

## The Evolution of the Idea of *Chuanran* Contagion in Imperial China

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During the last years of Qing imperial rule, when Western medicine and notions of public health were being introduced in China, intellectuals and the political elite tended to accuse Chinese society of ignorance about proper behavior related to the avoidance of diseases. Such accusations usually became particularly severe during epidemics. The ordinary Chinese were typically blamed for being superstitious, filthy, and ignorant of germs and of the danger of the spread of diseases—in other words, totally lacking basic scientific knowledge of health and hygiene.

An article from February 14, 1911, in *Dagong Bao*, a major newspaper published in Tianjin, compared the Chinese people, oblivious as they were to the great danger of the epidemic of pneumonic plague devastating Manchuria, to ignorant children playing around a well, unaware of their imminent danger of falling in. In his contribution to this volume, Sean Hsianglin Lei draws our attention to an important remark in the same year by Xi Liang (1853–1917), governor general of the region: “In the beginning [of the outbreak], our bureaucrats, local gentry, and medical practitioners did not believe that epidemics [*yi*] could spread by contagion [*chuanran*].”<sup>1</sup>

The above two public remarks suggest that Chinese identified the plague as a manifestation of the indigenous medical category of *yi* or *wenyi* (epidemics), which was not contagious. This consensus reflected long-standing orthodox medical teachings about febrile diseases. The oldest umbrella category for these conditions was *shanghan* (Cold Damage). Built into *shanghan* doctrine were configurationist assumptions that outbreaks affecting many people at the same time were triggered by something in the environment: unseasonable weather, perhaps, or malign local *qi* (breath, energy). Epidemics were simply extreme variants of this pattern.

Elite writers noticed that the pneumonic plague epidemic in Manchuria—a consequence of increasing global traffic—was totally new to the Chinese.<sup>2</sup> Moreover, for the Chinese authors, this newness seemed to explain popular ignorance. Nevertheless, this does not mean that the idea that some diseases could spread by contagion (*chuanran*) was unknown in China before 1900.

For a Chinese person before 1900, what exactly did it mean for a disease to involve *chuanran*? In the twentieth century, the term quickly became the standard translation for the biomedical notion of “contagion” as “the communication of disease from one person to another by bodily contact.”<sup>3</sup> But *chuanran* was actually an old word, used as early as the tenth century to express complex and ambiguous concepts about the spread of disease from person to person. Its root *ran*—literally, to dye—is part of ancient compound words (i.e., words made up of two or more characters) that convey notions such as transmission, infection, or even contagion. However, it is unlikely that a Chinese in the first years of the twentieth century talking about *chuanran* had in mind our biomedically inflected concept of a disease transmitted from person to person via a microscopic organism. Older ideas of *chuanran* specific to the Chinese context may have escaped our notice because today we take this modern meaning for granted. Such attitudes reveal the particular Chinese conceptualization of the *chuanran* (literally, transmission by dyeing) mode of the spread of diseases before the language of Western biomedicine came to dominate Chinese public discourse later on in the twentieth century.

The purpose of this essay, therefore, is not to study the history of the concept of contagion as defined by Western biomedicine in traditional Chinese society, but to trace the evolution of the term *chuanran* and its changing meanings, in comparison with other terms with the root *ran*. By so doing, we hope to gain a better understanding of the traditional Chinese idea of the communicability of diseases, indispensable for our assessment of the reception in China of the modern Western idea of contagion.

### *Contagion versus Chuanran*

Even in Europe, contagion as the transmission of diseases from person to person is a modern notion. It is generally agreed that there was no clear idea of contagion by contact up to the Middle Ages.<sup>4</sup> Some historians believe that the Western idea of diseases’ being communicable from one per-

son to another came from Arabic medicine in the twelfth century and was largely related to nonepidemic diseases.<sup>5</sup> As late as the sixteenth century, when Girolamo Fracastoro published an important book on contagion, in which he further developed the idea of “seeds” of contagion, the mechanism and channels of contagion remained ambiguous.<sup>6</sup> Ambiguities about contagion continued well into the nineteenth century. As Margaret Pelling has convincingly emphasized, the modern idea of contagion inherited a story involving “striking contrast, between the germ theorists, and the sanitarians who were miasmatisers and believed that smells caused diseases . . . The concepts of contagion, infection and miasma accumulated layers of connotation over time, and effectively became not single concepts but many.”<sup>7</sup> The contrast has been largely simplified in modern literature on the history of medical thought.

Pelling points out, for example, that it is too simplistic to say that the idea of contagion was monopolized by the scientifically minded bacteriologists and that the so-called miasmatisers were anti-contagionists. In fact, the two groups had some broadly similar ideas about contagion. The transmission of poison by water or air, for instance, was accepted by both, but the miasmatisers were unclear on the process by which the poison could travel from the sick to the healthy.<sup>8</sup> For an influential doctor such as Max Josef von Pettenkofer, who was not a germ theorist, cholera and typhoid did not spread directly from one individual to another, but by water and air infected by germs that had become toxic in the soil after leaving the bodies of the sick.<sup>9</sup> Therefore the similarities and differences between the miasmatisers and bacteriologists on the question of germs and contagion were complex and subtle in the mid-nineteenth century, when Western Europe experienced its first attacks of cholera.

This observation is also shared by François Delaporte in regard to the 1832 cholera epidemic in France.<sup>10</sup> In 1870, a discussion published in the *British and Foreign Medico-Chirurgical Review* on current theories of contagion admitted that “considerable obscurity still surrounds the whole question of the nature, origin and prevention of contagion.”<sup>11</sup> Contagion is therefore a difficult concept to trace and clarify before the nineteenth century, even in Western societies. It was the gradual domination of germ theory from the late nineteenth century onward that finally shaped our modern understanding of contagion.

*Chuanran*, the Chinese term used by Xi Liang and other political and cultural elite writers around the beginning of the twentieth century, was

equally ambiguous when used to express the spread of diseases. Between the tenth century and the end of the nineteenth, it was commonly used both as a verb and as a noun, but not as an adjective. It was used interchangeably with other terms with the root *ran*—such as *xiangran* (mutual dyeing), *ranyi* (exchange by dyeing), and *ganran* (affect by dyeing)—to express the spread of diseases during epidemics as well as the transmission of nonepidemic diseases. This illustrates the complexity and flexibility of the idea contained in the character *ran*. By the late imperial period, *chuanran* was clearly the most popular term to express the idea of the spread of diseases, including notions of contagion and infection.

*Ran* is a very old Chinese word, its first known meaning being to dye, implying tainting, staining, or changing color. It is interesting to note that the English word “infection” also originates from a root meaning “to put or dip into something,” “leading to *inficere* and *infectio*, staining or dyeing.” The same is true also of the nouns “contagion” and “miasma,” “which derives from the Greek verb *miaino*, a counterpart to the Latin *inficere*. Impurity is therefore a basic element in all three concepts.”<sup>12</sup> Similarly, the first Chinese concepts for the spread of diseases were also derived from the idea of tainting or dyeing, implying the polluting of an originally pure object after it comes into contact with a polluting source. The process of *ran* could also imply an implicit transformation of the nature of the polluted object after prolonged contact with the contaminating source.

