

Bubonic Plague in Nineteenth-Century China

CAROL BENEDICT

Stanford University

THE THIRD PANDEMIC OF BUBONIC PLAGUE

In the middle of the fourteenth century, Europe and the Middle East were devastated by a catastrophic pandemic of bubonic plague (Ziegler, 1969; Shrewsbury, 1970; Dols, 1977). Carried by trade caravans from the Mongolian steppes, the "Black Death" spread through the Crimea, Northern Africa, the Mediterranean, and finally Northern Europe. The initial demographic impact of the plague was extraordinary: The population of Europe declined perhaps by as much as one-third (Ziegler, 1969: 230-231). Mortality losses from plague continued to be an important factor in European demography until the eighteenth century. But then the disease disappeared from Europe, leaving its mode of transmission and contagion a mystery.¹

Major breakthroughs in understanding the nature of the disease did not come until the late nineteenth century (Hirst, 1953). In 1894, Japanese and French bacteriologists independently discovered the infective microorganism of plague, *Yersinia pestis*. In 1898, Paul Simond proved that rat fleas transmitted the microbe from rodents to humans. Further research in the early part of the twentieth century firmly established most of the currently known details of plague epidemiology.

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The occasion for these discoveries was the world-wide diffusion of bubonic plague in the late nineteenth and early twentieth centuries. Only the third in recorded history,² this modern pandemic had its origins in southwestern China. The disease had been endemic in Yunnan province since at least the late eighteenth century. The earliest recorded epidemic of plague in the province began around 1792. After what appears to have been a virulent epidemic in the early part of the nineteenth century, the disease subsided. In the wake of the Moslem Rebellion (1855-1873), bubonic plague broke out once again in Yunnan, and this time it spread eastward to Guangxi and Guangdong, reaching Guangzhou and Hong Kong in 1894. From Hong Kong steamships carried the plague bacilli to all the major seaports of the world. In most cases, the disease did not spread further inland, but in India plague claimed some 6,000,000 victims between 1898 and 1908 (Pollitzer, 1954: 26). The third pandemic continued well into the twentieth century and sporadic cases still occur even today (Gregg, 1985).

Several historians and historical epidemiologists (Wu, 1936: 15-31; Pollitzer, 1954: 15-20; McNeill, 1976: 152-153) have discussed the nineteenth-century plague epidemic in China within the broader context of the worldwide pandemic. Interested primarily in documenting the territorial spread of the disease, these scholars mention Yunnan only as the starting point of the pandemic, and Guangxi and Guangdong only as avenues for its further transmission. There has been little attempt to understand what this epidemic meant to those who experienced it. Although the epidemic passed through a very large area of China, we still do not know what its demographic consequences were, nor do we know how the Chinese tried to cope individually or communally with this crisis.

This is a preliminary attempt to address these issues in greater depth. Following a brief description of plague epidemiology, I chronicle the history of bubonic plague in Yunnan itself, from the earliest recorded outbreak in 1792 to the larger epidemic concomitant with the Moslem Rebellion. I then try to assess the demographic consequences of the plague epidemic on Yunnan's

population. The territorial spread of the disease from the Yun-Gui plateau to the Lingnan and Southeast Coast macroregions and its demographic impact on the southeast are the topics of my next section.³ Finally, I explore nineteenth-century Chinese medical, religious, governmental, and communal responses to the plague.

CHARACTERISTICS OF PLAGUE

Using Chinese historical sources to identify specific diseases that occurred as epidemics in the past is a hazardous enterprise.⁴ Official records and local gazetteers include epidemics in lists of natural disasters, but these typically use the generic term *yi* or *da yi* to describe all epidemics. Occasionally, diseases are named or specific symptoms are described, but names vary by locality and the symptoms of one disease might closely resemble those of another. Bubonic plague itself went by many different appellations: In Yunnan it was called *yangzi bing*, or *yangzi zhen*; in Guangdong it was termed *luanzi zhen*, *lizi zheng*, or *datou tianxing zheng* (Inspectorate General, 1894, No. 48: 42/65). In many areas it called simply *shuyi*, or "rat epidemic."

The task of identifying bubonic plague from the historical record is made somewhat easier by its particular characteristics: its dependence on rodent and rodent flea vectors for its transmission, its unusual symptoms, and its seasonal periodicity.

Bubonic plague is primarily a disease of rodents, particularly rats, and only incidentally a disease of humans (Pollitzer, 1954: 483-486). Fleas ingest the infective bacteria of plague from their rodent hosts and carry it from one animal to another (pp. 343-355). Rats can build up an immunity to the disease, and the organism can be continually propagated among a population of resistant animals with only an occasional death. If the microbe enters a new population of susceptible rodents, however, a large number will die. Following such an epizootic, infected fleas leave the bodies of their dead hosts and feed on any warm-blooded animals they can find, including people. One of the most telling

signs of a bubonic plague epidemic is thus the death of rats prior to the outbreak of human disease.

When a person is bitten by an infected flea, plague bacilli invade the lymphatic system (Pollitzer, 1954: 420). The most visible symptom of the disease are the buboes that appear in the groin, armpits, or neck two or three days after infection. Other symptoms include high fever, shivering, vomiting, headaches, giddiness, and delirium. If the buboes drain naturally, recovery is possible; otherwise, in the absence of treatment, death comes in four to five days. The severity of the disease varies in different epidemics and at different stages of the same epidemic, but case-mortality continued to be between 60% and 90% until the development of antibiotics in the late 1940s made treatment routine.

Bubonic plague cannot be transmitted directly from one person to another in the absence of the rodent flea vector (Pollitzer, 1954: 483-486). But, the bubonic form can become the much more highly infectious pneumonic plague (pp. 504-515). If a bubonic plague patient develops secondary pneumonia, he or she can cough up blood containing the plague bacilli. The bacilli then become airborne and spread directly from person to person, precipitating an epidemic of pneumonic plague. Death is more rapid than in the bubonic case, coming about three days after the onset of the infection. Before the use of antibiotics, pneumonic plague was invariably fatal. Other clinical forms of plague that occur less frequently include meningeal plague, septicemic plague, and tonsillar plague.

Climatic conditions are important in the epidemiology of both the pneumonic and the bubonic forms. Pneumonic plague develops in cool climates, under conditions that favor airborne droplet transmission (Pollitzer, 1954: 512).⁵ The effect of climate on the bubonic form is very complex and varies greatly depending on the species of flea and rodent vector involved (pp. 355-358). Epidemiologists have found that most epidemics occur during seasons in which temperatures are moderately high (between 18.3 degrees Celsius and 29.4 degrees Celsius) and relative humidity is about 70% (Twigg, 1984: 114). Under favorable temperatures,

fleas can survive for about six weeks, although they can transmit plague effectively for about only 14 days. Very high temperatures, dry air, or heavy rain kill the infected fleas; cold weather causes them to hibernate. In temperate climates, bubonic plague tends to occur in the spring and summer months; in tropical climates it occurs in late winter or early spring.

Both historical research and twentieth-century observation have shown that cities are far more vulnerable to bubonic plague than are rural areas (Twigg, 1984: 90-100; Pollitzer, 1954: 492-494). This is because the distribution and density of the rat population governs the virulence of human epidemics. Cities provide rats with protection from natural predators and harsh weather and also with a regular food supply. As a rule, therefore, the urban rat population is larger than that in rural areas and the potential for a rat epizootic is greater. Moreover, the higher density of the human population in cities and their closer proximity to rodent vectors facilitate the spread of plague and cause much greater mortality than in the countryside.

The spread of plague to other areas is also greatly enhanced in an urbanized region because cities serve as distribution centers of the infection through trade. Infected rats or their fleas can be passively transported to areas previously immune in merchandise such as woolen or cotton goods, grain, or animal hides, or in packaging material such as jute or hemp bags (Pollitzer, 1954: 387). Bubonic plague thus tends to follow long-distance trade routes, moving first from one city to another and then gradually spreading to the rural hinterland. Obviously, the more efficient the means of transportation, the faster the spread of the disease.

When plague bacilli are carried to a new area and enter a new population of susceptible rodents, there is an initial period of virulent epidemic in which rat and human mortality is high (Pollitzer, 1954: 500-501). This is followed by a stage of gradual decline, as rodent populations build up resistance to the microbe. *Yersinia pestis* can then become entrenched in wild rodent populations. Once the infection becomes enzootic among wild animals, it can remain latent until humans again come into contact with the rodent carriers.

BUBONIC PLAGUE IN YUNNAN

THE EIGHTEENTH-CENTURY EPIDEMIC

When and how the bacillus *Yersinia pestis* came to Yunnan originally cannot be known with any certainty. Although official records and local gazetteers include epidemics in sections on strange phenomena and natural disasters, these references are usually quite ambiguous and it is impossible to say what early epidemics, if any, were bubonic plague.⁶

While earlier "epidemics" are mentioned sporadically in many Yunnan gazetteers,⁷ there is a clustering of such reports beginning in 1787 and lasting until about 1830 (Table 1). Dengchuan county near Dali experienced a major epidemic in 1787 (Map 1). (See appendix for a complete list of gazetteers consulted.) Shortly thereafter, epidemics broke out in several other countries in western-central Yunnan: Jingdong had a great epidemic in 1791, Yongchang and Menghua in 1799, and Yaozhou in 1801. There was an epidemic in Dali in 1804. Kunming and its surrounding area suffered a series of epidemics beginning in 1803. Between 1810 and 1816, epidemics occurred in the area around Lin'an. Many of these same towns in western-central, eastern-central, and southeastern Yunnan continued to suffer epidemics through the 1820s.

Most of these reports use the generic term *yi*, or "epidemic," and could refer to any infectious disease. The gazetteer for Chuxiong county, however, mentions that rats died prior to a great epidemic in 1803, suggesting that bubonic plague was responsible for at least some of these epidemics (Chuxiong xian zhi, 1910: 1/6). Climatic conditions in Yunnan are unusually favorable for bubonic plague and it is not unreasonable to assume that many of these epidemics, most of which began in the spring and summer, were indeed plague.⁸

More substantive evidence that bubonic plague was present in the province at the end of the eighteenth century comes from a poem titled "Death of Rats" written by Shi Daonan (1765-1792), a young poet of Zhaozhou county:⁹

TABLE 1
Chronological List of Epidemics, 1787-1830

Date	County	Prefecture	Date	County	Prefecture
1787	Dengchuan	Dali	1808	Kunming	Yunnan
1791	Jingdong	Jingdong	1809	Kunming	Yunnan
1792	Zhaozhou	Dali		Yiliang	Yunnan
1798	Dengchuan	Dali	1810	Shiping	Lin'an
1799	Menghua		1812	Jianshui	Lin'an
	----	Yongchang	1813	Ami	Lin'an
	----	Yuanjiang		Nanning	Qujing
1801	Yaozhou	Chuxiong		----	Kaihua
1802	Menghua		1816	Mengzi	Lin'an
1803	Kunming	Yunnan	1819	Zhanyi	Qujing
	Chuxiong	Chuxiong	1820	Songming	Yunnan
	Yiliang	Yunnan		----	Jingdong
1804	Menghua			----	Yuanjiang
	----	Yongchang	1823	Nanning	Qujing
	----	Dali	1824	----	Jingdong
	Xinxing	Chengjiang	1825	----	Yuanjiang
1805	Nanning	Qujing		Heyang	Chengjiang
	Anning	Yunnan		Nanning	Qujing
1806	----	Yuanjiang	1826	Nanning	Qujing
	Heyang	Chengjiang	1827	Jianshui	Lin'an
	Zhanyi	Qujing	1828	Anning	Yunnan
1807	Zhanyi	Qujing	1830	Heyang	Chengjiang

Rats die in the east,
Rats die in the west.

