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0521591775 - Tigers, Rice, Silk, and Silt: Environment and Economy in Late Imperial South China

Robert B. Marks

Excerpt

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## INTRODUCTION

While prominent environmental historians in the West have referred to China's mode of agriculture as a model of sustainable development, that is a dubious claim. Rather, as this history of south China will show, by the turn of the nineteenth century, biodiversity in Lingnan had declined significantly, and the region was "leaking" huge amounts of energy that could only be replenished with massive rice imports to feed the booming human population. Simply put, agriculture in late imperial south China was unsustainable without increasingly greater inputs, and the drive to keep the system in balance led to a substantial remaking of both the environment and the economy of south China over the centuries covered in this book.

By way of defining (and defending) my choice of the two large and inclusive concepts of "environment" and "economy" both in the title and for the focus of this book, let me begin by explaining how the book came to be. I wish I could say I had the plan worked out when I began the research for it some 10 years ago, but that is not the case. In fact, what I have ultimately written is the result of an intellectual journey that began with the problem of food supply: How did the Chinese economy supply food, usually in sufficient quantity, to sustain a growing population during the late imperial period, and what were the economic and social consequences of producing too little or too much food?

The problem of food supply struck me as a good one for exploring the relationships among population growth, commercialization of agriculture, and rural class relations, each of which has been identified by one historian or another as constituting the driving force of long-term historical change. Indeed, the National Endowment for the Humanities was sufficiently convinced by this initial problematic to support me with two grants, for which I am exceedingly grateful. While I am still interested in these broader issues of social and economic history – and most have been incorporated in this book – along the way other topics and problems thrust themselves into my consciousness, resulting in a reconceptualization of my analytic framework.

In particular, while reconstructing eighteenth-century rice prices from the grain lists preserved in large quantities in the archives in Beijing and Taipei, I

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began taking notes from the equally voluminous “rain and grain” (*yu liang*) memorials in which provincial officials reported weather conditions and estimated harvest yields. My first effort to make sense of Chinese officials’ harvest yield estimates and their connection to rice prices led a sympathetic reader of a draft chapter to ask just one simple question: What role did climatic factors have in determining the size of the harvest? All I could offer by way of an answer was to confess my ignorance.

But that simple question sent me into the vast literature on climatic change, where I discovered that Chinese climatologists had produced some of the earliest and most comprehensive studies of the history of climate. With findings from this scientific literature in hand, I returned to my analyses of harvest yields and rice prices, thinking in the process that I might just broaden the focus of my book to include a more general consideration of the impact of climate and climatic change on the economy of late imperial south China. And there I left the conceptualization of the book – until some months later once again I was asked a few simple questions.

While trying to gain perspective on the amount of land under cultivation in Guangdong and Guangxi provinces during the Ming (1368–1644) and Qing (1644–1911) dynasties, I was reading the annual chronicles in the various provincial and prefectural gazetteers. As those familiar with China’s local gazetteers know, these chronicles include brief notations of major events in any given year, from floods and droughts to bandit “uprisings” and epidemics. With chronicles covering centuries, the gazetteers are a rich source of climatological data; indeed, they constitute an important source for the story I will tell here. But at the time I was rereading the Ming-era chronicles for Guangxi province, not for the climatological data (which I had already gathered), but for clues about the extent of land clearance: noting the vast number of accounts of aboriginal uprisings in the fifteenth century, it struck me that aboriginal resistance to Chinese occupation of the land was a very rough indicator of when and where Chinese had “reclaimed” the land for their style of cultivation.

As I pondered these fifteenth-century events and their relevance to land reclamation, I was drawn back to another kind of notation in the annual chronicles that I had found interesting but had overlooked as not relevant to my concerns: reports of tiger attacks on villages. The entries on tiger attacks and aboriginal uprisings had a striking similarity in the eyes of the Chinese chroniclers: both represented intrusions into and disruptions of the Chinese occupation of the land, and from the point of view of the Chinese authors of the gazetteers, aborigines and tigers were all part of the same threat to their culture of settled agriculture. If the reports of aboriginal uprisings roughly charted Chinese penetration of the Guangxi frontier, I reasoned, might not the reports of tiger attacks be a more sensitive indicator?