#### Early Connotations of *Ran*

As already pointed out by Barbara Volkmar, *ran* is the key Chinese term related to the concept of the communication of diseases.<sup>13</sup> Today Chinese still use *ran* as a verb to describe catching a disease: *ranbing* literally means to become tainted with a disease. This term implies two processes—namely, a healthy person's coming into contact with a polluting source, and the subsequent corruption of the originally healthy body. However, *ran* was initially not used in any medical context. It should therefore be useful if we first trace the use of the word in ancient Chinese, for a better appreciation of the original use of *ran* as an expression of contamination.

Dyeing was an important undertaking in ancient China, especially the dyeing of raw white silk into different colors, a task that was entrusted only to specialists in the Western Zhou court (roughly the eleventh to eighth centuries BCE).<sup>14</sup> Later on, *ran*, always in the form of a verb, was used

metaphorically, meaning to contaminate, especially in the context of bad customs and mores. The *Shang shu* (meaning “book of history,” compiled around the fourth century BCE) already used *ran* to mean the corrupting of customs by external influence.<sup>15</sup> Such a usage was fairly common in ancient texts, mostly in the negative sense, but sometimes in the neutral or even positive sense, meaning customs were or could be *ran* (changed or improved) by external influences.<sup>16</sup> This usage of *ran* became very common in ancient classics and historical writings, often in combination with *jian* (to immerse): *jianran* literally means to take up new color after prolonged immersion. According to the philosopher Mozi, this process caused a “change in the nature” of a person.<sup>17</sup>

One of the first appearances of *ran* in the sense of disease spreading appears in the *San guo zhi* (History of the three kingdoms) from the third century CE. In the extreme south of China, where “water and earth” were saturated with “poisonous qi,” soldiers and ordinary people traveling in and out of the region would “certainly develop illnesses and contaminate each other” (*zhuan xiang wu ran*).<sup>18</sup> The spread of disease is here linked to the concept of ubiquitous poisonous air and the large number of people exposed to such environmental influences. A similar term also appears in the *Zhouhou beiji fang* (Handy recipes for urgent uses), a famous contemporaneous medical text by Ge Hong (283–343). In this text, a dozen recipes, many of which are more ritual than herbal, are said to be effective in stopping *wenbing* (Warm Disease—that is, illnesses that are caught in the cold season but that develop only during the warm season), so that patients with such conditions would not *xiangran zhuo* (contaminate and affect each other). Judging from the fact that these recipes treated not only the patients themselves, but also members of the household and even the residence, we might conjecture that the idea of the spread of disease was linked essentially with contaminated bad air within the area of the household. The word *zhuo* is of particular interest here, as it emphasizes the effect of “being affected,” implying some fundamental change in the healthy body after the tainting process. *Zhuo* would later on be used rather frequently with *ran* (*ranzhuo*) to express a serious case of disease-causing contamination.<sup>19</sup>

It is important to emphasize that phrases containing *ran* to convey the spread of disease did not appear in the earliest medical classics. Indeed, those works were mostly concerned with the cosmic relations between the individual body and the environment. Discussions on the body as a vehicle for disease transmission appear in the literature only after the third century CE.

In the following paragraphs, I attempt to show that there is a historical development of the terms incorporating *ran* toward more specific modes of disease transmission after their first appearance. I would, first of all, suggest the following chronology: The idea of the spread of disease by contamination emerged around the third century CE, evidenced by the fact that the first terms containing *ran* in this sense are found in this period. The idea began as a vague and complex notion. Its content became richer by the seventh century, when the major modes of disease transmission were described and more or less fixed. From the tenth century on, and particularly after the twelfth century, with the emergence and popularization of the term *chuanran*, contamination by personal contact with the sick gained increasing attention. This concept of transmission was developed fully and in more concrete terms in the late imperial period. I would like to begin this discussion with Chao Yuanfang's classic, *Zhubing yuan hou lun* (On the origins and symptoms of all diseases), an important text compiled in 610 CE, in which the basic modes of disease transmission were described in detail.<sup>20</sup>

#### *Modes of Disease Transmission from the Seventh to the Twelfth Centuries*

Chao Yuanfang's classic provides the fullest account of the main modes of disease transmission within the specific social and religious context of the early seventh century. We can distinguish three major modes of transmission that were expressed by terms containing *ran* and also *yi* (exchange) in this important text.

#### Transmission by Contamination and Switching (Answering Question 1015)

First, we find *jianran* (dye by immersion; also in the reverse order as *ran-jian*). This term already occurs in ancient nonmedical texts to express the notion that prolonged contact with a polluting source provoked a change in the nature of a person. By contrast, Chao used the term to describe contamination within the body. Several disorders were characterized by the gradual growth of diseased parts inside the body that finally affected surrounding healthy parts, leading to more serious and distinct pathological conditions. The disorder called *zheng*, for instance, was initially caused by depletion of the viscera and bowels, leading to indigestion. The internal congestion

"after prolonged and deep imbuing" later on coagulated into a solid and immovable block, finally turning into a *zheng* (concretion). Another example is excessive skin or a polyp growing on the eye, which was explained as the result of "prolonged tainting and immersion" of the corner of the eye with hot *qi* rising from the Liver. The symptom of "great heat" (*zhuangre*) in children was explained by conflicting cold and hot *qi* inside the intestines and stomach that "emerge after prolonged tainting and immersion."<sup>21</sup>

One can conjecture from these cases that *jianran* in such disorders referred to contamination of the healthy parts of the body by an originally smaller, sick part that had developed a pathology, after a period of "immersion." In a way, *jianran* is comparable to what we now understand as infection—that is, a kind of internal contamination causing a fundamental deterioration of the concerned body part, showing symptoms different from the original malaise.<sup>22</sup> The original disorder thus underwent a radical transformation after prolonged imbuing and became something quite different and more serious for the patient.

The second mode of *ran* as disease transmission discussed in Chao's text is expressed by the term *xiangran* (mutual contamination) or its variations, such as *zhuan xiangran yi* and *xiangran yi*. *Xiangran* was perhaps the most frequently used term for contamination in the medieval period—meaning, mostly, contamination by sickly *qi* that existed in a specific locality or was generated by patients. Most of the time, the term referred to tainting by bad, pathogenic *qi* in the atmosphere. Chao specifically saw unseasonable (*shi*) or perverse (*guaili*) *qi* as causing illnesses that would "contaminate and exchange [hosts]" (*xiangran yi*).<sup>23</sup> Warm Diseases (*wenbing*) would also emit a pathogenic *qi* (*bingqi*) that would shift, contaminate, and exchange hosts, in a two-stage process: annihilating first the entire family (*miemen*), and then outsiders.<sup>24</sup> Unlike the *shanghan* (Cold Damage) disorders caused by cold and discussed by Zhang Ji during the Han dynasty,<sup>25</sup> warm diseases and disorders caused by unseasonable *qi* would "affect by dyeing/contaminating" (*ranzhuo*)<sup>26</sup> and were thus more dangerous. Similar observations were also made by other major doctors of the period, such as Sun Simiao.<sup>27</sup> The key polluting element involved in the *xiangran* mode of transmission was the pathogenic *qi* that affected people under its influence. The presence of such *qi* was a necessary condition for the secondary person-to-person transmission that affected first family members and then outsiders.