People look upon the dying rats
As if they were tigers.

A few days following the death of the rats,
People die like city walls.

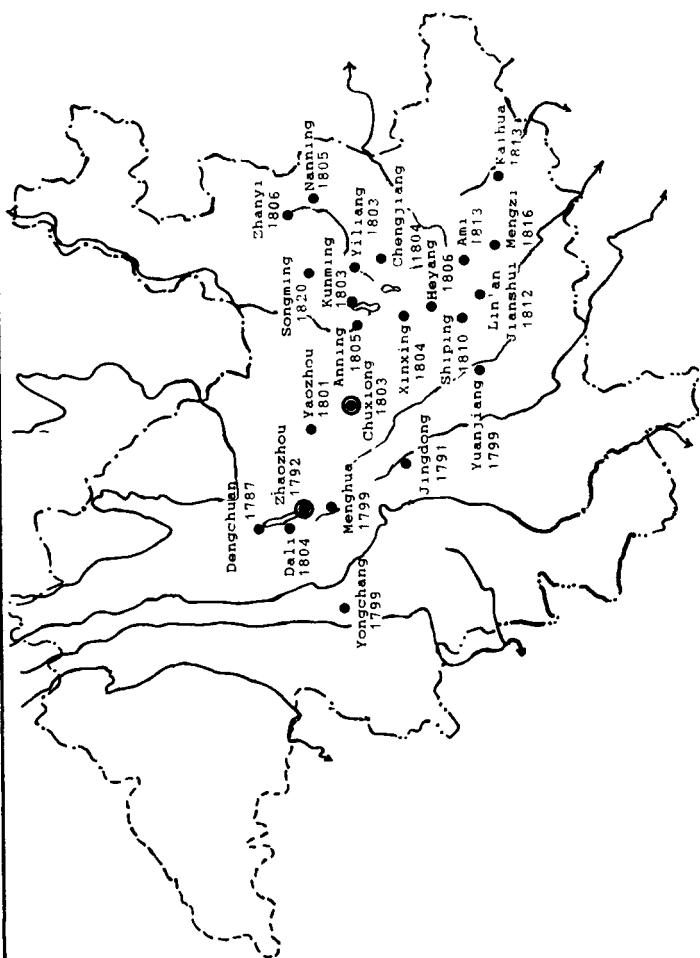
Do not ask how many people die,
The dim sun is covered by gloomy clouds.

Three people take less than ten steps together,
When two die, falling across the road.

People die in the night,
But no one dares weep.

The ghost of plague blows,
The light turns green.

Suddenly the wind rises and the light is blown out,
Leaving man, ghost, corpse, and coffin all in the same dark room.



Map 1: Epidemics Recorded in Yunnan Gazetteers, 1787-1830.*

● Human epidemic preceded by rat epizootic, probably plague.

● Epidemics (yi or da yi) listed in gazetteers, possibly plague.

* Only the first recorded epidemic for each locality is included.

Birds call without ceasing,
The dogs sometimes howl.

People resemble ghosts,
Ghosts struggle against the human spirit.

People met in the daylight are actually ghosts,
Ghosts encountered at dusk are actually people.

The dead litter the ground,
Traces of human habitation diminish.

Human bones are slowly decayed,
By the blowing wind.

There is no one in the fields to harvest the crops,
From whom can the official collect the tax?

I hope to ride the Divine Dragon to Heaven,
Hailing the God and entreating the Goddess,

To spread the heavenly wine and milk,
Saturating the nine plateaus and the 1000 zhang soil,

So that the dead will all return to life,
And the netherworld will be transformed by
The Spring rain.

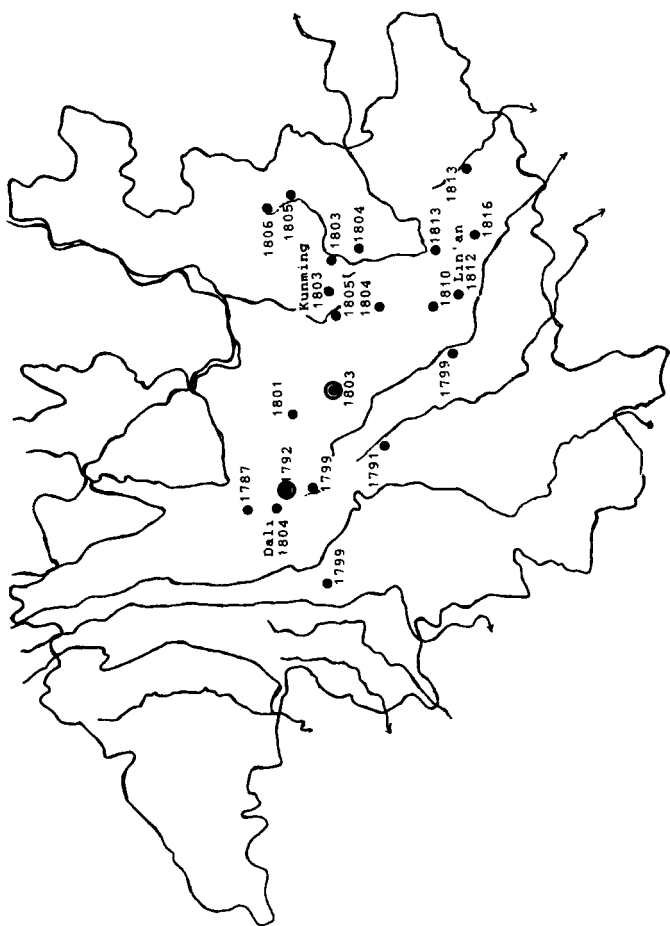
This poem is part of a longer one titled "Tian yu ji" that is mentioned by Hong Liangji (Hong Beijiang, 1736-1809) in "Poems by Beijiang" (1877-1879: 4/3b). In discussing Shi Daonan's poetry, Hong describes the "strange rats" of Zhaozhou that came out of the ground in the daytime, spit up blood, and then fell dead. People "breathing the odor of the dead rats" quickly became ill and died. Shi Daonan himself, according to Hong Liangji, died of this strange disease soon after writing this poem.¹⁰

In the 1790s, when Shi Daonan wrote his poem, southwestern China was undergoing the process of urbanization that is a precondition for the rapid and extensive spread of bubonic plague through the human population. In two recent articles,

James Lee (1982a, 1982b) has documented urban growth in Yunnan between 1750 and 1850. He identifies two major waves of immigration into the province, the first between 1250 and 1600, and the second between 1700 and 1850. The first immigration was predominantly rural in character: Agricultural colonists (normally soldiers and their families) were sent by the government to develop and settle the southwest. The second wave of immigration began in the early eighteenth century. Initially, this wave was also rural: Landless and poor Chinese from Sichuan moved into the southwest frontier, lured by the rich agricultural prospects there. But, gradually, the character of this second wave shifted. Immigrants began to gravitate toward the cities, drawn by new urban economic opportunities afforded by the opening of government-sponsored mines and the huge influx of miners into the southwest. Immigrant merchants arrived to service the mining population and an urban working class developed to work in manufacturing and transport.

This influx into towns transformed Yunnan from a predominately rural region to an increasingly urban one. Before 1750, only the town of Lin'an had reached a population of 50,000. Dali and Kunming had populations of about 30,000. Towns along the major trade routes with Burma—Sinan, Simao, and Tengyue—barely reached 5,000. The aggregate urban population of the Yun-Gui macroregion was about 5% of the total southwest population, the lowest proportion of urban to rural population for any region in China. By 1830, however, the total urban population had grown to about 10% of the entire population, a very high percentage within China at the time (Lee, 1982b: 300-301).

One consequence of Yunnan's urbanization in the late eighteenth and early nineteenth centuries was the increased vulnerability of the urban population to infectious diseases such as bubonic plague. The growth of cities must have precipitated the growth of the urban rat population as well, thereby increasing the risk of human plague epidemic. From descriptions of rat epizootics in Shi Daonan's poem and the Chuxiong county gazetteer, we know that bubonic plague was probably present in



Map 2: Epidemics in Yunnan, 1787-1830.*

● Human epidemic preceded by rat epizootic, probably plague.

• Epidemics (yi or da yi) listed in gazetteers, possibly plague.

* Only the first recorded epidemic for each locality is included.

Zhaozhou and Chuxiong at the end of the eighteenth century. The spatial and temporal patterning of the epidemics listed in the gazetteers suggest that they were part of a larger epidemic that moved first through the area around Dali, then Kunming, and finally Lin'an (Map 2). If plague was indeed responsible for many of the other epidemics listed in the gazetteers, then its spread through the heavily populated areas surrounding these three urban centers suggests that the epidemic was probably quite virulent. There is no way to estimate the number of people who may have died of the disease, but Shi Daonan's poem evokes images of great suffering and loss of life. In Dengchuan county, not far from Zhaozhou, more than ten thousand people reportedly died in the 1787 epidemic (Xu Yunnan tongzhi gao, 1898: 2/21a). The figure "ten thousand" cannot be taken literally, of course, but it does suggest that mortality from some diseases, possibly plague, was quite high.

THE NINETEENTH-CENTURY EPIDEMIC IN YUNNAN

Between 1830 and 1854, no epidemics are listed in Yunnan gazetteers, with the exception of Chuxiong county, which experienced another rat epizootic, followed by an epidemic in 1845 (Chuxiong xian zhi, 1910: 1/6). Then suddenly, beginning in the 1850s, a great number of epidemics appear in Yunnan gazetteers (Table 2). Again these epidemics began in western-central Yunnan: Chuxiong, Menghua, and Yaozhou all experienced epidemics in 1854 (Map 3). Dali had a major epidemic in 1856. Epidemics occurred in the area around Kunming in the late 1850s and early 1860s: Kunming itself was affected in 1858, Lufeng in 1862, Yiliang, Wuding, and Luchuan in 1863. Epidemics broke out in southeastern Yunnan in the late 1860s and eastern Yunnan had a series of epidemics in the 1880s.

