons, "Beriberi, or the 'Kakké' of Japan," 50. Victor Heiser later in the Philippines also observed the vulnerability of reproducing women to the disease by studying infantile beriberi. See note 18.

71. See Charlotte Furth, *A Flourishing Yin: Gender in China's Medical History, 960–1665* (Berkeley: University of California Press, 1999). See also Hilary Smith, "Foot *Qi*: History of a Chinese Medical Disorder" (PhD diss., University of Pennsylvania, 2008).

72. Chen Ziming 陳自明 (1190–1270) in his milestone publication of *Furen daquan liangfang* (All-inclusive good prescriptions for women 婦人大全良方, 1237) , thus framed the *jiaoqi* disorder: "Men get it because of depleted Kidney that makes them vulnerable to Wind and Dampness; while women get it because of depleted *qi* of the Womb vessel, making them vulnerable to Wind toxin." He also considered female *jiaoqi* closely linked to infertility. Chen Ziming's female version of *jiaoqi* linked to Blood and reproduction became a focus of debate in later medical discussions on the disease. Zhu Xiu 朱橚 (?–1425), author of the influential *Recipes for General Relief* (*Puji fang* 普濟方, 1406) of the early Ming distinguished between reproductive women and virgins as victims of *jiaoqi*: the former fell sick because of blood depletion, the latter because of blood stagnation. Most late imperial doctors tended to argue that women patients should be treated differently because of their unique reproduction function and their particular emotionality.

concluded that fewer women got the disease because, in general, they ate less rice than men. However, "I have noticed that amahs (who feed themselves, and can afford to buy plenty of rice), the Chinese wives of Eurasians, and Straits-born Chinese 'babas' (wet nurses) are particularly prone to the malady. This is also true of prostitutes. All these classes eat rice in excess."[73]

H. Durham writing in 1904 on the disease in the Malay Peninsula and on Christmas Island off the shore of Java concurred: Chinese women with beriberi could mostly be observed in brothels; "beriberi is very far from common, notwithstanding that they (the women patients) live herded together; on the other hand, their employment is fairly lucrative and they follow where money is plentiful; it may be supposed that they are not usually stinted in food." Similarly, he said, the rare Japanese female beriberi patients in the Malay States were also mostly prostitutes.[74] Noel Davis, assistant health officer of Shanghai, observing the beriberi epidemic in various institutions in the city in 1912, chose to gather data from the new jail; the police force; Shanghai Tramway Company's native employees, where only younger men were present; and the homes of Door of Hope Rescue Society, where girls "rescued" from brothels were interned, showing the close association made by Western doctors between female beriberi and prostitution in this period.[75] For these early biomedical experts working in Asia, polished white rice was a bad luxury food that few women could afford. The rare Asian women patients of beriberi, if they were not reproducing, must therefore be prostituting themselves to satisfy their gluttony in white rice.

Ding Fubao, the popular medical writer and publisher active in Shanghai in the first decades of the twentieth century, well versed in traditional medicine and a prolific translator of Japanese *kampō* and biomedicine texts, reasoned on the same line in his 1910 compilation on *jiaoqi*, "Men have predisposing causes (*suyin* 素因), due to their special lifestyle. . . . [T]hey have predisposing causes, but not women, due to their different lifestyles,"[76] implying that respectable women, perceived as idle and disconnected from public and economic activities were less vulnerable than working men, even though they were of the weaker sex.[77]

It was Liao Wenren (Ryō Onjin 廖溫仁, 1893–1936), a Japan-trained Chinese doctor in Japanese Taiwan, who provided a complete explanation on female *kakké* based on their somatic makeup subsuming their more

73. Braddon, *Cause and Prevention of Beri-Beri*, 256.
74. Durham, "Notes on Beriberi," 122, 125.
75. Davis, "Observations on Beriberi in Shanghai," 28. He noted that the jail had the most cases (134), twenty-six cases were found among the girls in 1910, a few more than those in the police force and Tramway Company.
76. Ding, *Jiaoqi bing zhi yuanyin ji liaofa*, part 2, 29, 36.
77. Many popular articles confirmed this view: Zhu and Chen, "Guangzhou jundui zhi jiaoqi bing," 10; Liu Shusen, "Jiaoqi zhi yanjiu," 16; Kuang Heling, "Ru'er jiaoqi bing" [*Jiaoqi* ailment of babies], *Zhongshan yibao* 6(5–6) (1951): 8.

noticeable social roles: women were less vulnerable to *kakké* as they did not normally have the occasion to indulge in excessive food and alcohol, as men did in their prime. They normally would not suffer from a stomach corroded by damp, a direct cause of the disease. Women, however, would contract the disease under two exceptional circumstances: when they were reproducing or if they indulged in excessive sex, like prostitutes. The pregnancy of the rare female *kakké* victims, according to Ryō, blocked not only blood and *ki* but also fluid flow in their lower burner, causing the lower limbs to swell. As for the case of prostitutes, he quoted the famous doctor Taki Motokata: prostitutes were depleted in the lower body because of excessive sex, making them vulnerable to the sudden, upward, and fatal "heart attack" (*shōshin* 衝心) of *kakké*. Ryō thus provided a neat set of explanations based only on the makeup of the female sexual and reproductive body.[78]