Being quite ignorant of tiger behavior, I did some initial reading but soon decided I needed to talk with tiger experts. Fortunately, one of the world's greatest authorities on tigers was almost literally in my own backyard. Living in Washington, DC, while writing most of this book, I called Dr. John Siedensticker at the National Zoo, and after explaining my project and questions about tigers, he invited me to visit him near the tiger house at the zoo.

That visit precipitated another reconceptualization of my project. After talking with Dr. Siedensticker about China and my project, he asked me three simple questions that led me once again into new areas of research: Tigers inhabit forests, he said, so what were the forests like? As anyone who has traveled in south China knows, there are no forests there any more. What were the forests like 400 years ago, I repeated? I felt the same pain of ignorance as when I had been asked about climate, and Dr. Siedensticker wasn't even finished yet. Next he said that tigers prey on large game like deer or wild boar, and asked me which large game inhabited the forests and swamps of south China. Again I admitted my ignorance. The last question he asked had less to do with tigers than with humans: in the other parts of the world where he has studied tigers, an environmental danger to the North American and European scientists is malaria, and so he wondered about the prevalence of malaria there. Once again, I could not answer, although I later came to understand that his questions were the ones any good ecologist would ask about the relationships among living things in an ecosystem.

These questions about the relationship of climate and climatic change to historic harvest yields, tigers and forests, and malaria sent me into the literature on environmental history, and there I discovered rich monographic studies and thoughtful reflections on both the history of the environment and the methods and scope of environmental history. My intellectual journey was not yet complete, but by the time I read these works I was quite prepared to understand that the primary goal of environmental history, in the words of one practitioner, is to anchor human institutions – states, economies, societies – in “the natural ecosystems which provide the context for those institutions.”<sup>1</sup> And that is just what I intend to do with this book.

As anyone who has read or studied Chinese history knows, nature is rarely part of the story.<sup>2</sup> Until I was asked these questions about climate, forests, tigers, and malaria and began reading in the secondary literature, I was not fully

<sup>1</sup> William Cronon, “Changes in the Land: Indians,” *Colonists, and the Ecology of New England* (New York: Hill & Wang, 1983), vii.

<sup>2</sup> A significant exception is the work of Edward H. Schafer, whose works on south China during the Tang and Song dynasties (roughly the eighth through the twelfth centuries) attempted to convey something of the sensibilities of Chinese intellectuals about the exotic world they encountered in south China. See especially *The Vermilion Bird: Tang Images of the South* (Berkeley and Los Angeles: University of California Press, 1967), and *Shore of Pearls* (Berkeley and Los Angeles: University of California Press, 1970).

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aware how little nature has figured into Chinese history. Where has nature been? Where does the natural environment fit into the story? Why has it been left out? Having grown up in a small town in northern Wisconsin, I had loved the “woods,” as we called the northern forest that surrounded the town and provided it with the raw materials for its basic industry, paper making. But as I moved away from that small town, first to the university and then to my first academic position in the urban sprawl of southern California, I became ever more removed from contact with the processes of nature. Perhaps our urban existence accounts in part for the disappearance of the natural environment from the histories we have written. But re-reading my Chinese sources – the local gazetteers, travelogues, and officials’ memorials – with these new questions about the environment in mind opened up a whole new vista on late imperial Chinese history. When queried, these sources speak and provide some answers to John Siedenticker’s questions.

And that, in brief, is how I came to write a history of the environment and economy of south China. To the questions about food supply, harvest yields, and agricultural production with which I started, I have added questions about climatic change and the environmental history of China. These questions are interesting enough in themselves, but the significant questions have to do with the relationships between humans and their environment: In what ways did the environment condition the ways in which people settled south China and provided for their subsistence? And what has been the impact of people upon the environment of south China?