Again, the ambiguity of Chinese terminology makes it difficult to tell from the gazetteers alone precisely what disease or diseases were afflicting so many communities. However, Emile Rocher, a French member of the Chinese Imperial Customs Service, made an extensive tour of eastern Yunnan from 1871 to 1873 and his

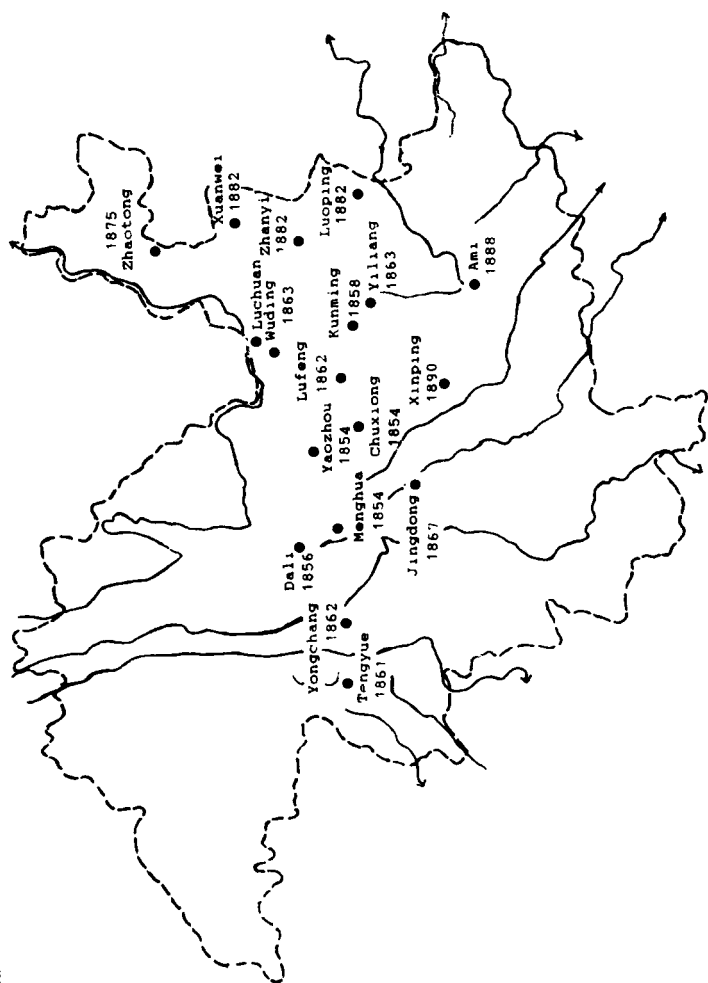
TABLE 2
Chronological List of Epidemics, 1854-1890

Date	County	Prefecture	Date	County	Prefecture
1854	Chuxiong	Chuxiong	1869	----	Yunnan
	Menghua		1872	Yaozhou	Chuxiong
	Yaozhou	Chuxiong		----	Dali
1856	Dali city	Dali		Yunnan	Dali
1858	Kunming	Yunnan	1873	Yaozhou	Chuxiong
1861	----	Tengyue	1874	Yaozhou	Chuxiong
	Menghua		1875	----	Zhaotong
1862	Yaozhou	Chuxiong		----	Yongchang
	----	Yongchang	1876	Jingdong	Jingdong
	Lufeng	Yunnan	1877	Jingdong	Jingdong
1863	Chuxiong	Chuxiong	1878	Yaozhou	Chuxiong
	Yiliang	Yunnan	1879	Chuxiong	Chuxiong
	Wuding	Wuding		Yaozhou	Chuxiong
	Luchuan	Wuding	1880	Yaozhou	Chuxiong
1864	Menghua		1881	Yaozhou	Chuxiong
	Yiliang	Yunnan	1882	Zhanyi	Qujing
	Luchuan	Wuding		Leping	Qujing
1865	Menghua			Xuanwei	Qujing
1866	Menghua		1888	Ami	Lin'an
	Kunming	Yunnan	1889	Ami	Lin'an
1867	Menghua		1890	Xinping	Yuanjiang
	----	Jingdong		Menghua	

notes on the virulent epidemic raging throughout the province leave little doubt that bubonic plague was indeed present at the time of his visit (Rocher, 1879: 1/75; 2/279-281). His observations also lend credence to the view that the disease was endemic in the area.

Upon his arrival in the province, Rocher at first refused to believe the descriptions of the strange disease provided him by Chinese officials, assuming that their "disturbed notions or their superstitious ideas" had led them to invent fantastic stories. When the epidemic reached the district in which he was staying, however, he quickly came to believe what he had been told.

Rocher noted that the epidemic was always preceded by the death of animals that lived in the ground, particularly rats. When these animals staggered out of their burrows and fell dead, people immediately undertook precautions to guard themselves from disease. They purified their houses by lighting a fire in every room and in some districts stopped eating meat. This observation indicates that the Yunnanese had experienced this phenomenon before and readily made a connection between the death of rats and the outbreak of human disease.



Map 3: Epidemics Recorded in Yunnan Gazetteers, 1854-1890.*

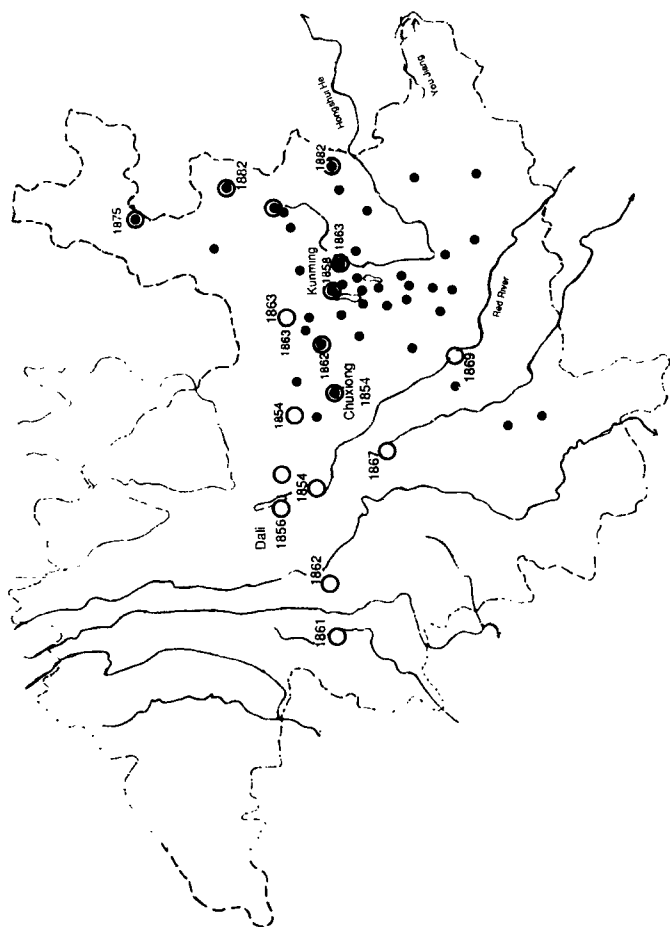
* Only the first recorded epidemic for each locality is included.

The symptoms Rocher describes are very clearly those of bubonic plague. The disease began when the patient had a slight fever. This fever rapidly increased and became very high within a few hours. Buboes appeared, usually in the armpits, the groin, or the neck. Often the patient lost consciousness or slipped into delirium. Occasionally, the buboes opened and then recovery was possible. Otherwise, death was virtually certain. Rocher estimated that in areas where the epidemic was very light, about 4% of the total population fell ill. In some areas, entire families died and the population was almost totally wiped out.

Rocher further noted that the disease appeared in the mountain villages of ethnic minorities, but chiefly among those who traded in the more densely populated plains villages. It did not pass in a direct course from one village to another, but was quite erratic, hitting some villages and sparing others. The plague usually began in May or June and lasted several months "until the rainy season began."¹¹

Rocher was told by Chinese officials that the plague first appeared in eastern and central Yunnan around 1840, but that it had existed in the western part of the province for a much longer time. Some officials thought it had come originally from Burma, while others claimed that it had come from Tibet. It seems most plausible that the disease spread to Yunnan from Burma: A British explorer noted in the 1870s that Yunnanese merchants annually purchased the entire cotton crop of Northern Burma and then brought it back to Yunnan by mule caravan (Cooper, 1871: 165). Cotton is one of the most suspect products in plague transmission because rats eat the seed and nest in the fiber and rat fleas thrive in cotton seed dust (Hirst, 1953: 316). It may have been this cotton trade that was responsible for importing plague into Yunnan in the first place.

For the eastern half of the province, Rocher drew a map designating all towns he knew to be affected by plague between 1871 and 1873 (Map 4). He was unable to investigate the epidemic in western Yunnan, because it was then under the control of Moslem rebels.



Map 4: Epidemics in Yunnan, 1854-1882.

- Epidemics (yi or da yi) listed in gazetteers, possibly plague.
- Outbreaks of bubonic plague noted by Emile Rocher, 1871-1873.
- Epidemics both listed in gazetteers and observed by Rocher.

THE DEMOGRAPHIC CONSEQUENCES OF THE MOSLEM REBELLION

The Moslem Rebellion in Yunnan broke out in 1855 and lasted 17 years (Wei, 1974; Wang, 1968; Wright, 1957: 113-117). The rebellion was sparked by a dispute over the price of ore between Han and Moslem miners in Shiyangchang, Chuxiong prefecture, in 1854. What began as a localized argument soon erupted into large-scale violence. On May 19, 1856, over a thousand Moslems were massacred in Kunming and the surrounding countryside. The massacre set off retaliatory killing throughout the entire province. Under the leadership of Du Wenxiu, Moslems in the western half of the province established a separatist government in Dali. A rival rebel force under Ma Rulong kept military pressure on the Qing forces in central and eastern Yunnan until 1861, when Ma transferred his loyalty to the government. Then, together with Cen Yuying, a native of Guangxi, Ma Rulong carried out a relentless campaign to force the Dali Moslems to surrender. From 1868 to 1873, the area between Kunming and Dali was the scene of contrast troop movement and siege warfare. Qing troops recovered the Moslem bases in southern, eastern, and central Yunnan by 1872. In 1873, government troops placed the Moslem stronghold of Dali under siege for six months. Finally, the city was captured in January 1873. Du Wenxiu committed suicide and the Qing forces laid the city to waste. After three days of murder, pillage, and arson, the entire population of fifty thousand was either dead or missing (Wright, 1957: 117). The government still had to take three other western cities before the rebellion was completely put down in June 1873.

The Moslem Rebellion created enormous disruption within Yunnan and brought population growth within the province to a halt. According to the Yunnan provincial gazetteer, in 1830, the registered population of the province was 6,553,108. In 1850, it was 7,375,503, and in 1855, it was 7,522,000. In 1884, the registered population had dropped to only 2,982,664 (not including the population of Guangnan prefecture and Zhenguan subprefecture) (Xu Yunnan tongzhi gao, 1898: 35/3b, cited in Wang, 1968: 314). The chronic problem of underregistration in the official population registers was no doubt exacerbated by the

civil war and it is impossible to get a truly accurate picture of the demographic consequences of the rebellion.¹² By all accounts, however, the population loss was dramatic. The population of Wuding prefecture reportedly dropped by 78% between the 1840s and the late nineteenth century (Wuding zhoujishi [n.d.], in Bai, 1952: 2/36). After Chuxiong county was recovered by Qing forces in 1869, only about 10% of the original population was left (Chuxiong xian zhi, 1910: 4/4). Only 10% to 20% of the population survived in Yongchang county (Xu Yunnan tongzhi gao, 1898: 81/28, cited in Wang, 1968: 315). Based on accounts like these, Wang Xuhuai estimates that Yunnan's population declined by five million people during the conflict (Wang, 1968: 314).

Depopulation was due more to emigration from the province or to mortality from famine and infectious disease than it was to deaths in battle.¹³ This is not to minimize the effects of the fighting on the civilian population. Descriptions of military violence against civilians during the rebellion are chilling: In one town, the rebels tied up all those under 50 *sui* and those above 16 *sui*, led them outside the city walls and summarily executed them ("Heqing jishi" [n.d.], in Bai, 1952: 2/211). The Yongchang poet, Yin Yi (Yin Yunong), describes the mass suicide of all the inhabitants of one Moslem village who could not face the terrible murder they expected from marauding Qing soldiers (Yin Yi, 1941: 32/20a).