The third mode—expressed by the terms *ranyi* (exchange by dyeing), *zhuyi* (exchange by pouring), and their variations—involved the specific

transmission of disorders directly from one person to another. Chao Yuanfang was one of the first medical authors to articulate the ancient idea of *zhu* (outpouring, pouring) fully in medical terms.<sup>28</sup> Chao defined *zhu* as follows: "Zhu [pouring] . . . implied [first] the *zhu* [stationing] of an illness [inside the patient] that will be [later on] poured and exchanged [*zhuyi*] to a person close by after the patient's death."<sup>29</sup> One of the main pathogens believed to be transmitted in this way was the one that caused consumption (*lao* or *zhai*).

In the eighth century, the medical author Wang Tao described consumption suffered by children, called *gan* (infantile depletion) or sometimes *wugu* (innocence), as a kind of *chuanshi* (corpse transmission), meaning a disorder caused by an outpouring of pathogens emerging from corpses: "Infants and children who suffer from *chuanzhu* [outpour transmission] [of this disorder] are many."<sup>30</sup>

Among the several types of *zhu* disorders described by Chao, it would be interesting to single out the magical transmission of *gu* (bug toxin) that entered the body of the cursed patient with the ultimate intention of killing him or her. After the death of the victim, the pathogen, called a *chong* (bug), would pour into a nearby person and "contaminate and affect" (*ranzhuo*) him or her.<sup>31</sup> This case deserves special attention as it implies the existence of vicious bugs inside the body of the affected person. These ancient religious or magical connotations remained a prominent feature of *zhu* as described in medieval medical classics.<sup>32</sup>

A significant development in the seventh century in the medical ideas of disease transmission was the new usage of the word *chuan*, the classic mode of transference of a pathogen within a body.<sup>33</sup> *Chuan* was now used to describe the flowing of a pathogen from one body, dead or sick, to another, healthy body, as in the above-mentioned *chuanshi* or in *fulian*, which described the flow of the (originally) static pathogen in sequence, as a result of which a series of victims, usually from the same lineage, were killed by the same pathogen as it flowed from one body to another.<sup>34</sup> This process did not involve tainting or corruption after prolonged contact with a polluting source. The word *chuan*, when combined with *zhu* (*chuanzhu*, meaning outpouring transmission) or *shi* (*chuanshi*, meaning corpse transmission), obtained this new meaning of the transmission of a pathogen from one body to another. The influence of Buddhist and Daoist ideas of shared guilt or collective responsibility of the lineage on the medical expression of transmission was marked in this period.<sup>35</sup>

Chao Yuanfang discussed another new medical idea related to *zhu*: If a weak person lived close in space to a patient with *zhu* disease, the *qi* would flow and shift, and the previously healthy person would contract the illness by "contamination and exchange" (*ranyi*) even when the latter was still alive. The fact that such an outpouring, called *sheng zhu* (*zhu* of the living) involved a process of contamination by a living patient further clarified the subtle difference that still existed between *chuan* transmission and *ran* (dyeing or contamination): The *zhu* transmission of the same disorder from one living body to another was essentially a *ran* process, in which contact between the two bodies caused contamination or some radical change in the originally healthy body. However, the *zhu* transmission of the same pathogen from a corpse to a living body was a *chuan* process, in which the pathogen simply left the dead body and traveled into another living body. Despite this difference, a key point is that the illness thus exchanged in both cases was still identical to the one suffered by the original patient or dead person,<sup>36</sup> while this was not specified in the above cases of *xiangran* (thus implying that the *xiangran* mode of transmission might include the spread of different disorders under the same perverse *qi*). In other words, the idea of the transmission of the same disorder was emphasized in the cases of *zhuyi*, *chuanzhu*, or *chuanshi*.

The descriptions of transmission modes involving *zhu*, *chuan*, and *ran* in Chao's classic show that in the seventh century, lines between *zhu* and *chuan* transmission and *ran* contamination began to blur. One should note particularly the new usage of the term *chuan* to express transmission of diseases from one body to another. This connotation prepares us for its eventual combination with the term *ran* (contamination) to create a new conception of disease spreading from one body to another—namely, *chuanran*.

Moreover, we can detect another characteristic of the *ranyi* or *zhuyi* mode of disease spreading: it sometimes involved a contaminating agent. One example in Chao's text is found in his discussion of the transmission of bad body smell (*huchou*; literally, a bad smell like that of a wild fox). According to Chao, inharmonious blood (*xue*) and *qi* caused a bad smell in the armpit: "This *qi* can contaminate, exchange [hosts], and affect others. Children who have this condition usually contract it from their wet nurses who have it in the first place."<sup>37</sup> In other words, breast milk, as the essence of blood and *qi*, was considered the agent of transmission of this disorder from the wet nurse to the infant. Sun Simiao summarized the two causes of this disorder as follows: "There are those who have this by heavens [*tiansheng*;

i.e., innately] and those who were contaminated [*ran*] by others to become smelly. It is hard to cure the former and easy to cure the latter."<sup>38</sup> The danger of bad milk, as the result of bad blood, would be further developed in the late imperial period.<sup>39</sup>

Finally, a subcategory of the third mode of person-to-person transmission by *yi* (exchange) was explained for the first time in these seventh-century texts—namely, exchange of disorders through sexual intercourse between a man and a woman. The term *yinyang yi* (exchange between *yin* and *yang*) first appeared in the Han classic on Cold Damage disorders, *Shanghan lun*, with descriptions of symptoms without any explanation.<sup>40</sup> Chao Yuanfang was one of the first to give this term a concrete interpretation: if a man or a woman had sexual intercourse before being completely cured of a Cold Damage disorder, Warm Disease, or unseasonable *qi* disorder (i.e., a disorder caused by the environment or weather), the person's sexual partner would fall ill. The reason the mechanism was called exchange was provided by Chao: "When *yin* and *yang* interact, the poison [dormant inside the original patient] will be activated and *duzhuo* [transfer and affect] the other person, like an exchange [*huanyì*]." This exchange occurred only during sexual intercourse between a man and a woman, not between partners of the same sex.<sup>41</sup> Sun also admitted that "the illness of a woman could be 'exchanged' to the man, and that of the man to the woman."<sup>42</sup> According to the *Shanghan lun* and the authors of the Sui and Tang texts, the illness thus exchanged was not similar to the original one and had its own specific symptoms.

Leaving aside the first mode of *jianran* that implied some kind of infection inside an individual body, the other two modes for the spread of diseases expressed by the terms *ran* and *yi* discussed above seem to allow us to draw the following conclusions, even though many points remain ambiguous or inconsistent: First, contamination was most damaging and widespread when there was a noxious *qi* affecting an entire locality. This would in turn provoke mutual contamination among people. Second, the exchange of a disease from an individual to another, not necessarily during an epidemic, was conceptualized in this period as involving two stages: the disorder would first be transferred to family members and then to outsiders. This two-stage transmission was systematic in the person-to-person *zhuyi* or *ranyì* mode and was only occasionally evoked in the *xiangran* mode, where an epidemic was implied. Third, it is unclear whether contamination in the *xiangran* mode caused disorders of the same symptoms, but the essential characteristic of the *zhuyi*, *chuanzhu*, or *chuanshi* mode was that

the disorder thus transmitted was the same. Fourth, two specific channels of person-to-person *ran* contamination were specified in this medieval period: breast-feeding and sexual intercourse. An identical disorder was transmitted through the first channel, whereas the second would generate different disorders.