Until recently, these large questions have not been the province of historians, but of anthropologists, geographers, and ecologists.<sup>3</sup> But this book is a history, and as a historian I would like to locate questions about China’s environment in the context of my discipline by viewing three “trptychs”: (1) Fernand Braudel’s division of historical time into three layers; (2) Donald Worster’s identification of the three levels upon which environmental history can proceed; and (3) a discussion of three different but related pairs of concepts – “ecology and technology,” “nature and culture,” and “environment and economy.”

*Fernand Braudel.* In his preface to *The Mediterranean and the Mediterranean World in the Age of Philip II*, Braudel divided his book into three parts, each representing separate layers “of overlapping histories, developing simultaneously.” “The first . . . is . . . a history whose passage is almost imperceptible, that of man in his relationship to the environment, a history in which all change is slow, a history of constant repetition, ever-recurring cycles.” The second layer, which Braudel called “social history,” concerned the history of human groups

<sup>3</sup> See especially B. L. Turner II et al., eds. *The Earth as Transformed by Human Action: Global and Regional Changes in the Biosphere of the Past 300 Years* (Cambridge University Press, 1990).

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and groupings: “economic systems, states, societies, civilizations and . . . warfare.” Braudel considered the last layer to be the traditional history of individuals, “that is, the history of events: surface disturbances, crests of foam that the tides of history carry on their strong backs.”<sup>4</sup>

Braudel of course has had an enormous impact upon historians, and he stands as perhaps the preeminent historian of the twentieth century. Many have learned from him and incorporated insights from his work, especially by locating their historical studies in terms of the “*longue durée*,” the long-term view of social history. But despite Braudel’s appropriation of the environment as belonging within the purview of the historian, few followed his lead in this direction. Without claiming that this book compares in any way with Braudel’s *Mediterranean*, I think it can be usefully located in terms of Braudel’s first two “layers” of history. To be sure, at some points in the book I will delve into the connections between social history and the “history of events,” especially when considering the mid-seventeenth-century general crisis, but that realm is not the focus of this book. Here we look at the relationship between the environment and the economy.

*Donald Worster.* Braudel did not conceive of *The Mediterranean* as a history of the environment or as environmental history, in part because he had a larger agenda and in part, perhaps, because the field of environmental history had not yet taken form when he wrote. But by the time *The Mediterranean* was translated and published in English in 1972, some historians had begun to write what they considered to be “environmental history.” Among these was the American historian Donald Worster, whose *Dust Bowl: The Southern Plains in the 1930s*,<sup>5</sup> was a pioneering and highly regarded work. In reflecting upon and trying to define the new field of environmental history that he helped create with his book, Worster recently argued that the new history proceeds along three lines of inquiry: “The first involves the discovery of the structure and distribution of natural environments of the past.” This task is a prerequisite for writing environmental history, both because of the paucity of source materials and because doing so is not easy. “To make such a reconstruction,” Worster advises, “the environmental historian must turn for help to a wide array of the natural sciences and must rely on their methodologies, sources, and evidence.”<sup>6</sup> As I have already related, I have found all of that to

<sup>4</sup> Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II*, Siân Reynolds trans. (New York: Harper and Row, 1972), 20–21. As much of the literature on global change now shows, the pace of environmental change both now and in the past has not been so slow as to be as “imperceptible” as Braudel thought.

<sup>5</sup> Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York: Oxford University Press, 1979).

<sup>6</sup> Donald Worster, *The Wealth of Nature: Environmental History and the Ecological Imagination* (New York: Oxford University Press, 1993), 48.

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be true, and to be good advice as well. As environmental historians, we must rely on the work of scientists, and we must synthesize large amounts of scientific work for our purposes. Thus, to write this book I have relied on the work of climatologists, geologists, physical geographers, botanists, soil scientists, and zoologists, to mention just a few, to learn about climatic changes, forests, elephants and tigers, malaria, and the growth rates of rice plants. I can only hope that I have fairly and accurately synthesized the scientific research and conveyed it in a way that is understandable to those interested in Chinese history.