Ryō's explanation of the way *kakké* attacked the woman either as mother or whore was a modern version of the East Asian classical account of *jiaoqi* in the twelfth century that focused only on the reproductive woman. This modern version articulates a new and profound anxiety on the prostitute as a public, working woman in modern, global Asia. Limiting the explanation of the ailment to the prostitute's somatic makeup, dismissing the social factor of immoral wealth and white rice gluttony once proposed by biomedical doctors, Ryō was confirming vital somatic vulnerabilities of the prostitute to this "modern" disease, caused not by too much bad food but by excessive sexual activity.

Ryō's explanation was formulated at the time of the consolidation of the deficiency theory, which was also wartime. Deprivation or excessive physical exertion was increasingly given more weight as a cause of the epidemic in Asia. Thus, working women did end up being counted in the epidemiologic statistics. Omori reported in 1925 that the disease was most prevalent among first soldiers, then laborers, factory girls (spinning girls), and students.[79] The Chinese doctor Zhu Qian (朱潛), studying pregnant women infected with beriberi in 1933, also noted their different occupations: of the thirty-eight cases he studied in Guangdong province, ten clearly belonged to the laboring classes, fourteen were of unknown occupations or interned in social institutions, with only three belonging to the well-to-do classes. Other than noticing the great fatigue of eight of them, he also indicated the possible association of the disease with other health issues such as syphilis, opium smoking, and alcoholism, hinting that some of these women were

78. Ryō Onjin, "Tōyō kakké byō kenkyō" [Research on Japanese *kakké*] 1932 ed. (Kyoto, doctoral dissertation, 1928), 299–303.

79. Omori, "Studies on the Cause and Treatment of Beri-Beri in Japan," 186. The statistics were said to be collected at the beriberi clinic at the Tokyo Imperial University by Dr. Baelz (no date given; Baelz left Japan in 1905). Omori claimed that statistics taken by him in 1921 and 1922 at his own hospital at Keio University were in agreement with the Baelz data.

actually prostitutes.[80] In a sense, prostitutes represented the extreme case of working women.

Qu Shaoheng 瞿紹衡, a famous Western-trained obstetrician working in Shanghai in the 1930s, was one of the first and rare experts who perceived women's social role and its relation to the disease differently. He stressed the importance of the exceptional hardship that women were facing because of the war: many lost their homes, not having a regular place to live in the crowded city, and having instead to work hard to sustain the family. Their body was highly "stressed" and became vulnerable to the epidemic in miasmatic Shanghai.[81] His explanation clearly shows that the white rice theory did not convince him as a sufficient cause for beriberi, in disagreement with Western biomedical doctors working in Asia.[82]

Conclusion

Modern East Asian populations familiar with the classical *jiaoqi*/*kakké* traditions first searched for causes of the epidemic in the rapidly changing living environment: miasmatic cities with excessive damp and warmth generated by human density, activities, and rivalry. As they saw it, man, especially able-bodied man, the main actor in the arenas of work and war in modern East Asia, was the natural victim of the epidemic. Before the 1930s when the vitamin B1 theory, adorned with a Nobel Prize won in 1929, came out triumphant, diagnostic assemblages of beriberi/*jiaoqi*/*kakké* worked together to frame East Asia as an unhealthy natural and human environment that damaged Asian men's physical prowess, diminished their bravery and economic productivity, and reduced women's fertility. The beriberi epidemic was thus the high price of modernity that Asian societies were paying with their bodies and health. The unique East Asian therapeutic strategies of removing patients from the site of sickness, either to a more "healthy" place or especially back to their native place from where they had emigrated to work, expressed the understanding of the epidemic as being rooted in a modern, global, and alienating context. To get cured required leaving that global stage and retiring to a private space or home, or going back to the

80. Zhu Qian, "Jiaoqizheng yu funü fenmianqi de guanxi" [Relationship between *jiaoqi* and women during pregnancy], *Guangji yuekan* 19(8) (1933): 3–9, especially p. 5.

81. Qu Shaoheng, "Renchen yu *jiaoqi*" [Pregnancy and *jiaoqi*], *Xin yiyao kan* 69 (1938): 38–39.

82. For example, Cort reported from Siam in 1930 that pregnant women there got the disease because, "according to an old and still strongly observed custom, the diet of a woman for the month following childbirth consists of only rice and dried fish," or "almost exclusively, a glutinous rice." E. C. Cort, "Sporadic Beriberi in Chiengmai, Siam," Far Eastern Association of Tropical Medicine (FEATM) Transactions of the 8th Biennial Congress, Siam, 1930, 98. Another report on beriberi of mother and child in Burma also attributed the cause to the heavy proportion of rice in their diet, despite the fact that they also had a reasonable portion of vegetable, meat, and fruit. See S. Postmus, "Beriberi of Mother and Child in Burma," *Tropical and Geographical Medicine* 10 (1958): 363–69.