A less drastic response to the threat of violence was to flee. Wealthy gentry and merchants were often able to move to Sichuan, Burma, or Vietnam (Wang, 1968: 318). Others were forced to take refuge in the mountains. In 1859, Gan Yurun, a man from Yang'an, fled to the west to live in Han Cun, a small village in Lianhe. In 1862, when the Moslem army forces advanced on the area, the villagers of Han Cun were forced into the wild. Later, Gan Yurun described the hardships the villagers faced. In addition to the burning and pillaging by Moslem troops, the people of Han Cun had to endure the dangers of wild animals and bandits and the nuisances of insects and inclement weather (Gan Yurun [n.d.], "Buguo Zhaiyi ji," 1/27, cited in Wang, 1968: 319).¹⁴

The primary military strategy used by both the rebels and the Qing forces was siege warfare. As food supplies dwindled in besieged cities, many died of starvation (*Chenggong xian zhi*, 1885: 4/47a). During an 11-month siege of Kunming in 1857-1858, so many died that the corpses could not be buried and "the voices of ghosts could be heard in the daylight" (Zhang Tao [n.d.], "Dianluan Jishi," in Bai, 1952: 1/265-268). In rural areas, the war disrupted agriculture, and grain prices increased, creating famine even in areas not directly affected by the violence (Wang, 1968: 320).

Yunnan's depopulation can also be attributed in part to mortality from infectious disease. The chronicles of the rebellion are filled with references to the devastating effects of epidemics on local populations. Close by the provincial capital, in Lufeng county, between 1862 and 1867, about 70% to 80% of the population died of epidemic disease "as a result of the military campaigns that moved through the area" (*Lufeng xian zhi*, 1927: 1/23). In 1861, in Tengyue county, "The people were utterly exterminated after an epidemic spread" (Cao Kun [n.d.], "Tengyue Dulan jishi," in Bai, 1952: 2/225). In Luoping county, after nine successive years in which epidemics appeared, the area was left sparsely populated (*Luoping xian zhi*, 1932: 1/76). In Yaozhou (Yanfeng) county, some 2,000 people died in an epidemic in 1854 (*Yanfeng xian zhi*, 1922: 12/15b), and several hundred died in Menghua in 1861 (*Menghua zhigao*, 1919: 2/3b). In Yongchang in 1865, some 500 people died, about 70 of them Qing soldiers (Zhang Zhongfu [1878], in Bai, 1952: 2/473).

Western accounts of Yunnan in the 1870s and 1880s also describe a population stricken by epidemic disease. In 1872, Louis de Carne, a member of the French Commission for the exploration of the Mekong, noted that the town of Simao, which once had a population of 30,000, had lost 5% of its people (de Carne, 1872: 219). This devastation was largely caused by the war, but de Carne noted that an epidemic of "plague" was raging at the time they passed through the province. He wrote that in Yunnan prefecture, "the ravages of plague had succeeded those of war. Many coffins lay on the ground without burial" (p. 281). In

Yuanjiang, "not withstanding certain appearances of prosperity, [we soon discovered] the signs of mourning and of poverty. Epidemics are permanently here. . . . I continually saw coffins carried along the streets by four men" (p. 243). Only one street in Puer was inhabited when the expedition passed through (p. 227). Ten years later, in 1883, A. R. Colquhoun (1883: 2/135) traveled through the province and wrote his impressions of areas devastated by epidemic disease:

We had hardly entered the plain [of Yunnanfu] when this [the epidemic's effects] became more evident, and the first villages we passed through—those very ones that had looked so substantial and prosperous from the height—proved that we had entered upon a series of almost totally deserted villages. There are only two enemies of man that can work such desolation where Nature has been so bountiful—war or pestilence. Ten years of peace had given ample time for the wounds inflicted by the civil war to be so far healed as not to show such signs. Besides, the desertion of these well-built, substantial villages and hamlets was evidently not the result of war. There was no destruction here. We soon learned the cause, which confirmed our surmise—we had entered a plague-stricken valley.

Colquhoun was told by the prefect of Jingdong that the city had dwindled from five thousand households to five hundred because of an epidemic (p. 2/137). Another British explorer, Captain William Gill (1883: 272), observed: "The main road, we were told, passes through the plain of Fu-Piau [sic] which had been entirely depopulated by an extraordinary disease, of which the symptoms were like those of plague, and which had, during the months of August and September, carried off upwards of a thousand people. Our informant added that there was no one left except a few poverty-stricken wretches who could not afford to move."

Unfortunately, the above accounts are all ambiguous and we do not know how many are actually describing the effects of bubonic plague.¹⁵ Estimates of deaths due to plague specifically were not made until the 1890s. In 1895, Dr. J. L. Michoud noted that plague killed as many as 50 people a day in the city of Mengzi,

claiming a total of 1,200 to 1,500 victims in the year (Inspectorate General, 1896, No. 50: 41). A French Catholic missionary who had lived in Yunnan for some years was quoted by Michoud as saying that the 1890s epidemics were milder than previous ones and that when plague raged most severely in Kunming, there were 600 to 800 victims daily (Inspectorate General, 1894, No. 48: 51).

The fact that Yunnan's population decline can be attributed to many causes, including military violence, famine, and emigration from the province makes it impossible to sort out the demographic consequences of epidemic diseases generally, let alone the effects of one specific disease. Although both Chinese- and Western-language accounts occasionally provide estimates of the total numbers who died in epidemics in specific localities, we cannot know for certain that bubonic plague was the infective organism in all cases. Moreover, these figures are meaningless without aggregate population figures. The spatial patterning of plague outbreaks as noted by Emile Rocher shows that plague was present throughout much of the province in the 1870s. That it was so widespread suggests that plague was indeed an important factor in Yunnan's overall population decline, but unequivocal statements to that effect must wait until better data are found. The only thing that can be said with any certainty is that deaths from plague continued long after order had been restored in the province and deaths from warfare and famine had ceased.

THE SOUTH CHINA COAST EPIDEMIC

THE TERRITORIAL SPREAD OF THE DISEASE

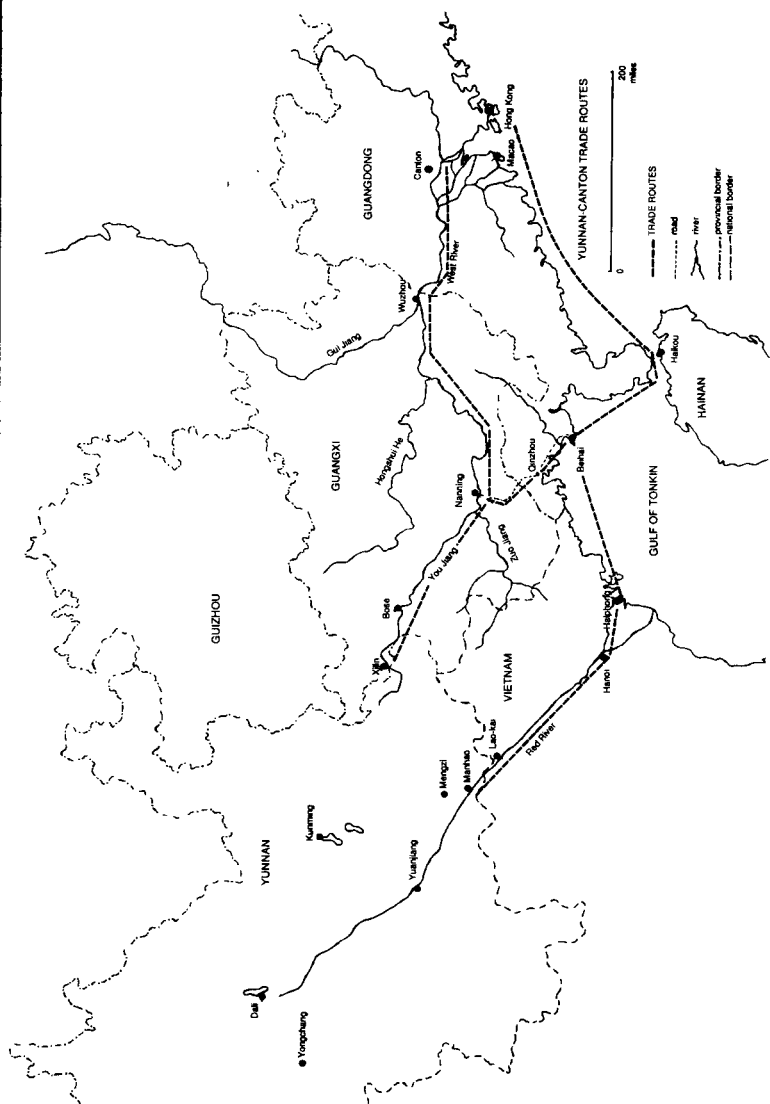
In the latter part of the nineteenth century, bubonic plague spread from Yunnan to the south China coast, moving first through Guangxi province, then through western Guangdong, and finally to Guangzhou and Hong Kong. Once it reached Hong Kong, the disease spread further up the Chinese coastline and across the Taiwan straits, reaching Fuzhou in 1895 (Rouffiandis, 1904), Tainan in 1901 (Maxwell, 1905), and Shanghai in 1908

(Inspectorate General, Decennial Reports, 1902-1911: 25).

It is difficult to determine exactly when and how the disease spread from the Yun-Gui plateau to the Lingnan macroregion.¹⁶ It may have been carried into Guangxi by militiamen returning home from Yunnan, or by migrants fleeing the violence of the Moslem Rebellion. Far more likely, the plague was carried eastward through trade. In the late nineteenth century, there were two avenues of transport between Yunnan and Guangzhou, both of which were important in the domestic opium trade (Map 5). The first was the Red River, which turns south and flows through Vietnam into the Tonkin Gulf. The second was along the You jiang, which originates in eastern Yunnan, flows through the deep river valleys of Guangxi, and then converges with the Hongshui and Gui rivers to form the West River in Guangdong.

Opium and tin from the western half of Yunnan were transported to Guangdong via the Red River (Inspectorate General, Decennial Reports, 1882-1891: 665-680). The upper reaches of the river are scarcely navigable and opium bales bulked at Dali or Yongchang had to be carried by mule train to the market towns of Manhao, 40 miles south of Mengzi. From there, shallow-bottom boats, especially designed for maneuverability in rapid current, departed for the Vietnamese border town of Laokai. The cargo was then transferred to larger boats, and moved down the river to Hanoi and Haiphong, where it was transferred to the junks that carried it across the Gulf of Tonkin to Beihai (Pakhoi) in Guangdong.

In the 1860s and 1870s, there were political obstacles to trade along the Red River. The Vietnamese authorities officially prohibited movement between Annam and Yunnan and the river was controlled by bands of Guangxi pirates (McAleavy, 1968: 95). These barriers may have inhibited trade, but they did not suppress it completely. Francis Garnier, a French adventurer seeking a trade route between Indochina and Yunnan in 1867, was told that this was the route favored by opium and tin merchants from Guangdong and Guangxi (McAleavy, 1968: 83). Following the establishment of the French Protectorate in Vietnam in 1895 and the opening of Mengzi as a treaty port in



Map 5: Yunnan-Canton Trade Routes.