### The Emergence of the Term *Chuanran*

Between the seventh and twelfth centuries, the term *chuanran* appeared both in literary and medical texts to describe the spread of diseases. One of the earliest examples is found in *Ji shen lu* (Records of the deities), by the early Song literatus Xu Xuan (917–92). In chapter three, Xu mentioned that the consumption of a fisherman's daughter was transmitted (*chuanran*) from one person to another, killing several people.<sup>43</sup> In the famous Song collection of occult anecdotes—*Yijian zhi* (Record of Yijian), by Hong Mai (1123–1202)—the family of a woman suffering from consumption avoided her for fear of *chuanran*.<sup>44</sup> A third early example is found in Chen Fu's *Nong shu* (Book on agriculture, ca. 1131–49) in which the author stressed that just as human diseases such as Wind disorders, consumption, and foot disorders could *chuanran*, peasants should keep healthy animals separate from sick ones.<sup>45</sup> A striking common feature of the above early records of *chuanran* is that the term referred predominantly to what we consider today as chronic disorders, especially consumption, believed to be transmitted by the ancient mode of *zhu* or *chuanzhu* mentioned above, often involving transmission by bugs flying out from corpses, affecting their family members. The term *chuanran* in these early cases was apparently not used to describe the spread of acute diseases.

The idea that consumption could be transmitted to others was very probably introduced by Daoist liturgists in the twelfth century. Lu Shizhong's ritual handbook revealed an emerging idea of disease transmission in relation to consumption, perceived to be transmitted by bugs. The text described rituals to prevent contagion by clothing, bedclothes, the bed, and utensils, or by entering the house of the patient or sharing food. Things used by the sick or deceased were believed to be impregnated with corrupt *qi* or polluting bug toxin (*gu*).<sup>46</sup> While disease transmission by bug toxin, as found in medical texts from the Sui and Tang dynasties, was typically described as occurring within a household, this Southern Song Daoist text recognized contagion irrespective of family relationship. Michel Strickmann consid-

ered this text a departure from the Daoist tradition that a chain of disease transmission was a consequence of shared guilt or genetic predisposition within a lineage. From then on, anyone in proximity to the sick or the dead was liable to *chuanran* contagion.<sup>47</sup> Such contagion was no longer uniquely a moral cause of disease; rather, it could simply be a consequence of carelessness.

One of the first medical authors to use the term *chuanran* was Zhang Gao (1149–1227), who mentioned two recipes to treat consumption and prevent the disorder from spreading.<sup>48</sup> Chen Yan, the author of the important medical text *San yin fang* (On the three causes of diseases, 1174) considered the common skin disorder ringworm as transmissible by physical contact with the sick even though its main cause was the stagnation of Blood and *qi* on the skin.<sup>49</sup> He was also the first to consider the *dafeng lai* disorder (big-wind scabies, an ancient disease now considered a kind of leprosy) as transmissible by contact. “Transmission through blood and *qi*,” according to Chen, was not due to the retribution of sins from a former life, but to “carelessness.”<sup>50</sup>

*Chuanran* by sexual intercourse began to be discussed in the twelfth century. We have seen how Chao Yuanfang and other seventh- and eighth-century doctors explained the “*yinyang* exchange” of Cold Damage, unseasonable *qi*, or Warm Disease through sexual intercourse, as a mechanism integral to a cosmic process involving a man (*yang*) and a woman (*yin*). In the twelfth century, this mechanism was conceived as yet another form of *ran* contamination. Cheng Wuji of the northern Jin (Jurchen) dynasty—who in 1156 wrote an authoritative commentary on the *Shanghan lun* (Treatise on cold damage)—explained the *yinyang* exchange as follows: “Residual poison [from the patient] contaminates the other person [*xiangran*] and affects [him or her] like an exchange [during sexual intercourse].”<sup>51</sup> The exchange was thus a contamination, a *ran* contagion. Cheng might have been influenced by the imperial medical encyclopedia compiled around 1111–17, *Shengji zonglu*, in which the same exchange was explained as an “exchange by contamination” (*ranyi*) whereby “the disorder of the man was transmitted [*chuan*] to the woman, or that of the woman to the man.”<sup>52</sup> This particular disorder, which originally had belonged to the larger category of Cold Damage disorders, was gradually conceptualized as a mode of contamination through sexual intercourse. It was not only an exchange but also a *chuan* transference and a *ran* contamination.

Despite the first appearances of *chuanran* being applicable mainly to

chronic diseases, the term seems to gradually have obtained a broader meaning, becoming applicable also to the spread of diseases during epidemics of acute disorders and, from the twelfth century onward, replacing the much older term *xiangran*. The popular use of the term *chuanran* can be seen in the much-quoted debate on the fear of contagion during epidemics by two important twelfth-century Confucian scholars. Both Cheng Jiong and Zhu Xi condemned the practice of abandoning one’s relatives during epidemics for fear of *chuanran*, which was a common practice (*li su*) at the time. Even though Cheng and Zhu approached the debate differently,<sup>53</sup> their views reflected current ideas on the spread of epidemics as revealed in Chen Fu’s *Nong shu*, mentioned earlier. In this text, Chen claimed that while diseases such as consumption and Wind disorders could mutually *chuanran*, the spread of epidemics was in fact due to the “steaming and smoking” of vicious *qi*.<sup>54</sup> Without making a conscious distinction between chronic and acute diseases, doctors of the time did differentiate among various modes of transmission for different diseases.

We could conclude from the descriptions in these twelfth-century texts that doctors and society had grown increasingly interested in the question of contamination or the transmission of medical disorders by physical contact with the sick. However, during epidemics and for certain chronic diseases, *chuanran* was still considered as one of the many causes of illness, not the only or even the main cause. For epidemics, classic configurationist explanations of pathogenic *qi*—the pollution of the environment by filth, bad weather, or social injustice, or vicious demons’ generating perverse pathogenic *qi* and contaminating people in a locality with weak constitutions or morals—remained widely accepted, and the spread of disorders remained a *ran* process. Mutual contamination among inhabitants within a single locality was only a secondary cause. Finally, there was a growing interest in transmission by sexual intercourse. The above ideas on the spread of diseases by *chuanran* or *xiangran* were well established in Chinese medical texts by the twelfth century. In the subsequent Ming and Qing dynasties, doctors and scholars enriched the concept of *chuanran* by providing concrete details on the process of transmission.

#### *The Ming-Qing Period (Fourteenth to Nineteenth Centuries)*

Developments in the conceptualization of the spread of disease in the late imperial period included the following. First, doctors in the Ming and Qing



dynasties provided many more concrete details about *ran* contamination. Second, *chuanran* clearly became the dominant term used to talk about the spread of disease from person to person, and it was increasingly used to mean transmission by physical contact, either direct or indirect, with the sick. Third, two lines of medical reasoning emerged. In one, *chuanran* was identified—with increasingly concrete details—with chronic diseases transmitted through intimate contact; in the other, medical innovators began to apply the concept to acute outbreaks of what we today would think of as epidemics.