The second panel in Worster's triptych "focuses on productive technology as it interacts with the environment." The historian's tasks here, according to Worster, are to understand "how technology has restructured human ecological relations" and to analyze "the various ways people have tried to make nature over into a system that produces resources for their consumption. In that process of transforming the earth, people have also restructured themselves and their social relations."<sup>7</sup> In this book I am concerned mostly with agricultural technologies, including the use of fire to clear the forests and the construction of the vast and impressive water control and irrigation works necessary for wet-rice cultivation. An important part of that story is not only the human effort to produce enough food to support a large and growing population, but the ways in which that effort transformed the physical environment of south China.

From physical geography and the working of technology upon it, Worster turns in the third panel of his triptych to a consideration of the "more intangible, purely mental type of encounter in which perceptions, ethics, laws, and myths have become part of an individual's or group's dialogue with nature."<sup>8</sup> I wish I could have spent more time considering Chinese and non-Chinese conceptions of the environment within which they found themselves – from their explanations of diseases like malaria to attitudes toward forests and beliefs about the morality of land clearance – for they do raise important questions. Did their belief that the best use of land was for agriculture provide the Chinese with the moral justification for expropriating the lands of non-Chinese forest dwellers? Or did they not even feel the need for justification? Did beliefs about the causes of drought devalue tigers and remove compulsions about killing them off? I do not know the answers to questions like these. The most I am able to do is pose them and speculate about possible answers. I hope that readers will not feel shortchanged; perhaps others will take up a study of Chinese "mental encounters" with their environment, for such a study surely is needed.

The third triptych that I use to locate the subject matter of this book is a discussion of three related but different pairings – "ecology and technology,"

<sup>7</sup> Worster, *The Wealth of Nature*, 49.    <sup>8</sup> *Ibid.*

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“nature and culture,” and “environment and economy” – each of which I considered as possible subtitles; I chose only the last as most apt, and I would like to explain why. First, the pairings themselves indicate that I am interested in exploring relationships, not just one or the other element. It is entirely possible, for example, to write a history of technology without considering the impact of technology upon ecosystems or to write the history of an economy without consideration of the environment, as any casual perusal of the books under the Library of Congress classification “HC” or “HD” will reveal. These three pairings thus represent a problematic conveyed by the tiny word “and”: What was the relationship between the development of the economy *and* the environment? Was there a causal relationship that ran one way or the other, or a more complex and less certain relationship? The “and” in the subtitle therefore is highly problematic and not easily analyzed, regardless of which concepts are linked through it.

*Environment and Economy.* I have chosen to use the term “environment” rather than “ecology” or “nature” not just because it includes climate and climatic change, but also because the field has defined itself as “environmental history.” To be sure, if “ecology” is the study of the relationship between living things and their environment, then it includes human beings. But “environmental history” has come to connote specifically the relationship of people to their environment, and so “environment” conveys a more precise meaning here than “ecology.” By “economy” I do not mean to include all forms of production, distribution, and consumption, although that of course is its general definition, but rather in the context of late imperial China I want to emphasize the agricultural economy. I do so on the grounds not only that the economy was overwhelmingly based on agriculture and thus that the cycles of agriculture for the most part determined larger economic cycles, but also that agriculture is the economic activity most closely connected to the environment. Indeed, a whole field of study (and a journal) is devoted to “agricultural ecology.” “Agriculture” or even “agricultural economy,” though, would be too narrow, for in the scope of this book I include markets and grain prices, both of which are more properly included in the concept of economy; on the other hand, “agricultural economy” is often conceived in terms of the ways in which farming households make cropping and marketing decisions. Hence, for the title of the book at least, “economy” seems more appropriate and “economical” than other choices.