1887 (Inspectorate General, Decennial Reports, 1882-1891: 665), the opium and tin trade along the Red River became more regularized. Passage on the river was still difficult; piracy continued to be a problem and rapids destroyed a high percentage of boats every year. Nonetheless, the opium trade continued to grow (Inspectorate General, Decennial Reports, 1882-1891: 666-670). By the 1890s, commercial intercourse between Yunnan and Guangdong along this route was said to be "incessant," with thousands of peddlers and mule caravans embarking each day from Mengzi for the overland trip to Manhao (Inspectorate General, 1894, No. 48: 42).

The second trade route between Yunnan and Guangzhou followed the southern branch of the West River, the You jiang (Inspectorate General, Decennial Reports, 1882-1891: 647, 653-655, 658, 661). The You jiang has its source in eastern Yunnan but is not navigable until the Guangxi town of Xilin (Badu). Opium was carried overland from Guangnan to Xilin and then shipped by small boats to Bose, the first market for opium in Guangxi. From Bose, a small amount was carried overland to the southwest of the province; the rest was shipped further down the You jiang to Nanning. From there it was further distributed down the West River to Guangzhou, up the Zuo jiang to Taiping, Longzhou, and Pingxiang, and overland to the coastal cities of Qinzhou and Beihai (Inspectorate General, Decennial Reports, 1882-1891: 655).

The journey between Yunnan and Guangzhou along the You jiang and West rivers was long and arduous. From the Xilin terminus of the You jiang to Guangzhou, it was some 830 miles along a river that was filled with rocks, sandbars, and rapids (Inspectorate General, Decennial Reports, 1883-1891: 647). Travelling up the river was extremely laborious. The trip from Guangzhou to Nanning alone, along the most navigable part of the river, took about 30 days (p. 654); from Guangzhou to Bose took about 75 days (p. 665). During the summer rainy season, torrential currents made many parts of the river impassable. Only merchants engaged in the lucrative business of opium could afford to transport goods over such a difficult route.

In addition to transportation costs imposed by distance and topography, transit fees along the West River were high because of the numerous *lijin* stations situated between Nanning and Guangzhou. Before 1891, however, there were very few *lijin* posts west of Nanning and as a result transportation between Yunnan and Nanning was relatively cheap (p. 655). To avoid paying transit fees farther downriver, opium traders often transported their cargo overland from Nanning to the coastal cities of Qinzhou or Beihai (pp. 547, 661). From there, large junks carried the opium by sea to Macao and Hong Kong.

Carrying opium consignments overland from Nanning to the coast and then shipping them by junk to Hong Kong was slower than transporting the goods down the West River. When steamships began making regular trips between Beihai and Hong Kong in the mid-1880s, however, the travel time between the two ports was considerably reduced (p. 637).¹⁷ Whereas it took a month to travel from Guangzhou to Nanning via the West River, it now took only 16 days to ship goods to Beihai and then to carry them overland to Nanning (p. 654). The Beihai route never replaced the West River route entirely because it did not enjoy the same advantage of water communication with the inland trade centers of Guangdong. But, the absence of *lijin* stations between Yunnan and Nanning combined with the speed afforded by steamships meant that a considerable portion of the Yunnan-Guangzhou opium trade along the You jiang and West rivers was diverted through Beihai between 1884 and 1891 (p. 547).

Beihai was thus an important entrepôt for the Yunnan-Guangzhou opium trade along both the Red River and the You jiang trade routes. In the late nineteenth century the amount of domestic opium passing through the port increased significantly (p. 642). Not surprisingly, bubonic plague soon spread to the coastal city. The disease first appeared in Beihai in 1867 (Inspectorate General, 1882: No. 24: 31). It reappeared in 1871, and then reoccurred each spring until 1877. A severe outbreak occurred in 1882 (Inspectorate General, Decennial Reports, 1882-1891: 645), and epidemics of plague continued to appear in Beihai into the twentieth century (Inspectorate General, Decennial Reports, 1902-1911: 263; Pollitzer, 1954: 16-17).

It is possible that plague was imported into Beihai in goods transported along the Red River route (Map 6). Chinese sources consistently state that *shuyi* (rat epidemic) originally spread into China from Annam during the Tongzhi reign (1862-1874) (Shunde xian zhi, 1929: 23/16; Yangjiang xian zhi, 1926: 37/43; Wu Xuanchong, 1901: 2). Only examination of French and Vietnamese sources will show if the disease was indeed transmitted from Yunnan to Beihai via Vietnam.

The path of the disease along the You jiang is more easily traced (Map 6). The first reported outbreak of bubonic plague in Guangxi's interior was in Shanglin county, located on a southern branch of the Hongshui he, about 50 miles north of Nanning. "Shuyi" is reported to have begun in Shanglin in 1867 and continued each successive year for the next 13 years (Shanglin xian zhi, 1934: 16/13). It is unlikely that this was an isolated case, although careful examination of Guangxi gazetteers has turned up no other reference to plague in Guangxi in the 1860s or 1870s.¹⁸ In any event, by the 1880s, bubonic plague was present up and down the West River. The plague struck Nanning in 1889 (Inspectorate General, 1889-1890, No. 39: 15). Rongxian, located on a tributary of the West River close to the border of Guangdong, also experienced an outbreak of plague in 1889 (Rongxian zhi, 1897: 2/11b). Taiping, Longzhou, and Pingxiang, all on the Zuo jiang upstream from Nanning, were affected the same year (Inspectorate General, 1889-1890, No. 39: 15).

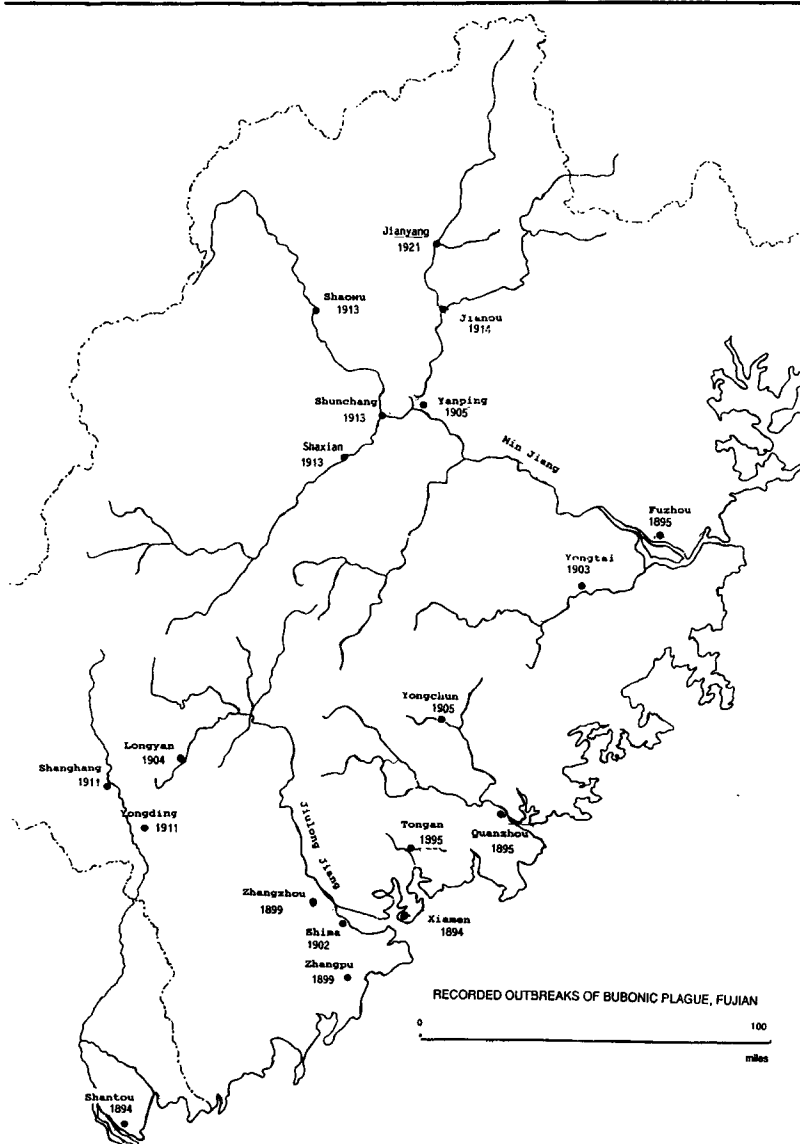
Bubonic plague first appeared in Beihai in 1867, but it did not reach Hong Kong until 1894. The disease did not spread to the colony until steamships made travel between Beihai and Hong Kong fast and convenient. In the late 1880s, when steamships replaced junks as the principal means of conveyance between the two ports, travel time was reduced and the likelihood that plague would spread to Hong Kong and Guangzhou increased substantially. Indeed, bubonic plague appeared in Shunde, Panyu, and Dongguan, all close to Guangzhou, in 1892 (Panyu xian zhi, 1931: 4/7; Shunde xian zhi, 1929: 23/16; Dongguan xian zhi, 1921: 36/71). Finally, Guangzhou and Hong Kong experienced full-blown epidemics in 1894.

The invasion of Guangzhou in 1894 led to the spread of the infection to surrounding areas. Kaiping and Enping, for example, both located on a river south of Guangzhou, had outbreaks in 1898 and 1902, respectively (Kaiping xian zhi, 1900: 25/31; Enping xian zhi, 1934: 14/30). Gaoyao and Luoding, inland cities along the West River, experienced epidemics of plague in 1901 and 1902 (Gaoyao xian zhi, 1938: 13/45; Luoding xian zhi, 1936: 9/21-22).

From Guangzhou and Hong Kong, steamships rather quickly exported the disease to major ports further up the coast (Map 7). Plague broke out in Shantou (Swatow) and Xiamen (Amoy) in 1894 (Cousland, 1896: 23-24; Wu, 1936: 24), in Fuzhou and Quanzhou in 1895 (Maxwell, 1902: 17-22; Rouffiandis, 1904: 417-433), and in Zhangpu in 1899 (Maxwell, 1902: 17-22). Once it became established in coastal cities, plague was slowly carried along the inland waterways to small towns and villages throughout the southeast. Haiyang (Jieyang) county, north of Shantou, had its first recorded epidemic in 1898 (Haiyang xian zhi, 1900: 25/31); Yongding and Shanghang were affected in 1911 (Yang et al., 1939: 56). Tongan, not far from Xiamen, had an outbreak of plague in 1895 (Tongan xian zhi, 1930: 3/20a). Yongtai, south of Fuzhou, was afflicted in 1903 (Yongtai xian zhi, 1932: 2/7). Longyan, about 100 miles upriver from Zhangpu, was infected in 1904 (Longyan xian zhi, 1920: 3/33). Yanping, on the Min River, had an outbreak of plague in 1905, and the disease was further transmitted upriver to Shaxian, Shunchang, and Shaowu in 1913, Jian'ou in 1914, and Jianyang in 1921 (Yang et al., 1939: 56; Jian'ou xian zhi, 1929: 3/21). By the early twentieth century, bubonic plague had become firmly entrenched throughout southern China and perennial outbreaks continued in Guangxi, Guangdong, and Fujian into the 1950s (Wu, 1936: 23-28; Pollitzer, 1954: 16-20).