In Ming and Qing medical texts about certain chronic diseases, three different paths of transmission by contact were described: by direct or indirect physical contact with the sick, by hereditary transmission, and by transmission through sexual intercourse. One of the first doctors to write on the first type of transmission was Gong Tingxian, a palace doctor of the early sixteenth century who authored several influential medical texts. His descriptions of the transmission of leprosy (*mafeng*) were reminiscent of the above-mentioned twelfth-century Daoist liturgical text, but couched in medical terms: "If careless while traveling, it could be transmitted [*chuanran*] in toilets, in living quarters, or by bedding and clothes."<sup>55</sup> The term "careless while traveling" reiterating ideas from Chen Yan's twelfth-century passage on consumption mentioned above, probably means "men carelessly seeking sexual pleasure during their travels." The consequence would be contagion by sexual intercourse or contact with materials contaminated by the sick as listed above. The second type of transmission by contact was hereditary transmission. As mentioned earlier, the medieval religious belief of shared guilt within a lineage was behind the notions of *zhuyi* (outpouring exchange), *ranyi* (exchange by dyeing), and *chuanshi* (corpse transmission), in which a disorder poured from a dead patient into a healthy person—usually the patient's progeny or a close relative—as in the case of consumption. The idea of hereditary transmission of disease in the late imperial period basically developed from these notions. Gong explained another cause for leprosy: "[The disorder could be] transmitted to others from ancestors or parents [to descendants], from husbands and wives, or other members of the family."<sup>56</sup>

The third type of transmission by physical contact was through sexual intercourse. We have already traced the development of the ancient idea of *yinyang* exchange that had developed into transmission by contamination through sexual intercourse during the Song dynasty. Sexual transmission

was discussed in the late imperial period mostly in the context of a new disease called *yangmei chuang* (bayberry sores) or Guangdong sores, as it was believed to have originated in Guangdong province. Modern historians of medicine usually identify this disease as syphilis, which was first recorded in southern China during the first decade of the sixteenth century.<sup>57</sup>

Li Shizhen, the author of the great classical pharmacopeia *Bencao gangmu* (1579–93), was among the first to provide a detailed account of this disease:

Bayberry sores are not recorded in the old recipes, and there were no patients with it. The disease has begun recently in the southeastern region and spread all over. It is because the southeastern region is low and warm. There are mountains with miasma that evaporates under the heat. People like to eat spicy and hot food. Men and women are lascivious and immoral. Dampness and heat accumulate deeply and form a pathogenic agent. This causes the development of noxious sores that are contagious to other people [*huxiang chuanran*]. Spreading from the south to the north, the disease is now everywhere. But then all those who fall victims are lascivious people.<sup>58</sup>

The spread of the disease through sex is clearly expressed in this passage, even though Li also emphasized the other causes of the disorder, especially the perverse climatic and environmental conditions and the unhealthy dietary regimen in the south.

The same idea was repeated by Chen Sicheng, who authored the first book devoted entirely to the disease, titled *Meichuang milu* (Secret record of rotten sores) and published in 1632: "Recently, customs have deteriorated, and numerous are those who indulge themselves in brothels and do not take precaution while doing so . . . Before they realize [that they are infected], they have already transmitted [the disease] to their wives and concubines or to their pretty boy servants. In earlier times, there were few medical books to correct this, which explains the uncontrolled transmission and contamination."<sup>59</sup> One should note here that the reason why leprosy was considered highly contagious in late imperial China was probably the fact that it was frequently confused with Guangdong sores.<sup>60</sup> In other words, the appearance of the new disease of Guangdong sores might have modified the etiological discussions of an old disease that had deceptively similar external symptoms, and enforced the idea of sexual transmission as a major channel of transmission.

Nevertheless, sexual transmission was still considered part of a general



mode of transmission within a lineage. The belief that members of the same household had similar physical traits and lifestyles, making them more vulnerable to the transmission of diseases, remained strong. In religious terms, transmission was a consequence of shared guilt. For Guangdong sores, for instance, Chen considered *chuanran* to occur not only between husband and wife: "The disorder is not only transmitted through sexual intercourse . . . The disease can be transmitted [by the husband] to the wife or concubine. Even if the wife or concubine does not fall ill, the disease could be shifted (yi) to children, nephews, and grandchildren."<sup>61</sup> The 1742 imperial compendium *Yizong jinjian* provided a similar account of the transmission of leprosy: "One cause is transmission [*chuanran*] through the contact with a patient, or from parents, between husband and wife, or other family members."<sup>62</sup>

Despite the growing interest in the notion of *chuanran* as person-to-person transmission of disease in the late imperial period, there were still voices expressing reservations. While discussing the possible modes of transmitting *mafeng*, the early Ming palace doctor Liu Chun (1358–1418) expressed his doubts: "As for the question of *chuanran*, it may be possible. However, even though within the same family, there is mutual transmission [*xiangchuan*] through blood and channels, eating and drinking [in the same place], sharing the same habitat and temperament [*qiwei*], there should be no contamination [*ran*] if internal heat has not accumulated deeply into a toxin."<sup>63</sup> Although he accepted the possibility of mutual contamination within the same household because members shared similar physical traits, habits, and living space, he did not see this as a normal channel of transmission and reluctantly conceded that it was possible only if the internal accumulated poison had reached an extraordinary degree. This difficulty of accepting person-to-person transmission can still be detected in later texts. Xiao Xiaoting — the author of an important work on leprosy, *Fengmen quanshu*, with a preface dated 1796 — wrote: "Some would say that [since] the *qi* and blood of a person each follows its own vessels, how could [any pathogen] be transmitted from one [person] to another?" Being himself convinced of the contagiousness of the disease, he tried to convince his readers by using an analogy: "Do they not realize that even scabies can be transmitted and contaminate others, to say nothing of leprosy?"<sup>64</sup> Liu and Xiao showed the difficulties of accepting *chuanran* when the vital Blood and *qi* of a person were believed to circulate in a closed system, corresponding to and interacting only with the cosmos.

The idea that *chuanran* contamination could be a factor in the spread of epidemic diseases began to be discussed in the seventeenth century.<sup>65</sup> The development was epitomized in the seventeenth century by an important work on epidemics authored by Wu Youxing (mid-seventeenth century), a native of the lower Yangzi region. For Wu, abnormal weather was only one of several factors that provoked noxious epidemic *qi*. He coined the term *zaqi* (impure *qi*) to express a kind of pollution-generating epidemic: *zaqi* "could originate from towns or from rural settlements . . . The so-called *zaqi* . . . actually is the breath emanating from the earth of a locality [*fangtu zhi qi*]. Such and such a *qi* will cause such and such a disorder."<sup>66</sup> Epidemic *qi*, therefore, was mostly earthly, linked to the specific material conditions of a locality, causing all victims to suffer from a similar disorder. This idea of epidemic *qi*, not unlike that of miasma in contemporaneous Europe, was often associated with dampness of the earth and with foul matter.<sup>67</sup> A combination of filth and dampness, when steaming from the soil and mixing with unseasonable *qi*, generated epidemics. Disease-causing filth was believed to steam and become a poisonous and infectious haze when the weather turned warm and humid. Zhang Lu, a late Ming doctor in the south (mid-seventeenth century), attributed *shiyi* (seasonal epidemics, specific in time and locality) to the emanation of filthy dampness from the earth, triggered by unseasonable, impure *qi*.<sup>68</sup>

One particular contribution of some southern Ming and Qing doctors to the idea that environmental pollution provoked epidemic *qi* was the emphasis on dead organic matter.<sup>69</sup> Death, to them, was the most dangerous and polluting element. Zhou Yangjun, an important early Qing doctor, was emphatic about the deadly polluting effect of corpses:

Because of the shallow burial of flesh and bones, *qi* emanating from corpses amasses in the earth, ascends and descends with [the *qi* of] heaven and earth, and drifts everywhere. People [under the influence of] this *qi* have no escape and will be infected with illness and die. This then aggravates seasonal pathogenic *qi* or corpse *qi*. It spreads and [people] get contaminated and recontaminated after prolonged immersion [in that *qi*; *fu xiang jianran*]. After a while, the *qi* becomes more deadly. Therefore epidemics always follow wars. Not only are people weakened by being under the influence of the *qi*, it is also that the accumulated filthy *qi* has reached an extreme level . . . The most venomous and filthy *qi* on earth produces epidemics.<sup>70</sup>

In other words, medical texts by many seventeenth-century southern doctors stressed that miasmatic *qi* emerging from the earth of a locality polluted by filth, dampness, and especially death was more devastating than the climatic *qi* causing Cold Damage disorders described in early medical classics. This harmful, earthly *qi* was, moreover, believed to enter the victim's body through the nostrils and the mouth. Wu explained that seasonal epidemics (*shiyi*), caused by special impure, epidemic breaths (*zaqi*, *liqi*), contaminated people "through the mouth and the nostrils . . . [whereas non-contaminating] Cold Damage pathogens enter [through] tiny pores [*hao-qiao*] into the circulation vessels [*jing*] where they flow from one [vessel] to another. The effect of Cold Damage is immediate, whereas the contaminated victim of seasonal epidemics manifests symptoms only after a period of time." He also noted: "The mouth and the nostrils communicate directly with heaven. Received *qi* can come from heaven or from *chuanran*."<sup>71</sup> Wu's idea of *chuanran* was therefore closely associated with local epidemics, where victims were infected by a seasonal external pathogen through the upper respiratory system. Consistent with the configurationist explanation (related to cosmological or environmental patterns such as *yin* and *yang*, the five phases that constituted the basis of Chinese thought, and the six pathogenic *qi*) of epidemics, Wu's inventiveness rested in his singling out local epidemics from the general classic category of Cold Damage disorders, highlighting the infectiousness of the specific epidemic *qi*. It is from this tradition that TCM experts in China drew inspiration for explaining and treating SARS in the spring of 2003.<sup>72</sup>

In brief, the ideas of *chuanran* and contamination underwent interesting changes in the Ming-Qing period, although the basic modes of transmission remained largely unchanged since the seventh century. To explain the contaminating nature of epidemics, increasingly concrete elements such as filth caused by dead organic matter, in addition to dampness and warmth, were stressed. Local, earthly impure *qi* was now considered more dangerous than unseasonable atmospheric *qi*. For nonepidemic diseases, contamination and transmission were also described in more concrete terms, referring to mechanisms for indirect transmission such as toilets, bedding, and clothing. Pathogenic *qi* in both acute and chronic disorders was seen as entering the victim's body through the mouth and the nostrils. Most important, the notion of transmission by close and direct physical contact, including sexual and hereditary or congenital transmission, was also specified. This idea of transmission by breath or bodily fluids such as blood of the parents, urine,

perspiration, and breast milk, already described in seventh-century texts, had clearly become a widespread concept. Transmission of disease by sexual intercourse was the main point developed in this late imperial period—transmission both to the sexual partner, and to the fetus in the form of fetal toxin,<sup>73</sup> if the intercourse resulted in a pregnancy.

### Conclusion

It is quite clear to me that the sick body has been scrutinized more and more closely by medical writers, including in a social context, since the third century. By the seventh century, the basic modes of the spread of disease had been established and expressed in a language of contamination, epitomized in the word *ran*. But the term *chuanran* emerged only in the tenth century to refer more specifically to the transmission of the same disorder by contact with the sick, especially for chronic disorders like consumption. The term gained popularity in written texts, probably due to the ethical controversy launched by Neo-Confucian moralists in the twelfth century over the necessity to stay with one's sick parents and relatives despite the danger of contagion during epidemics. In that context, however, there were different perceptions of *chuanran* by doctors, nonmedical elites, and the general populace. The full complexity of the notion of *chuanran* was not reached until the late imperial period, when both the content of noxious epidemic *qi* and the types of transmission for chronic disorders were given more concrete descriptions in medical texts. *Chuanran* as a term for disease transmission also came to eclipse the other older terms containing *ran* to express the general idea of the spread of disease.

The growing popularity of *chuanran* since the twelfth century had an important consequence for the conceptualization of the spread of diseases. Among its many layers of meaning, transmission by contact—in particular, direct physical contact with the sick not necessarily related by blood—probably became most significant. It conveyed the sick body as a dangerous body producing contaminating breath, bodily fluids, and excrement, and as a lascivious sexual body polluting its sexual partners and producing sick infants. The sick body was dangerous even after its death, as it would pollute the environment, provoking an epidemic *qi* and contaminating not only its progeny or relatives by the process of *zhu*, but also strangers in contact with the emanating *qi*.

The impact of the idea of *chuanran* on late imperial society remains a

topic to be studied. We can at least enumerate a number of new practices that revealed an increasing concern with contagious bodies. The first institutions for the segregation of leprosy patients, for instance, appeared in the sixteenth century. Unprecedented measures of segregation against smallpox were established by the Manchu government, beginning in the early seventeenth century. Variolation against smallpox was practiced after the sixteenth century, with the conviction that by so doing the vulnerable child with an innate fetal toxin could avoid contagion during an epidemic by having the toxin released under controlled conditions. And from the seventeenth century onward, community associations were organized on a massive scale to provide proper burial for exposed bodies.<sup>74</sup> These late imperial practices demonstrate the currency of the idea of *chuanran*, either as direct person-to-person transmission, or as the spread of disease under the influence of a contaminating, local, epidemic *qi*.

One should indeed be mindful of the multiple layers of meaning of *chuanran* that built up throughout China's long imperial history. First, the term meant contamination not only by contact with the sick, but also by contact with a pathogenic *qi*, be it epidemic or nonepidemic, an old idea originally expressed by *xiangran*. Furthermore, from the late Ming onward, many southern doctors distinguished between the noncontagious *qi* provoking Cold Damage disorders and the contagious local impure, epidemic *qi*. Second, during an epidemic and for certain chronic disorders, members of the same household or people related by blood were believed to be more vulnerable to contamination by a patient, a notion already described in seventh-century texts. Third, *chuanran* was never the only cause of the spread of any disorder. A polluted location, the weak physical constitution of the victim, bad geomancy of a residence, or moral flaws or wrongdoing were equally valid or more important causes, an idea confirmed and emphasized in twelfth-century texts. Fourth, disorders considered to be more prone to *chuanran* tended to be particularly deadly, such as severe epidemics caused by impure *qi*; chronic disorders with conspicuous poisonous sores such as smallpox, measles, Guangdong sores, and leprosy; or diseases ending in a slow, painful death, such as consumption. Some of these disorders were closely associated with sexual transmission, and all of them provoked fear or disgust in late imperial society.

The term *chuanran* reflects how Chinese medicine easily accommodated pluralistic models of events, including outbreaks of disease, imagining them as the outcome of a dynamically interacting web of influences. This ap-

proach was different from that of the Aristotelian-trained European medical scientists, whose search for the strict understanding of a sufficient cause produced in the late nineteenth century monocausal explanations—some of which had great explanatory power, but which tended, at times, to be reductionist.