traditional ideal mode of life of moderation in desire, food, and sex. Like *feilao* 肺癆 (lung-exhaustion), or tuberculosis, beriberi was an Asian modern old disorder par excellence, with classical diagnostic categories engaging with an uncompromising health-threatening modernity.[83]

As beriberi research gradually became a key to the development of biochemical nutritional science after squeezing out competing diagnostic concepts such as germs, miasma, overcrowding, poor drainage, lack of sunshine, contagion, toxic foods, and the like,[84] vitamin theory came out triumphant in the late 1920s. Thiamine (B1) was singled out as the necessary substance for healthy nerves and for beriberi prevention. This groundbreaking discovery that formed the basis of this new science eliminated the miasmatic theory tied to a locality as a cause and did away with the factor of somatic makeup that was central to Asian traditional diagnostic systems. Beriberi could have been a disease independent of place and race. However, the specific link made all along between deficiency and the consumption of polished white rice put East Asia and Asians right back into the controversy on beriberi, now defined as an unfortunate product of an inferior Asian diet, seen as simple and monotonously rice based. The white rice theory also gained explanatory power on the relative vulnerability to the disease along racial, class, and gender lines. The immoral aspects of this modern Asian "junk food," polished white rice—as a mechanized modern commodity in lucrative global capitalist ventures—also stigmatized some of the beriberi victims: indulgent, able-bodied, urban men and gluttonous prostitutes who desired too much white rice in the earlier period, and ignorant and uneducated industrial workers in the latter period.

However, one should note that, unlike Western biochemical experts of nutritional science, East Asian biomedical doctors' take on thiamine deficiency was interestingly different and understated. Instead of incriminating white rice as a bad food, and thus promoting the taxing of regional rice trade as an international policy to curb beriberi as did Western scientists,[85] Chinese doctors focused more on deficiency theory by emphasizing the

83. It may be interesting to compare *jiaoqi*/beriberi with *feilao*/tuberculosis described in Sean Lei's "Weisheng weihe bu shi baowei shengming" [Why is hygiene not about protecting life?], in *Diguo yu xiandai yixue* [Empires and modern medicine], ed. Li Shangren [Shang-Jen Li] (Taipei: Linking Publishers, 2008), 438–48, in which Lei contrasts the traditional "life-nourishing" approach toward *feilao* as an exhaustion, and the modern combative attitude toward tuberculosis as a germ-caused disease.

84. Carpenter, *Beriberi, White Rice, and Vitamin B*, 32–35, 44–45, 64–65, 84.

85. Despite the Americans' unilateral decision to ban the use of polished rice in all state institutions in the Philippines in May 1910 and the urging of other medical officers in the region to control the polished white rice trade in Asia, no collective decision was made by the FEATM for fear of popular discontent and opposition from rice traders. For David Arnold, "it was the cultural objection to banning or taxing white rice that seemed most conclusive." David Arnold, "Tropical Governance: Managing Health in Monsoon Asia, 1908–1938," Asia Research Institute, National University of Singapore, Working Papers Series, no. 116, 2009.

extreme physical exertion to explain the lack of thiamine. For them beriberi was not about how much rice that patients ate but about how much thiamine they could and should retain in their body with the increasingly demanding physical activities in the workplace and especially during wartime, a question that even postwar American nutritionists could not have answered.[86] For them, these young men's, and increasingly women's, bodies were not weakened or sterilized exactly by white rice but by, again, an increasingly stressful living and working environment in an uncertain world order.

The therapeutic solutions for biochemically framed beriberi became highly technical: to increase foodstuff rich in thiamine, to tax polished white rice, and, most importantly, to give "miraculous" thiamine injections developed in the late 1930s to prevent the ultimate fatal heart attack. The Hong Kong Tung Wah Hospital purchased a large amount of thiamine injections from Britain in September 1940, after which the board decided that from then on *jiaoqi* patients would be solely treated by Western medicine. The exclusion of Chinese medicine in the treatment of *jiaoqi* in this hospital, even though it claimed a 70 percent success rate,[87] was a significant step toward the complete ban of Chinese medicine in the hospital in 1945.[88]

86. The American *Nutrition Reviews* (Washington, DC) published many articles on the incomplete knowledge on thiamine deficiency in the postwar period reflecting the unresolved question in the late 1940s. See especially the 1947 issue, vol. 5, that posed the question, "What is the complete biochemical picture in beriberi?" (7), which remained without a satisfactory answer.
87. DHA, *Minutes of Board Meeting*, August 26, September 3, September 10, 1940.
88. The pressure of banning Chinese medicine came directly from the Hong Kong colonial government, DHA, *Minutes of Board Meeting*, September 10, 1940; Xian Yuyi and Liu Runhe, *Yishan xingdao* [Enhancing charity and practicing the way] (Hong Kong: Sanlian, 2006), 68–69.