DEMOGRAPHIC IMPACT OF THE EPIDEMIC ON THE SOUTHEAST

As in Yunnan, it is difficult to pin down the exact demographic consequences of the epidemic on the south China coast. Official



Map 7: Recorded Outbreaks of Bubonic Plague, Fujian.

records in Hong Kong show that there were 2,500 cases in 1894, with 82% mortality; only 44 cases in 1895, with 90% mortality; and 1,204 cases in 1896, with 90% mortality (Wu, 1936: 21, 51). These figures cannot reflect the actual deaths caused by plague in the colony, however, because not all plague cases came to the attention of the British authorities. Crude estimates made by Western observers in various localities are all substantially higher than these official figures. A French doctor put the number dead in Hong Kong in 1895 at 12,000 and those in Guangzhou at 174,000 (Rouffiandis, 1904: 419). A British doctor in Guangzhou estimated that 2.6% of that city's population died in the first four months of the 1894 epidemic (Inspectorate General, 1894, No. 48: 69-70).¹⁹ The plague arrived in Fuzhou in 1895 but there were not many cases until 1899, when 3,000 people died. In 1900, the number of deaths rose to 5,000, and in 1901, 20,000 people, or 5.7% of the city's population reportedly died of plague (Rouffiandis, 1904: 419). The 1902 epidemic of plague in Fuzhou killed perhaps as many as 25,000 people out of a total population estimated to be 350,000 (Rouffiandis, 1904: 423). In Zhangpu in 1902, about 1,500 persons, or 7.5% of the total population, died (Maxwell, 1902: 17-22). In Tainan, where the Japanese implemented strict quarantine, inoculation, and sanitary measures, the plague killed 2.4% of the city's population in 1901 (Maxwell, 1905: 231-235).²⁰

There is some indication that women and children were more susceptible to the disease than were men. The British doctor in Shantou reported that women and children were disproportionately infected (Cousland, 1896: 23-24). In Guangzhou, a British doctor also noticed that plague mainly afflicted women and children (Inspectorate General, 1894: No. 48: 71). In Mengzi, Dr. Michoud observed that the only survivors were young men with strong constitutions (p. 50). This tendency was also recorded by Chinese physicians. Wu Xuanchong (1901: 2), author of a pamphlet on plague and plague prevention, noted that mainly women, maidservants, and children died of the disease. He believed this was because they were often inside the house, usually on the ground floor, where they were closer to the source of

infection, a poisonous vapor that rose from the ground. (I discuss Wu Xuanchong's theory of contagion below.)

There is no biological reason for women or children to be disproportionately affected. Differences in sex and age incidence of bubonic plague cases are due solely to different degrees of exposure to the infection (Pollitzer, 1954: 503-504). Wu Xuanchong's theory may shed light on the reason for differential gender and age susceptibility: In many houses in southern China, there was a space between the floor boards and the soil where rats made their burrows (Yang et al., 1939: 166). If women and children lived on the first floor, they may have come into contact with infected animals or fleas more often than did men. Or, perhaps it was the job of women and children to dispose of rat corpses after an epizootic.

The poor almost certainly suffered more than the wealthy. The poor could not afford cement or brick houses; the mud and wood they used for construction offered ample harborage for burrowing rats (Yang et al., 1939: 165-167; Legendre, 1907: 615-620). Overcrowded conditions made things worse. Rubbish and sewage were often close by (Inspectorate General, Decennial Reports, 1882-1901: 645; Tidswell, 1900: 36), providing food for rats, thereby increasing the rat population and the risk of human infection. Although the wealthy lived in more substantially built homes, even their houses were not free of rats. The double floors of such homes provided a space for rat burrows, and large grain stores were certain to attract rodents. Plague was largely a disease of the poor, but the wealthy did not escape entirely (Inspectorate General, Decennial Reports, 1882-1891: 645; Tidswell, 1900: 36).

SOCIAL RESPONSES TO THE PLAGUE

CHINESE MEDICAL TREATMENT AND ETIOLOGY OF THE PLAGUE

The pamphlet written by Wu Xuanchong (1901), a doctor from Wuchan, Guangdong, provides insight into nineteenth-century Chinese theories on the etiology of plague.²¹ Wu believed that the

disease was caused by a vapor (*qi*) that rose from the ground. Rats were affected first because this poisonous *qi* passed through their burrows on its way to the surface. For the same reason, the ground floors of buildings were more dangerous than were upper stories. This miasma could become trapped inside poorly ventilated buildings; thus dark, sunless houses were more likely to be infected than were open spaces. Rural areas were more immune than cities because they had more fresh air.

Because he believed that the poisonous *qi* could be dissipated by fresh air, Wu Xuanchong urged people to live outside during an epidemic, or, if possible, to move to the countryside. To underscore his point that fresh air was essential for health, Wu cited a case of a man taken for dead who had his clothes stolen just before he was to be placed in his coffin. As a result, his body received the beneficial effects of the cool night breezes and he recovered. In another case, a trader returned home from the market in a sedan-chair. Because he had neglected to open the windows of the chair, he fell dead on his own doorstep.

Wu Xuanchong stressed preventive medicine over medicinal treatment. He urged people to sweep up dust, to clean their kitchens and drains, and to stay away from dark and damp places. He also made a connection between rats and the plague: He urged people to be on guard for dead rats. These, he wrote, had to be buried immediately, but people should plug their nostrils and keep their faces turned away while doing so to avoid breathing the pestilent *qi*.

When preventive measures failed and patients contracted the disease, Chinese practitioners tried various remedies. Herbal therapies were most common and there were dozens of different prescriptions put forward as the most efficacious in treating the disease (Wu Xuanchong, 1901: 35-51). The ingredients for these prescriptions were often difficult to get, however, and became extremely expensive during epidemics (Yu Yue, 1935: 2/130). Herbal therapies were often combined with acupuncture, hot compresses, or scraping of the skin. When nothing else worked, some doctors tried incising the buboes with a knife (Rocher, 1879; Yu Yue, 1935: 2/130).

CHINESE REACTIONS TO
FOREIGN MEDICAL TREATMENT IN HONG KONG

Although they themselves could do little more than administer strong doses of alcohol to their dying patients, many Western doctors working in China at the turn of the century scoffed at the "superstitious" therapies used by Chinese physicians. Yet before the discovery in 1898 that the flea was the missing link in the chain of plague contagion, many Western practitioners believed that the disease was transmitted through dirt, food, or a poisonous vapor rising out of the ground (*China Medical Missionary Journal*, March 1896: 54). For a time, the British in Hong Kong placed patients suffering from plague on boats because it was believed that people living and working on the water were not exposed to the miasma that rose from the ground (Kerr, 1894: 178-179). The British authorities also kept up house-to-house visitation throughout the epidemic, isolating the sick in plague hospitals and removing their relatives to camps outside the city (Wu, 1936: 469; Severn, 1925: 274). But until 1901, they did nothing to eradicate rats or rat corpses because there was not yet a consensus on the role of the rat flea in transmitting the disease. Needless to say, in the absence of effective rodent control, these "scientific" measures did little to prevent the epidemic from spreading.

Not only were the British efforts unsuccessful in stemming the epidemic, they created enormous resentment among the Chinese community in Hong Kong. The Western method of cooling down the patient's fever with ice was anathema to many Chinese, who thought that such extreme cold would only cause further damage. A Chinese daily newspaper in Guangzhou claimed that, "not one person out of ten manages to leave the floating hospital alive" (translated in *North China Herald*, June 15, 1894: 946). The article also asserted that the searchers sent to find sick people rounded up anyone who looked the least bit lethargic:

If they happen to see some one in a recumbent position or taking a nap, he is pounced upon as having been plague-stricken, and the unlucky person is forcibly taken to the floating hospital where with the remedies mentioned above his life is soon taken away.

The Chinese also complained that the bodies of plague victims were not being buried properly but were being "dumped" on a rocky burial ground (*North China Herald*, May 25, 1894: 794).

One response to such treatment by the foreign authorities was to flee Hong Kong. The *North China Herald* (May 25, 1894: 794) reported that "the Chinese are leaving [Hong Kong] for Canton in large numbers. It is to be noticed that it is not the plague they are flying from, as they are going to the nest at Canton from which it [plague] came to Hong Kong. They seem rather to be flying from the sanitary measures taken in Hong Kong, which while foreigners recognise their importance, no doubt appear to them unnecessary and vexatious." Another response was to organize. Over 1,000 people attended a meeting at the Dongwa hospital, about 100 of them women whose relatives had died of plague in the foreign hospital (*North China Herald*, June 15, 1894: 946). These women surrounded the meeting place, wailing and crying against the leaders of their neighborhood districts and against the hospital administration. As a result of this meeting, searchers were forbidden to enter houses without permission and patients were allowed to be placed in Chinese hospitals under Chinese treatment.

POPULAR EXPLANATIONS OF THE EPIDEMIC AND CHINESE RELIGIOUS RESPONSE

In the popular imagination, the epidemic was the result of the displeasure of the gods, witchcraft, or ghostly magic. One story in Yunnan held that the Moslems were using black magic to kill the Han Chinese (*Yongchang fu zhi*, 1886: 3/9). In Liujiang county, Guangxi, it was rumored that foreigners had poisoned the water supply (*Liujiang xian zhi*, 1939: 5/199). Another story from Yunnan claimed that the disease was brought by a ghostly fire that swept through the villages at night (*Yu Yue*, 1935: 2/130).

Probably more commonly, people believed that the epidemic had been inflicted by the gods as a punishment for wrong-doings (Inspectorate General, Decennial Reports, 1882-1891: 671). In Guangzhou, Guan Yu, the God of War, revealed the origins of the

plague to some Buddhist nuns through *fuji*, or spirit writing with the planchette (Portengen, 1896-1897: 461-468). According to the god, the heavens were irritated because the world had become overpopulated and contained too many impious creatures. Thus the gods ordered the annihilation of over half the population by floods and pestilence. Guan Yu told the nuns that he had intervened on behalf of humanity, and that the sentence had been reduced to plague alone. The Celestial Palace had put Guan Yu in charge of the plague, and he supervised 1,000 "ghosts of dead functionaries and demons of the night" to inflict the plague on humanity.

The *fuji* is filled with ethical injunctions, calling on the populace to repent of their misdeeds and to engage in good works in order to be spared. It also disparages unorthodox religious practices, claiming that magical remedies, animal sacrifices, and the burning of paper-joss would do little to stop the plague. Only by adhering to Confucian and Buddhist values could one avoid the pestilence. The *fuji* claimed that the demon of the plague did not enter the houses of "those who respect their parents and who are sincere with their friends." It also offered protection to the wealthy who contributed to charitable institutions. The poor were admonished to read the Buddhist liturgy and illiterate women were urged to burn incense and say prayers every morning and night. Everyone was encouraged to attach an amulet with the 10 characters of Guan Yu's name and title to the door of their house to ward off the infection.