Thus when Xi Liang said that people did not believe that the 1910 pneumonic plague could be transmitted (*chuanran*), he referred to one, but not all, layers of the term's meaning. He was probably referring to specific, direct, person-to-person transmission, while the populace upheld the traditional belief that they were under the influence of an epidemic *qi*, or that it was an epidemic of the noncontagious Cold Damage type, as Wu Youxing of the late Ming might have suggested. Some Chinese probably thought that running away from the place under the influence of that *qi* would keep them safe. They did not believe in person-to-person mutual contamination under that particular epidemic breath, especially when the illness did not provoke conspicuous external symptoms, or if their family members were not affected. All these ideas were built into the term *chuanran* that, nonetheless, disregarded the acuteness of epidemic diseases. Xi's perception of *chuanran* might already have incorporated modern biomedical ideas of germs, justifying Wu Lien-teh's (the head of the mission to fight the 1911 Manchurian pneumonic plague, see Sean Hsiang-lin Lei's chapter in this volume) drastic measures of quarantine, while the understanding of the populace was still loaded with traditional meanings.

This leads to a final point that I would like to stress here: the choice of *chuanran* as the Chinese term to translate contagion and infection when Western medicine was introduced into China, especially after germ theory became dominant around the beginning of the twentieth century. The complexity of the modern idea of *chuanran* at its early stage is revealed in an interesting text for a popular audience that was published in the newspaper *Dagong Bao* in the summer of 1902, ten years before the pneumonic plague epidemic and Xi Liang's comment: "These diseases are caused by minute living poisonous *chong* [*weisheng du chong*] introduced into the blood and channels, causing various disorders. These *chong* multiply very quickly, so that transmission is fast. I think that *chong* is a transformative living substance [*huasheng zhi wu*], and that there must be a *chong*-transforming poisonous *qi* [*huachong zhi duqi*] that provokes the proliferation of *chong*."<sup>75</sup> This passage shows the persistent importance of the traditional notions of *chong* as a polluting element, and of poisonous *qi* as constituting a patho-

genic ecology. Germs (eventually translated as *weisheng wu*, or "minute living things") are here perceived as a variation of *chong* pullulating under toxic *qi*. Hence we clearly see the emergence of a biomedical perception of contagion or infection by germs, still heavily loaded with traditional ideas. The term *chuanran* facilitated and at the same time distorted the new biomedical idea it was incorporating at the early stage of the idea's introduction, partially explaining the tremendous efforts Wu Lien-teh had to make to convince people of the necessity to set up a quarantine.

## NOTES

All translations are by the author, unless otherwise indicated.

1. See chapter 3. For the original source of the quote, see Xi, "Xuyan," 4.
2. A public notice in the vernacular language, published by the Bureau for Epidemic Prevention in Baoding District in *Dagong Bao* on February 25, 1911, stressed: "Plague was unheard of in China in the past. Therefore nobody knew how terrible this disease could be." The same notice also refuted the common Chinese belief of that time that the disease "was no different from some unseasonal epidemics that we have always had in the past," stating that this "new disease" was introduced from foreign countries after "the great global communication." Hence, this text clearly emphasized the newness of the plague.
3. *Oxford American Dictionary and Thesaurus*, s.v. "Contagion."
4. See Pelling, "Contagion/Germ Theory/Specificity."
5. Touati, "Contagion and Leprosy," and Conrad, "A 9th-Century Muslim Scholar's Discussion of Contagion."
6. Nutton, *From Democedes to Harvey*, 22.
7. Pelling, "The Meaning of Contagion," 16.
8. Pelling, *Cholera, Fever and English Medicine 1825-1865*, 276-85, on William Budd.
9. *Ibid.*, 284, and Worboys, *Spreading Germs*, 126.
10. Delaporte, *Disease and Civilization*.
11. Quoted in Worboys, *Spreading Germs*, 125. The author of this article proposed three contending hypotheses on the nature of contagion: a chemical or physical theory; bioplasm, or germs; and ideas based on Pasteur's notion of living organic ferments producing zymosis.
12. The quotes are from Pelling, "The Meaning of Contagion," 20.
13. Barbara Volkmar, "The Concept of Contagion in Chinese Medical Thought," 151. This fine article is about the concept of contagion in China up to the twelfth century. Volkmar stresses the difference between the demonological view of folk medicine and the rationalistic view that assigns the cause of epidemics to cosmological and meteorological conditions.

14. *Zhou li*, 12.
15. *Shang shu*, 7:8a (in this work page numbers restart at the beginning of every chapter, so I give the chapter number after the book title to help identify the cited pages). The full phrase is *jiu ran wu su* (to have been tainted by the corrupt customs for a long time).
16. For an example of the positive meaning of *ran*, see Chen Shou, "Wu shu," 58:1350. In this story from the *San guo zhi* (History of the three kingdoms), a "barbaric group" is described as having caused upheaval in China, since it "had not been tainted with the culture of the Emperor" (*wei ran wang hua*).
17. Mozi (ca. 476-390 BCE), one of the leading philosophers of the early Warring States period, specifically compared the dyeing of silk to positive and negative moral influences on individuals. He used *ran* to express the action of one individual who was influenced by another—e.g., "King Wu was influenced by the Prince of Zhou" (*Wu wang ran yu Zhou gong*; Mozi, 1:11).
18. Chen Shou, "Wu shu," 60:1383.
19. Ge, *Zhouhou beiji fang*, 2:43.
20. Chia-feng Chang has published a long and interesting paper ("Yiji yu xiang-ran") on the modes of contagion in Chao Yuanfang's classic. Chang's paper discusses ideas related to contagion as found in this and other contemporary texts. By contrast, my present approach is based on an analysis of the different uses and evolution of terms containing the character *ran*. I believe that a study of the terms themselves can reveal subtle changes that often escape our modern mindset.
21. This and the preceding two examples are found in Chao Y., *Zhubing yuanhou lun*, 19:578, 48:1368, and 45:1287, respectively.
22. Apparently the same idea of contagion within the body, applicable to "the internal and pathological process in which the body slowly becomes impregnated with venomous humour, leading to the destruction of the whole edifice," was still prevalent in the West until the twelfth century (Touati, "Contagion and Leprosy," 188).
23. Chao Y., *Zhubing yuanhou lun*, 8:277; 9:302.
24. *Ibid.*, 10:333-34.
25. Zhang Ji, *Shanghan lun*.
26. Chao Y., *Zhubing yuanhou lun*, 8:277.
27. See, for example, Sun S., *Beiji qianjin yaofang*, 9:174, for similar notions of perverse *qi*: "At times there is the *qi* of epidemics [*yiqi*] and vicious wind [*zeifeng*], resulting in contamination from one to another, or hot wind and *zhangqi* [miasmatic breath] that causes contamination from one to another and again results in the destruction of the entire household."
28. Li J., "Contagion and Its Consequences," 203.
29. Chao Y., *Zhubing yuanhou lun*, 24:708.
30. Wang T., *Waitai miyao*, 13:351. Chao Yuanfang provided a different explanation for the term *wugu*: "There is a bird called Innocence that hides in the daytime and flies at night. If it sees children's clothing or bedding being dried outside, it flies over it. The child who wears the clothes or sleeps on the bed with the bedding will catch

the disease" (*Zhubing yuanhou lun*, 48:1378). Chao's explanation was repeated and developed by most late imperial doctors explaining pediatric consumption. Some, for instance, considered that feathers or bugs dropped by the Innocence bird caused the disorder, as stated in the 1742 imperial compendium edited by Wu Qian (*Yizong jinjian*, 52:78).