*Time and Place.* I would like now to return to a more personal narrative to explain my choices of time and place for the book. China, with an eighteenth-century population about the same as all of Europe west of the Urals, is too large and complex to analyze as a single unit. Merely because it remained a unified empire with a single name rather than fragmenting into countless



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political units that would become independent states, as happened in Europe, is not a good reason to attempt to write the history of “China” as if it were an undifferentiated whole. Like Europe, China is best analyzed in smaller units. The question is not whether to conceive of China in smaller units, but how best to do so. The strongest case so far has been developed by G. William Skinner, who analyzed China in terms of eight physiographic “macroregions” and then provided considerable empirical evidence that demographic and economic cycles of development occurred within those regions. As I will argue in various places in the book, Skinner’s macroregional analysis is compelling and provides a starting point for analyzing China’s economic and environmental history.

The region discussed here is called “Lingnan,” which can be translated as South of Mountains. I will discuss the meaning and location of Lingnan more in Chapter 1, so for now it will suffice to identify it as the region roughly within a 200-mile radius of Hong Kong. I chose historic Lingnan for two basic reasons. Despite the compelling rationale for analyzing Chinese economic history in terms of macroregions, the Chinese state reported demographic and economic data according to political units – provinces, prefectures, and counties. Fortunately, Lingnan as a physiographic region is nearly coterminous with two provinces – Guangdong and Guangxi – so that collecting data has been significantly simplified. The two terms – “Lingnan,” as defined physiographically, and “Liangguang,” or the “Two Guang” provinces – are not exactly the same, so I will at times note and discuss the differences, but even these designations provide opportunities to test some of the hypotheses generated by a macroregional analysis.

I also chose Lingnan because I already knew something about the region and its history<sup>9</sup> and because few other scholars are focusing their attention on its history. Because this region of China is currently undergoing the most rapid and transforming economic development, an environmental history of Lingnan thus can provide an important context for understanding contemporary developments in the People’s Republic of China.

Originally I had conceived of the book as focusing on just the eighteenth century, the period for which archival sources are most rich. But as I worked on the problems of the economy I realized I had to extend my analysis both earlier and later into the middle of the nineteenth century, with the bulk of the study on the period beginning about 1400 and ending in 1850. As Braudel pointed out, the history of the environment can best be told on the scale of centuries, while that of the economy requires long periods to chart the changes too. On these grounds alone, four and a half centuries would seem defensible. But they are not just any 450 years: they begin with the first reasonably

<sup>9</sup> Robert B. Marks, *Rural Revolution in South China: Peasants and the Making of History in Haifeng County, 1570–1930* (Madison: University of Wisconsin Press, 1984).



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good, disaggregated population data and end with the mid-nineteenth-century Opium War, the Taiping Rebellion, and important changes in global temperatures.

Most of the book thus concerns the period of Chinese history most scholars now call “late imperial China.” But a 1994 trip to Lingnan convinced me that it was necessary to extend the period of study even earlier. I visited three elements of the Lingnan landscape that had emerged in my mind as significant in defining the region: the Meiling Pass in northern Guangdong, “chiseled” through the mountains in 716 CE; the Ling Qu Canal in northern Guangxi, linking the Xiang River flowing north into the Yangzi River drainage system to the Li River flowing south into Lingnan’s drainage system and constructed during the Qin dynasty (ca. 215 BCE); and the alluvial fields (*shatan*, or “sand flats”) of the Pearl River delta, one of the most agriculturally rich and productive areas of China. The first two chapters thus cover aspects of the environmental history of Lingnan from the Qin (221–207 BCE) through the Yuan dynasty (1279–1368 CE), including the story of how the Pearl River delta came to be “made.”