Whether they were responding to the ethical appeals of the gods or not, it is clear that local elites were involved in charitable works and the organization of religious ceremonies to rid the community of plague.²² Some gentry in Guangzhou believed that an image of a minister of the Song dynasty named Bao Zhen, enshrined at Zhaoqing fu, would drive away the plague demons. They petitioned the Zhaoqing circuit intendant to allow this image to be transported to Guangzhou. He consented, and money was collected for the expenses of the god's trip and it was paraded through the streets of the city (North China Herald, June 15, 1894: 946). When the plague appeared in Xiangshan county,

Guangdong, in 1898, the local gentry also brought a new god from elsewhere and set up a new temple in his honor (Xiangshan xian zhi, 1920: 16/7). In Wuzhou, wealthy merchants arranged for "idol processions" to get rid of the plague, paying for the priests, the food, lanterns, and fireworks that were necessary for the ceremonies (Inspectorate General, 1899, No. 58: 45). In Guangzhou, processions "with a view to dispel the evil influences, paraded the streets day and night, accompanied by much noise and firing of crackers." When these measures failed to stem the epidemic, it was proclaimed that a new year would be inaugurated in order that the misery of the early part of the year would be left behind (Inspectorate General, 1894, No. 48: 71-72).

In Yunnan, villagers tried to scare off the plague demons by parading through the village, making all kinds of noise with gongs, drums, bells, and firearms (Yu Yue, 1935: 2/130). The prefect in Mengzi in 1896 assembled the soldiers of his guard every evening in front of his yamen and had them fire salvos in all directions to scare away the evil spirits (Huard and Wong, 1968: 70). When the epidemic raged in Kunming, Cen Yuying is reported to have closed the city gates, and marched his men through the city as each soldier struck at invisible demons with his sword (Huard and Wong, 1968: 70).

PUBLIC HEALTH MEASURES

Although some British in Hong Kong accused the Chinese administration in Ghangzhou of indifference to the epidemic, there are indications that local government both in Guangzhou and elsewhere did respond to the crisis. The concept of full government responsibility for public health had not yet developed within China, but normative prescriptions for public relief during epidemics existed at least as early as the seventeenth century. Although I was unable to find similar nineteenth-century recommendations, the section on epidemics in Huang Liuhong's seventeenth-century handbook for local magistrates is worth quoting at length (Huang Liu-hung, 1984: 554, translated by Djang Chu):²³

On occasions when (epidemics) strike, many victims die; their corpses fill the roads and ditches and give out a terrible stench. It is the magistrate's duty to provide burial land for these unfortunate souls. He should purchase land, preferably from his own allowance or by soliciting voluntary contributions from wealthy families, to provide free cemeteries. Coffins of poor people and travelers without claimants are permitted to be buried there. Unburied coffins with no claimants or identification found in the wilderness or in temples should be reported by the village headman or the monks of the temples and immediately buried in the free cemetery.

When a number of people die in (an epidemic), surviving relatives of the victims will bury their dead, but victims without surviving relatives will have to be buried by the government. If there are enough contributions from philanthropists, these victims will be buried in coffins. If not, the village headmen or the monks will have to bury them in deep pits. A wooden sign describing the deceased's age, appearance, and clothing should mark the grave. The number of burials should be reported to the magistrate's yamen. If the corpses are buried in shallow pits, dogs or wild animals may dig them up and leave the bones exposed, and the village headmen or the monks who conducted the burial should be held responsible. A kind-hearted magistrate will not feel comfortable when there are exposed bones within his jurisdiction.

During the late nineteenth-century plague epidemic, burial of the dead was one responsibility local officials took on themselves. The superintendent of Yaozhou (Yanfeng) county, Yunnan, ordered that the corpses of those who died of plague be buried immediately because he feared their smell would be contagious (Yanfeng xian zhi, 1922: 12/15a). Of course, not all officials carried out this duty diligently. In Beihai, the poor buried their own dead, often on the beach and very close to the surface with the result that corpses were often uncovered by dogs and other animals (Inspectorate General, 1899, No. 58: 46).

Officials also took the initiative in the disposal of rat corpses. Unlike the Europeans, the Chinese made a connection between the dead rats and the epidemic and endeavored to get rid of the carcasses by burying them outside of the city gates (Inspectorate General, 1894, No. 48: 69; Wu Xuanchong, 1901: 5). One official in Guangzhou offered 10 cash for every dead rat brought to him.

Mary Niles, a doctor in Guangzhou, reported that he had collected 35,255 in one month and that about 2,000 a day were brought in (Niles, 1894: 116). Officials also ordered that city streets be cleaned, that all rubbish be thrown out rather than sold, and that the clothes of plague victims be burned (Inspectorate General, 1899, No. 58: 45).²⁴

For the most part, however, local initiative in plague prevention and relief came from the community itself rather than the state. In Yizhang, the local elite gave away a large quantity of medicine and between 20 and 30 coffins per day (Inspectorate General, 1890, No. 40: 5). During the Shantou epidemic of 1899, 170 people formed a relief society intended to "supply medical attentions and comforts, purchase coffins, and arrange for burials" (Inspectorate General, 1899, No. 58: 37). In Yunnan, a guild opened a soup kitchen for plague victims (Zhaotong xian zhi, 1919: 12/17b). In Guangzhou, "charitable institutions" advertised for and engaged doctors, distributed free drugs, and treated plague victims in their halls (*North China Herald*, June 15, 1894: 946). The institutions also promised to reimburse any doctor who treated patients free of charge.

In Yunnan, there is some evidence that communities implemented quarantines against the plague. William Gill (1883: 274) was told that public health guard stations were customary before the rebellion. Stationed on the outskirts of a city or town, guards would prohibit entry to any infected person (also see Cooper, 1871: 165).

Despite the best efforts of physicians, public officials, and charitable institutions, the epidemic continued to spread. Certain practices actually exacerbated the crisis. For instance, the common response of fleeing from a plague-infected area only risked carrying the disease to new areas. And the officially sponsored collection of rat corpses for burial outside the city no doubt increased the risk of infection because people handling the dead rats were convenient alternate hosts for infected fleas.

During the early part of the twentieth century, bubonic plague continued to be a major health problem throughout southern China and the threat it posed spurred the development of new

public health institutions. In 1905, the city officials and merchants established a sanitary department in Beihai (Inspectorate General, Decennial Reports, 1902-1911; 260); following an outbreak of bubonic plague in Tangshan, Guangdong in 1908, local officials opened an isolation hospital and bacteriological laboratory (Wong and Wu, 1936: 521). In 1912, the first "National Board of Health" was established in Guangdong province (Lucas, 1982: 46). Lacking a strong and vibrant central government, however, plague prevention in southern China remained largely a regional and local enterprise. The development of truly effective national-level public health agencies had to await greater political stability.

CONCLUSIONS

Bubonic plague may have been present in Yunnan long before the late eighteenth century, but it did not reach epidemic proportions until the large influx of immigrants into Yunnan's cities and towns between 1750 and 1850 created the urbanized environment necessary for the extensive spread of plague through the human population. Plague is largely an urban disease because its dissemination among the human population depends upon the presence of a large rat population. Because human settlements provide rats with food and shelter, rat populations tend to increase along with human populations. It should not surprise us that the first recorded incidence of what can confidently be identified as bubonic plague occurred in the 1790s, precisely the time when Yunnan's urban population was growing most rapidly (Lee, 1982a: 727-738).

The late eighteenth-century epidemic may have been quite virulent. The imagery in Shi Daonan's poem suggests great loss of life, and the clustering of epidemics in the most densely populated areas of the province at the turn of the century intimates that mortality was probably quite high. Still, deaths from plague were not great enough to offset the dramatic population growth Yunnan experienced in the late eighteenth and early nineteenth centuries. James Lee (1982a: 729) estimates that between 1775

and 1850, Yunnan's population grew from about four million to ten million people. Epidemic disease alone, even one as deadly as plague, could not counteract the demographic effects of large-scale immigration into the province. Moreover, as Lee has pointed out (1982a: 741), the urban character of this immigration meant that Yunnan's population was less vulnerable to Malthusian pressures on food supplies than was the rural population that preceded it because urban development stimulated food production in the periphery.

The Malthusian scenario of depopulation due to pressures on the land was not the only one possible, however. The increased concentration of people in cities and towns created an urban dependency on the rural hinterland. When this supply line was cut by siege warfare during the Moslem Rebellion, urban populations became extremely vulnerable to both famine *and* epidemic disease. The combined effects of war, famine, and disease were devastating for Yunnan's population. While it is impossible to determine how many people died as a result of the conflict, Yunnan's total population declined by perhaps as many as five million people. In the years following the rebellion, bubonic plague was present throughout the province and was almost certainly an important factor in this population decline.

That plague did not spread beyond the borders of Yunnan in the late eighteenth century suggests that the Yun-Gui macroregion was not yet well integrated into an interregional trading system. This is not to say that long-distance trade did not exist in the eighteenth century; it is possible that the plague bacilli originally entered Yunnan from Burma in goods transported back to the region by Yunnanese merchants. Nonetheless, in the early nineteenth century, Yun-Gui remained relatively isolated from the rest of the empire.

Yun-Gui's insularity was a consequence of its unique physiographic features. Unlike the other macroregions described by G. William Skinner (1977: 212), Yun-Gui is not formed by drainage basins surrounded by mountain ranges. Rather, it is a plateau through which most commercial transport had to move by land. The two waterways that connected the Yun-Gui plateau with the

Lingnan macroregion were little used for commerce because they were difficult to navigate and because sections of the rivers were controlled by pirates. By the mid-nineteenth century, only two commodities, opium and tin, had become valuable enough to warrant the exorbitant costs of transport imposed by Yunnan's topography and its distance from the rest of the empire.

Opium bales wrapped in hemp sacks were no doubt excellent nesting places for rats. As the domestic opium trade between Yunnan and Guangzhou increased, so did the likelihood that infected rats would be carried from the interior to the coast. In 1867, bubonic plague appeared for the first time in the Guangdong port of Beihai, an important entrepôt for the domestic opium trade along both the Red River and the You jiang trade routes.

Beihai appears to have become a new endemic focus for the disease: Outbreaks of plague were reported almost every year from 1871 to 1891. With the introduction of steamships in the 1880s, travel time between Beihai and Hong Kong was considerably reduced and the spread of plague to the colony became virtually assured. Once the disease reached Hong Kong, it spread rapidly up the coast, carried by steamships and junks to Xiamen, Shantou, and Fuzhou. From port cities in both the Lingnan and southeast coast macroregions, plague was carried along the inland waterways to towns and villages in the interior. The process of transmission into the hinterland was quite slow, however, and underscores the difference between the coastal and riverine trading patterns at the turn of the century.

The precise demographic consequences of the disease on China's population can be determined only if better data are found. There seems to be a greater likelihood of finding concrete demographic data for the southwest than for Yunnan. We already have rough estimates of mortality in specific localities provided by nineteenth-century Western observers. These estimates range from between 2% to 7% of the total population of the city or town. Submitting these figures to more rigorous demographic analysis might set this epidemic in proper perspective. Was every community over a wide area affected severely or did it affect only a very small percent of the total population?

We may never know the exact demographic dimensions of the nineteenth-century epidemic. But, for the residents of one Cantonese town, at least, its impact must have been great. In gratitude to the god Zhe Gong for his help in finally delivering them from the epidemic, the people of Shatin (Shatian) promised to stage elaborate processions in his honor every 10 years in perpetuity (Hsu, 1983). Today, although few can remember exactly when the plague epidemic occurred, the residents of Shatin faithfully carry out the pledge of their ancestors, honoring Zhe Gong once every decade to keep the demon of plague away.