31. Chao Y., *Zhubing yuanhou lun*, 24:702-3.

32. That the human body contained a great number of bugs was an idea present both in Buddhist and Daoist views of the body. See Strickmann, *Chinese Magical Medicine*.

33. *Chuan* refers to the classic process whereby a pathogen introduced into the body through the skin would enter the flesh and flow into the vessels and from there into the bowels (*fu*). The curability of the case depended on the path taken by the pathogen within the visceral system. See *Huangdi neijing suwen*, 19:121-123, and 56:290.

34. Li J., "Contagion and Its Consequences," 204.

35. L. Yang, "The Concept of 'Pao' as a Basis for Social Relations in China," 298-99; Li J., "Xian Qin liang Han bingyin guan ji qi bianqian" and "Contagion and Its Consequences," 203. I thank Li Jianmin for sharing his thoughts on this point with me.

36. Chapter 24 of the *Zhubing yuanhou lun* is dedicated to *zhu* disorders. For *zhu* related to *gu*, see Chao Y., *Zhubing yuanhou lun*, 24:702-3; for *sheng zhu*, see *ibid.*, 699.

37. Chao Y., *Zhubing yuanhou lun*, 50:1401.

38. Sun S., *Beiji qianjin yaofang*, 24:439.

39. Childhood consumption (*wugu gan*) was also attributed to the milk of sick wet nurses in the eighteenth century (Wu Q., *Yizong jinjian*, 52:78).

40. The term in fact first appeared in chapter 22 of the *Huangdi neijing suwen*, in an apparently philosophical discussion of *yin*, *yang*, and *mai* (vessels), with no clear indication that sexual intercourse was involved. Zhang Ji's discussion of the "yin-yang exchange," even though also unclear as to its true meaning, was followed by a recipe using burned underwear close to the private parts of the man or the woman, suggesting a ritual remedy for a disorder of sexual nature (*Shanghan lun*, 7:7b-8a). This recipe is recorded in almost all later medical texts mentioning this disorder.

41. Chao Y., *Zhubing yuanhou lun*, 8:275. While discussing another closely related disorder called *laofu* (recurrence), meaning recurrent Cold Damage disease in a patient who had sex before total recovery, Chao stated that this would not happen if the man's sexual partner was a young boy (*ibid.*, 8:277).

Wang Tao in the eighth century faithfully repeated the mechanism that Chao had described, and added a further detail: a woman who obtained an illness through this exchange could be cured if treated early enough, whereas it was much more dangerous and even fatal for a man who fell ill after such sexual intercourse (*Waitai miyao*, 2:98 and 3:124).

42. Sun S., *Beiji qianjin yaofang*, 10:191-93.

43. Xu X., *Ji shen lu*, 3:16a. The story goes on to tell us that people believed that putting a living patient inside a nailed coffin and abandoning him or her in the river would end the spread of the disease. The fisherman's daughter was treated this way but was saved by another fisherman who lived downstream. After being cured by eating eels, she married her savior.

44. Hong M., *Yijian zhi*, 7:4a-b. This collection has different editions, some of which do not specify the disorder of the woman, but all editions mention the fear that the disorder would spread by *chuanran*.

45. Chen F., *Nong shu*, 2:5a.

46. Lu S., *Wushang xuanyuan santian yutang dafa*, 470. For a description of the text, see Schipper and Verellen, *The Taoist Canon*, 1070-73. Strickmann (*Chinese Magical Medicine*, 37) reminded his readers that Liu Cunyan was the first to bring this text to the attention of the learned world in 1971, on the question of the Daoist concept of tuberculosis in the twelfth century.

47. Strickmann, *Chinese Magical Medicine*, 35-38. See his note 85 for a detailed description of the Daoist text.

48. Zhang G., *Yishuo*, 2:19b and 4:7b.

49. Chen Y., *Chen Wuzi san yin fang*, 15:11b.

50. *Ibid.*, 12b-13a.

51. Zhang Ji, *Shanghan lun*, 4b-5a.

52. *Shengji zonglu*, 29:631.

53. Volkmar, "The Concept of Contagion in Chinese Medical Thought," 159-62. See also Cheng, *Yijing zhengben shu*, 3-5; and Zhu X., *Huian xiansheng Zhu Wengong wenji*, 71:10b-11a. Volkmar points out that "all arguments against the notion of contagion were developed on practical, political, cosmological or moral, rather than strictly medical grounds" (161).

54. Chen F., *Nong shu*, 5a.

55. Gong, *Jishi quanshu*, 8:1066.

56. *Ibid.*

57. Many Chinese historians argue that the disease called Guangdong sores was first brought to China by European traders in the sixteenth century. Contemporary Chinese doctors, however, never considered it a disorder with a foreign origin, unlike smallpox. Judging by the first mention of the disorder by Yu Bin, an early-sixteenth-century doctor who recorded that the disorder was first noticed in the south during the Hongzhi reign (1488-1505), the disorder seems to have arisen before the massive arrival of Europeans in China in the later sixteenth century. I do not try to explain the origin of this disease here.

58. Li Shizhen, *Bencao gangmu*, 18:36. See also A. Leung, "Jibing yu fangtu zhi guanxi," 181.

59. Chen Sicheng, *Meichuang milu*, 10-11.

60. The author of the first book on leprosy, Shen Zhiwen, wrote that the disease he described was called "Guangdong sores" in the south. See his *Jiwei yuansou*, 1:3a.

61. Chen Sicheng, *Meichuang milu*, 6.

62. Wu Q., *Yizong jinjian*, 73:376.

63. Liu Chun, *Liu Chun yixue quanshu*, 40:389.

64. Xiao Xiaoting, *Fengmen quanshu*, 1:9a.

65. See A. Leung, "Jibing yu fangtu zhi guanxi." See also Marta Hanson's dissertation, "Inventing a Tradition in Chinese Medicine," in which she analyzes some Qing views on diseases caused by the warmth factor in southern China.

66. Wu Youxing, *Wenyi lun*, 42-43.

67. For some experts, epidemic *qi* emerging from the soil was characterized by dampness. The mid-Qing doctor Tang Dalie (late eighteenth century) suggested that epidemics emerging from the soil were actually caused by the dampness of the earth (*Wuyi huijiang*, 9:17b). The noxious nature of dampness was stressed first by the Yuan master Zhu Zhenheng and further elaborated by Ming and Qing doctors. See A. Leung, "Jibing yu fangtu zhi guanxi," 183-84.

68. Zhang Lu, *Zhangshi yitong*, 2:32.

69. Medical writers and scholar-officials of the Song dynasty since the twelfth century had already written abundantly on the polluting effects of filth accumulated in waterways in crowded urban areas. See Liang G., "Nan Song chengshi di gonggong weisheng wenti."

70. Zhou Yangjun, *Wenre shuyi quanshu*, 469.

71. Wu Youxing, *Wenyi lun*, 11 and 9, respectively.

72. See Marta Hanson's chapter in this volume.

73. See C. Chang, "Dispersing the Foetal Toxin of the Body."

74. A preliminary count of charitable associations in the Ming and Qing dynasties suggests at least 589 burial associations in the late part of the period. See A. Leung, *Shishan yu jiaohua*, 291-306.

75. "Shiyi yuanqi zhifa shuo [On the origins and curing methods of seasonal epidemics]," *Dagong Bao*, July 13, 1902, 2.