*Problems and Perspectives*

The central problematic of this book can be summarized as follows: What was the nature and extent of environmental change in south China? Did the activities of people contribute to environmental change? How can those changes be documented? Did climatic changes affect the environment and the economy? If so, how? And finally, did the environment and the changes (both naturally caused and anthropogenic) in the environment affect people, their choices, and, hence, their history? The picture of the relationship between people and the environment that emerges from this book is dialectical, not unidirectional. Just as people changed their environment, so too did the environment condition and shape the society and economy of south China. I explore this broad theme in terms of four major topics that are interwoven throughout the book: climatic change, population dynamics, commercialization of the economy, and the role of the state.

*Climate.* The sharpest way to phrase the question is: To what extent has climate change affected the course of history? In the context of current concerns about global warming and its possible dangers, this question is of more than passing interest. Answers so far have ranged from “slight, perhaps negligible,”<sup>10</sup> to “an important (and neglected) historical force.”<sup>11</sup> The issue

<sup>10</sup> Emmanuel Le Roy Ladurie, *Times of Feast, Times of Famine: A History of Climate since the Year 1,000*, Barbara Bray trans. (Garden City: Doubleday, 1971) 119.

<sup>11</sup> The position attributed by Jan deVries to John Post and Christian Pfister, in “Measuring the Impact of Climate on History: The Search for Appropriate Methodologies,” in R. I. Rothberg

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has been highly controversial, stimulating debate over both data and methodologies.<sup>12</sup>

While these issues inform the work on climate that I present in this book, I do not suppose for one moment that my work will resolve the question. But I think it does contribute to the debate in at least two ways. First, nearly all of the work exploring the connection between climate and history has focused upon Europe. And while Europe and Europeans turned out to have been historically significant for the world, it seems to me imprudent to generalize from the history of that highly unusual peninsula of Asia. Bringing the Chinese historical record to bear should thus serve to broaden the base from which generalizations are made. Second, the evidence from south China leads me to take a middling position in the controversy. I certainly will not present a “climatic determinist” argument, but I do think that climatic fluctuation and change have affected human societies, especially those like late imperial China that were based upon agriculture. The problem is not merely to determine the specific linkages of climatic change to the ways a society or economy functioned, but also to document the ways in which humans responded to a changing climate, building and sustaining institutions that buffered people from unwanted consequences of climatic fluctuations, especially upon food supplies. Thus, rather than seeing humans as unresponsive, passive objects in the face of climatic changes (or vice versa), I think it makes more sense to think about the ways that climate and human society interacted. This does not mean that climatic fluctuations or changes were insignificant, but neither does it suppose that climate changes alone account for the course of historical change in south China (or elsewhere for that matter).

*Population.* Demographers are beginning to demonstrate similarly complex interrelationships between population dynamics and economic conditions;<sup>13</sup> one has even begun to probe the ways in which grain prices affected vital rates.<sup>14</sup> The point of this recent work is that population dynamics are

and T. K. Rabb, eds., *Climate and History: Studies in Interdisciplinary History* (Princeton: Princeton University Press, 1981), 23.

<sup>12</sup> See the essays in Rothberg and Rabb, eds., *Climate and History*, and in T. M. L. Wigley, et al., eds., *Climate and History: Studies in Past Climates and Their Impact on Man* (Cambridge University Press, 1981). The debate, of course, is much older, going back at least to Ellsworth Huntington's *Climate and Civilization* (New Haven: Yale University Press, 3rd revised edition, 1924).

<sup>13</sup> See especially three articles by Patrick Galloway: “Annual Variations in Deaths by Age, Deaths by Cause, Prices, and Weather in London, 1670–1830,” *Population Studies* 39 (1985): 487–505; “Long-Term Fluctuations in Climate and Population in the Preindustrial Era,” *Population and Development Review* 12, no. 1 (Mar. 1986): 1–24; and “Basic Patterns in Annual Variations in Fertility, Nuptiality, Mortality, and Prices in Pre-industrial Europe,” *Population Studies* 42 (1988): 275–303.

<sup>14</sup> James Lee, Cameron Campbell, and Guofu Tan, “Infanticide and Family Planning in Late Imperial China: The Price and Population History of Rural Liaoning, 1774–1873,” in Thomas