APPENDIX: List of Gazetteers

I. Yunnan gazetteers

Ami zhou zhi, (1931): II, 23/415-419.
 Chenggong xian zhi, (1885): 4/48b.
 Chuxiong xian zhi, (1910): 1/6.
 Dali xian zhigao, (1917): 9/26a.
 Dengchuan zhou zhi, (1854): 5/4-5.
 Jingdong xian zhi gao, (1923): 2/10a-10b,
 11b-12b.
 Kunming xian zhi, (1894): 8/15.
 Langqiong xian zhi lue, (1903): 1/5b.
 Luchuan xian zhi, (1928): 1/38b.
 Lufeng xian zhi, (1927): 1/22-23.
 Luoping xian zhi, (1932): 1/74-76.
 Menghua zhigao, (1919): 2/2b-3b.
 Songming zhou zhi, (1889): 2/10a.
 Tengyue ting zhi, (1887): 1/6.
 Xiping xian zhi, (1933): 2/6.
 Xu Yunnan tongzhi, (1898): 2/13b-24a.
 Xuanwei xian zhi, (1934): 5/407.
 Yanfeng xian zhi, (1922): 12/14a-15b.
 Yiliang xian zhi, (1921): 1/12-13.
 Yongchang fu zhi, (1885): 3/8-9; 28/13.
 Yuanjiang xian zhigao, (1922): 6/1.
 Yunnan xian zhi, (1890): 1/7.
 Zhanyi zhou zhi, (1885): 4/80-81.
 Zhaotong xian zhi, (1919): 12/16b-17b.

II. Guangxi gazetteers

Guixian zhi, (1934): 18/585.
 Laibin xian zhi, (1936): 2/150.
 Liujiang xian zhi, (1937): 199.
 Shanglin xian zhi, (1934): 16/13.
 Rongxian zhi, (1897): 2/11b.

III. Guangdong gazetteers

Danxian zhi, (1936): 18/16b.
 Dongguan xian zhi, (1921): 36/71.
 Enping xian zhi, (1934): 14/30.
 Gaozhou fu zhi, (1889): 51/2.
 Gaoyao xian zhi, (1938): 13/45.
 Haiyang xian zhi, (1900): 25/31.
 Kaiping xian zhi, (1900): 25/31.
 Luoding xian zhi, (1936): 9/21-22.
 Panyu xian zhi, (1931): 42/7.
 Shicheng xian zhi, (1931): 10/34.
 Shunde xian zhi, (1929): 23/276.
 Xiangshan xian zhi, (1920): 16/7.
 Yangjiang xian zhi, (1926): 37-43.

IV. Fujian gazetteers

Jian'ou xian zhi, (1929): 3/21.
 Longyan xian zhi, (1920): 3/33.
 Tongan xian zhi, (1929): 3/13.
 Yongjun xian zhi, (1930): 3/20a.
 Yongtai xian zhi, (1932): 2/7.

GLOSSARY

Cen Yuying	岑育英
datou tianxing zheng	大头天行症
dayi	大疫
Du Wenxiu	杜文秀
fuji	扶乩
Hong Liangji	洪亮吉
lizi zheng	痲子症
luanzi zhen	卵子疹
Ma Rulong	马如龙
Shi Daonan	师道南
shuyi	鼠疫
Tian yu ji	天愚集
Wu Xuanchong	吴宣崇
yangzi bing (zhen)	痒子病(疹)
yi	疫

NOTES

1. The demographic consequences of the Black Death and the reasons for the plague's disappearance from Europe continue to be debated by historians and epidemiologists (Appleby, 1980: 161-173; Flinn, 1979: 131-148). Indeed, some question whether the "Black Death" was caused by bubonic plague at all (Twigg, 1984).

2. The first was the "Plague of Justinian," which began in Egypt in A.D. 542; the second was the fourteenth-century "Black Death."

3. Yun-Gui, Lingnan, and the Southeast Coast designate three of the physiographically defined macroregions described by G. William Skinner (1977: 211-220).

4. In her pioneering work on epidemics in Ming China, Dunstan (1975) discusses in detail the problems posed by Chinese source materials for historical epidemiology.

5. There is no evidence that the pneumonic form developed in southern China during the nineteenth century, so I do not discuss it further here. There was an epidemic of pneumonic plague in Manchuria in 1910-1911, however, in which some 60,000 people died (Wu, 1936: 31-32).

6. The *Gujin tushu jicheng*, the Imperial encyclopedia published under orders of the Kangxi emperor in 1726, contains a list of epidemics that occurred from 224 B.C. to A.D. 1718 (reproduced in Wu, 1936: 43-51). Epidemics for Yunnan province are included beginning in A.D. 1165.

7. Numerous epidemics are listed in Yunnan provincial gazetteers, but prior to the late eighteenth century such references are quite sporadic (Xu Yunnan tongzhi gao, 1898: 2/13b-24b). See also gazetteers listed in Appendix and lists for Yunnan in Imura (1936-1937).

8. In the late spring, summer, and autumn, temperatures and relative humidity in most parts of Yunnan are moderately high, conditions under which bubonic plague epidemics are known to occur. In May and June, temperatures in Mengzi, for example, range from 18 to 29 degrees Celsius and relative humidity is between 57% and 64% (Pearce and Smith, 1984: 223). In the summer months, temperatures remain about the same, relative humidity is about 70%. In the fall, temperatures range between 15 to 28 degrees Celsius and relative humidity is about 67%. The only season plague would not occur in Mengzi would be the winter, when temperatures dip to between 8 to 20 degrees Celsius and relative humidity is about 55%.

9. Reproduced in Yu Baitao (1910). My translation with the help of Yue Mingbao.

10. I am grateful to Susan Mann for her assistance in locating Hong Liangji's reference to Shi Daonan.

11. Rocher concluded that the mountain people brought the disease into the plains villages, but twentieth-century observations (Pollitzer, 1954: 494) of plague transmission have shown that the infection typically is transported from cities or towns to rural areas. It therefore seems far more likely that the mountain people carried the disease back with them from the lowlands. That the disease spread so erratically indicates that the infection was being passively transmitted by people carrying infected rat fleas or rodents with them as they traveled. If the disease was being spread by the migration of rodents, it would spread in a more uniform fashion (Appleby, 1980: 164). By "rainy season," Rocher may have meant the late summer when thunderstorms are most prevalent in Yunnan. The rainy season actually begins in May and lasts through October, but the heaviest rainfall comes in August (Zhu Binghai, 1962: 533-543). Since heavy rain can kill fleas, Rocher's observation suggests that the plague season in eastern Yunnan lasted from May until August.

12. James Lee (1982a) discusses in detail the problems of underregistration of Yunnan's population in the official population registers. Wang Xuhuai (1968: 315) examines the particular problems the rebellion caused for accurate registration.

13. It is clear that military violence itself was not the major cause of population decline. Officially, about 135,000 Qing soldiers, militia, and officials "died in the line of duty" (Xu Yunnan tongzhi gao, 1898: 109-110, cited in Wang, 1968: 317). As Wang points out, these numbers are probably too low because officials might have underreported casualties in order to put the best face on their campaigns. The *Pingding Yunnan Huipei fanglue* claims that 200,000 Moslems died in battle (Fulu 3, biao 6, cited in Wang, 1968: 317). Wang takes this higher number as a more probable count of the numbers killed on the government's side as well, and he estimates that a total of about 400,000 to 500,000 people died as a result of military action. Yet even this higher estimate accounts for only 12.5% of the recorded population decline.

14. In the mountains, villagers could easily have come into direct contact with wild rodents infected with plague and then carried the disease back to human settlements.

15. The population no doubt suffered from many diseases, any one of which might have caused significant mortality. Ann Carmichael (1983) points out that epidemic diseases are rarely autonomous infections, but are usually part of a "synergistic package" of infections simultaneously besetting a population. Given the prevalence of famine, it is likely that many were afflicted by the "famine fevers," typhus and dysentery. (For the medical relationship between famine and disease, see Bang, 1981.) Malaria was endemic to the area (Li Yaonan, 1954); cholera and other water-borne diseases were probably present as well.

16. Given that the Yun-Gui macroregion is composed of large parts of both Yunnan and Guizhou, plague probably spread to Guizhou as well. However, I was not able to find any reference to rat epizootics in Guizhou gazetteers. In the spring of 1864, in Cunyi prefecture, a large number of rats came out during the daytime. That fall, in the prefectural capital, there was a major epidemic in which entire families fell ill and from which few recovered (Cunyi fu zhi, 1936: 13/5a-5b). The appearance of the rats seems to have been taken as an ill omen but was not actually a rat epizootic.

17. The first steamship arrived in Beihai from Hong Kong in 1879, but until 1885, steamships made only irregular trips between the two ports. In the 1880s, steamships gradually replaced the junks that had monopolized transport along the western coast of Guangdong, and, by 1891, foreign-operated steamships were the primary means of conveyance between Beihai and Hong Kong (Inspectorate General, Decennial Reports, 1882-1891: 637-640).

18. Many epidemics are recorded in Guangxi gazetteers during the 1860s and 1870s, but I have used only those accounts that specifically mention shuyi, rat epizootics, or describe symptoms that are clearly bubonic plague. Inasmuch as Lianzhou, Qinzhou, and Beihai, the coastal towns connected to Nanning by "much used land routes" (Inspectorate General, Decennial Reports, 1882-1891: 661), all experienced severe epidemics of plague in 1882 (Inspectorate General, 1882, No. 24: 31) it seems likely that the disease was present further inland before 1889 as well. Nanning probably experienced outbreaks of plague before 1889; a French missionary who had long lived in the city reported that plague had been present "for years" (Inspectorate General, 1889-1890, No. 39: 15).

19. He estimated the total population at 1,500,000 and the number of plague deaths between March and June at 40,000. Case-mortality was 80%.

20. There were 1,458 cases resulting in 1,202 deaths out of a population of 49,667.

21. Wu Xuanchong wrote his pamphlet on plague in 1891 in the wake of outbreaks of Anpu in 1889 and 1890. His work was collated by another practitioner of Chinese medicine, Zheng Fenyang, in 1901 and reprinted in Qiu Jisheng (ed.) *Zhenben yishu jicheng* (1936). Divided into eight juan, the work covers the history of the plague in the southeast, theories on contagion, different symptoms of the disease, preventive measures, case histories of individual patients, and the many different herbal remedies thought by Chinese medical practitioners to be efficacious.

22. Unfortunately, historical descriptions of the content and purpose of these parades and ceremonies are lacking. There is enough evidence, however, to suggest that they were very similar to the ritual observances Francis Hsu (1983) witnessed in a village near Dali in 1942 during a virulent cholera epidemic.

23. Djang's translation reads "plague." I have changed it here to "epidemic," assuming that the original reads "yi."

24. In 1975, people in Shatin, Hong Kong, burned clothes during the ritual ceremonies commemorating the nineteenth-century plague epidemic (Hsu, 1983: 102). The purpose of this was to provide the dead with clothing. It is not clear if this twentieth-century practice originated in what had been a nineteenth-century public health measure or if there was a ritual aspect to the clothes burning in the nineteenth century as well.

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Carol Benedict is a doctoral candidate in the Department of History, Stanford University.